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BUSINESS CYCLES
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BUSINESS CYCLES AND FORECASTING

By

ELMER CLARK BRATT, PH.D.

Professor of Economics
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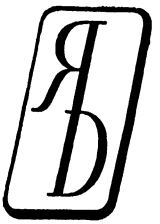
THIRD EDITION



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PREFACE

THE purpose of this book is first, to provide the background essential for explaining economic change, and, second, to point the way toward the possibilities for stabilizing and controlling business cycles. Seasonal variation, business-cycle fluctuation, and longer-term movements are considered separately because they represent different patterns of behavior. In line with recent thinking, secular and secondary trends are differentiated in the analysis of longer-term movements. The secondary trend incorporates a widely recognized pattern frequently noted by long-cycle measurements. Its separate consideration adds leverage to the analysis and is one of the distinctive features of this third edition. The secondary trend is of primary importance both in explaining and in controlling deep depressions.

In the eight years since the second edition was published, the economic picture has fundamentally changed. Much has been learned about the forces responsible for the business cycle, and the chapters on business-cycle theory have been rewritten accordingly. In the present world no hope remains for completely automatic adjustment, and therefore proposals for forcing stabilization are given a new importance, with the central thread of development reaching into the problem of economic planning.

Other major changes have been made, such as bringing the business-cycle history up to date and giving recognition to the almost completely changed series of business barometers now available. Newly available data provide the basis for a method of business-cycle forecasting far more promising than any heretofore employed. This method is developed in Chapter XVIII.

As in the previous editions, emphasis is placed upon the information necessary to understand economic conditions at any given time. Of first importance is recognition of the divergent contribution to economic change of seasonal variation, business-cycle fluctuation, and secondary and secular trends. The forces responsible for the business cycle are the most difficult to trace, and some conflict still exists in business-cycle theory. It is important that the student learn something of this conflict as well as of the more substantial area of agreement. It is even more important, however, to recognize business-cycle processes as they occur. The consideration of opinions regarding fundamental causes is less important than the recognition of patterns

of behavior in economic change. Both in forecasting and in economic planning, central emphasis must be placed on patterns of behavior.

Acknowledgment is made to my students at Lehigh University and elsewhere whose reactions in the last twenty years have been of substantial aid in developing the thought in this book. Special recognition is due Professors F. A. Bradford, J. V. Burkhead, and R. M. Davis of Lehigh University, who have read portions of the manuscript; to Professor L. A. Maverick of Southern Illinois University, who supplied extensive comments on the second edition; and especially to Mr. R. D. Woodward of Bethlehem Steel Company, who read about half of the manuscript so thoroughly and brought to it such an extensive background that his contributions are particularly important. The author's wife has contributed by rendering a measure of constant and generous assistance during the various stages of the book's development. Wherever practicable, acknowledgment is made at various points in the book. The author is deeply grateful for the assistance rendered and happy for the opportunity to shoulder complete responsibility.

ELMER CLARK BRATT

BETHLEHEM, PENNSYLVANIA
November, 1947

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CHAPTER I

INTRODUCTION

THE perpetual fluctuation in economic conditions in the twentieth century pervades almost all phases of human life. This pervasion appears to be as general as at any time in the history of man, in spite of the greatly increased standard of living which is enjoyed today. Change in economic conditions determines the amount of available employment; it also has an important influence upon the use of leisure, the function performed by government, the rate at which people marry or divorce, the attitude toward religion, the liberality of ideas, etc. Many persons think that world peace is dependent upon reasonably stable economic conditions.

Economic change exerts a disproportionate influence upon life in general. This fact has led to many proposals for reducing the fluctuations which occur. To prevent these fluctuations, reforms have been suggested which range from the slowing-down of technological progress to the replacement of the capitalistic system by communism or socialism.

Any remedy should be founded upon an understanding of the nature of economic change. It is necessary to know why economic change takes place, how it can be measured, and the extent to which it can be forecast. To provide this information is the function of the present book.

An understanding of economic change depends, first of all, upon a realization that there are different types of change taking place concurrently. Economic change results from the shifting seasons of the year, from recurrent prosperities and depressions, and from long-period movements. Each of these three types of change must be analyzed. Without this segregation economic change is confusing. Seasonal improvement may be mistaken for recovery. An industry showing long-period decline may appear to be experiencing a temporary depression only. Understanding is required to discriminate between the recession present in all depressions and the long-period decline which may continue into the distant future.

Seasonal variations produce unemployment at off-seasonal periods and prevent the most efficient use of capital. A failure to give adequate consideration to the seasonal variations which are likely to occur may

have serious results, such as, unpreparedness for slack seasons, the piling of inventories in active seasons, or the purchase of goods at high prices during active seasons, when purchase at lower prices during dull seasons would have been more satisfactory.

Recurrent prosperities and depressions produce the business cycle. Our central problem is the analysis and description of the forces which perpetuate and reverse these movements. Six steps are involved. The first is a general statement of the forces responsible for the business cycle. These forces are of two general types: those which keep the cycle going from within the cycle itself and those which originate outside the cyclical round of events. The purpose at this stage of analysis is not to isolate specific causal factors but to describe the *process* of cyclical movement.

The second step involves an analysis of the outstanding attempts to isolate specific causal factors. The theories involved are classified and described. Many common ideas run through the various theories, and many opposing positions are taken. The issues involved are resolved in the light of present knowledge.

The third step introduces the history of the business cycle. This shows how the business cycles which occurred in the past conform to the process described and the theories developed to explain them. Major emphasis is placed on the period since 1929 because of the violent character of the recent movement, because of wide interest in the period, and because of the improved data now available.

In the fourth step a description is provided of the important series available for following current economic change. A great deal of information is necessary to understand the current cyclical position at any time, and much of the necessary information is now available.

The fifth step involves projecting the cyclical movement into the future. In the past, business-cycle forecasting has been notoriously deficient, but with information now available the basis has been laid for effective forecasting into the near future.

Finally, the proposals which have been made for stabilizing business conditions are taken up. Representative proposals present widely varied programs. Most of the current proposals look toward full employment, and therefore it is very necessary to give careful attention to this aspect of the problem.

The factors responsible for the business cycle differ substantially from those responsible for long-period movements. For instance, destruction of property will reduce secular growth, but in a depressed period it will ordinarily drive the cyclical movement upward. (This is not to say that the destruction of property is desirable in a depression.) Failure to differentiate between long-period and

business-cycle movements leads to even more confusion than when the seasonal change is not clearly identified. If rapid business-cycle recovery is projected indefinitely into the future as if it were a long-period movement, much overexpansion is the inevitable result. On the other hand, the projection of the levels of a cyclical depression indefinitely into the future leads to a tragic underestimation of potential markets.

The long-period movement is comprised of two sections: a primary, or secular, trend and a secondary, or fluctuating, trend. The secular trend describes the growth in the possible standard of living or capacity to produce. The factors responsible for secular growth are given special consideration because secular growth determines the conditions which will be required for full employment in the future. It also provides the basis for determining what expansion programs are advantageous.

The secondary trend is a pernicious drift away from secular levels. It is sometimes called the "long cycle," but it is important to differentiate the secondary trend clearly from the business cycle, for the former is not subject to rapid reversals, such as occur in the business-cycle movement. The secondary trend clearly has existed in the past, but neither our logical understanding nor our measurement of it is completely satisfactory. Nevertheless, there is urgent need to differentiate this drift from change in the secular trend so that something may be done about it. Therefore, the range of logical factors which may conceivably be responsible are suggested. Most important in a secondary-trend decline appears to be a reduced estimate of potential markets.

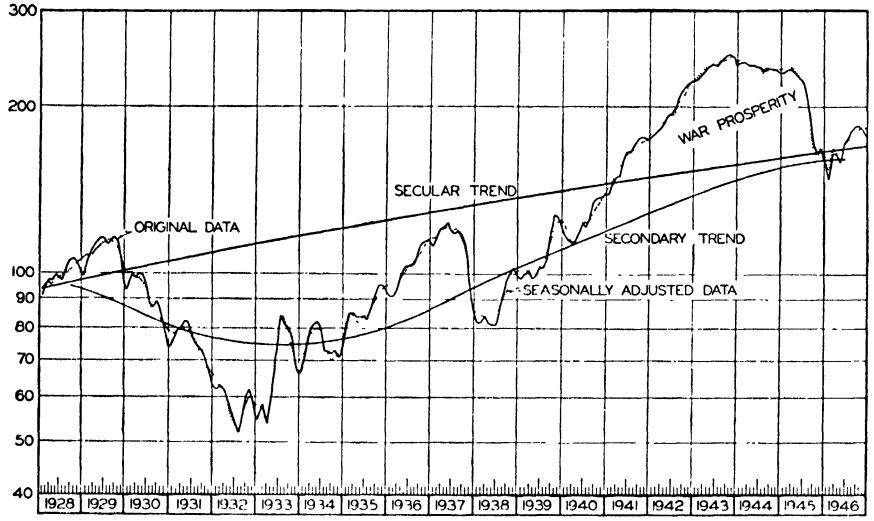
In order that the component elements of economic change here distinguished may be seen more clearly, Chart 1 has been drawn. It shows a conceptual division of industrial production into the four components noted above: seasonal variation, business-cycle variation, and secondary and secular trends. Since the period covered is so recent and major difficulties are involved in estimating the long-period movements for this period, the secondary and secular trends are purely hypothetical and presented only for the purposes of this illustration. The solid line labeled "original data" shows the total movement. The difference between this line and the dotted line is the seasonal variation. The difference between the dotted line and the secondary trend is the business cycle. ("Irregular fluctuations" as classified in Chapter IV, such as strikes, are included with the business-cycle movement.)

It will be seen that the seasonal variation fluctuates about the business cycle, the business cycle about the secondary trend, and the secondary trend about the secular trend. At times when the secondary

trend does not depart so violently from the secular trend as in the thirties, approximate results can be obtained by measuring the business cycle about the secular trend. In the thirties, however, such a method is unsatisfactory, for the 1937 peak is substantially under the secular trend. As shown in Chapter XIII, the 1937 peak truly represents a high point in the business cycle. Seldom has a business-cycle

CHART 1

CONCEPTUAL DECOMPOSITION OF TIME SERIES COMPONENTS APPLIED TO INDEX OF INDUSTRIAL PRODUCTION (1928 TO 1946)*



* Board of Governors of the Federal Reserve System. Secular and secondary trends are preliminary estimates made by the author.

peak fallen under the secular level, but its occurrence in this instance definitely illustrates the necessity of recognizing the secondary trend.

The secondary trend in Chart 1 has been drawn to represent civilian production only. The extremely high level of industrial production from 1942 to 1945 results from war prosperity. The decline from 1943 to 1946 does not represent a business-cycle recession but merely a decrease in the manufacture of war munitions. To represent civilian activity, the top part of the curve can be cut off by an approximately horizontal line running from December, 1940, to December, 1945. The series shown in Chart 1, representing principally manufacturing, shows the war prosperity more strikingly than do inclusive series. Chart 1 therefore depicts the excessive heights of war prosperity in addition to the four recurring parts of economic change noted above.

There is now almost universal agreement that the long-period movement is too complex to be satisfactorily described by one line.

Less universal agreement is found for the division into secular and secondary trends, although the author believes this to be the most effective method available. It may be contrasted with Schumpeter's conception of three instead of two divisions, as shown in Chart 2. On this chart there are two long waves in addition to the business cycle, while the secular trend is represented by the horizontal line.[1] The more we multiply the parts into which we divide economic change, the more complicated the picture becomes. Schumpeter's chart shows the secondary trend broken down into two long waves. As a result of this additional complication, Schumpeter finds it desirable to think of cycles with a uniform length. Periodic, or uniform length, cycles appear unrealistic as developed later.[2]

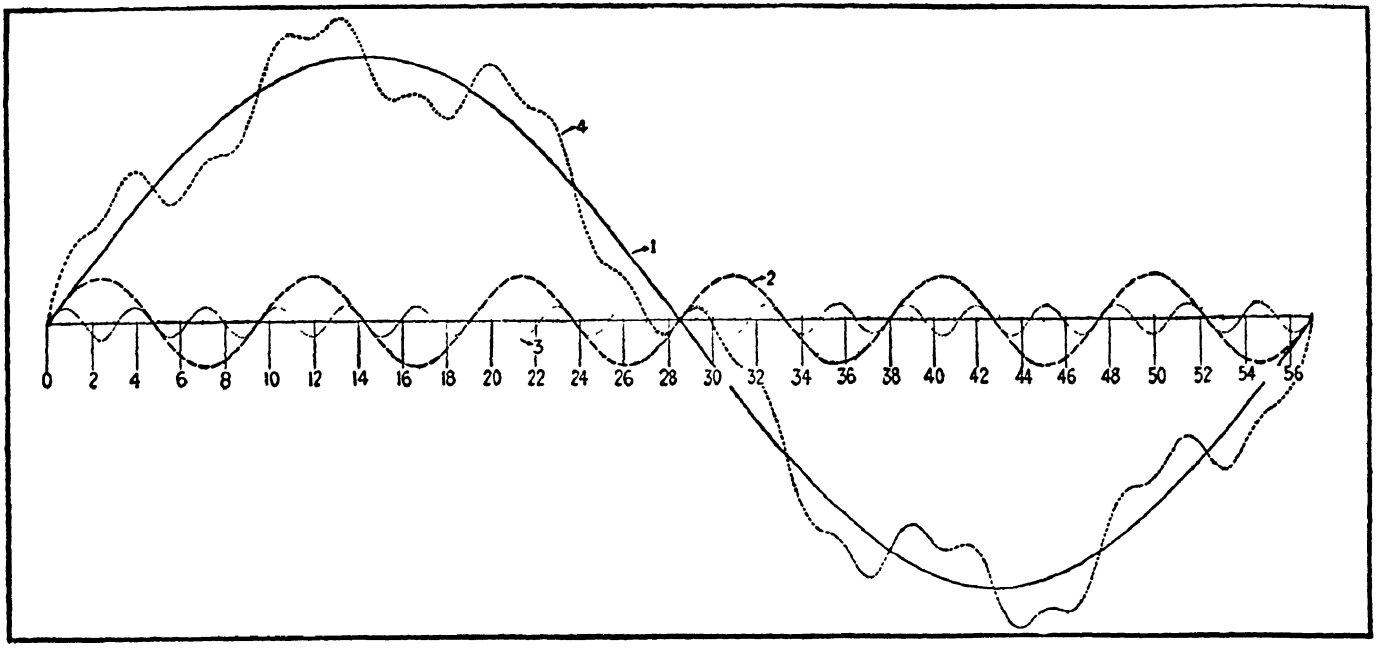
The purpose of this book is not to develop a program for stabilizing economic change. Nevertheless, to illustrate the conclusions reached, a tentative program is submitted in Chapter XXII. The student is entitled to be forewarned of this program. In the barest outline, the problem can be stated as follows: The greatest instability is represented by the output of durable goods. Since these goods will last into the indefinite future (usually defined as at least three years), their output provides a future, as well as a current, supply. Bad mistakes are likely to be made in assuming that current market demand faithfully reflects long-period future needs. This is because of the discordant movement of the various component elements of economic change, as developed in the chapters which follow. In making durable goods the appropriate guide is the line of secular growth or secular decline. Because of the business-cycle variation, general development indicated by this line is somewhat obscured, but enterprising management could be expected to isolate secular needs from business-cycle variation if there were no other complications. But planning expansion programs according to the needs indicated by secular growth is likely to be a self-defeating program under present conditions because

[1] Schumpeter names his cycles as follows: the 50-year cycle is called a Kondratieff, after the famous scholar who did much to discover these long cycles; the 9- to 10-year cycle a Juglar, after the French economist who thought of a cycle of this length; and the 40-month, or business, cycle a Kitchin after the English economist who found cyclical measurements of this length. See J. A. Schumpeter, *Business Cycles* (New York: McGraw-Hill Book Co., 1939).

[2] See especially the summary of business-cycle lengths shown in Chapter X. In this connection some readers may find of interest a quotation from G. K. Chesterton with which F. R. Macaulay prefaces his book, *The Movements of Interest Rates, Bond Yields, and Stock Prices in the United States since 1856* (New York: National Bureau of Economic Research, 1938) as follows: "The real trouble with this world of ours is not that it is an unreasonable world, nor even that it is a reasonable one. The commonest kind of trouble is that it is nearly reasonable, but not quite. Life is not an illogicality; yet it is a trap for logicians. It looks just a little more mathematical and regular than it is; its exactitude is obvious, but its inexactitude is hidden; its wildness lies in wait."

CHART 2

COMBINATION OF LONG, INTERMEDIATE, AND SHORT CYCLES *



* Taken with permission from J. A. Schumpeter, *Business Cycles* (New York: McGraw-Hill Book Co., 1939), p. 213. (Curve 1, long cycle, curve 2, intermediate cycle; curve 3, short cycle; curve 4, sum of 1–3.)

of the existence of the secondary trend. Businessmen cannot afford to build according to basic standard-of-living requirements as indicated by the secular line of growth, because of the risk that the long-period movement will drift indefinitely away from secular needs.

As a result, capital goods are usually built according to the indications of current market demand. Prosperities feed on themselves. Thus, the higher activity rises in prosperity, the greater are the needs indicated by current market demand, and the lower activity falls in depression, the less are the needs indicated. Hence the business cycle movement is magnified. The secondary trend is the villain. Before turning to the problem of stabilizing it, attention must be given to a delineation of the component elements of economic change and especially to a step-by-step analysis of the business cycle. An attempt has been made to state generally accepted positions or to identify differences of opinion where they exist. The body of the book is not a background for the program developed in the final chapter. On the contrary, the program developed merely serves to provide a specific application to bring the issues which arise to grips with reality.

CHAPTER II

SEASONAL VARIATIONS IN INDUSTRY

1. FACTORS RESPONSIBLE FOR SEASONAL VARIATIONS

SEASONAL variations are fluctuations occurring within a year which tend to recur in some consistent fashion from year to year. The length of time from the occurrence of a variation to its recurrence is a uniform period of 12 months.[1]

Fundamentally, seasonal variation results from one or both of two influences: (1) the yearly cycle of weather; (2) custom or the traditional use of goods in conventional observance of social seasons.

Because of weather changes, it is necessary to produce certain goods at stated periods within the year. This is usually true of organic products. For example, most of the raw materials produced for food and clothing are organic, and their production is dependent on the seasons of the year. Not only is the weather responsible for the time of production of such goods as cotton or wheat, but it also affects the many activities, such as financing, transportation, and manufacture, which arise in connection with these products. Thus, the peak in railroad carloadings, which occurs in the fall, is caused partly by the transportation of goods after harvest.

Custom is the second important factor which causes seasonal variation. The existence of conventional social seasons causes a great concentration in the use of goods at certain fixed times of the year. For example, the retail sale of goods is greater in December than in any other month of the year because of the purchase of Christmas presents. A second point of concentration in retail sales comes in the spring as a result of the Easter season.

Subsidiary to the two fundamental causes of the seasonal, the following three factors may, on occasion, influence the seasonal measurement obtained: (1) limitation of the size of the market; (2) specialization of production by each company; (3) spurious factors resulting from the measurement of time in the Gregorian Calendar now in use.

[1] In a few exceptional cases, the length of period may vary slightly from 12 months, although the period averages 12 months in all cases. A case in point is the seasonal variation resulting from the variable occurrence of Easter.

The first two may be related either to weather or custom, but the third, of course, only to custom. A restricted market often tends to increase seasonal variation. Local demands are founded on a given climate and on the needs of particular industries. The tin container industry forty years ago illustrates this situation. The production of tin containers was localized so that plants supplied the demands of companies in a very limited territory. Some plants produced containers in fruit and vegetable canning centers and operated at a very low rate except at the season when the fruit and vegetables were harvested. Others which operated in localities specializing in the preparation of fish for market produced little except when containers were needed for this limited purpose.[2] The growth of large corporations which sell their products throughout the country has reduced the seasonal variation created by local markets.

Excessive specialization of individual companies with regard to the number of products made tends to aggravate the seasonal influence. For instance, the sales of a rubber tire company will show greater seasonal variation than a rubber products company making a more diversified line of products. Rubber tires are made largely for a spring market, while rubber footwear shows a peak demand in the fall. Many companies have diversified their product in order to reduce the seasonal variation in their sales.

Neither geographical nor product specialization could be of great consequence in aggravating seasonal influences if labor were perfectly mobile. Laborers moving according to seasonal needs would accomplish the same effect, in so far as employment is concerned, as companies do when they enter national markets or diversify their products. More is likely to be accomplished by diversification within companies, however, because of the relative immobility of labor.

The problem of specialization has been presented at this point to show its relation to seasonal causes rather than to analyze methods of modulation. Neither specialization nor limitation of the market is a fundamental cause of seasonal variation. In the exaggerated case seasonal variation may disappear entirely with national markets. Nevertheless, the seasonals present when industries are localized are due to the influence of weather or custom. To return to the illustration used above, vegetables are canned at only one time in the year in one locality because of the effect of weather. The production of any given commodity exclusively at a given time in the year in a given locality is the result of weather or custom. Diversification by individual companies merely neutralizes these influences. Neutralization of geo-

[2] See H. Feldman, *The Regularization of Employment* (New York: Harper & Bros., 1925), pp. 121–23.

graphical differences occurs principally when weather is the fundamental cause, since most customary buying seasons are general throughout the country.

The practice of measuring time by the present Gregorian Calendar results in spurious factors which must be considered in determining the seasonal. The month is commonly used in deriving seasonal measurements. Its length varies from 28 to 31 days. The 3-day variation produces an expected difference of activity of more than 10 per cent between the shortest and longest month. This is not the result of any actual variation in activity, but occurs merely because of our artificial method of measuring time. Adjustment for difference in length can be made by dividing the monthly total of the activity concerned by the number of days in the month. Such adjustment, however, discloses limitations not immediately apparent. First, time is artificially divided not only into months, but also into weeks. Since Sunday is not ordinarily a working day, this introduces a complication. Any month of more than 28 days in length may contain either 4 or 5 Sundays. The number of days overstates the working time in 5-Sunday months to a greater degree than in 4-Sunday months. It is necessary, therefore, not merely to divide by the number of days in a month, but by the number of working days. Working days must exclude not only Sundays but also other holidays. We divide not by the number of days minus Sundays, but by the number of days minus all holidays.

A determination of the working days in any industry requires considerable technical knowledge of the industry. All industries do not celebrate holidays uniformly. In fact, what are holidays, or half-holidays, in some industries may be peak days in other industries. In most industries Saturday is not more than half a working day. In retail trade, however, Saturday is far more important than any other day; in fact it is sometimes counted as one and one-third working days for the purposes of reducing the data to a working-day basis. A separate set of working days thus must be used for each industry. Even this is not entirely satisfactory because holidays are not always celebrated uniformly in any one industry.

Adjustment for the number of working days goes beyond a mere correction for the spurious comparison of varying length months. It is an attempt to correct for part of the seasonal which actually does occur as a result of the observance of conventional holidays when production does not take place. There seems to be no avoiding the making of this additional correction if correction is made for a variation in the length of the months. Correction merely for the number of days in the month is unsatisfactory because the number of holidays also produces

an erratic influence. Yet, if in the extreme case only one day were worked in a month because of almost complete holiday, the working-day correction would obscure the actual seasonal decline.

Making an adjustment for varying length months by dividing by the number of working days in the month will result in a seasonal measurement showing less variation than actually exists. The only adequate solution to this difficulty is to change our reckoning of time to a year with months of uniform length. The two most important proposals for doing this are: (1) the "World Calendar" which retains the division of a year into 12 months, but reduces the variation in length of the months; (2) the "International Fixed Calendar" which divides the year into 13 months of 28 days each.[3]

The World Calendar, as shown in Chart 3, accomplishes all of the most desirable reforms, except that the month does not become an even multiple of the week. The calendar is perpetual. Dates are always on the same day of the week. Each month has 26 week days, and each quarter contains 91 days except for "Year-End Day" and "Leap-Year Day." Each quarter always contains 13 Sundays. The adoption of the World Calendar would dispel the most serious of the difficulties involved in the use of the present Gregorian Calendar. The month would become a constant statistical unit.[4] Holidays would no longer shift about the week in a confusing way.

Objection to the adoption of the World Calendar arises principally from the fact that the change would make comparisons with the past more difficult and produce some disturbance in reckoning the dates of certain holidays, such as Easter, which are dependent upon dates in the Gregorian Calendar. The discontinuity in the weeks which arises from the insertion of Leap-Year Day and Year-End Day is also disturbing.

The International Fixed Calendar represents a more violent break with the past. The adding of a thirteenth month would necessitate a

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[3] The following references are especially recommended: *Journal of Calendar Reform* and *Economic Aspects of Calendar Reform* (The World Calendar Association, 630 Fifth Avenue, New York City); P. W. Wilson, *Romance of the Calendar* (New York: W. W. Norton, 1937); W. J. Donald, "The 13-Month Business Calendar," *Journal of the American Statistical Association*, XXIX (December, 1933), Supplement, 100–104; Simon Kuznets, "The Attitudes of Members of the American Statistical Association toward the Question of Calendar Reform," *Journal of the American Statistical Association*, XXX, 437–45.

[4] December and June would be exceptions if Year-End Day and Leap-Year Day are called Saturdays, inasmuch as December would always have 27 week days and June would have 27 every four years. Actually, the extra Saturday might be treated as an extra Sunday. Of course, some economic activity also proceeds regularly on Sunday, and therefore the difference in number of Sundays might produce seasonal variation in these activities.

revision of almost all dates.[5] The year would no longer be readily divisible into quarters which would be a distinct disadvantage. The total days readily accounted for is 364, the same as under the World Calendar, so it remains necessary to intercalate Year-End Day and Leap-Year Day, producing the slight discontinuity of the weeks, as noted above. The International Fixed Calendar has the very distinct

CHART 3

THE WORLD CALENDAR*

THE WORLD CALENDAR

All Years Alike
All Quarters Equal

First Quarter							Second Quarter							Third Quarter							Fourth Quarter						
JANUARY							APRIL							JULY							OCTOBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
8	9	10	11	12	13	14	8	9	10	11	12	13	14	8	9	10	11	12	13	14	8	9	10	11	12	13	14
15	16	17	18	19	20	21	15	16	17	18	19	20	21	15	16	17	18	19	20	21	15	16	17	18	19	20	21
22	23	24	25	26	27	28	22	23	24	25	26	27	28	22	23	24	25	26	27	28	22	23	24	25	26	27	28
29	30	31	..	..	..	.	29	30	31	..	..	.	..	29	30	31	..	..	..	..	29	30	31	.	.	.	..
FEBRUARY							MAY							AUGUST							NOVEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
.	..	..	1	2	3	4	.	.	1	2	3	4				1	2	3	4		.	.	1	2	3	4
5	6	7	8	9	10	11	5	6	7	8	9	10	11	5	6	7	8	9	10	11	5	6	7	8	9	10	11
12	13	14	15	16	17	18	12	13	14	15	16	17	18	12	13	14	15	16	17	18	12	13	14	15	16	17	18
19	20	21	22	23	24	25	19	20	21	22	23	24	25	19	20	21	22	23	24	25	19	20	21	22	23	24	25
26	27	28	29	30	..	..	26	27	28	29	30	..	..	26	27	28	29	30	..	..	26	27	28	29	30		
MARCH							JUNE							SEPTEMBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
		..	..	..	1	2	..	..	..	..	..	..	1	2	..	..	..	..	..	1	2	..	..	..	..	..	1	2
3	4	5	6	7	8	9	3	4	5	6	7	8	9	3	4	5	6	7	8	9	3	4	5	6	7	8	9
10	11	12	13	14	15	16	10	11	12	13	14	15	16	10	11	12	13	14	15	16	10	11	12	13	14	15	16
17	18	19	20	21	22	23	17	18	19	20	21	22	23	17	18	19	20	21	22	23	17	18	19	20	21	22	23
24	25	26	27	28	29	30	24	25	26	27	28	29	30	24	25	26	27	28	29	30	24	25	26	27	28	29	30
													..														

* YEAR END DAY, December Y or 31, an extra Saturday, follows December 30th every year
** LEAP YEAR DAY June L or 31, another extra Saturday, follows June 30th in leap years

* Taken from the *Journal of Calendar Reform* (The World Calendar Association, 630 Fifth Ave., New York City, June, 1938).

advantage of making the months multiples of weeks. Data kept on a weekly basis could readily be cumulated into monthly data. In fact, this advantage is so great that many companies use the 13-month business calendar in making their accounting reports.[6] Well-known

[5] In adopting the World Calendar, many dates would be unaffected if a year in which the first of January comes on Sunday were chosen for the change. 1939 was such a year. The next one will be 1950.

[6] The American Management Association made a survey of the companies using the 13-month business calendar in 1928 and found some sixty companies then using it. In December, 1933, Mr. W. J. Donald reported to the American Statistical Association that

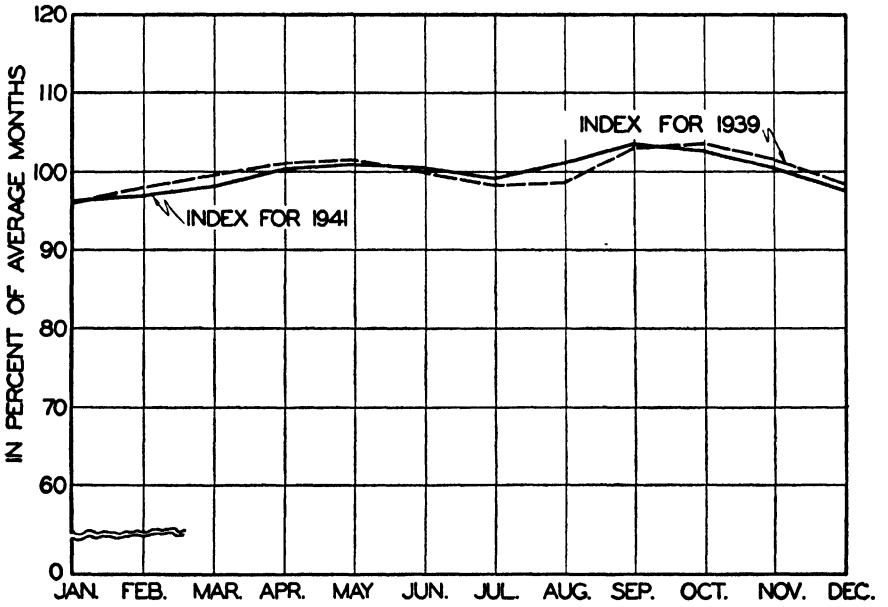
corporations making use of the 13-month business calendar include the Eastman Kodak Company and Sears, Roebuck and Company.

The advantage of the months being an even multiple of the week is offset by the disadvantage involved in being unable to divide the year into quarters. The World Calendar has the net advantage of being a less distinct break with the past, and therefore appears more likely to be adopted.

The best procedure at the present time is to adjust monthly data for the number of working days. We must not lose sight of the fact that

CHART 4

SEASONAL VARIATION IN INDUSTRIAL PRODUCTION*



* Board of Governors of the Federal Reserve System.

by so doing the seasonal measurement made will be artificially reduced in violence.

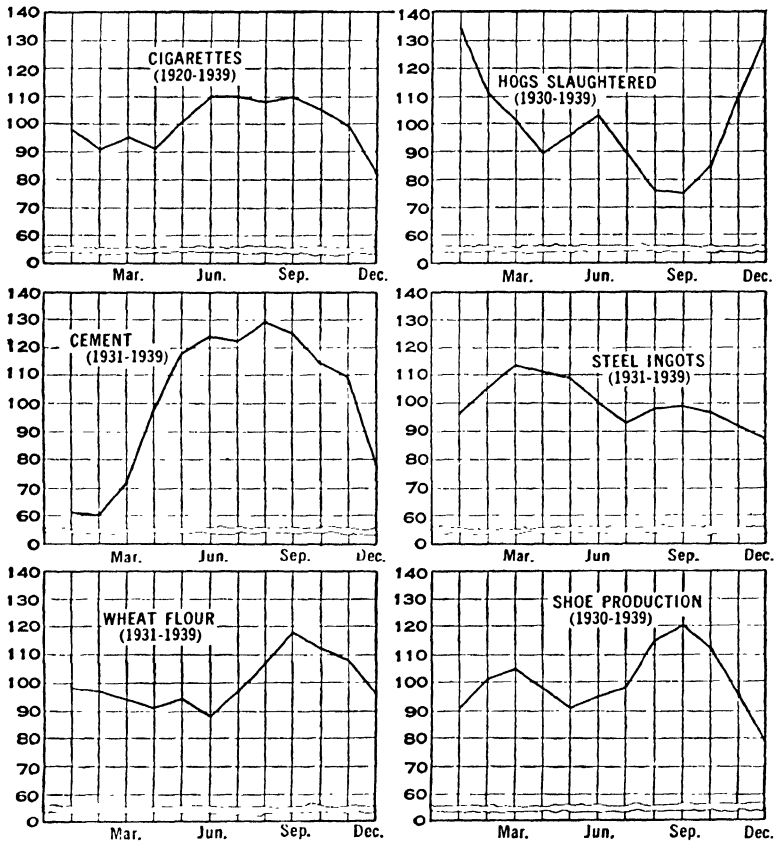
Although seasonal variation is not all-pervading, most economic activities and processes fluctuate with the seasons. Most price series display no regular seasonal movement, but almost all production and employment data do. The seasonal movement in total industrial production before World War II is shown in Chart 4. Under the pressure of demand on available capacity, seasonal variation disap-

the "number could probably be reckoned in the thousands." See "The 13-Month Business Calendar," *Journal of the American Statistical Association*, XXIX (December, 1933), Supplement, 100–104.

peared in many industries during the war. As we move into a more normal peacetime demand, probably the prewar rise to a spring peak, drop to a summer slump, and rise to a fall peak will be restored. The seasonal movement varies substantially from industry to industry, as

CHART 5

SEASONAL INDEXES OF SELECTED SERIES ON INDUSTRIAL PRODUCTION*



* Used in the computation of the *Federal Reserve Index of Industrial Production.* See description in Chapter XV.

shown in Chart 5. Employment in agriculture rises to a high peak with a summer absorption of students. The socially most significant seasonal variation is that in nonagricultural employment, but a satisfactory measurement is not as yet available.[7] As pointed out later,

[7] A measurement can be derived by dividing the unadjusted index of employment in nonagricultural establishments by the Federal Reserve Board of Governor's adjusted index

reduction of this seasonal is the major aim of efforts to iron out the seasonal.

Seasonal variations may originate either in the production or in the consumption of commodities. A seasonal variation originating either in production or consumption affects the other process. For instance, a seasonal which originates in the production of fruits and vegetables is superimposed upon the consumption of these commodities. On the other hand, a seasonal which originates in the consumption of fireworks or toys affects production. In general, seasonal variations originating in production are caused by weather changes,[8] but seasonal variations originating in consumption may be caused either by weather changes or by the existence of traditional periods of consumption.

It is useful to classify seasonal variation into three general types, according to whether the seasonal originates in production or consumption:[9]

1. Production subject to seasonal variation
   a) Raw materials, principally agricultural
   b) Fabrication industries
2. Consumption or purchase subject to seasonal variation
3. Production of raw materials subject to one seasonal, and consumption or purchase of the finished product subject to another seasonal.

Most foods, including all meats and cereal crops, have a seasonal variation characterizing the first type. There may be some slight seasonal in the consumption of these commodities, but in general it is not significant, except when it results from the seasonal in production, for example, the consumption of seasonal foods such as raspberries or watermelons.

The construction industry is the most important case where seasonal variation originates in the process of fabrication. Until recently, at least, the seasonal variation in construction occurred as a result of the exigencies of the weather. It may be that construction could now proceed at a much more even rate throughout the year, but it has become customary to build principally in warm weather.[10]

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of the same series, but the result is not satisfactory, partly because of pending revisions in the employment index which is computed by the Department of Labor. See the reported figures in the *Federal Reserve Bulletin*, for example, the issue of December, 1946, p. 1398.

[8] The seasonal in the construction industry, as noted below, originated because of weather changes but may now be largely due to custom.

[9] See Simon Kuznets, *Seasonal Variations in Industry and Trade* (New York: National Bureau of Economic Research, 1933), chaps. 1, 3, 4, 5, and 6.

[10] For a more complete statement of the extent to which custom controls the seasonal variation in building operations see E. S. Smith, *Reducing Seasonal Unemployment* (New York: McGraw-Hill Book Co., 1931), pp. 284–92; Committee of the President's Conference on

The purchases of automobiles, gasoline, furniture, toys, and Christmas cards furnish excellent illustrations of seasonal variation arising from consumption or purchase. In fact, most fabricated products whose principal raw materials are inorganic, or organic materials whose maturation is independent of the seasons, show a seasonal only because of the time of purchase. In most of these cases, the goods could well be produced at a constant rate throughout the year if they were consumed at a constant rate.

The production of most clothing—cotton, wool, and fur products—has a seasonal variation characterized by the third type. Cotton is harvested in the fall and early winter, wool is shorn from sheep in the spring, and furs can be taken only in the winter while they are prime. There is also a seasonal in the consumption of clothing, but it is entirely unrelated to the seasonal in production. It is caused principally by the shifting need for clothing with weather changes, and secondarily by a traditional shift in the demand for different clothing through the year. Cotton, especially, is used in the production of goods other than clothing, but there is a seasonal in many of these uses which is unrelated to the seasonal in the production of the raw material, for example, the use of cotton in the building of roads.

To summarize, the fundamental causes of seasonal variations are weather and custom. Excessive specialization and limitation of the size of the market may accentuate the seasonal variation in the sales of given companies and thus increase seasonal unemployment. The unequal length of the months produces a seasonal variation in the measurement if the time unit used is the month. This spurious factor can be avoided completely only by changing the calendar. It is important to analyze any individual seasonal variation to determine whether it originates in production or in consumption.

2. MEASUREMENT OF THE SEASONAL AND MEASUREMENT OF ITS ADEQUACY

Description of the statistical methods of measuring seasonal variation is readily available in any one of the large number of adequate texts on statistical methods. It is not the purpose of this section to repeat these descriptions, but merely to present a very brief summary statement of the meaning of the methods used.

Before any attempt is made to measure the seasonal variation in a

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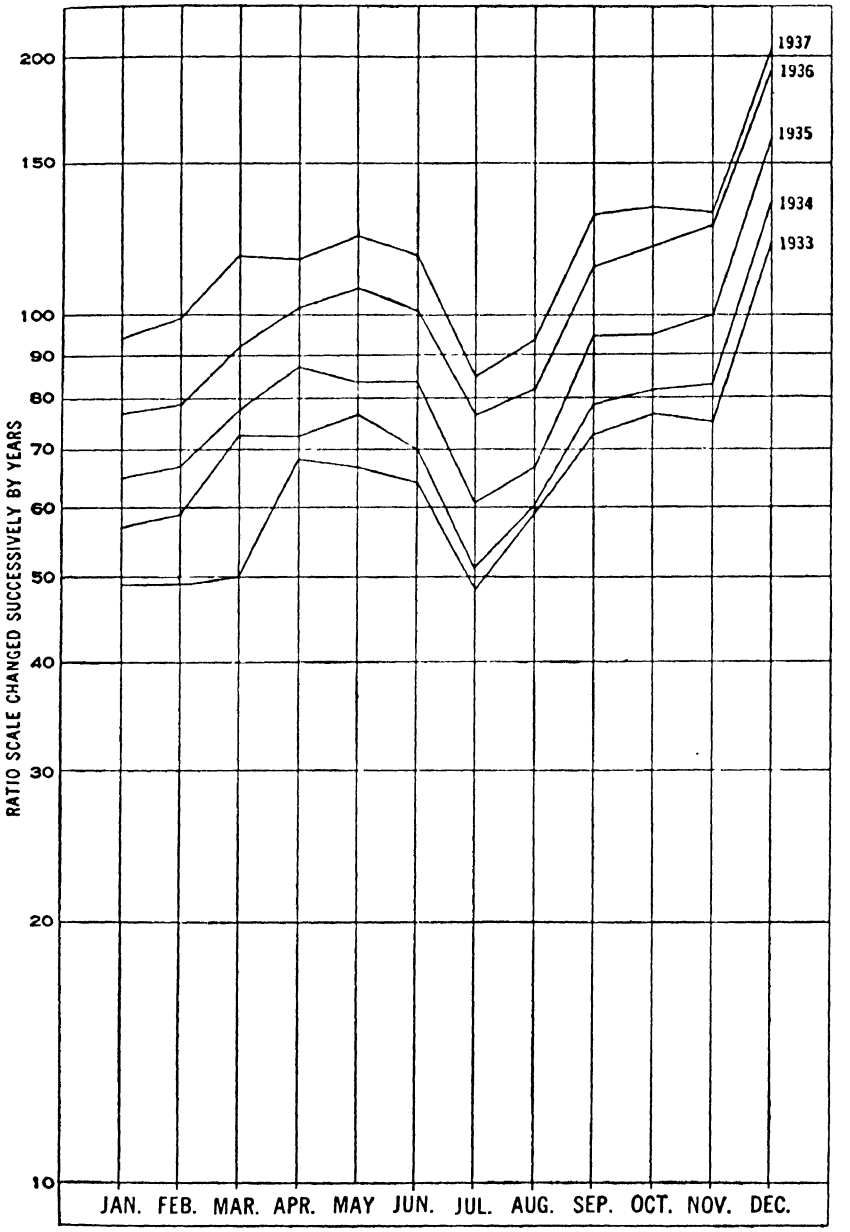
Unemployment, *Seasonal Operation in the Construction Industries* (New York: McGraw-Hill Book Co., 1924). See, further, Harry Jerome, *Mechanization in Industry* (New York: National Bureau of Economic Research, 1934), p. 390, and references there cited; Arthur D. Gayer, *Public Works in Prosperity and Depression* (New York: National Bureau of Economic Research, 1935), pp. 333–49.

CHART 6

DEPARTMENT STORE SALES TIERED TO SHOW SEASONAL EXTENT*



* Computations made from series collected by the Board of Governors of the Federal Reserve System.

series we should assure ourselves that some recurrent seasonal variation is present. Variations caused by the round of the seasons may be present in a series which, however, show no similarities from one year to another. There is no method known by which such a seasonal variation can be measured. An adequate test to determine preliminarily whether any recurrent seasonal exists is provided by the simple device of plotting the data for each year, preferably on a ratio chart. One year is plotted above another, which is called *tier charting*. By examination of such a chart, we can determine fairly well whether or not any recurrent seasonal exists in the series. If there is a similarity in the gyrations of the curves, it is very probable that a recurrent seasonal does exist. If there is no such similarity, the existence of a recurrent seasonal is unlikely.

To get an adequate measurement of the seasonal variation, it is necessary to isolate, however roughly, the seasonal present in the data before computing the average which gives the seasonal measure. Statisticians call the seasonal variation actually existent at any particular time the *specific seasonal*. The measure obtained by averaging the specific seasonals is called the *normal* or *typical seasonal*.

Several adequate methods have been devised for computing the typical seasonal. The difference between the various methods is largely dependent upon different schemes for obtaining a rough measure of the specific seasonal for use in averaging. A common method of obtaining such a seasonal measurement is called the *percentage-to-twelve-month-moving-average method*. (See Table 1.) The first step is to compute a twelve-month moving average which eliminates the seasonal movement fairly effectively because the seasonal repeats itself every twelve months. The second step is to find the percentage of the original data to the centered moving average. Since the original data contain the seasonal and the moving average does not, the ratio of the former to the latter should roughly reflect the specific seasonal. Using data for several years, the percentages to the moving average are next arrayed for each month, and the central three or four averaged to get the typical percentage, as shown in Table 1. By a purely mechanical process the typical percentages can be shifted into the form of a typical seasonal index.[11]

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[11] For a more complete description of the method see F. E. Croxton and D. J. Cowden, *Applied General Statistics* (New York: Prentice-Hall, Inc., 1939), pp. 471 ff.

Professor William A. Spurr has developed a graphic method of computation, using free-hand smoothing. This method appears to have some promise, but the chief difficulty is that the results depend upon a certain amount of subjective judgment which cannot be objectively stated. The principal advantage is a great saving in time. Spurr has described his method in "A Graphic Method of Measuring Seasonal Variation," *Journal of the American Statistical Association*, XXXII (June, 1937), 281–89.

Sometimes the recurrent seasonal cannot be measured by a scheme of averaging the specific seasonals because the seasonal has slowly become more or less pronounced at certain seasons of the year. An illustration is provided by the seasonal variation present in the production of automobiles. There is a marked seasonal in this industry, but for years the drop in production in the winter months became less pronounced. A seasonal variation of this type is called a *changing seasonal*. The method of computing a changing seasonal is to take the

TABLE 1

MONTHLY DISTRIBUTIONS OF PERCENTAGES OF TWELVE-MONTH MOVING AVERAGES*

Data = Automobile Production

Percentages	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec.
Below 40	I								II	II	II	II
40–43									I	I		I
44–47											I	I
48–51		I									I	II
52–55	I										II	I
56–59										I	I	
60–63	I								II	I		
64–67		I						I		I		II†
68–71	II							II	I		†	I
72–75	I									I	II	
76–79	III	II	II							I	I	
80–83	†					I		I	II			I
84–87	II	II						II	I†	†	I	II
88–91	I	I†					I		I	I	I	I
92–95	I	III	I					I	I	II		
96–99	I				I		III	I		I		
100–103	III	IIII	I				III	II†	I	II	I	
104–7		I				I	I		IIII	I	I	
108–11				I		I	†		I	I		I
112–15		I	III	II	I	IIII	IIII	I				
116–19			III†	III	II	II†		II		I	I	
120–23		I	I		I	I	II	I			I	I
124–27			II	II	II	II		I				
128–31			II	I†	III†							I
132–35				I	II		I	I				
136–39				III		I						
140–43					I			I				
144–47				I	I	II	I					
148–51												
152–55				I	I							
156–59			I		I	I						
160 and above			I	II	I	I	I					
†Modified median	80.9	91.8	117.4	129.0	129.2	118.8	110.0	100.4	86.0	87.1	69.1	66.5

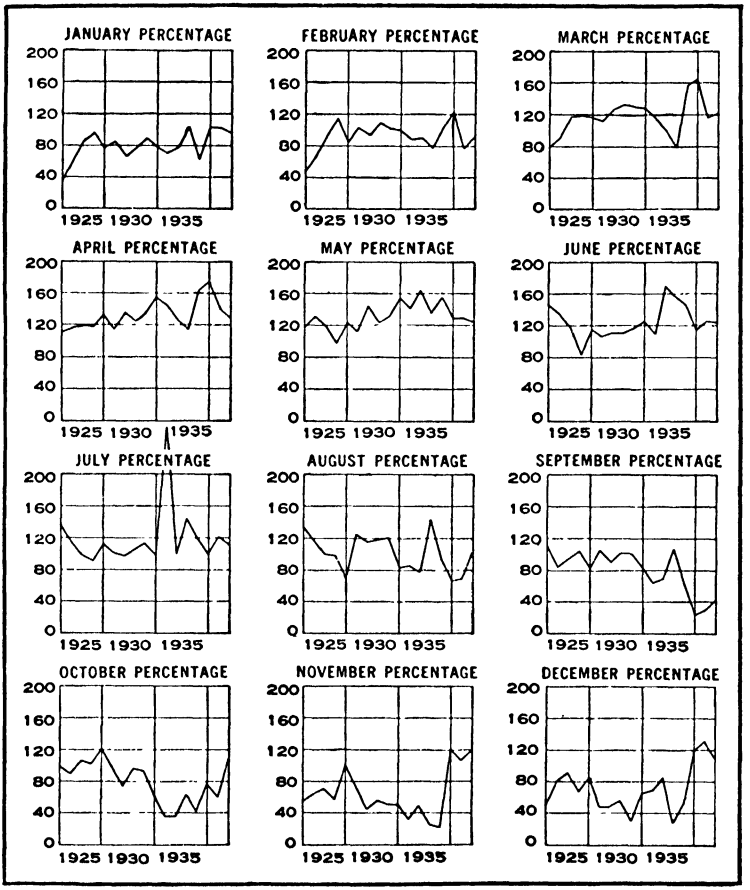
* The data used were passenger-car production in the United States for the period 1921–37. For purposes of ready illustration, the scale in the table is somewhat more compressed than is usually desirable in practical work.

rough measures of the specific seasonals and chart them, by years, for each month separately. This is illustrated for the automobile industry in Chart 7. If the lines on the twelve component charts move around

CHART 7

METHOD OF TESTING FOR CHANGING SEASONAL*

Showing Percentages of Automobile Production to 12-Month Moving Average

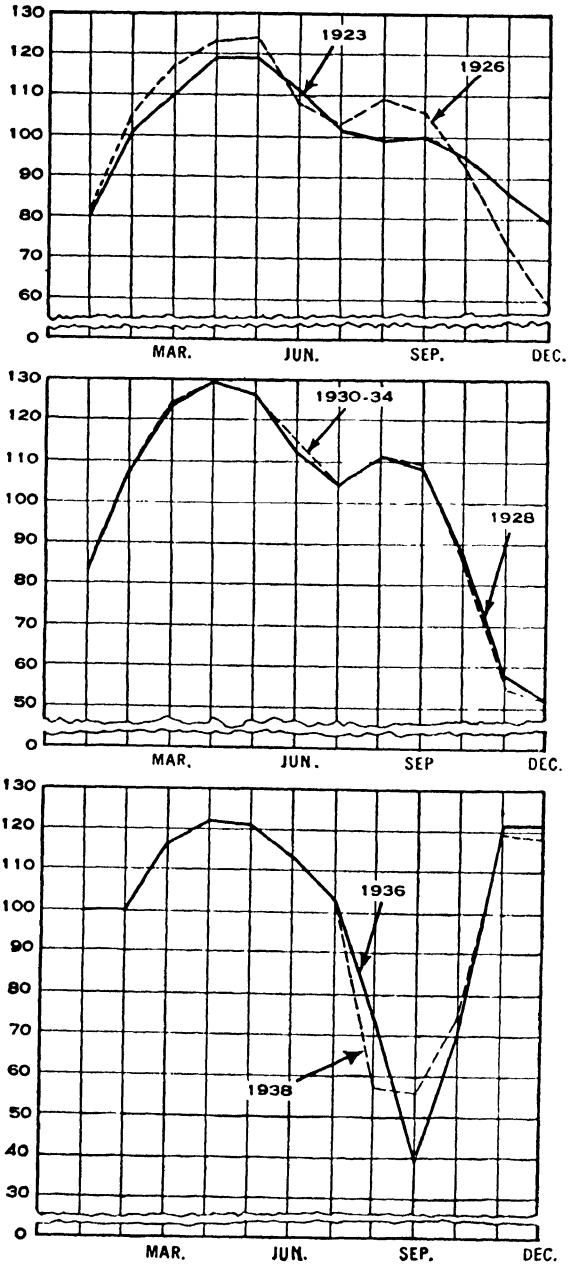


* Statistical measurements made from data compiled by the U.S. Bureau of the Census.

a horizontal level, the seasonal is constant. If any of these plotted curves fluctuates about an upward or a downward trend, there is a changing seasonal. The measurement of changing seasonal involves the fitting of trend lines to each of the twelve series of specific seasonals. Instead of an average of the specific seasonals for each month, the trend value obtained from the line fitted to the specific seasonals is

CHART 8

CHANGE IN THE AUTOMOBILE SEASONAL*



* Board of Governors of the Federal Reserve System.

taken as representative. By this procedure there is a trend value for each year which differs from that for every other year, unless the trend found is horizontal. Thus, we have a different set of typical seasonals for each year if a changing seasonal exists.[12]

The statistical significance of the seasonal index found by averaging rough measures of the specific seasonals depends upon how closely the specific seasonals cluster about their average. A visual picture of how closely the monthly percentages cluster can be obtained by examining Table 1. The question of major importance is not the extreme width of the scatter but that of the bulk of the cases. One or two extreme items may reflect nonseasonal influences.

It is conceivable that the seasonal variation may be so violent that the specific seasonals will vary greatly from the typical seasonal without affecting the statistical significance of the seasonal index. Some measurement of this violence is indicated by the "displacement" between columns in Table 1. Displacement is the vertical distance, either up or down, between the cluster of percentages in *adjacent* columns. If the typical percentages are on a horizontal line, there is no significant seasonal, no matter how closely the individual items cluster about the typical item in each column, for such would indicate no average difference from month to month.[13]

Any seasonal index should be tested by common knowledge as to the seasonal present in a given economic process. For instance, if a seasonal index of the production in a given industry is computed, this should be checked against what people in the industry believe the seasonal variation to be. If the two do not agree, detailed analysis should be made to account for the difference. It may be caused by inadequacy of the data used in computing the seasonal measurement, or it may reflect an incomplete understanding of the seasonal variation by those in the industry.

3. ATTEMPTS TO IRON OUT THE SEASONAL VARIATION

The desire to reduce or eliminate seasonal variation is a result of industrial development. This desire has not arisen because the in-

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[12] For a description of the technical statistical processes involved in computing a changing seasonal index, see F. E. Croxton and D. J. Cowden, *Applied General Statistics* (New York: Prentice-Hall, Inc., 1939), pp. 500 ff.

[13] For a statistically more adequate statement of methods of testing for significance of the seasonal index, see Simon Kuznets, *Seasonal Variations in Industry and Trade* (New York: National Bureau of Economic Research, 1933), pp. 31–38. See also A. F. Burns and W. C. Mitchell, *Measuring Business Cycles* (New York: National Bureau of Economic Research, 1946), pp. 49–50; H. C. Barton, "Adjustment for Seasonal Variation," *Federal Reserve Bulletin*, June, 1941.

tensity of seasonal variation has increased; it has arisen because the reasons for its existence have become less obvious and its effects more injurious. Peak agricultural activity in the spring and summer is expected, and the farmer's life is adapted to it. On the other hand, it is difficult for the factory worker to provide for seasonally slack periods. Ordinarily he is largely divorced from the land and does not produce his own living as the farmer does. Not only do slack times use up a part or all of his savings, but they markedly reduce his total income. This is less obviously true of the farmer. He raises much of his own food, and his expenses are relatively small in slack seasons.

The importance of seasonal variation is founded on the unemployment it creates. Idle men mean labor and income forever lost. The resultant leisure for the unemployed is not enjoyable because it is enforced. The unemployment of capital involved is of less importance. Unless the elements wear a machine out just as rapidly when kept idle as when used, the possible service is not entirely lost by keeping it idle a part of the year. Furthermore, a certain amount of idle time is advantageous in that it provides ample periods for keeping machines in good repair. On the other hand, seasonal peak periods require a greater quantity of capital than would be necessary if production were at a more uniform rate. The greater the quantity of equipment necessary, the more costly the product, because it increases the necessary investment and the risk of obsolescence.

It is well to bear in mind the fact that seasonal unemployment is of less serious importance than cyclical. Seasonal unemployment is definitely limited to a portion of the year. The indefiniteness of cyclical unemployment makes it socially much more significant. If depressions were mild, they might actually cause less total unemployment than slack seasons. Under present conditions the havoc they breed is much the more serious. It is anomalous to designate as stabilization any plans for increasing the stability of employment within the year.

Many attempts have been made to reduce or eliminate the seasonal variations in economic processes. The success of these attempts has a highly varied history. A summarization of this history would be interesting but has never been made and would be very difficult to make. All that it is possible to do here is to present a short analysis of the various methods which have been suggested for ironing out the seasonal variation.

Building Up Off-Seasonal Stocks. The seasonal variation of greatest social importance is that in employment in the production of goods. Seasonal variation in employment is certain to be resented bitterly, even though a higher wage rate in such employments may fully dis-

count the short period of work. This resentment has some logical basis, since it seems natural to spend more during the part of the year when income is being received.

To offset the seasonal unemployment of labor, it is suggested that goods should be produced at a constant rate throughout the year. Producing the same goods at a constant rate will require either the building up of inventories or the regularization of consumption. The seasonal cannot be ironed out by this method when it originates in the production of raw agricultural materials. For instance, we cannot decide at will to produce wheat at a constant rate throughout the year. It is only where the variation arises from the purchase or consumption of the commodity or from the productive process in other than raw agricultural materials that we can decide at will to begin producing at a constant rate throughout the year.

The precipitate shifting from production at a variable rate to production at a more nearly constant rate will either result in (1) a transfer of seasonal in production to an opposite seasonal in inventories or (2) consumption at a more nearly constant rate throughout the year.

It is our purpose to analyze at this point the first of these possibilities. Some manufacturers have felt that they could avoid the seasonal variation in production by refusing to accept more orders at seasonal peaks than at seasonal lows or by filling the peak orders with goods contracted out to other manufacturers. Such procedures merely shift the seasonal burden to other manufacturers. The seasonal demand has not been changed and the seasonal variation for the total industry will not be reduced.

Shifting the seasonal in production to an opposite seasonal in inventories is likely to create puzzling problems. If the product is bulky, large storage space will be required, which may necessitate the building of additional warehouses. If the product is perishable, or if it readily deteriorates with time or exposure, the storing of inventories may be inexpedient. Storing inventories of style goods will ordinarily be an inadvisable policy. Some simplification or standardization of products probably will be necessary in many industries before inventory accumulation is advisable, because storing of inventories for a product made in a very large number of sizes and qualities is exceptionally vulnerable to obsolescence or style change.

Even if warehouse space is adequate for storing seasonal inventories, the financing of inventory accumulation is a serious problem. An increase in the inventory accumulation will require a large increase in the necessary working capital. It is possible, of course, that the storing of inventories may be shifted from the manufacturer to a

later stage in distribution if the manufacturer can encourage off-seasonal purchase. However, the same problems of financing and possible deterioration face anyone who carries the off-seasonal stocks.

Another problem faced by those who would store inventories at off-seasonal periods is a possible demoralization of the price structure. After inventories have been stored to await consumption at peak periods, manufacturers may proceed to produce at the peak rate of consumption as the principal selling season arrives. Instances of such experience as this are provided by the petroleum refining industry in the late twenties and by the automobile industry in 1929. In spite of all these problems, cases may arise where the storing of inventories may successfully reduce the violence of the seasonal variation. It will be necessary to appraise separately the probable success for each individual product.

Mitigating Buying Seasons. Consumers may *increase* the seasonal in production by concentrating purchases at holiday seasons. The production of cigars reaches a seasonal peak in the fall, partly because cigars are given as Christmas presents. There is an important tendency for consumers to buy style goods at the height of the selling season for use throughout the year. It was recorded thirty years ago, for instance, that "the most conscientious buyer finds it difficult to find any stock on hand in a millinery shop in January and August. What she finds is usually an advance model of the coming season, and if she happens to prefer winter hats while winter lasts, she goes away disappointed."[14] Customary buying seasons are strongly intrenched in our social life, and as long as such seasons exist for style goods, the consumer would be rash to buy when the style is uncertain.

Some department stores have found January and August sales an effective method of forestalling excessive inactivity in those months. In a few spectacular cases, reports indicate that little decline in sales is now sustained between December and January. The time of purchase may not actually be shifted since the individual store may merely take sales from competitive stores where the policy is not to grant such large out-of-season price cuts. The director of one large department store reports, "Barring a few exceptions price has slight relation to demand out of season."[15]

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[14] Mary Van Kleeck, *A Seasonal Industry* (New York: Russell Sage Foundation, 1917), p. 196. Quoted by H. Feldman, The Regularization of Employment (New York: Harper & Bros., 1925).

[15] Oswald W. Knauth, Director, R. H. Macy and Company, "Some Reflections on Retail Prices," *Economic Essays in Honor of Wesley Clair Mitchell* (New York: Columbia University Press, 1935), p. 207. Knauth footnotes the *exceptions* with the statement: "The August Furniture Sale, August Fur Sale, and January White Sale have become so well established as to create a new seasonal cycle." He also calls attention to the following

The consumer tends to buy durable goods at the time of peak need. Peak automobile purchase comes in the spring. No individual could buy such durable goods at an even rate throughout the year, but it would appear possible to encourage a large proportion of individuals to buy such goods at times when the use for the good is less great. The most hopeful technique for doing this would appear to be the offering of a price advantage in off seasons, but this practice is not very general. It is possible, for instance, that the best way to reduce seasonal variation in the automobile industry is not to have a new yearly model at all, but to offer the purchaser a price advantage in slack seasons.

As an illustration of an attempt to sell durable goods at a uniform rate, we may cite the L. C. Smith and Corona Typewriter Company. They substantially reduced the seasonal in the sales of typewriters at one time by intensifying sales activity in off seasons. The outlay was so great, however, that no increase in profits resulted.[16]

If the durable good incorporates a style element, and if the style is fixed for a limited time by the manufacturer, the seasonal violence may be reduced somewhat by the introduction of new styles or "models" in the early part of the season of unfavorable weather. The most ambitious plan of this type yet devised would appear to be the introduction of new automobile models started in the fall of 1935.

Regularizing Consumption. What is frequently thought of as a regularization in the rate of consumption may merely be a transfer of the carrying of inventories from the manufacturer to a later agent in the process of distribution. This is what many schemes to push sales in off seasons amount to. The practice of the Dennison Manufacturing Company in promoting the sale of Christmas cards throughout the year by offering a preseason price advantage is a case in point.

The preservation of foods has been a vital factor in regularizing their consumption throughout the year. Canning has preserved many foods that otherwise would be available only at seasons of harvest, and its use has been greatly extended in recent years. Refrigeration also has been an important factor in making many foods available the year around, and its significance is rapidly increasing at the present time. By reducing the seasonal variation, preservation of foods has made possible a widening of our diet and the exercise of greater selection in the consumption of foods. In most cases, however, the reduction of seasonal variation in the consumption of these foods has not greatly

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experience: "In one instance an offering of white curtains at a low price in the middle of February brought a demand for only 600 pairs; in the middle of March, the same curtains at the same price brought a demand for 11,000 pairs."

[16] See E. S. Smith, *Reducing Seasonal Unemployment* (New York: McGraw-Hill Book Co., 1931), pp. 34-35.

reduced seasonal variation in their production. Many foods can be economically harvested in any given locality at only one time in the year. Preserving the foods so harvested may increase the amount consumed but since the increased production occurs at the same time of year as before, this results in an *increase* in the seasonal variation of *production*. If, instead of increasing the production from one locality, the product is drawn from localities with progressively shifting harvesting seasons, no increase may result in the seasonal of production.

The most significant regularization of production resulting from regularizing consumption involves a slight change in the product which makes it adaptable to out-of-season uses. Some illustrations of this may be cited. Breakfast food companies have brought out different breakfast foods for various seasons of the year. Ice cream companies have put out specially packaged ice cream to appeal to the public in winter, but the seasonal variation seems to be as great as ever since whatever increase has taken place in consumption in the winter has been matched by an increase in consumption in the summer.

Some companies have conducted expensive selling campaigns for the purpose of developing off-seasonal uses for their products. The General Foods Corporation at one time advertised the use of Certo as an ingredient which makes it possible readily to make jelly from grape juice in the winter. The Royal Baking Powder Company has advertised the use of pure fruit gelatin as a summer beverage.[17]

Slight adaptation of certain products to seasonal needs may reduce the seasonality in their production, although we have no evidence that this has been widely significant. Attempts to "educate" the consumer to buy products in what are normally off-seasons appear to offer less promise than the adaptation of products to seasonal needs.

Dovetailing Seasonal Movements. Attempts to iron out seasonal variation may go further than the building up of off-seasonal stocks and attempted regularization of consumption. One seasonal variation may be dovetailed with another by diversifying the market or the product, or by shifting the employees.

If sales are made in different geographical latitudes, a company may operate at a relatively constant rate and still supply seasonal goods to each geographical section. Several agricultural implement companies sell machinery to southern farmers very early in the year and to northern farmers through the spring months. Some businesses have reduced the seasonal variation in production by exporting to South America. Various companies producing goods for the consump-

[17] Information regarding companies discussed in this section is taken from E. S. Smith, *Reducing Seasonal Unemployment* (New York: McGraw-Hill Book Co., 1931), chap. iv.

tion of city dwellers have found that sales fall off markedly during the summer vacation period. To offset this, several milk and laundry companies have opened branch offices at summer resorts.

Diversification of product offers an important possibility for reducing the seasonal variation of the total sales or employment of a given company. Specialization of output in given geographical districts is listed above as one of the causes of seasonal variation. Examples of diversification of product in manufacturing companies include: the making of rubber tires for sale in spring and summer and rubber footwear for sale in fall and winter; the canning of various types of soups at different times in the year by the Campbell Soup Company; the making of automobile parts and radios by the same company; and the making of soft drinks and chocolate candy by the same company. Retailers usually diversify their line in order to get business the year around. An obvious illustration is the handling of both coal and ice.

Another possible method of dovetailing seasonal variations is to shift employees from one employment to another. The net accomplishment in this direction to date has been meagre. At one time a seasonal transfer of employees back and forth between the National Cash Register and Frigidaire plants in Dayton was effected. This arrangement broke down during the Great Depression, however, because of seniority rights for more people than any of the plants employed at the low levels. The United States Employment Service makes job analyses for placing people laid off by one company in jobs they can fit elsewhere. Several employers' associations, notably in Cincinnati, provide free placement services for workers laid off by members. In the summer of 1938 Marshall Field and Company of Chicago set up notable intercompany arrangements to exchange employees with printing shops. Some of their employees were sent to the print shops in the slack summer period, and print shop employees were taken on by Marshall Field during the Christmas rush. The number of employees involved has been small.[18] Furthermore, the short seasonal rush periods have been partly supplied by the seasonally unemployed in the past, although less efficiently than by the contractual arrangement made by Marshall Field.

Interchange of workers would have to be carried on between communities some distance apart in order to become of major importance. The best instance of such a transfer of workers is the annual trek of factory laborers to the harvest fields before the present development of the combine harvester. This trek was carried out only by means of

[18] See "Big Firms Interchange Workers," *Business Week*, January 28, 1939, pp. 22, 27; also Sam Arnold, *Planned Dovetailing of Seasonal Employment* (Columbus: Ohio State University Bureau of Business Research, 1944).

paying very high wages for harvest labor. Because of the relative immobility of labor, a large shift appears to be impractical.

Reducing Seasonal by Agreement. Annual wage plans sometimes involve payment of the laborers under contract at a more regular rate than seasonal variation in the industry has permitted in the past. However, the seasonal for all employees will be reduced only by achieving an actual reduction in the seasonal in production, and the annual wage can no more than encourage the discovery of methods of accomplishing a reduction. For example, the annual wage plan might contribute substantially to a reduction of the seasonal in residential building. The abnormally high wage rates in this industry result from its high seasonality. The high seasonal variation, in turn, is due in substantial degree to a hangover from times when technological methods were not available for building in the winter. Annual wages could supply an inducement to provide more uniform activity throughout the year because not only might they provide more annual income than the laborers now receive, but at the same time they might reduce labor costs.

Controlling the Causes of Seasonal Variations. The most direct method of eliminating seasonal variations of course is removal of the cause. Perfectly plausible procedures for partial accomplishment were developed above. Production may be evened out by storing inventories. Seasonal variation in production dependent upon a limited market can be removed by extending or widening the market. Seasonal variation in employment can sometimes be reduced by widening the manufacture of individual companies to include a better distribution of seasonal products. These procedures all fail to remove the fundamental cause, although they frequently reduce the seasonal variation in employment.

The problem of eliminating or offsetting the seasonal influences created by custom or weather is much more difficult. The weather is largely beyond our control. Customs usually are very hard to change. Direct offsetting of weather conditions appears much more promising than the elimination of weather changes. A few useful techniques for offsetting weather variation are well known. The best illustration we have is involved in the controlled production of poultry and poultry products. Chickens are raised in houses having controlled temperature and light, and hence the production of eggs and of young "fries" becomes independent of the weather.[19] Somewhat similar results can be accomplished in the production of vegetables by the use of greenhouses and hotbeds. Production in greenhouses may not greatly re-

[19] A short description of one such establishment will be found in *Reader's Digest*, September, 1935, p. 11.

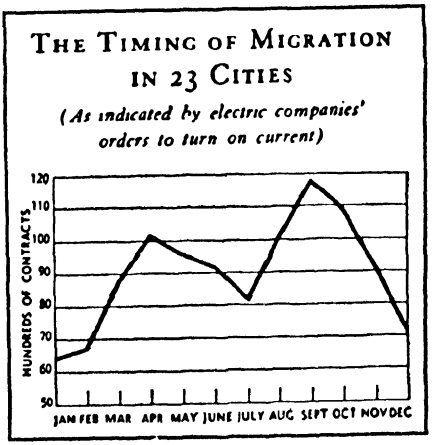
duce the seasonal variation of any one concern, however, since the company operating the greenhouse may not produce out of doors in the summer.

Something may some time be done in an engineering way to control variation in the weather. There appears to be no very great probability that it will be accomplished in the near future, however.

Control of customs appears to be even less promising than control of the weather. We are not likely to stop giving Christmas presents or

CHART 9

SEASONAL CONCENTRATION IN MOVING*



* Taken from Johnson Heywood, "Moving Day Again—but Nothing Is Done about It," *Dun's Review*, October, 1938, p 26, with permission.

buying Easter goods just to reduce seasonal variation. Even so singular a custom as making residential leases expire during limited periods in the spring and fall appears to be very difficult to revise. The Chicago Real Estate Board carried on an extensive program to stagger the expiration date of leases, but with little sustained success. Other cities have had somewhat similar experiences. The seasonal concentration in moving in twenty-three cities is illustrated in Chart 9.

Elimination of Seasonal Variations by Forecasting Them. Most of the schemes for ironing out seasonal variations assume at least a modicum of forecasting ability. An accurate forecast of the seasonal variation is absolutely essential in building up off-seasonal stocks. The building up of such stocks assumes a knowledge of the seasonal variations which will occur during the coming year, because the plan is to produce just enough goods for inventory during the off-seasonal pe-

riods to balance a production under the full demand at the seasonal peaks.

It has been suggested that, if we forecast adequately, the variation forecast will not occur because the movement will be discounted ahead of time. This is true only to a limited extent in the case of seasonal variations. The discounting of seasonal variations will prevent them only in the case of certain prices. Adequately forecasted seasonal variations will not occur in prices if there is no storage problem and if a limited supply which disappears with time, whether used or not, is not involved. Seasonal variation, if adequately forecast by all involved, would not occur in security prices.[20] There is no reason why we should pay more for a security at one time of year than at another if we clearly understand that any improvement in the condition of the industry concerned is entirely seasonal and takes place every year.

Some seasonal variation should occur in the price of commodities whose supply becomes available at only one time during the year if this supply is to be consumed fairly regularly throughout the year. The seasonal variation should allow for the cost of storing the commodities, for the cost of insuring them while stored, and for the cost of borrowing money to finance such operations. It may be that some prices have a seasonal variation greater than that necessary to allow for such variations in cost. If so, an adequate forecast should automatically reduce the seasonal variation.

Some commodities may not have to be stored during the year but may have to be produced at an irregular rate. If this type of production necessitates keeping capital and labor idle part of the year, proper cost accounting would show that the price of the commodity should fluctuate seasonally, the price being higher at the seasonal peak period than at the off-seasonal period. It is probable that the prices of many commodities show *less* of a seasonal variation than they should because of this yearly variation in cost. Perhaps if prices fluctuated more, the seasonal variation in production and employment might be *reduced.*

Forecasting seasonal variation in wage rates will not by itself make the variation any less, but it might lead to plans to provide more regular employment at reduced costs. In most cases seasonal variation in production results in uniformly high wage rates throughout the year, rather than in seasonally variable rates. A greater seasonal variation in *wage rates* might provide inducements to produce at a more regular rate, and a better forecast of seasonal conditions in the industry could conceivably lead to an increase in the seasonal in wage

[20] An exception to this general statement is involved in the selling of stocks at the end of the year to register tax losses.

rates. As noted above, this might be accomplished in the building industry if annual wage plans were instituted.

The seasonal fluctuation in production and employment is principally the result of meteorological weather changes and shifts in demand because of customary buying seasons. We may forecast accurately the changes in production required through the year, but such a forecast will not make the seasonal variation unnecessary. Just because we know we ordinarily buy overcoats in the winter will not make us buy them in the summer.

4. TECHNIQUE OF SEASONAL FORECASTING

Although almost all experienced persons make their plans with allowance for the typical seasonal variations which concern them, seldom is this a conscious process. Frequently there is not available a quantitative measure of the seasonal. By long experience it is found that the sales of certain products are typically low at given seasons of the year and high at other seasons, or that a number of men are likely to be laid off at given seasons and that overtime is likely to be demanded at other seasons. This type of knowledge is a valuable business asset and may become the principal "stock in trade" of the special industry expert in a large corporation. The knowledge of periods of peak and slack employment helps individuals to plan their private finances better and makes for greater peace of mind. It is far better, however, to have available a quantitative measurement of the seasonal variation and to know something of the statistical significance of this measurement. Quantitative measurements may detract from the mysticism of such information, but by the same token, they state the information more precisely, make it possible to get some understanding of its probability, and remove the possibility of bias.

The necessary steps involved in making an adequate forecast of the seasonal variation for any economic process can be stated as follows:

1. Measurement of the seasonal variation—computation of the seasonal index
2. Determination of reliability of the seasonal index—analysis of statistical significance
3. Logical explanation of the seasonal variation
4. Analysis of the probability that the seasonal variation will continue into the future.

The problems involved in carrying out the first two of these steps are analyzed above in the section on measurement of the seasonal. The classification of possible logical reasons for the existence of any seasonal is presented in the section on factors responsible for the seasonal.

The probability that the seasonal variation will continue to exist in the future depends principally upon its logical explanation. If a seasonal movement depends upon the weather, the basic question involves continuance of past weather changes. If the seasonal variation depends upon custom, the basic question is whether the customary buying seasons are so habitual that they can be counted on.

After we have fully assured ourselves as to the likelihood of the continued operation of the factor basically responsible for the seasonal variation, the remaining question regarding the probability of its occurrence in the future is what chances there are that it will be blotted out or that its violence will be reduced by artificial control. The analysis of the possibilities of ironing out the seasonal variation is presented at an earlier point in this chapter. It is possible, for example, that weather changes responsible for a seasonal variation in *consumption* may be prevented from having any influence upon the rate of production throughout the year by means of storing inventories in off-seasons. Whether any one of the possible attempts at artificial control can be expected to change the seasonal variation in any particular economic process will depend upon the relative strength and weakness of any scheme attempted in the near future. It is worth pointing out that diversification, which is probably the most potent scheme for reducing the seasonal variation, does not always reduce the component variations but may merely combine those which are negatively correlated in their movements.

After a forecast of the seasonal variation has been made, several factors should be kept in mind. Such a forecast does not consider long-period changes and the business cycle. These other elements must be forecast separately. For many economic processes the seasonal change will almost invariably account for most of the change between various months or between various quarters. For forecasting the total change in most processes six months ahead, a forecast of the seasonal is less important, and for forecasting changes a year ahead it is of no significance.

We have no measure of the adequacy of the forecast of the seasonal, principally because of the qualitative nature of most such forecasts in the past. In spite of the fact that the qualitative forecast is likely to be much inferior to a forecast carefully made according to the procedure laid down above, it is probable that most seasonal forecasts have been more adequate than most long-time trend forecasts or business-cycle forecasts.[21]

Our rather general understanding of the seasonal change likely to

[21] The making of long-time trend forecasts is analyzed in Chapter III; the making of business-cycle forecasts is analyzed in Chapter XVIII.

occur is socially desirable. The techniques still in use in some industries, however, are cumbersome. Reliance upon a qualitative statement of the seasonal in each economic process may be very expensive when industry is conducted in units as large as those which exist today. Large corporations must have available information about the seasonal in many industries, because they deal with many industries. If it is necessary to hire an individual with experience in each such industry to obtain this information, it will be far more expensive than a statistical analysis of the data.

REVIEW QUESTIONS

1. Reducing the fluctuation in production may either reduce or increase the seasonal in the inventory of the product. When will the seasonal in inventory be reduced? When will it be increased?
2. What is the most promising method of encouraging consumers to buy goods at an even rate throughout the year?
3. What seasonal variation does the preservation of foods reduce?
4. If a scheme to push sales in off-seasons is successful from the manufacturer's standpoint, what is the most likely realignment which has taken place in the seasonal variation in various processes?
5. Can a manufacturer reduce the seasonal by refusing to fill orders in off-seasonal periods?
6. It has been said that the seasonal in the production in any given industry will be less than the seasonal in the production in any one plant of the industry, because unlike variations will tend to offset each other. Is a similar statement correct regarding the seasonal in employment?
7. Diversification is said to be the most promising scheme for reducing the seasonal variation in the near future. Would such diversification reduce the seasonal in any economic process?
8. Give concrete illustrations of prices for which an increase in the seasonal variation would reduce the seasonal variation in production.
9. Flour milling is, to a considerable extent, a decentralized industry. Does this mean that the seasonal variation in flour milling is due to specialized output concentrated in various geographical districts?
10. What relation is there between a seasonal variation resulting from specialized output concentrated in various geographical districts and the growth of large companies which engage in nation-wide advertising?
11. Can air-conditioned chicken houses completely eliminate the seasonal in the production of eggs and young "fries"?
12. Write out the list of procedures necessary for computing the seasonal variation in an industry with a changing seasonal.
13. Draw up working plans for forecasting the seasonal: (*a*) in department store sales; (*b*) in automobile production.
14. What relation is there between engineering procedures for reducing the seasonal due to weather variations and the following: (*a*) geographical concentration of production; (*b*) industries based on the satisfaction of the demands of summer

vacationists; (*c*) geographical diversification to reduce the seasonal variation in the sales of a product by a given company?

15. It is sometimes held that the way to eliminate the seasonal variation in the automobile industry is to discontinue annual model changes, to make automobile improvements continuously through the year, and to offer price reductions in the periods of off-seasonal demand. Discuss.
16. How were seasonal variations largely eliminated during World War II?

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CHAPTER III

LONG-PERIOD MOVEMENTS IN INDUSTRY

OF THE various types of change occurring in economic time series, the seasonal variation, discussed in the previous chapter, is the shortest; the long-period movement, discussed in the present chapter, is the longest. The long-period movement is the level around which the business cycle fluctuates. The statistical mechanics of the type of variation involved are analyzed in Chapter IV. The interrelationship between the business cycle and the long-period movement is generally believed to be of major importance in economic analysis and is considered at various points throughout the book. In addition, the long-period movement has independent significance. The purpose of the present chapter is to discuss the economic change occasioned by the long-period movement.

The long-period influence was traditionally identified as the secular trend in economic data. Twenty years ago the trend was usually accepted to represent long-period growth or decline. Recent economic experience, however, makes the long-period movement appear much less simple than an uninterrupted long sweep of growth or decline. It has become customary to break the long-period movement into two or more parts as indicated by empirical data. In the present book, the breakdown is assumed to involve the secular or primary trend representing output when capacity is effectively employed and the secondary trend breaking away from it. The secular trend represents the movement traced by long-period growth or decline, while the secondary trend represents a long cycle entailing slow variation or drift away from the more fundamental primary or secular trend of growth or decline. Some alternative methods of time-series analysis break down the long-period movement into more than two parts. These methods are believed by the writer to be inferior for economic analysis because of the greater complication introduced by increasing the number of movements to be analyzed and the inadequacy of the logical explanation of the several movements.[1]

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[1] See particularly J. A. Schumpeter, *Business Cycles* (New York: McGraw-Hill Book Co., 1939).

1. THE SECULAR TREND

In terms of several hundred years, the secular trend is probably a cycle not dissimilar to the other components of economic change. The period in which the secular trend reverses itself, however, may generally be disregarded in economic analysis. The secular trend can be accepted as a fundamental movement from which all of the other types of economic change show variation. Employed as a base the secular trend adds meaning to the fluctuations that occur about it.

The secular trend is identified as the growth or decline for total industry, individual industry, or individual enterprise units. The application of the concept of growth or decline to economic data actually derives from biology, but it is in general use in economics and indicates the slow development typically experienced by industry of various sorts. The factors responsible for growth and decline are analyzed in detail later in this section. In the simplest sense, the secular trend represents a structural change arising wherever the fundamental framework of economic resources is expanded or contracted.

Usually secular trends trace a slow, continuous movement. A rising secular trend indicates growth; a falling one, decline; a horizontal one, a stagnant or static condition. A continuous alteration in the fundamental framework is taking place in most industries in that they are experiencing growth or decline. The resulting change produces a new level of activity which differs from the old by the extent of the growth or decline. The analysis of economic change cannot get far until structural or long-run changes are viewed separately from those which are temporary and superficial. Structural changes tend to occur in a slow, cumulative way. Organic growth, to which industrial growth is analogous, takes place in this way. Plants and animals slowly become larger as long as growth continues.[2] The rate of growth, however, does not remain constant for any extended period.

Industrial growth must be viewed as the manifestation of steady development. Increases in activity which do not have a lasting quality should not be termed growth. Since the changes involved are both fundamental and continuous, there appears to be a basis for rational treatment.

Economic growth is most aptly applied to physical production and services rendered. Except for closely related processes, such as ship-

[2] The analogy may also be applied to the period of maturation. Trees grow as long as they live, and many raw-material industries continue to grow for a very long time. The growth of animals is analogous to the growth of consumer-goods industries. The rapid development and withering of fads is like that of the mushroom.

ments or orders which coincide with production in the long run, and for component factors, such as employment, long-period movement does not indicate growth in the sense described above. Notably, prices which appear to have moved in a long cycle cannot be said to grow. Prices undergo a change in a growing industry or economy, but they do not grow. If technological improvements are made in a growing industry of decreasing costs, prices probably will show a generally downward movement. This movement is related to the increasing size of the industry but is not in itself structural development.

Changing output over the long run, with regard both to the total and its components, may denote either growth or decline. Three major forces are determinate: (1) productive ability, (2) social institutions, and (3) individual habits. Except under unusual conditions these forces change in a slow, cumulative way. Productive ability depends upon population growth, technical improvements, and increased utilization of capital equipment. On the average, even technical improvements for total industry usually occur in a steady, cumulative stream. A spectacular change resulting from them is an exception.[3] Social institutions by their very nature are slow to change and exhibit a social lag. Individual habits can be changed only with great difficulty. Their change in society as a whole arises principally by the growing up of new generations.

The slow, steady character of growth makes it amenable to analysis. Growth, however, is not a mechanical process as implied by a rigid, simplified model, but rather the result of spontaneous, autonomous development. The smooth line is undoubtedly a simplification of actual development. Growth of plants and animals is wholly involuntary. It nevertheless is relatively steady since the natural forces are quite inflexible. The forces creating industrial growth are principally involuntary and are largely of a spontaneous character. The result is that growth to some extent speeds up and slows down over short intervals. Improvements surge forward under special incentives. It might seem that in these terms the business cycle itself would trace the pattern of growth, but this is not true. In a rapidly growing economy, prosperity forces up the secular trend by huge additions to capital equipment, while depression represents a period of adjustment to the additional capital equipment and may contribute by the studied development of improved methods. The labor force grows at an un-

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[3] See particularly W. F. Ogburn, "National Policy and Technology," and S. C. Gilfillan, "The Prediction of Inventions," *Technological Trends and National Policy* (publication of the National Resources Committee), June, 1937, pp. 3–38.

diminished rate in depression. The average advancement represented by the secular trend is a satisfactory approximation of growth.

2. MEASUREMENT OF THE SECULAR TREND

Statistical measurement of growth and decline can be made by means of long-time trend methods. It is question-begging, however,to accept a chance trend measurement as a representation of growth. The trend method only provides a technique for getting the measurement. The mechanical result of trend measurement is useful in studying growth, but will not of itself determine the path of growth. A rational basis for substantiating the belief that any long-time trend measurement represents growth is essential. Nevertheless, measurement of the long-time trend is important as a first step in growth analysis, even though it is only a mechanical graduation of the data.

Since, as will be pointed out in Chapter X, the length and amplitude of the business cycle varies greatly, it will be necessary to use data covering several cycles if we hope to obtain a representative measurement of the long-time trend. The more variable the business cycle is for any given industry or process, the longer is the period of data needed for measurement of the trend.

No absolute rule can be laid down as to the length of period which should be used. The longer the period used the better, if certain conditions are met. The first of these conditions is that the period used should include no shorter periods of unusually rapid structural change. The long-time trend of any industry shows growth or decline either because of an increase or decrease of use by those now consuming the product or because of an increase or decrease in the number of those consuming the product. Ordinarily both types of change are present. The trend method assumes a reasonable continuity both in change in consumption per user and in change in the number using the product. If there are periods when the number using the product has shown an unusual increase it is better to use as data for the trend only the figures since such increase. Fitting most trend types to cigarette consumption in the twenties' decade, for example, gave impossible extrapolated values. A large increase in the number of women smokers was taking place year by year. To assume that women would continue to begin smoking at this rate amounted to assuming that there soon would be more women smoking than there are women. The discovery of periods of rapid structural change must be made largely by logical analysis. No rigid rules can be laid down, but extreme care should be used, otherwise the trend extrapolation is likely to be unreliable. It is always desirable to make some estimate of the

extent to which growth is dependent upon new users instead of greater per capita use.

A second condition which must be met in choosing the period to use in measuring the trend is that the period must begin and end at the same stage in the business cycle, preferably at prosperity levels. If the first year used is in prosperity and if the last year used is in depression, the resulting measurement will show an artificially small growth. If the first year used is in depression and the last is in prosperity, the resulting measurement will show an artificially large growth. This can be visualized by drawing rough pictures of these situations. Ordinarily, the trend fitting should begin and end with prosperity. The peaks and troughs are the only phases of the business cycle which stand out in the original data. Depressions vary greatly in their severity, while prosperities cannot rise far above secular trend levels. It can be shown that the extent of the error involved depends on the number of business cycles covered, the greater the number the less the error. With violent cycles, however, the error may still be sizable with a substantial number of cycles.

The trend measurement may be obtained either by freehand methods or by the fitting of mathematical equations to the data. The procedure of the freehand method is to lay a *Ship* or *French* curve on the plotted series and draw a smooth line as indicated by the curve used. Prior to the drawing of the freehand curve, several sets of moving averages are usually computed and drawn. The computation of a moving average involves averaging the data for a constant, but progressively shifting, period. The values for the moving average are plotted at the midpoint of the period for which it is computed.[4]

The fitting of a freehand curve is not necessarily any less accurate than the fitting of a mathematical equation to the data. The difference lies in the fact that the *assumptions* made regarding the trend are of necessity explicit in any equation fitted by mathematical methods, while they can be only vaguely recognized from lines fitted by freehand methods.[5] Actually, the freehand curve cannot be employed extensively in forecasting because extrapolation is difficult, if not impossible. Extrapolated values can be readily obtained from any mathematical equation.

One procedure in measuring growth is to start with a statement of

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[4] The technical method of computing a moving average is described in most books on statistical method. See, e.g., W. A. Neiswanger, *Elementary Statistical Methods* (New York: Macmillan Co., 1943), pp. 501–6.

[5] Corollary to this proposition are the following facts: (1) it is much more difficult to defend a freehand curve than it is to defend a fitted equation; (2) the fitted equation can be described simply and completely by statement of period used, method used, and the resulting equation; description of the freehand curve requires a picture of the plotted curve.

the *nature* of the growth of the industry or process. If a reasonably logical statement can be made, it is a relatively simple problem to incorporate the assumptions in a mathematical equation and fit this equation to the data. Raymond Pearl and L. J. Reed attempted to state the logical nature of the growth of population. They concluded that the so-called logistic curve incorporates this logical nature.[6] The fundamental assumptions of this and several other curves commonly used in fitting long-time trend lines are stated in Table 2.

Pearl and Reed have fitted the logistic curve to the population of all of the countries of the world, even to the growth of most kinds of biological phenomena such as various individual plants and individual animals over time. From their apparent success in applying the logistic curve, a wide claim grew up that a curve of this type states the general law of growth. Besides the logistic, the Gompertz curve is commonly used. The general difference between the two can be ascertained by examining Table 2. Since it was believed that these curves illustrate the general law of growth, all such curves came to be called "growth" curves.

Although the growth curve necessarily represents a continual decline in the geometric rate of growth, plotted on arithmetic paper it looks like a stretched-out S. It postulates a period of slow growth, then more and more rapid absolute growth until a most rapid amount of increase is reached, then a declining amount of growth until an almost stable level is reached. In general, therefore, the growth curve can be said to assume that the industry involved passes through three stages:

1. Stage of experimentation
2. Stage of exploitation
3. Stage of stability or saturation

It is reasonable to believe that the growth of most consumer goods industries progresses through these three stages. It may be that most consumer goods industries, which have not yet reached stability, will pass through these stages in less than fifty years. The growth in the use of automobiles, radios, and mechanical refrigerators is evidence of this likelihood. An indication of the relative position on the growth curve occupied by any consumer goods industry may be valuable.[7]

[6] The equation of the logistic curve may be written as $Y = L/(1+e^{a+bx})$. A comprehensive description of Pearl and Reed's measurement of the trend of population will be found in Raymond Pearl, *The Biology of Population Growth* (New York: Alfred A. Knopf, Inc., 1925). For a similar curve applied to data more simply, see the description of the New York Federal Reserve Bank Curve in notes by N. O. Johnson, published in the *Journal of the American Statistical Association*, XXX, 717, and XXXI, 731.

[7] See W. W. Hay, "Study of the Nature of Demand Would Obviate Many Mistakes of Management," *The Annalist*, May 22, 1931.

TABLE 2

Assumptions Made by Equations Commonly Used to Measure the Long-Time Trend*

(1) Type of Equation	(2) Equation	(3) Assumptions Made	(4) Meaning of Constants	(5) Use of Curve
1 STRAIGHT LINE	$Y = a + bx$	Growth by constant absolute amounts per year	a represents height b represents slope	Simple method of obtaining general impression; sometimes assumptions are typical of data
2 SECOND-DEGREE PARABOLA	$Y = a + bx + cx^2$	Difference of series changes by constant absolute amounts.	a represents height b represents average slope c represents concavity	Useful as a general method if all that can be determined is that trend has curvilinearity without change of concavity, also, size of c determines existence or nonexistence of curvilinearity under these conditions
3 COMPOUND INTEREST CURVE	$Y = ab^x$ or $\log Y = \log a + x \log b$	Growth by a constant rate, a concave upward line.	a represents height $b - 1$ = rate of increase or decrease	Useful when a constant rate of growth can be logically assumed.
4 PARABOLA OF LOGARITHMS	$\log Y = a + bx + cx^2$	Difference of relative changes of the series changes by constant relative amounts	a represents height b represents average slope of relative change c represents concavity of relative change	Useful as a general method when it is shown that curvilinearity of relative change expresses the nature of the data better than curvilinearity of amount of change
GROWTH CURVES: 5. SYMMETRICAL LOGISTIC	$Y = L\ (1 - 10^{a-bx})$	An S-curve, with upper and lower asymptotes, and a declining relative rate of increase throughout the range of the curve, curve is symmetrical about point of inflection	L represents upper asymptote	
6. INTEGRATION OF NORMAL PROBABILITY CURVE	No equation, use arithmetic normal probability paper	Same as symmetrical logistic		
7. GOMPERTZ CURVE	$Y = ab^{c^x}$ or $\log Y = \log a + c^x \log b$	An S-curve, with upper and lower asymptotes, and a declining relative rate of increase throughout the range of the curve, point of inflection is reached when the level of the ordinate is 37 to 38% of the distance between the two asymptotes	a represents the upper asymptote c lies between $+1$ and -1	The "growth" curves assume three general stages of growth (1) experimentation, (2) exploitation, and (3) stability. This is the characteristic growth of consumers' goods industries over a span of 15 to 50 years. It may be the characteristic of total industry or basic industries over several centuries.
8. INTEGRATION OF LOGARITHMIC NORMAL PROBABILITY CURVE	No equation, use logarithmic normal probability paper	Same as Gompertz curve.		
9 NEW YORK FEDERAL RESERVE BANK CURVE	$Y = bc^{1/(d+x)}$ or $\log Y = \log b + \log c^{1/(d+x)}$	A growth type developed to save labor in computing		

* Equations 1, 2, 3, and 4 are ordinarily fitted by the method of least squares; this method assumes a normal distribution of the data about the trend line. The equation of the symmetrical logistic as usually written involves the use of the logarithmic base e. For common methods of computation, however, the logarithmic base 10 gives the same results more simply.

When analyzing the growth of a consumer-goods industry in the stage of stability, however, it is advisable to divide the trend of the industry into the part due to replacements and the part due to new owners. This has been done in the most careful studies of the long-time trend of automobile production.[8] It should also be noted that a sufficiently revolutionary change in the product might start another cycle of growth.

When we come to the long-time trend of total industry or of raw-material industries, there is no good evidence that progress through the stages of the growth curve will ordinarily take place in less than several centuries. The stage at any given time must remain rather uncertain in these cases. Whether the steel industry, for instance, will reach a horizontal level of growth fifty years hence depends on many uncertainties, such as the development of competitive raw materials, changes in the quality of steel, and changes in the nature of the demand. It is not possible to make even rough judgments about the changes in such factors over so long a period.

Thompson and Whelpton of the Scripps Foundation have made a detailed analysis of the change in the logical factors determining the growth of population. These factors are births, deaths, and net immigration. From this analysis, they arrive at a future trend of population which differs markedly from Pearl and Reed's extrapolation of the logistic.[9] This discrepancy raises a fundamental question. Can any predetermined curve describe the general law of growth? It must be recognized that the determination of the logical nature of growth involves personal judgment so that doubts always will arise regarding any equation type which some may conclude to be correct.

Major reliance should be placed upon a detailed study of each important variable involved in making an analysis of various types of

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[8] The basic study was made by C. E. Griffin in "The Life History of Automobiles," *Michigan Business Studies*, Vol. I, No. 1 (February 1, 1926). For more recent analyses of the problem, see *The Dynamics of Automobile Demand* (General Motors Corporation, 1939), which represents a series of papers given at December, 1938, meetings of the Econometric Society and American Statistical Association.

[9] *See* W. S. Thompson and P. K. Whelpton, *Population Trends in the United States* (New York: McGraw-Hill Book Co., 1933); National Resources Planning Board, *Estimates of Future Population of the United States, 1940–2000* (Washington: Government Printing Office, 1943). Comparison is as follows (in millions of persons):

Year	Actual Population	Pearl-Reed Forecast	Thompson-Whelpton Medium Forecast
1920	105.7	107 4	
1930	122 8	122 4	
1940	131.7	138 0	133.1

industrial growth. The two important variables tending to affect the reliability of fit are: (1) the mathematical equation, and (2) the particular period of years used to fit the equation. In making a satisfactory analysis of the growth of any given industry, it is advisable to fit a wide range of equations, using all types which might be held reasonable. These equations should be fitted to varying periods. By relating the assumptions of each equation, and the differences between periods included in fitting the equation, it will be possible in most cases to determine at least a range of the resultant equations which best describe the past growth.[10]

If a forecast is desired, it will be necessary to analyze in detail each of the major logical determinants of the structural change, and it will be necessary to consider the probability that each of these logical determinants will exert the same influence in the future as it has in the past.

3. THE GROWTH OF TOTAL INDUSTRY

The growth of total industry is most important because, as will be noted later, the growth of almost all industries is partly dependent upon this total growth. Some of the problems of measurement are considered in the present section, and the responsible factors are analyzed in the following one.

Gross National Product (GNP), or an estimate of the total expenditure of consumers, producers, and the government, derived from national income data, is now extensively employed in the determination of the "full-employment" level of total industry.[11] The full-employment level is frequently utilized to represent growth. In American usage, "full employment" may be defined as the level of GNP which will employ all individuals 14 years old and over who have a job or are seeking one, less unemployment due to a "frictional" float factor. The amount of frictional unemployment is not readily determined objectively but is defined as the amount necessary to permit the flexibility required in shifting from one job to another. Estimates of frictional unemployment are principally determined by subjective criteria, and most of them now fall between one and one-half and three and one-half million out of a total labor force in the order of sixty million (including the armed forces). In the spring of 1947 roughly two and one-half million were estimated to be unemployed

[10] See, further, Elmer C. Bratt, "Forecasting the Growth of the Steel Industry," *The Iron Age*, March 19, 1936; "Long-Time Trend of Steel Industry," *The Annalist*, December 25, 1936.

[11] The currently reported measurement of Gross National Product is made available by the Department of Commerce. It is described in Chapters XV and XVI.

and GNP was in the order of two hundred and twenty-five billion dollars.[12]

Full-employment levels of GNP may be said to fall below capacity to produce in proportion to the allowance for frictional unemployment. As noted later, growth of total industry moves parallel to capacity to produce but must lie somewhat below it.

The adequacy with which full employment actually represents growth—increase in the growth level—is more complicated. The measurement of GNP is new and subject to a rather indeterminate error. The task of estimating all-inclusive expenditure with available data is tremendous. Ingenious methods are employed to derive reasonable estimates of expenditure in areas of the economy for which no direct measurements are available, but the changes from year to year can scarcely be accepted as completely reliable. A growth rate of 3 per cent per year, which is estimated for GNP since 1929,[13] might be incorrectly measured if the change from year to year were in error by 1 or 2 per cent. Such an error certainly would not be in the same direction every year and over a long period might tend to cancel out. The trouble is, however, that the farther we go back the less adequate GNP estimates become, and they are available only for thirty years in the longest series.

Furthermore, the changes in GNP represent the *value* of expenditure or output and are, therefore, distorted by price changes. Methods of removing the price influence have been greatly improved, but there is still much uncertainty as to how effective these methods are for so comprehensive a measurement as GNP. For these reasons, a direct computation of the secular trend by the formal methods discussed in Section 2 is seldom attempted for GNP, but rather the full-employment level is estimated by the use of figures on the extent of unemployment. Projections are made from estimates of the trend of factors responsible for the growth of GNP. The factors usually employed are size of the labor force, hours of work, and output per man-hour.[14] The result is a forecast of GNP rather than a measurement of past growth. It will be considered later in Section 5.

To obtain a measurement of growth, resort must be had to physical production series. Growth of total industry over a long period of time is best represented by Silberling in a series he developed by using

[12] In addition to the two and one-half million unemployed, over two million—an abnormally large number—have a job but are not at work.

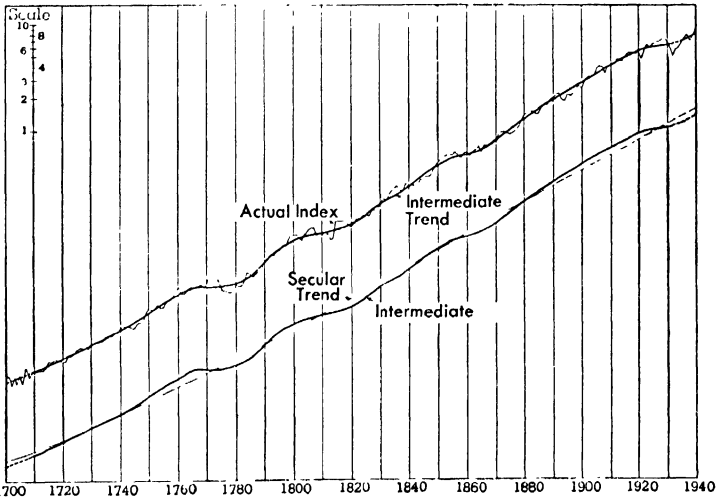
[13] See S. Morris Livingston, *Markets after the War* (78th Cong., 1st sess., Sen. Doc. 40).

[14] Another factor which will partly determine the resulting GNP forecast is the allowance made for frictional unemployment. Since an assumption is not made of growth in frictional unemployment, it will influence only the level of the GNP estimate and not its growth from time to time.

shifting weights and splicing series together from the scanty materials available from 1700 to 1940. His measurement is shown as the secular trend line in Chart 10. This trend line gives us some idea of the long growth of American industry, but it must be accepted as no more than indicative, not only because of the inadequacy of data, but also because of the inherent tendency for physical-production series, representing total activity, to show a downward growth bias.

CHART 10

AMERICAN BUSINESS TRENDS AND CYCLICAL MOVEMENTS, 1700–1940*



*Reproduced by permission. N. J. Silberling, *The Dynamics of Business* (New York: McGraw-Hill Book Co., 1943).

Physical-production series, such as Silberling's, include principally the output of manufactured goods. Silberling is careful to add in agricultural production as well. Several organizations have developed inclusive annual measures of physical production.[15] All such measures of total physical production with a constant weight system have a

[15] See Carl Snyder, *Business Cycles and Business Measurements*, and *Capitalism the Creator* (New York: Macmillan Co., 1927 and 1940, respectively); E. E. Day and W. Thomas, *The Growth of Manufactures 1899 1923* (Washington: Government Printing Office, 1928); W. M. Persons, *Forecasting Business Cycles* (New York: John Wiley & Sons, 1931), and Edwin Frickey, *Barron's Index of Business since 1899* (Barron's, 1943); G. F. Warren and F. A. Pearson, *The Physical Volume of Production in the United States*, Cornell Agricultural Experiment Station Memoir 144, 1932, and mimeographed material from same for later years; E. G. Nourse and others, *America's Capacity to Produce* (Washington: Brookings, 1934); S. Fabricant, *The Output of Manufacturing Industries, 1899–1937* (New York: National Bureau of Economic Research, 1940); Edwin Frickey, *Economic Fluctuations in the United States* (Cambridge: Harvard University Press, 1942).

downward growth bias, that is, they understate the growth which is taking place. The following factors are responsible for this bias:[16]

1. Services, such as those provided by stenographers and garage mechanics, have grown rapidly, but they are almost entirely omitted from consideration in computing a production index.
2. Since data on raw materials are most readily available, the indexes tend to be overweighted by them. The same amount of raw material has accounted for more and more product as time has gone on. Improvement in design has reduced the amount of raw material necessary to make the same product in some cases. Increased life of products has decreased the amount of raw material needed per unit of time in others.
3. Secondary production, the reclaiming of used metals, has ordinarily grown more rapidly than primary production. Secondary production is largely omitted from the indexes, however, because there are no adequate data representative of such production.
4. The indexes give inadequate representation to the increasing salvage of by-products.
5. No allowance can be made for the increasing quality of products. For example, for the purpose of constructing these indexes, a 1920 model automobile must be accepted as the same as a 1940 model.[17]
6. New industries are added to the index very tardily, but new industries ordinarily grow much more rapidly than the average of all industries.

The gross influence of the factors creating downward growth bias is usually somewhat reduced by factors working in the opposite direction, which may be said to result in an *upward growth bias*. Two factors are principally responsible:[18]

1. Gradual decline in quality. This applies principally to extractive industries such as represented by the fact that the better grades of iron ore are first used. Reflection will convince that most women's clothing is less durable than it used to be. While quality generally has improved in most industries, cases of decline in quality make for upward growth bias.
2. The data base of indexes has become more comprehensive, and this may make the series show artificial rises. This characteristic is well illustrated by the use of

[16] See, further, A. F. Burns, *Production Trends in the United States since 1870* (New York: National Bureau of Economic Research, 1934), pp. 17–27, 258–59; P. G. Hudson, "The Construction of Indexes of Physical Production," *Journal of the American Statistical Association*, June, 1939.

[17] See A. T. Court, "Hedonic Price Indexes," *Dynamics of Automobile Demand* (General Motors Corporation, 1939), pp. 99 119 for a pioneer study of the problem of adjusting automobile prices to changes in quality of automobiles.

[18] Burns also lists the fact that "the index never includes industries which vanished at some point, and ordinarily does not include decadent industries which have lingered on" (A. F. Burns, *Production Trends in the United States since 1870* [New York: National Bureau of Economic Research, 1934], p. 259). This is not necessarily a factor of downward growth bias, however, since if the industry *disappears*, dropping it is correct. If it has lingered on, and shown slight increases after the period of pronounced decline, dropping the industry results in a *downward* growth bias.

government inspected cattle slaughter as a measure of beef production. An increasing proportion of the total slaughter came under government inspection up to the World War II period and therefore the measure rose with an artificial rapidity.

Interestingly enough, the cattle slaughter series shows a downward growth bias because of successive decreases in the weight of cattle at slaughter, since the count is not by weight but by number. This largely offsets the increasing coverage of the measure.

It is clear that on balance the downward growth bias of indexes of total physical production is greater than upward growth bias. Removal of a large proportion of this bias is not unlikely in the future, but its presence now is troublesome.

Practically every industry is growing at a decrescent geometric rate at the present time; that is, the rate of growth becomes successively less as time goes on. Nevertheless, it is probably true that the geometric rate of growth of total industry has remained about *constant*. Since we have no adequate measure of the growth of total production, this of course cannot be indicated by any one index. By careful, detailed analysis, Burns is led to the following conclusion, which is more soundly established than any other available regarding total industrial growth: "If there has been any decline in the rate of growth in the total physical production of this country, its extent has probably been slight, and it is even mildly probable that the rate of growth has been increasing somewhat."[19]

Some of the available indexes of physical production show very nearly a constant geometric rate of growth, although they are the combination of series, practically all of which show a decrescent growth. This result follows from the fact that the sum of a group of trend lines becomes a trend line of different type from the component lines. The simplest illustration is the building of wedges on top of one another; if all of the wedges have the same slope, the top wedge, sitting on others like it, will provide a slope much greater than any one does singly.

The fact that industries are in different stages of development adds to the tendency for total industry to grow at a steadier rate than any of the single industries of which it is composed. This can be shown by a simple illustration. Assume that total industry is made up of two industries, one mature and growing slowly, the other young and growing rapidly, as shown by the table at the top of the following page. It is clear upon examination that both industries A and B are growing at a decreasing rate. The total, however, grows 1.98 per cent from

[19] A. F. Burns, *Production Trends in the United States since 1870* (National Bureau of Economic Research, 1934), p. 279. Burns's data end with 1929.

year 1 to year 2, and 2.43 per cent from year 2 to year 3. Such a mathematical relationship is logically possible, since the amount of growth of the small industry is so much greater from year 2 to year 3 than it is from year 1 to year 2 that it produces an increased percentage on the larger base.

At the present time there are a large number of small and rapidly growing industries as well as a large number of large and slowly

Industry	Hypothetical Production in the Stated Year		
	1	2	3
A	100.0	101.0	102.0
B	1.0	2.0	3.5
Total	101.0	103.0	105.5

growing industries. This may well account for the fact that most indexes of total physical production have been growing at nearly a constant geometric rate.

4. FACTORS DETERMINING THE GROWTH OF TOTAL INDUSTRY

As pointed out in Section 1, the growth of total industry is determined by productive ability, social institutions, and individual habits. Habits or institutions operate principally by changing the *effective* capacity to produce—by changing the proportion of the population engaged in productive work, by shifting the proportion between leisure and working hours, by determining the support given to the helpless, and by directing interest in productive activity. As a practical expedient, therefore, we can consider the growth of total industry to be determined by changes in capacity to produce.

Capacity to produce will always lie above the line of growth. Frictional unemployment is one aspect of the incomplete use of resources which indicates the impossibility of operating at full capacity levels. Frictional unemployment of the labor force involves shifting from one job to another. A similar characteristic can be described for capital equipment also; continuous use may require rapid shifts to new products when markets for the established standard products flowing from the facilities become satiated. In any case, the complete use of all capital resources at any one time is impossible because in expansion some industries will attain full capacity use before others. For example, in peak prosperities the basic steel industry has always utilized 100 per cent of its capacity, while many steel consuming industries had capacity to produce substantially more, were additional supplies of

steel available. Expansion of total industry is not so neatly meshed in capitalistic countries that the balanced expansion necessary for continuous use of all facilities will result.

As stated earlier in the chapter, the secular trend is taken to represent the line of growth. This procedure may be defended either theoretically or on pragmatic grounds. The secular trend will cut through the data, leaving about as much prosperity above the line as depression below. Since the line of activity at peak levels can reach a point little, if any, closer to capacity when there is a wide cyclical variation than when there is a narrow one, the wider the cyclical variation the farther the secular trend line will lie below the capacity-to-produce line. Variation produced by the secondary trend, discussed in Section 9, represents a similar reason why the growth line is below the level of productive capacity.

If the growth of total industry is determined by capacity to produce, the growth line and capacity-to-produce line theoretically should be parallel. Bits of empirical evidence tend to corroborate this theoretical tenet. The most significant is that developed by the Brookings Institution in their study on *America's Capacity to Produce*. The measurements are admittedly somewhat crude but are about as comprehensive and satisfactory as can be made with available data. They show that for industry generally an average of about 80 per cent of total plant capacity was utilized in each prosperity from 1900 to 1929.

Capacity to produce is frequently explained by the following factors: number in the labor force, hours of work, and productivity (output per man-hour). This is a particularly useful scheme for projecting GNP and will come up for attention in connection with the forecast of growth. The use of this set of forces results from the fact that measurements can be derived to represent them. It is best to consider first the more fundamental set of determining factors, analyzed below, even though measurements are not so readily available:

CAPACITY TO PRODUCE

1. Quantity and quality of labor
2. Quantity and effectiveness of capital
3. Economy of materials and labor
4. Distributional efficiency
5. Demand distribution
6. Condition, kind, and quantity of natural resources
7. Support of unproductive activity

Although our knowledge of the way each of these factors affects the growth of total industry is incomplete, the basic facts are known. Emphasis is forced upon the changes taking place because it is the change rather than the situation at any given time which affects

growth. In each case the past influence on economic progress is summarized, and any expected change in this influence is indicated.

Quantity and Quality of Labor. The number in the labor force is closely related to the level of population. The proportion of those who are, or wish to be, gainfully employed has changed little in forty years. The proportion of the men who work has remained about constant, while a decline in the proportionate number of children working has been offset by an increase in the proportionate number of women workers.[20]

Up to the middle twenties, population growth remained at a relatively high rate, although distinctly lower than that of the nineteenth century.[21] After the middle twenties, population growth slowed down markedly. This decreasing rate was caused almost wholly by a decline in the birth rate, since immigration has been negligible since 1910.[22] The present birth rate has reattained the high levels of the twenties, but this is probably partly a war influence and partly a recovery from the temporary lows of the thirties.

The number added to the labor force follows the change in the birth rate with about a 20-year lag. The "normal" additions to the labor force in the years ahead will be scarcely half a million, contrasting with close to 700 thousand in 1940. The picture is complicated by the withdrawal of the "abnormal" World War II entries into the labor force, but it is clear that the labor force will tend to increase less rapidly in the years ahead.

The decline in hours of work has been going on for a long time and may be expected to continue. The prevailing work week in manufacturing industry dropped from 60 in 1890 to 50 in the late twenties and has since declined to a scheduled week of 40 hours in most industries.[23] A shorter working week represents a choice in favor of

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[20] For the following years the percentage of gainful workers 14 years and over in the population was: 1900, 55.0; 1910, 57.9; 1920, 55.6; 1930, 54.5. A similar percentage in the labor force in 1940 was 52.2, but the labor force is differently defined and runs lower than gainful workers. In the World War II period this percentage rose substantially and in early 1947 stood at over 55. See U.S. Bureau of the Census, *Statistical Abstract, 1946*, and *Monthly Report on the Labor Force*.

[21] The growth per decade fluctuated about a level of approximately 35 per cent from 1790 to 1860. From this point it declined steadily to 15 per cent in the second and third decades of the twentieth century.

[22] The increase in the foreign-born population was less than 1 per cent in the decades ending in 1920 and 1930. It was 30 per cent in the decade ending in 1910. The increase in native whites was 18.5 per cent in the decade ending in 1920 and 18.1 per cent in the decade ending in 1930; this compares with over 30 per cent in the 1860 and 1880 decades. A decline in the birth rate was under way at least from the last quarter of the nineteenth century, but not of highly spectacular proportions such as occurred during the thirties.

[23] See Leo Wolman, "Hours of Work in American Industry," *National Bureau of Economic Research Bulletin*, No. 71 (November 27, 1938).

greater leisure. So far, at least, the decrease in weekly hours has not slowed down economic progress proportionately for a number of reasons, among which may be listed: the continued increase in the labor force, increased production per worker, the extent to which overtime is resorted to in prosperity, and the decrease in fatigue accompanying shorter hours. The effects of decrease in fatigue have not been satisfactorily measured, but it is believed that the reduced hours have tended to increase hourly output. A decline in working hours from 50 to 40 slows economic progress less than the expected 20 per cent, but it is reasonable to expect a decrease of at least 15 per cent.[24]

The growth experienced to date shows evidence of slight retardation because of a decline in prevailing working hours for the reasons listed above,[25] but no appreciable retardation resulting from decline in the labor force. By the middle fifties both slower increase in the labor force and a reduced working week likely will be retarding.[26]

The quality of labor is another matter. As time has gone on, greater and greater emphasis has been placed on training and education. The conclusion that increased training increases the quality of labor is plausible but difficult to demonstrate. A most important factor is the development of skills required in handling machine processes in industry. In this connection the immediate situation is very hopeful because of the industrial training programs developed during World War II. These programs were very effective in rapidly increasing the required skills, and many of them are being continued.

The average age of workers may have some relation to quality. Our population has been aging rather rapidly since 1920. A marked increase in the number of men over 55 will appear in a few years.[27] Although older workers differ in quality from younger ones, there is

[24] For summary analyses of the effect of fatigue, see P. S. Florence, *Economics of Fatigue and Unrest* (New York: Henry Holt & Co., 1924); D. P. Boder, *Influence of Concomitant Activity and Fatigue* (Baltimore: Johns Hopkins Press, 1935); Research Committee of the Buffalo Chapter of the Society of Industrial Engineers, *Bibliography of Time Study Engineering* (New York: H. W. Wilson Co., 1933).

[25] Wolman shows the decline in average full-time hours to be from 55.1 to 51.0 from 1914 to 1920, and a further drop only to 50.6 in 1929. A comparable figure for the present is about 40 hours per week.

[26] On growth of the labor force, see U.S. Bureau of the Census, "Normal Growth of the Labor Force in the United States: 1940–50," *Population Special Reports Series P—44*, No. 12 (June 12, 1944).

[27] Of the people between 20 and 74 years of age, the following percentage was in the 20–44 group in 1920 and 1930 according to the Census, and will be in this group in 1940, 1950, and 1955 according to Warren S. Thompson's estimate (see *The Annals of the American Academy of Political and Social Science*, CXC [March, 1937] 131–37):

Year	1920	1930	1940	1950	1955
Percentage	66.4	64.3	61.1	59.8	57.9

Thompson estimates that the per cent of the 20–74 group over 54 years of age will increase from 20.1 in 1940 to 23.6 in 1955. In 1955, the proportion of the population 35–44 will be greater than today. The decline in the 20–34 group will be marked.

no clear-cut evidence that the quality is any lower, all things considered. The older worker is somewhat slower and less adaptable, but he is more dependable and more conservative.

Quantity and Effectiveness of Capital. Capital is here accepted as equivalent to producer durable goods. The quantity of capital available is related to the capacity to produce but much less directly than is the quantity of labor power. Labor power is differentiated as to quality, skill, and specialization, but is generally adaptable to new employments.[28] Capital is much less adaptable to new uses for two reasons. To a major extent, it is immobile. If capital is required in growing geographical sections it must be built anew in most cases, even if a plant is lying idle somewhere else. Capital which cannot be used effectively represents wasted effort. Therefore, the smaller the proportion of capital that is highly specialized, the greater is the capacity to produce.

The effectiveness of capital equipment depends upon the economic soundness with which investments are made, which in turn is influenced by many factors. Plants should be geographically located with regard to sources of supply, available power, and demand centers. They should incorporate the most efficient mechanical methods which can be obtained for the funds which may justifiably be used. Of no small importance is the fact that investment should be placed in the industry where the promise of gain is the greatest. The failure to get investments appropriately distributed as to industry results in bottlenecks in the least adequately equipped industries. Whether failure to use plant capacity completely is an important drag on the growth of capacity to produce depends upon obsolescence and deterioration. If a plant wears out only as it is used, and if obsolescence is of no importance, plant capacity which lies idle is not wasted in the long run. Excess plant capacity is costly in such a case only because of interest. If plants are built nearer the time they are needed, capital funds will be tied up for a shorter period. If a plant rusts out in disuse as rapidly as it wears out with use, and if obsolescence is rapid, excess plant capacity is a drag on capacity to produce as well as costly. The investment in excess capacity may be virtually thrown away in such a case.[29]

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[28] The long unemployment of people in distressed areas, such as in the anthracite coal mining section, represents an immobility which is exceptional. In like manner, the few cases where older skilled workers remain unemployed when their skill becomes obsolete are exceptional. This is secular labor mobility; as noted at other points in the book, cyclically labor is quite immobile.

[29] The identification of plant capacity with total capacity to produce is a common error. Total capacity depends additionally upon labor power, conservation of materials, natural resources, efficiency of distribution, and the proportionate quantity of unproductive activity.

The amount of plant capacity depends to a major extent upon the length of time it is employed daily, for example, whether it is worked one, two, or three shifts. The working day for capital equipment is not necessarily the same as that for labor, since some machinery may be used only part of the time and since the same machinery may be used by more than one group of workers each day. Probably some decrease in the hours of capital has accompanied the reduced hours of labor, but definite information for industry as a whole is unavailable. Since change in the hours of capital results principally from a change in labor's working day, the working day for capital will usually be reduced no more than for labor.

A decrease in the operating hours of capital equipment results in: (1) a decrease in effective plant capacity, (2) an increase in depreciation resulting from natural elements together with an increase in the rate of obsolescence, and (3) an increase in the period in which capital must be invested to produce a given return. Except that depreciation from natural elements is less severe, these are the same considerations as those which apply when part of the plant is kept idle. Their significance can readily be overemphasized since they refer to plant capacity and not to total capacity to produce. If a twenty-four-hour shift were rapidly introduced in industry generally, a deficiency of labor and raw materials would immediately become apparent. Furthermore, if the building of new plants were avoided until present capacity could be used twenty-four hours a day, the net advantage attained in using capacity at all times would be small. In some industries the machinery will operate better if not used continuously, and in other industries idle hours are needed for check up and repairs. The disadvantage of night work may more than offset any economies attained by employing less capital for longer hours.

The greater the supply of useful capital, the more effectively labor can be employed and the greater is the total capacity to produce. There are still many instances where labor would be more productive if more capital were available, but this situation is much less universal than existed in the past. Many large companies use capital to the point of its utmost efficiency today, but small companies often are handicapped by an inadequate supply.

There is no clear evidence that the effectiveness of the use of capital is either speeding up or slowing down progress. The tendency to overinvest in many well-established lines of endeavor does not appear to be becoming any more pronounced. The SEC has been trying to improve the degree to which new investments are competitively tested in the capital market and no doubt has achieved reasonable success. This and other control measures have discouraged fraud, but the

extent to which they have improved the direction of capital into the best outlets is unknown. On the whole, no important change in economic progress is indicated.

Economy of Materials and Labor. There are three important ways whereby materials can be saved. One is by an improved design which reduces the necessary raw material and at the same time performs equivalent service. This has occurred especially in cases where dead weight is expensive, such as in the building of suspension bridges or railway rolling stock. A saving of steel of 20 per cent or more can often be effected by using special types of alloy steel.

A second way in which material may be saved is by building products which will last longer without using a proportionately greater quantity of material. Our knowledge concerning the life of economic goods is too inadequate to make tentative conclusions possible.

A third factor is the development and use of by-products. Waste materials, which otherwise would have to be hauled away for disposal, adding to the cost of manufacture, have become the raw material for valuable products. The complete use of the beef carcass in the packing plant has become a classic illustration. Slag from the steel plants is now made into rock wool, a valuable insulating material. The bagasse waste from the sugar cane mills is now made into a building material. There is no evidence that the increasing exploitation of waste material is ended. The development of synthetic processes will provide valuable uses for materials still wasted.

Labor may be saved principally by the effective placing of men, by the specialization of activity, by standardizing the most efficient motions for performing tasks, by efficient routing of material and semifinished product, and by the employment of laborsaving machinery. When men are given only tasks which they perform most efficiently, the labor requirements will be reduced. The development of personnel departments would make it reasonable to believe that something has been accomplished along this line, although no clear-cut conclusion is possible. As personnel departments accumulate more experience, men may be placed still more effectively. An individual worker can do more if the tasks he must perform are limited in number. Much has been accomplished in this respect in large factories. Accomplishment will be extended as the smaller factories increase in size. Time and motion studies have at times been carried to the extreme, but they have made possible a saving of labor. Such studies are applicable to many tasks where adequate analysis has not been made, and they may therefore continue to save as much labor as in the past. The assembly-line method of factory operation, as typified by the Ford automobile plants, has become almost universal in large-scale enter-

prise. The saving of labor effected by this method has been very great. Further accomplishment depends largely upon increasing the size of small enterprise.

The increasing use of laborsaving machinery has been a highly dynamic factor. Many laborsaving devices known to be feasible have not been commercially applied. Adoption of new techniques was at first slow after World War I, and then proceeded very rapidly for a few years. It appears probable that this history is being repeated. The marked development of more efficient machinery and methods of routing materials is one of the most notable characteristics of the age. Although single developments are less startling than those introduced during the Industrial Revolution of the eighteenth century, the adoption is so much more rapid and the number of innovations so numerous that the efficiency of machinery probably is improving at the most rapid rate in the history of the world.

The saving of labor is best measured by output-per-labor-time-unit, or productivity, figures. Estimates of the National Bureau of Economic Research indicate that output-per-man-hour in manufacturing increased at an annual rate of nearly 3 per cent in the first forty years of this century.[30] Estimates for total industry are much cruder, but it is generally believed that 2 per cent per year is a reasonable approximation. There is no evidence so far to indicate a secular slowing down in these rates. A major force which is rapidly extending society's capacity to produce is thus indicated.

Distributional Efficiency. Both transportation and marketing appear to offer substantial promise of increased efficiency. New and improved methods have brought substantial improvements in the past. These have been marked in the case of self-service stores. The problem is too complicated to make a simple projection, but it does not appear unlikely that the past rate of improvement will continue undiminished into the near future. This could occur by a wider adoption of the most efficient methods now in use. If the past rate of increasing efficiency continues, distribution will not tend to retard growth.

Demand Distribution. The quantity of goods available depends in part upon the quality demanded. An increasing number of persons are coming to demand custom-made goods. Such goods are made much less efficiently than if large-scale factory methods were used. The larger the proportion of people who shift to the demand for such goods, the more greatly will the total quantity of output be restricted. To some extent, the sacrifice of quantity is balanced by increased

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[30] See S. Fabricant, *Labor Savings in American Industry, 1899–1939*, Occasional Paper 23 (New York: National Bureau of Economic Research, 1945).

quality. Clothing production could be much greater than it is if no hand tailoring were involved, but the increased quantity probably would be a poor substitute for the resulting loss of appearance. On the other hand, a complete elimination of machine processes would not improve the quality to a great enough extent to offset the smaller quantity which would be available. A factor affecting the future level of production is the extent to which the upper middle class will demand custom-made goods.

The distribution of demand according to income classes may affect growth. The more rapidly the income of the lower classes is lifted, the greater will be the increase in quantity production, for an increased amount rather than high quality is sought by them. However, as income recipients move into still higher income brackets, there is in time a definite improvement in the quality of goods desired.

A choice in favor of appearance and convenience of use at the expense of quantity has been made in almost all income classes. Many foods formerly purchased in bulk are now almost universally sold in small, convenient packages. The cost of the packages is a large item and does not increase the quantity of goods which may be consumed. It is scarcely probable that any acceleration of the movement toward more expensive packaging will occur in the future. The movement toward custom-made goods by the upper middle class, on the other hand, may show some acceleration.

The proportionate increase in demand for durable goods is reducing the rate of growth of total industry by making output more unstable. This does not change actual capacity to produce, but it forces a more conservative estimation of capacity because less constant utilization is possible.

Condition, Kind, and Quality of Natural Resources. A large quantity of diversified resources of high quality are to be found in the United States. On the whole it is reasonable to expect the condition to remain approximately the same in the period of the businessman's perspective. In minor detail, quality changes are occurring. In furniture, veneers have replaced the solid walnuts and mahoganies of yesteryear. Some of the best coal has long since been appropriated. Use has been adapted to such limitation of resources without great handicap. It is more than offset by improvement of quality in many processes where the cunning of adaptation has greatly improved. For instance, a barrel of cement is the equivalent of two barrels of thirty years ago in the sense of a given amount of concrete of stated strength.[31]

[31] This is based on studies of the Portland Cement Association. See Philip G. Hudson, "The Technical Problems and Limitations to the Construction of Indexes of Physical Production," *Journal of the American Statistical Association*, June 1939, pp. 249-50.

Agricultural products, which are closely related to soil resources, have been successively improved by the application of scientific methods.

Our economy depends to a predominant degree upon exhaustible mineral and fuel resources. These were built up by natural forces over a period of time too long for our imaginations to grasp. The fact that they appear to be plentiful enough for our generation is not the proper background for a social policy. Efforts to conserve them for future generations are desirable. Conservation and the development of substitute products need encouragement so that future generations may begin with equally good resources. For our purposes, the major problem in this field relates to the rapidity of development of substitutes. The oil resource well illustrates the nature of this problem. Prior to World War II known oil reserves continuously increased because of new discoveries and improved technology which made deeper drilling possible.[32] The tremendous rate of exploitation during the war reduced known reserves for the first time. The development of processes for making a gasoline substitute from corn or coal may forestall any significant disruption in industry when exhaustion finally is approached.

Unquestionably, the condition of natural resources is slowly deteriorating. However, the rate of deterioration is so slow that economic progress is but slightly retarded. Although possible, it is unlikely that the exhaustion of a critical resource, such as oil, will produce disruption.

Practically no new land is being brought into cultivation, but the rate of land development is no slower that it has been for twenty-five years. Decline in quality on the whole appears to be steady enough to exert no retarding effect. Resources are essentially a passive factor in explaining continued progress.

The excellence of our resources, however, is important in accounting for our relatively high standard of living. In other words, resources are a major factor in accounting for the level of the secular trend but not for the rise in the secular trend.

Support of Unproductive Activity. A certain part of the effort of any society must be directed to unproductive ends. The delinquent, the defective, and the destitute must be cared for. Disabled veterans will add slightly to the dead weight in the near future.

Some persons believe that insanity is on the increase. If this proves to be a long-period tendency, it will be a minor influence tending to slow down economic progress. An increase in crime also would be a retarding influence.

Foreign programs of relief and rehabilitation add to unproductive

[32] The recent estimates of proved reserves are published yearly in *The Mineral Industry*, ed. G. A. Roush (New York: McGraw-Hill Book Co.).

activity. Our international responsibilities would appear to put these expenditures on a permanently higher level. If programs of export are used extensively to support domestic full employment, such expenditure will increase still more.

Under the social security program a widespread, old-age benefit plan has come into effect. The numbers in the population in the old-age groups are beginning to show substantial increases. If social security reduces the number who perform useful service, labor power will be curtailed.

On the whole, unproductive activity would appear to be on the increase. This will contribute a minor tendency toward retardation of growth. Capacity to produce is limited when increasing activity must be diverted to the support of those who do not contribute to production.

In summary, an analysis of the logical factors determining the growth of total industry indicates but a slight retardation of growth. Normal increase in the labor force will be less rapid, but this may be partially offset by retention in the labor force of a substantial proportion of those drawn in by World War II. Successive declines in the work week are also a retarding influence. The quality of workers may be increased by the continuance of training programs developed during the war. The supply and effectiveness of capital are likely to increase rapidly enough to maintain past growth. Economy in the use of materials and labor will probably continue to improve at the very high rate of the past years. Productivity, or the measurement of economy in use of labor, may advance at an accelerated rate for a few years and make up for the slackened rate experienced in industries making civilian goods during and immediately after the war. Both transportation and marketing should continue past advances in efficiency. Demand for more convenient packaging and custom-made goods is likely to continue to curtail slightly growth in the total quantity of goods available, as it has done in the past. A slow deterioration of natural resources will continue but should not slow down growth. The rate at which unproductive activity is supported may increase slightly and produce a minor slackening in our capacity to produce. No factors can be expected indefinitely to increase growth, although the quality of labor and the productivity of industry are possibilities in the near future. Growth will be slackened slightly by a slower increase in the labor force and its work week and by our commitments to support an increasing area of unproductive activity.

5. FORECASTING THE GROWTH OF TOTAL INDUSTRY

If the tentative conclusions reached in the preceding sections are accepted, the growth of total industry can be roughly approximated

by an expedient procedure of estimating full-employment levels. As noted in Section 3, this method involves a projection of labor force, hours of work, and output per man-hour. The extent to which such a projection is likely to be consistent with the changes indicated in these determining factors is reviewed later.

For the full-employment projection in a representative study, "the size of the labor force in 1950 is first estimated. Labor productivity in each nonagricultural component is next calculated. Output in each component is then estimated, and the results summated to yield an estimate of total gross national product."[33] A difficult step involved is an estimate of the distribution of employment in 1950. Only crude methods are available for doing this, but the step necessitates that some assumption be made. Manufacturing, especially durable goods, has expanded disproportionately in past prosperities. Would it be relatively so large at permanent full-employment levels? Further, productivity has increased with greater than average rapidity in manufacturing. The dollar output per worker has been well above average in manufacturing. Hence the larger weight given to manufacturing, the larger the projected GNP will be. If productivity projections by major industries are avoided by extrapolating the value of output per worker for all industry,[34] rather extreme assumptions must be made as to the expansion of those industries rising most in prosperity.

Projecting output per man-hour figures by major industries necessitates the development of past relationships. We noted above the downward growth bias physical production indexes tend to possess, and dividing physical production by total man-hour employment does not cancel this bias. Therefore, the projections are likely to understate productivity increases. Offsetting this understatement is failure of estimates made with such a crude set of determining forces to ignore one factor likely to slacken growth—the increase in unproductive activity. Other forces developed in Section 4 are either neutral in effect or are taken into account by the full-employment method.

The full-employment projection possesses the great advantage of developing a quantitative estimate. The more detailed analysis of factors determining growth presented in Section 4 cannot properly be said to result in a forecast because a quantitative projection cannot be derived; the method provides a basis for indicating whether or not the assumptions made by the full-employment method overlook determining forces.

[33] E. E. Hagen and N. B. Kirkpatrick, "The National Output at Full Employment in 1950," *American Economic Review*, XXXIV, (September, 1944), 472-500. Also see U.S. Department of Labor, "Full Employment Patterns, 1950," *Bureau of Labor Statistics Serial R. 1868*, 1947.

[34] See, for instance, S. Morris Livingston, "Postwar Manpower and Its Capacity to Produce," *Survey of Current Business*, April, 1943.

The arithmetic of the full-employment method would be very simple if estimates of the value of output per worker instead of productivity changes by industry group could be used. The greater simplicity can be illustrated by a projection in 1943 of the full-employment level for 1946.[35] GNP amounted to 97 billion dollars in 1940; adding 20 per cent for the estimated increase in productivity and 20 per cent for the estimated increase in civilian man-hours, a 1946 GNP of 142 billion dollars in 1940 prices was derived. Of the 20 per cent estimated increase in employment, three-fifths results from reducing the level of unemployment existent in 1940, rather than from secular increase in man power. The secular increase estimated for employment, therefore, is 8 per cent. The GNP estimate for 1946 came out to be approximately equal to the actual level, but man power increased much more than anticipated, due to the retention of a part of the extra war workers in the labor force, while productivity increased much less than anticipated. By the more accurate method of estimating productivity by major industries, the same general method is applied separately to each industry group, and the resulting projections are added together to estimate total GNP.

The full-employment method is crude at best, and the resulting forecasts of total industry growth must be recognized to be very approximate. The potentialities of the method appeared to be so great that many estimates were made from 1943 to 1946. Carelessness and misunderstanding occurred and some rather fantastic estimates appeared. The forecast provided by the full-employment method is not very precise but will roughly approximate future growth, if made with care.

Estimates of the near-future growth of total industry made with physical-production series are even less satisfactory. The physical-production index has an indeterminate downward growth bias. An empirical measurement of trend from a statistical series is less convincing than a method which projects a simple set of causal factors as in the full-employment method. Physical-production projections of past growth into the future cannot be taken very seriously until more dependable measures of past growth are available. When and if this occurs, the methods summarized in Section 7 for forecasting the growth of individual industries can be employed.

6. GROWTH AND DECLINE OF INDIVIDUAL INDUSTRIES

The growth of total industry is a major determinant of the growth of any individual industry. This is because the structure of production, other than for cyclical disturbance, is relatively stable. Statistical data

[35] S. Morris Livingston, *Markets after the War* (78th Cong., 1st sess., Sen. Doc. 40). (1940 GNP estimate from old Department of Commerce series.)

show that the product distribution changes slowly and according to a predictable pattern.[36] Few products are used in isolation. A high interrelationship exists between the level of production of different commodities. With greater production of finished goods, more raw materials must be produced and more transportation must be provided. Except for fads, a given disposable income is used to buy a fairly well-distributed group of products. The amount of any one group which will be produced depends in large degree upon total output. If industry is divided into large enough groupings so that all of those providing one type of service fall in one group, the level of total industry is the most important determinant. For instance, the amount of transportation needed at any one time and stage of development is relatively fixed by the total level of production. If the transportation group were broken down into competitive types, total industry might no longer be the most important determinant for each type.

The level of total industry determines the output needed for various types of products, not for all times and places, but with regard to a given age. A balanced per-capita output exactly equivalent to that existent in the United States is conceivable with no production of motor cars at all, but not in the near future. The growth of total industry determines the growth of the major components for short periods, starting with a given distribution of total industry. The important fact is that the anticipated growth of any individual industry must be checked against the growth of total industry.

Other than the growth of total industry, the most important determinant of growth or decline in individual industries is the type of development in competitive industries. This influence becomes most important if the industrial grouping is made fine enough so that competitive products, although they may be put to the same end use, are listed as separate industries. For example, railroads and trucking conceived as separate industries may grow or decline at the expense of each other, while this effect is not apparent if we think of both as a part of the transportation industry.

Products may compete on the basis of adaptation to use, quality, or price. Steel provides a good illustration of adaptation to particular uses. Much attention has been given to the development of steel alloys, and the steel industry is thereby retaining part of the market which otherwise would have been lost to competing products. Competing quality is broadly illustrated by improvements of the automo-

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[36] W. W. Leontief has shown this most painstakingly. See his pioneer monograph, listed below, but more comprehensive formulations are about to be published. *The Structure of the American Economy, 1919–29: An Empirical Application of Equilibrium Analysis* (Cambridge, Mass.: Harvard University Press, 1941).

bile. One of the reasons for the shift from the railroad to the automobile for travel probably was that train service changed little, while the automobile improved rapidly in comfort and convenience. Price competition is the most obvious type. If a cheaper product will serve the purpose reasonably well, its use is likely to grow the more rapidly.

In particular industries other special influences may need to be taken into consideration in studying growth. A most common one is population growth. Some products, for example, residential housing, have depended in part on population growth. Other products are sold only to given age groups, and as population changes the proportionate age grouping shifts.

7. FORECASTING THE GROWTH OF INDIVIDUAL INDUSTRIES

Forecasting the secular trend is predicated upon moderately steady development. When the cyclical variation remains within reasonable bounds, development is clearly indicated by the general trend shown in the data when the levels at the peaks and troughs are ignored. For the period for which records are available this general procedure has made fairly obvious the growth or decline existent in various industries.

Current growth is more difficult to assess than past growth. With a time perspective, it is fairly easy to decide on what are abnormally high levels or abnormally low levels. During the current period, with the future always an unknown quantity, this differentiation is much more difficult.

Long-term forecasting has been proposed by two strikingly contrasting procedures. One is a discovery of the law of growth applicable to the given process or industry. Such a procedure is best illustrated by the Pearl-Reed Studies on population growth considered in Section 2. The results scarcely lead us to expect a great deal from this approach. The contrasting procedure is the fitting and forward projection of any convenient secular trend equation. This method immediately becomes questionable as soon as we realize that some other type of equation may give a very different projection, even though for the period for which data are available the two equations may fit equally well. Furthermore, backward extrapolation may give a poor fit. Because neither of these procedures has great promise, one might be inclined to conclude superficially that the forecasting of development is impossible. The conclusion is not justified. Breaking the problem down into several detailed problems makes possible a more satisfactory method. This method is briefly summarized below.

Obtaining a Series Which Represents Changes in Production or Consumption Adequately for Trend Measurement. The problem of obtaining a homogeneous series for the purpose of measuring the long-time trend leaves much to be desired. The most desirable data would be figures on the finished product, if such figures were comparable from one time to another. In many cases, as a result of changes in the quality, data on the finished product are not comparable. For instance, an automobile manufactured today is very different from an automobile manufactured twenty years ago, although all trend measurements consider them the same thing. It may be that such an article as an automobile satisfies about the same desire at one time as at another, and that the practice of considering no difference in the article over time is justified from this point of view even though the quality changes. The importance of changes in quality has not been given adequate consideration, however.

Use of a raw material or the semifinished product to measure production presents even subtler difficulties than those encountered when the finished product is used. These difficulties are all the more important since data on the production of the semifinished product are ordinarily more readily available. One of the difficulties involved results from the increased efficiency in the use of raw material which gives a downward bias to the growth estimate. Another type of problem can be illustrated by steel ingots which have typically been used to measure the growth of the steel industry, although they have not done so efficiently because of the increased proportion of finished products made out of steel instead of iron.[37] A further difficulty which arises from the use of secondary or reclaimed products can be illustrated by the case of pig iron, which does not represent the growth of the steel industry because of the increasing use of scrap in the manufacture of the final product.

Great care must be exercised in picking a series to be used in measuring the long-time trend. Such a series should be checked carefully for any indication of changing quality or any shift in the adequacy of its representation of the industry.

Obtaining an Equation Describing the Logical Nature of Growth or Decline. As pointed out above, Pearl and Reed's work on population best typifies attempts to discover the law descriptive of the logical nature of growth. There are so many factors determining the logical nature of the secular trend that any attempt to write all of them into an invariable law would be so cumbersome as to be unmanageable. Because of the statistical nature of social and economic

[37] For an analysis of this see Elmer C. Bratt, "How Can the Growth of the Steel Industry Be Measured?" *The Iron Age*, November 14, 1935.

knowledge, only an approximate estimate can be determined for each of the factors involved. The probable error of each separate factor can be much more satisfactorily dealt with individually than in one single over-all equation. Further, it is very difficult to cover the possibility of rapid structural changes in an invariable equation.

There will be important differences between industries in the fruitfulness of any attempt to discover the invariable law of growth. It was pointed out above that the application of the growth curve to a consumer-goods industry may bring out important facts about the stage of such an industry's growth. It is possible that cases will be found in which the growth of a consumer-goods industry may be shown to be properly forecast by a growth curve. It will always be valuable to make some preliminary analysis to ascertain whether we can determine the logical nature of the growth of the industry being considered.

Obtaining the Equation of Change Best Describing Growth or Decline in the Past. For the purpose of description of the past trend, a large range of equations will be equally effective. Slight differences in the way the line moves, however, will make a great difference in the extrapolated future trend.

When the purpose is that of extrapolation, great differences will result (1) when different types of equations are used, and (2) when the equation is fitted to different periods of the available data. It is necessary, therefore, to fit a reasonable range of equation types and to compare the results. It is necessary, also, to fit equations to varying periods and to compare the extrapolated results. In many cases, it will be useful to extrapolate the trend backward as well as forward. A comparison of these various equations will bring out the nature of the trend in the past. Major emphasis should be given to periods beginning and ending with peak prosperity; otherwise the growth trend may be distorted.

It is to be noted that past data must not be used indiscriminately. Changes in the long-time trend result from change in consumption per user and from change in the number using the commodity. Times occur when the change in the number using the commodity may be so rapid that an assumption of long continuance into the future is ridiculous. The illustration previously furnished of the consumption of cigarettes by women in the twenties' decade was a good example of such fallacious reasoning.

It is a statistical adage that all of the data forms evidence as to the level of the long-time trend. The saying is useful to prevent us from disregarding production at peak cyclical periods or at low depression periods. It is not invariably true, however. Although not frequent, there are times when the consumption of a product may be temporar-

ily untypical. The most common case occurs in the war consumption of some commodity. Many consumer durable goods were abnormally restricted during World War II.

Analyzing the Factors Determining Growth or Decline. A determination of the past growth of an industry is by no means sufficient evidence from which to conclude what level can be expected for the long-time trend of the future. The opposite would be true, of course, if the past growth represented an invariable law describing the logical nature of the series.

All we can hope to do is to list the factors determining growth which appear to be of major importance at any given time. We should not be deceived by any claims that these factors will be the sufficient and necessary ones at all times and places. The consideration of such factors for any individual industry is beyond the scope of this book. The major considerations are likely to be the growth of total industry; changes in use, quality, and price relative to competitive products; and population changes. These factors are outlined in the preceding pages. Many analyses of the market for major industry groups consistent with secular levels for total industry are now becoming available.[38] While these cannot replace studies made at the industry level, they should be helpful as a guide.

Using the Conclusions Regarding the Determining Factors in Modification of the Past Equation of Change. Modification of the extrapolation of the past equation of change according to indications given by changes in the determining factors always must be far from mathematically precise. The advisable procedure is to study separately the probable quantitative effect of each determining factor on the growth. This is far simpler than would be the process of attempting to study each factor and make some sort of qualitative sum. It is difficult enough to reduce each one to some approximate quantitative size and then sum.

It is necessary to caution that ordinarily a mere sum of such rough quantitative amounts will not be sufficient, for there may be a relationship between some of these factors so that anticipated changes taking place in one factor may offset, to some extent, anticipated changes in another. An illustration is provided in the case of an industry when there are anticipated changes in the quality both of

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[38] See particularly "Full Employment Patterns, 1950," *Monthly Labor Review*, February, and March, 1947; also S. Morris Livingston, *Markets after the War* (78th Cong., 1st sess., Sen. Doc. 40), and supplementary study by Paul McCracken "A Hypothetical Projection of Expenditures for Commodity Groups Based on Past Relationships to GNP" (publication of the Department of Commerce, May, 1943), Committee for Economic Development, *American Industry Looks Ahead* (1945).

the product of the industry and of the product of competitive industries. Anticipated improvement of the industry's product may offset, to some extent, tendencies for competitive products to take its place. The improvement of steel alloys, for instance, will tend to offset the tendency for competitive metals to replace steel in certain uses.

8. NEED FOR FORECASTING GROWTH AND DECLINE

The forecast of growth is more important than any other type. It is necessary in order to provide a basis for determining the needed investment in plant and equipment. Cyclical deviation is predominantly related to the output of durable goods. At high levels of activity the rate of capital building is disproportionately high; at low levels it is disproportionately low. A common practice is to build capital when the market demand for products is so great that the need for additional capital is evident. This practice accentuates prosperity because high activity in consumer goods industries is added to by exceptional spurts in the building of capital goods.

If a more fundamental basis for building capital equipment can be discovered, it will prove profitable for individual companies. Costs typically are lower in depression, and therefore a saving will be effected if capital is built then. Furthermore, prosperity demand is often a very unstable type. Greater incomes than ever before may lead people temporarily to buy erratically; and if this proves to be the case, the market-demand basis will have been found illusory. The building of new capital assumes the demand shown on the market to be recurrent. Peak inventory demand is nonrecurrent. To the extent prosperity buying is of this type, capital building will prove to be a mistake.

Market demands reach their highest level as the peak of prosperity is attained. Adding to capital equipment at that time will tend to result in a maximum period of idleness for capital because business conditions will begin to get worse shortly after, or even before, the equipment is completed. Dependence on current market demand makes for stagnant conditions in depression. The abnormally low level of market demand clearly indicates the need for little additional capital equipment. Need becomes less evident the further the market declines. However, as a social policy, the *studied placing* of capital is far more satisfactory. The importance of the problem has increased with time. The obvious way by which this tendency can be reversed is by giving more attention to analytical long-term forecasting. A forecast of the secular level does not depend upon the temporary market conditions existent at any particular moment.

The making of any fixed-capital investment implies a long-time

trend forecast. The length of period for which the forecast is implied is the life of the capital good. This period is probably ten to fifteen years for the bulk of capital equipment, although there are important cases where the expected life is not over five years and others where the expected life is at least twenty-five years. In understanding current economic change, any long-time trend forecast for a period longer than the life of the capital good is unimportant, even though it may be important for social purposes. The analysis presented here considers forecasts up to the length of life of the capital good.

Since the need for a forecast of growth or decline is to determine where capital should be placed, physical production is the type of activity most immediately concerned. This does not mean that forecasts of the secular needs of service and utility industries are unimportant. Dentistry, for instance, requires a large capital investment. If this is made only in prosperity it is as unstabilizing as capital investment in the manufacturing sectors. Trade and services of all sorts require about as much capital building as manufacturing. Out of an average yearly expenditure of 7.5 billion dollars for plant and equipment from 1937 to 1940, manufacturing and mining took only 2.5 billion.

A forecast of desirable public works is much needed. Most works of this type have a very long life, and great care should be taken to find out whether effective use can be expected during their life. Not only may the funds otherwise be wasted to a considerable extent, but, if used, harmful effects may accrue. A bridge located without regard to future needs may, for instance, make it impossible to keep through-traffic out of the heart of a city. Power development should be related to probable industrial growth of the particular territory.[39]

Congested population areas necessitate planning for effective development. The need is partially met by zoning ordinances, but a zoning ordinance must be based on an estimate of probable future development of the city, even though this is merely implied in the study on which the ordinance is based. The layout needed for a city depends upon its size, the type of industry it will attract, transportation systems which will be used, and many other factors dependent upon its development. Traffic congestion and inadequate parking facilities illustrate difficulties which often could have been partially avoided by the use of longer-term perspective.[40]

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[39] Notable in this respect is the vast power development made in recent years under government auspices. See particularly *Public Works Planning* (75th Cong., 1st sess., House Doc. 140), and various studies of the National Resources Committee on the subject.

[40] See a pamphlet by Orin F. Nolting and Paul Opperman, *The Parking Problem in Central Business Districts* (Chicago: Public Administration Service, 1938).

The basic forecast is that of *total* physical production because the first determinant of the secular level of individual industries is the secular level of total industry. Before the forecast can become of value in determining the types of capital equipment to construct, it must be applied rather specifically to individual products. The product studied must be sufficiently individual so that the special kind of machinery involved may be separately considered. Since such machinery is used in combination with other types, and sometimes in the same building, its forecast must be related to a forecast of the growth of the broader industry concerned.

A forecast of geographical distribution is also useful. It is just as important, and sometimes more important, to know the regions in which an industry needs to develop as to know the development which is likely to take place in the country as a whole. A decision must be made as to where the plant will be built, if the development of the industry appears to warrant the building of an additional plant. The answer to this question depends upon the geographical concentration of market demand, natural resources, power, and labor supply.

The difficulties of long-term forecasting are so great that probably the major part of capital equipment will be constructed only after market demand for the product indicates a need for additional capacity. The building of a minor part of capacity as a result of long-term studies can exert critical influence.[41] Use of long-term forecasts should reduce the extent to which productive facilites are duplicated by imitative competitors in a competitive society. The most successful forecasts will follow the indications of long-term growth as well as market demand. Expansion will be emphasized less in prosperity because long-term indications will dampen the alert enterpriser's enthusiasm. The successful enterpriser is less likely to be aped in his farseeing extensions during depression because of the pessimistic market indications existent at that time.

9. THE SECONDARY TREND

If an equation represented in Table 2 is fitted to almost any long production series, an important difficulty will immediately appear. Entirely aside from the usual business-cycle fluctuation, the fitted trend will be seen first to lie under the actual data for a long period and then to lie above it for a long period. If a relationship did not

[41] Not only should an enterpriser watch a plausible forecast of the long-term growth possibilities, he must also assure himself that the downswing has nearly spent itself before he can rationally begin an expansion program. The point is that a growth forecast is needed to prevent the building of durable equipment when it is almost universally excessive for continued market demands.

exist throughout industry between the periods of time during which various series moved above and below the secular trend, these longer length variations might be marked down as due to a vacillation in the measurement of the individual series rather than to a variation in the long-period movement of total industry. But, these long-period movements are closely similar throughout industry, as shown by A. F. Burns.[42] This long-period movement about the secular trend is termed "secondary trend" in this book. This movement does not rise steadily as does the secular trend but represents a speeding-up or slowing-down of long-period growth, and at times manifests an actual decline while the secular trend is rising substantially.

The secondary trend is as truly a cycle, in the sense that it registers plus and minus departures from the secular trend as a reference line, as is the business cycle; but the movement it traces is a long drift rather than a movement showing rapid reversals like the business cycle. Calling it a "trend" rather than a "cycle" emphasizes this fact.

The secondary trend might be still further divided into components. Schumpeter's scheme, described briefly in Chapter I, would effect this division. The same data may be described as an indivisible whole or as divided into two or more component parts, depending upon the regularity found in the component cycles and the logical meaning which can be attributed to them. It is obvious upon reflection that the line showing the original data must contain all of the component series. Although Schumpeter conceives of his component cycles as being almost completely periodic, he is unable to present measurements showing this to be the case. The more divisions into which time series are classified, the more involved the analysis becomes. Without much better reasons than have been advanced so far, it is better to study the secondary trend as a single movement rather than as divided into separate movements.

The best available measurement of the secondary trend over the long period since 1700 has been developed by Silberling, and is presented in Chart 10 (labeled "intermediate" trend by Silberling). This chart shows a low point on the secondary trend in 1870 and again in the 1930's. These major dips unquestionably occurred and will show up in practically all measurements. A question remains, however, whether the methods of piecing series together used by Silberling did not neutralize in the measurement a minor dip in the 1890's and possibly others.[43] Silberling's measurement must be taken as indica-

[42] A. F. Burns, *Production Trends in the United States since 1870* (New York: National Bureau of Economic Research, 1934).

[43] A splice is made in Silberling's index at 1890. Subsequent to that year the index depends entirely on industrial and agricultural production, with slowly declining weights for

tive of, rather than as a representative measurement of, the secondary trend.

The method of measuring the secondary trend employed by Silberling is the moving average, and this is the only effective method available unless rather rigid assumptions are made regarding regularity of movement.[44] A mathematical equation could be employed, but it would assume some *regularity of recurrence* of the secondary trend, a completely undemonstrated conclusion. Silberling's measurement represents an unweighted average of two centered moving averages of fifteen and twenty-one years. These particular lengths and the combination were determined experimentally by trying out various moving-average procedures. The particular moving-average lengths employed by Silberling cannot be taken to have any inherent significance as a combination to employ generally in measuring the secondary trend. In fact, it is possible that the moving averages utilized are too long and that this is partially responsible for the missing minor dips in the secondary trend which are indicated by measurements developed by Burns and others.[45] The moving average cannot be brought down to date, and this is a marked disadvantage in measuring the secondary trend. It means that, with known procedures, the only way a current estimate of the secondary trend can be obtained is to project the moving-average computation by a freehand curve. This is the reason why Silberling shows each end of the secondary trend by a dash line instead of the solid line which represents it throughout the rest of its course.

In summary, we know that a secondary trend exists, but no satisfactory measurement has been made of it. What factors are responsible for it? Burns shows that the long-period movements of growth industries tend to move farther away from those of declining industries

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the latter. From 1871 to 1890, the index is represented by an average of the production measure and deflated imports. Earlier, major resort is had to import data, although in the early years population growth is given important weight. See N. J. Silberling, *The Dynamics of Business* (New York: McGraw-Hill Book Co., 1943), pp. 685–94. Burns's data also show dips near 1910 and 1920. See A. F. Burns, *Production Trends in the United States since 1870* (New York: National Bureau of Economic Research, 1934), chap. v. C. A. R. Wardwell suggests major cycle troughs in 1895 and 1914. See his *An Investigation of Economic Data for Major Cycles* (Philadelphia: privately published, 1927).

[44] In this connection, see the pioneering suggestion on the use of the moving average for this purpose: L. A. Maverick, "Time Series: Their Analysis by Successive Smoothings," *Econometrica*, I (July, 1933), 238–46; also, the standard work on trend measurement by use of successive moving averages: F. R. Macaulay, *The Smoothing of Time Series* (New York: National Bureau of Economic Research, 1931).

[45] A. F. Burns, *Production Trends in the United States since 1870* (New York: National Bureau of Economic Research, 1934); Simon Kuznets, *Secular Movements in Production and Prices* (Boston: Houghton Mifflin Co., 1930); C. A. R. Wardwell, *An Investigation of Economic Data for Major Cycles* (Philadelphia: privately published, 1927).

when the secondary trend is rising than when it is falling.[46] He suggests that "when during an upward [secondary-trend] movement the divergence exceeds what is 'normal' for the time, a strain will develop in the economic system; this is likely to lead to a general crisis and to a curtailment in the rate of development of the system." As Burns emphasizes, this is merely a *possible* hypothesis and is not to be taken as a complete explanation in any case.

The position is taken here that the logical meaning of the secondary trend derives from the reason that it must be recognized as a movement separate from the business cycle and from the secular trend. That the secondary trend, as far as purely *mechanical* considerations are concerned, would be satisfactorily represented either as a part of a unitary long-period movement or as part of an expanded concept of business-cycle variation should be reemphasized. If handled as part of the long-period movement, the analyst is deprived of a basic tool for studying secular growth. The low, average level of operation in almost all industry in the thirties would not be distinguished from the secular trend which permitted such high activity during and since the war. Without such a tool of analysis, the peak of a business cycle such as the one in 1937, when eight million persons remained unemployed, is not distinguished sufficiently from such a business-cycle peak as the one in 1929.

Considered as a part of the business cycle, the result is just as unsatisfactory. The 1937 peak lay substantially below the secular-trend level and would have to be marked as part of a business-cycle depression if the business cycle and secondary trend are accepted as one and the same movement. But the 1937 peak with eight million unemployed was not characteristic of business-cycle experience. Furthermore, if business-cycle and secondary trend are viewed as one, the business cycle comes to have associated with it dragged-out low levels of employment characteristic of deep depressions, and the business cycle cannot then be employed to delineate sharply the characteristic upswing and downswing described in Chapter VI.

The fact that the secondary trend is a disturbing element either as part of a single long-period movement or as part of the business cycle provides a clue to its significance. As a persistent drift in the ease or difficulty of organizing and employing economic resources, the secondary trend represents a slow shift about the secular growth trend, pressing during a substantial secondary uptrend on the limits of ca-

[46] A. F. Burns, *Production in the United States since 1870* (New York: National Bureau of Economic Research, 1934), pp. 226 ff. He shows that a measure of dispersion of the trend change from decade to decade follows closely with his measure of secondary trend. His terminology is trend-cycle instead of secondary trend.

pacity to produce and accentuating during a substantial secondary downtrend the depression phase of the business cycle, which by comparison describes a relatively rapid upswing and downswing about the secondary trend.

It is very doubtful that any single force is responsible for the persistent drift represented by the secondary trend; and involved theories have not been developed to attribute it to single processes, such as have been submitted for business cycles. The major need is for a range of factors which might logically be considered responsible. The following tentative list is suggested:

1. Cyclical movements of much longer duration than the typical business cycle, occurring, for example, in industries making a product of very long life, notably residential housing
2. Cultural lag, representing the failure to adjust social institutions and individual habits to conform to changing economic, political, and social patterns, including the failure of agencies like the government to recognize their expanded responsibility with respect to economic change
3. Social, political, or economic revolution or crisis involving profound changes in the community
4. Extended downward movements in the business cycle which produce a paralyzing effect on market relationships and on the mobility and ease of adjustment of economic resources
5. Derived effects of temporary expedients employed to lighten the burden of a business-cycle downswing
6. A shift in confidence and perspective which changes the appraisal of potential markets, growing out of the pattern of movement of the secondary trend itself because the relatively low or high average sales of the recent past are projected into the future

In the following discussion it will be noted that emphasis is placed on factors which cause a fall in the secondary trend. As developed later, the important problem is one of preventing such a fall, and a rise is therefore of substantial interest to us only if it suggests ways of preventing the fall which may be expected to follow.

Long cycles in prices are not assigned independent significance, although there is some evidence that they are timed with secondary trends in production.[47] At times in the nineteenth century, it appears likely that the factors producing a long cycle in prices were influential in making for the broader movement as a result of such factors as gold discoveries and changes in the monetary system. If prices are important as an independent force in the future of secondary trends, however, they are likely to operate through the logical factors listed above.

[47] See particularly A. F. Burns and W. C. Mitchell, *Measuring Business Cycles* (New York: National Bureau of Economic Research, 1946), pp. 431 ff. Note particularly reference to the Kondratieff hypothesis on long waves in prices.

This is because money supply and bank deposits are already at so high a level that further increases would not be of primary importance, and monetary controls are exercised in terms of the effect on economic change.

1. There is reasonably clear evidence that the longer period cyclical movements in industries making a product of very long life, notably residential building, contribute to the secondary trend in general industry, although it appears that the timing may not always have been precisely the same. Practically all of industry tends to reveal the business-cycle fluctuation and the secondary trend, but the longer period fluctuation in the very durable industries is so much wider than their business-cycle fluctuation that these longer period movements can be assigned independent significance. The explanation of the long cycle in residential building reaches into uncertain ground, which has long been perplexing to those analysts who attempt to explain variation by empirically discovered cycles thought to be representative of particular industries.[48] The explanation of this long cycle probably is related to the very long life of a residence. It is possible that it is partly caused by the secondary trend itself.

2. Cultural lag[49] tends in many ways to interfere with the normal business responses of the community, which otherwise tend to promote prompt market adjustment. Man's social institutions and habits frequently adjust slowly to underlying changes in the economic, political, and social pattern. The result of such delayed adjustments, which may accumulate over several decades, is that the change, when it comes, moves rapidly and frequently upsets normal behavior patterns, causing uncertainty and reluctance to assume risk until more settled conditions arrive.

Two examples of such rapid change, based on cultural lag, may be cited: (1) the changes in the national labor policy in the thirties and (2) the traditional attitude toward enforcement of the antitrust laws with respect to monopoly prices.

In the early thirties the balance of power in labor relations was shifted from the business management to the labor union. The shift, instead of occurring gradually, came with such speed and over so wide a range of industry that normal behavior patterns were unduly shaken. With respect to monopoly price investigation, such action tends to entail the enforcement of pricing procedures which have be-

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[48] See, for instance, E. R. Dewey and E. F. Dakin, *Cycles: The Science of Prediction* (New York: Henry Holt & Co., 1947), who took the discovered rhythms as given and projected them into the future without attempting to assign logical meaning to them.

[49] This concept is simply described by W. F. Ogburn and M. F. Nimkoff, *Sociology* (Boston: Houghton Mifflin Co., 1940), pp. 886–98.

come quite untypical of our major industries. Whether these proposed methods are right or wrong, they tend to create much uncertainty. To attempt to re-establish conditions which have not operated under the types of economic organization we have permitted to develop is bound to have repercussions on business responses.

The change in the responsibilities of the government under recent transformations came so rapidly that little or no attempt was made to develop a co-ordinated program which would take into account the requirements of an environment in which the individual private enterprise system could thrive. The era of the thirties, when the reforms of the "New Deal" national administration were introduced in quick succession into many areas of economic activity, generated widespread uncertainty.

3. Delayed adjustment of social institutions and habits to underlying changes in the economic, political, and social pattern may arise so suddenly as to create social or political revolution. The effect is of the same character as that which arises out of the order of events in the secondary depression, as pointed out in the preceding paragraphs, but to a much magnified degree. Not just part, but virtually all, of the institutional guideposts or moorings are lost. Whether or not the old line of secular growth retains any of its central importance under these conditions depends upon the extent to which old habits and institutions come to be re-established. Chances are that, in the end, many of them will be so re-established, but the intervening period of uncertainty could become so great as to make the secondary-trend decline in the period of the Great Depression in the United States appear mild by contrast. In the world's major revolutions such disturbance has been avoided by temporary control under a dictatorship, which either builds on the pattern of past institutions or firmly dictates new modes of behavior to replace them.

4. Extended business-cycle decline reacts with exceptional force on certain areas of the economy, notably on industries producing raw materials under competitive conditions. The effect is a round of disastrous deflationary influences in raw-material products leading to extremely low price levels. The extremely low prices for raw materials tend to produce very unfavorable effects on the raw-material industries, in particular, and on the economy, in general. For example, such raw materials are important in foreign trade, which tends to become unduly restricted by various types of protective devices, notably by special bilateral agreements, when disastrous declines occur in raw material prices. The effect of the deflationary forces on domestic production is an attempted freeze of prices and an effort to ride out the "storm." Throughout the economy the extended business-cycle de-

cline tends so to upset the normal pattern of relationship that vigorous revival may be indefinitely delayed. The decline ultimately may produce widespread insolvency, tending to reduce the available funds for financing a later business expansion. Thus, maladjustments in the raw-material industries, growing out of a severe business-cycle decline, may tend to perpetuate low levels of economic activity.

5. In attempting to prevent the business-cycle downswing, measures may be adopted which are restrictive and which tend to reduce potential activity. These restrictive measures may be introduced by business and by the government. Business agreements may be made to limit expansion because capacity already appears excessive and to limit production in order to protect prices. The government is likely to introduce a reform program and, although it may promote satisfactory reform, it may also produce uncertainty among enterprisers regarding changes in the rules of doing business.

6. As business activity remains at low levels, people in general, and businessmen in particular, begin to plan in terms of restricted levels of activity. The failure of the enterpriser to visualize adequately the potential markets is of special significance because it leads to restricted expansion and to prices permitting low break-even points. Such high prices, in turn, discourage consumption and limit the available market. What is desirable is for enterprisers to raise their sights to output levels necessary to permit high-level employment and to the exploitation of resources required for this purpose. On the other hand, if investors are pessimistic with respect to the long-range profitability of investment, there is a reluctance to furnish the necessary funds, and interest rates may remain unduly high.

The reason for the reduced expectation may be any of the factors cited to explain the secondary trend, but reduced expectation can, in turn, be a causal factor of the secondary trend. The driving force necessary for business activity to return to prosperous levels tends to be lost. Failure to recognize needs consistent with reasonably full use of our resources, in time, may even limit some of the available critical resources necessary for the attainment of this goal. An illustration is provided by the discontinuance of training and apprenticeship programs in the Great Depression, so that when business activity expanded to the peak reached in 1937 there was an insufficient supply of skilled labor.

In the brief paragraphs above, an attempt has been made to identify the factors which may logically be expected to produce a fall in the secondary trend. It will be seen that most of these forces are so interrelated with the business cycle that they cannot be effectively analyzed in isolation. The secondary trend therefore will be given

further consideration at various stages of the analysis of the business cycle.

Under present conditions no consideration can be given to the forecast of the secondary trend. Since fairly long-moving averages must be employed to measure it, the measurement can be brought down to date only by a freehand projection. Until a better current measurement is available, or the logical basis is more fully established, little can be expected in the way of a significant forecasting technique.

Having recognized these facts, we should frankly face the key influence of the secondary trend. Clear as is the need for long-term forecasting, as developed in Section 8 above, actual variation from the secular trend level has raised several questions regarding the practical utility of the techniques developed. The reason is that, because of the secondary trend, the enterpriser cannot afford to plan according to the secular trend. His need for planning is for a period equivalent to the life of the plant and equipment he must put in place, but practically he can seldom hope to plan for more than about fifteen years. The growth of total industry can be roughly forecast, and in line therewith most individual industries will extend their past growth. However, over a period of fifteen years the secondary trend might force demand far below the requirements the businessman could count on with some assurance if total activity followed its secular trend.

The elimination or moderation of the secondary-trend movement is therefore of crucial importance for business planning. The implementation of secondary-trend elimination is suggested in Chapter XXII. As noted above, Burns suggests the hypothesis that the fall in the secondary trend follows from overdevelopment of some industries during the secondary-trend rise. The plausibility of this position will become clearer in later chapters where it is shown that the length of the depression is somewhat dependent upon the extent of capital overexpansion in prosperity, which, however, is largely due to capital building on the basis of market demand. A careful analysis of the secular trend would make the need for expansion much clearer. The dilemma today is that enterprisers cannot plan according to the secular trend because the secondary trend may carry actual operations far below fundamental requirements for an indefinite period. Planning according to the secular trend would avoid the worst of the difficulties Burns envisages as possibly responsible for the secondary trend; but the secondary trend has to be eliminated before plans based on the secular trend become practicable.

REVIEW QUESTIONS

1. Set up a scheme for establishing the present position on the "growth" curve of the following consumer-goods industries: (*a*) radio, (*b*) automobile, (*c*) electric refrigerator, (*d*) cigarette.
2. Draw rough pictures of the result which will be obtained if a straight-line trend is fitted to data (*a*) beginning with a depression and ending with a prosperity, (*b*) beginning with a prosperity and ending with a depression.
3. Is the fitting of a mathematical equation to data any more precise than the fitting of freehand curves?
4. What is the chief need for a secular-trend forecast?
5. Under each of the factors determining the growth of total industry, list the influences, with reasons for them, which seem likely to be present in the future.
6. What quantitative change usually best indicates unusually rapid long-time trend changes in consumer products?
7. If each and every industry is now growing at a decreasing rate of growth, is it necessarily true that total industry is growing at a decreasing rate?
8. Why is it believed that most measurements of total physical production have a "downward growth bias"?
9. Draw up working plans, stating the detailed procedural steps to be performed, for forecasting the secular trend of (*a*) the steel industry, (*b*) electric power production, (*c*) automobile production, (*d*) the building of post offices.
10. Compare the influences of population growth on (*a*) the perambulator industry, (*b*) the golf-club industry, (*c*) the production of beef cattle, (*d*) the quantity of dental service performed, (*e*) the growth of total industry.
11. Rugs are now being made out of glass. Which will have more important effects on the textile rug weaving industry: (*a*) a reduction in the price of glass rugs, (*b*) an improvement in the quality of glass rugs, (*c*) a change in the habits of cigarette smokers? Generalize, to state the three general ways by which the growth of competitive industries may shift the growth of any industry.
12. Expansion programs were encouraged to prevent the arrival of serious depression in the winter of 1929–30. Compare this with a program of growth forecasting.
13. In *Business Cycles* (McGraw-Hill, 1939), pp. 206–7, Joseph Schumpeter holds that the long-time trend "carries realistic meaning only in discrete points or intervals. If we connect them by straight lines or fit a smooth curve to them, it must be borne in mind that the stretches between the neighborhoods are nothing but a visual help and devoid of realistic meaning. No facts correspond to them. Real is only the cycle itself." Compare this with the position taken in the preceding pages.
14. Discuss the problem of growth forecasting in an industry like phonograph records which nearly failed in 1932 to 1933 only to reach boom proportions in recent years.
15. Discuss (*a*) the reasons for believing that the growth of total industry has independent significance apart from the growth of component industries, and (*b*) the reasons for believing that the growth of the total should be looked on as a compounding of the growths of separate industries.
16. Would the use of more adequate forecasts of growth increase or reduce the extent of duplication of expansion facilities by competing concerns?

17. Write an essay on the fact that the demand for capital is not properly demand for its current product but rather demand for its product spread out over the life of the capital.
18. Outline the full-employment approach to forecasting the future secular level of total industry.
19. Which of the logical factors listed as responsible for the secondary trend are dependent upon each other?
20. Write an essay on the relation between secular-trend forecasting and the problem of moderating the secondary trend.

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CHAPTER IV

STATISTICAL MEASUREMENT AND ANALYSIS OF THE BUSINESS CYCLE

1. METHOD OF MEASURING THE BUSINESS CYCLE

UNFORTUNATELY, there is now no standard method generally accepted for measuring the business cycle. Twenty years ago, a *residual* method developed by Warren M. Persons had become standard, although its initial development came after World War I. The essential characteristics of this method are the elimination of the seasonal and long-time trend influences from the measured data. It was recognized that the residual remaining included irregular, as well as business-cycle, influences in the data, but the retention of the irregular influences was considered to be no unmixed disadvantage. The position developed later in this book that, in so far as total industry is concerned, the irregular influences operate as originating causes of the business cycle has not been seriously challenged; in a sense, then, they are properly accepted as part of the business cycle.[1]

The residual left after eliminating the seasonal and trend influences appeared to be a reasonably satisfactory business-cycle measurement as long as the seasonal and trend measurements were satisfactory. Some difficult problems, developed below, have long been recognized in the seasonal measurement and elimination, but they have not been accepted as damning, and therefore *seasonally adjusted* data remain very common. The decline in the secondary trend after 1929, however, made trend correction unsatisfactory. If the combined secular and secondary trend were eliminated, very depressed levels no longer appeared so depressed. The Great Depression was generally understood to include both the business cycle proper and the secondary trend. The elimination of the secular trend came to be scarcely available as an alternative, for, with the extensive decline in the secondary trend, the secular trend came to be less and less clearly recognized. The outcome was that fewer and fewer series were corrected for trend as the years of the Great Depression dragged on.

[1] Ruth P. Mack is said to be working on this problem. See A. F. Burns and W. C. Mitchell, *Measuring Business Cycles* (New York: National Bureau of Economic Research, 1946), p. 322.

With new bench marks at peacetime prosperity levels now being made, measurement of the primary secular trend is becoming feasible for industry generally for the first time in fifteen years. Correction for trend may therefore be resumed to some extent. It is not likely to reattain its former standing, however, for two reasons. First, as explained in Chapter III, no satisfactory method is available for current measurement of the secondary trend. At best, data corrected for secular trend and seasonal variation will produce a residual containing secondary trend as well as the business-cycle variation. Whenever the secondary trend influence again attains major proportions, the problems of measurement faced in the Great Depression will recur. Second, the belief that the business cycle is closely interrelated to all change except seasonal variation is growing. The measurement of business cycles by the National Bureau of Economic Research, reviewed in the following section, does not begin with trend-corrected data, partly because it is thought that the trend must be retained to represent the "cycle of experience."[2] Such a series as railroad investment is found to show long leads during the period of rapid growth but to lag as secular decline sets in.

The standard method of seasonal correction is to divide the original data by a seasonal index developed by methods outlined in Chapter II. The great advantage of seasonally corrected data is that the cyclical movement will not be distorted by purely seasonal changes. Building operations, for instance, almost always rise in the spring. It is important to determine the extent to which the rise actually occurring at any given time is more or less than the amount to be expected because of seasonal change. Actually, the methods of seasonal correction answer this question only crudely, but the answer available is substantially better than no isolation of the seasonal influence in industries showing a pronounced seasonal variation.

The crudity of seasonal correction arises principally from the fact that the data are divided by the *typical* seasonal while the *specific* seasonal variation is the one which actually occurs. It will always be true that the seasonal variation occurring will be above or below the typical or average. The difference between the typical and specific seasonal variation will therefore always be a source of distortion in the seasonally adjusted data. If the specific seasonal variation is larger than the typical, the resulting measurement will be artificially high; if the specific seasonal variation is smaller than the typical, it will be arti-

[2] A. F. Burns and W. C. Mitchell, *Measuring Business Cycles* (New York: National Bureau of Economic Research, 1946), pp. 37–40. "There is always danger that the statistical operations performed on the original data may lead an investigator to bury real problems and worry about false ones."

ficially low. There is no known method of getting an adequate measurement of the specific seasonal, and therefore the difference between it and the typical seasonal eliminated always results in an error of uncertain size.

When adjustment for the trend is made, it is also usually made by dividing. The original data are divided by ordinates of the trend. This process can be visualized by drawing the trend line through the points of the original data. After trend adjustment, the variation shown on such a graph will appear around a horizontal line, for trend elimination or adjustment means taking out the trend line and leaving a horizontal line in its place. The variation about the horizontal line will be precisely the same as that about the plotted trend line when adjustment is made by dividing *only* if the plotting is done on a ratio (semilogarithmic) chart. Hence, division is the appropriate method of adjustment only if the amplitude of the variation about the trend line tends to maintain a constant width when plotted on a ratio chart. If this amplitude tends to remain more nearly constant when plotted on an arithmetical-scale chart (the amplitude tends to become smaller on a ratio chart), subtraction is the correct method of adjustment. In this case, the trend ordinate is subtracted from the original data.

If the amplitude of the seasonal variation appears approximately the same in prosperity and depression on an arithmetical-scale chart (a rather unusual case), the trend ordinates times the seasonal index can be subtracted from the original data in making a correction for both components. Subtraction of the seasonal separate from trend correction is awkward; it involves the use of "seasonal base numbers" or the product of the seasonal index by a representative average monthly figure. Otherwise, the seasonal index is not expressed in the units of the original data.[3]

The very process of obtaining a practicable current measure of the seasonal and long-time trend involves forecasting these elements for a period into the future. Unless the method of measuring the cyclical fluctuation is currently revised, a relatively fixed seasonal and long-time trend correction is presupposed. Assume that we wish to find the cyclical measurement for some series of data as it becomes currently available. We cannot wait to compute the seasonal and long-time trend by use of the figure when it becomes available; we must

[3] Brumbaugh proposes a direct method of cyclical measurement dependent upon dividing the data for a given month by the figure for the same month of the previous year. But this will not correct for trend from one year to the next and does not avoid the difficulty presented by differences between specific and typical seasonals. See M. A. Brumbaugh, *Direct Method of Determining Cyclical Fluctuations of Economic Data* (New York: Prentice-Hall Inc., 1926). Compare with the National Bureau method described in the following section.

correct, for practical purposes, by use of measures established with past data. To do otherwise would result in constant and confusing revision and interminable delay.

The measurement of the business cycle requires data for more frequent periods than provided by yearly series.[4] Sometimes important cyclical changes take place within the space of one year. This is the reason why seasonal adjustment is almost universally required in studying cyclical changes. Seasonal variation is introduced when a time unit of less than a year is employed. If data are available for different parts of the year, they are usually available monthly. For the purpose of measuring the business-cycle element, quarterly data would be just as adequate in many cases. It is customary, however, to use the monthly figures.

2. THE NATIONAL BUREAU OF ECONOMIC RESEARCH MEASUREMENT OF BUSINESS CYCLES

In the work the National Bureau of Economic Research is doing on business cycles, described further in Chapter VIII, special methods of business-cycle measurement have been developed.[5] The purpose is to derive averages which show the characteristic movement of the cyclical fluctuation in various economic series, as illustrated in Chart 11. Before averaging several cycles to get movements like those illustrated on the chart, the series are seasonally adjusted and the *intercycle* trend is eliminated.

After making the seasonal adjustment, cyclical turning points are determined by inspection, using a set of mechanical rules, such as placing the turning point at the end of a flat top or flat bottom, as a guide. Each cycle so set off is called a "specific" cycle and is now expressed in percentage variations from its average value. This step eliminates the intercycle trend, that is, the trend from one cycle to the next. It does not eliminate the intracycle trend, that is, whatever trend movement took place within the period of the cycle itself. Expressed as a per cent of the average value during the cycle, the figures in the early months of the cycle will be relatively low if the series has an upward trend.

The next step is to obtain an average specific cycle. This is done by locating nine stages in each cycle—the initial and terminal trough, the peak, and three approximately equal periods each for expansion and contraction. A wide range of averages is computed for each stage, some of which are shown for coke production in Chart 11.

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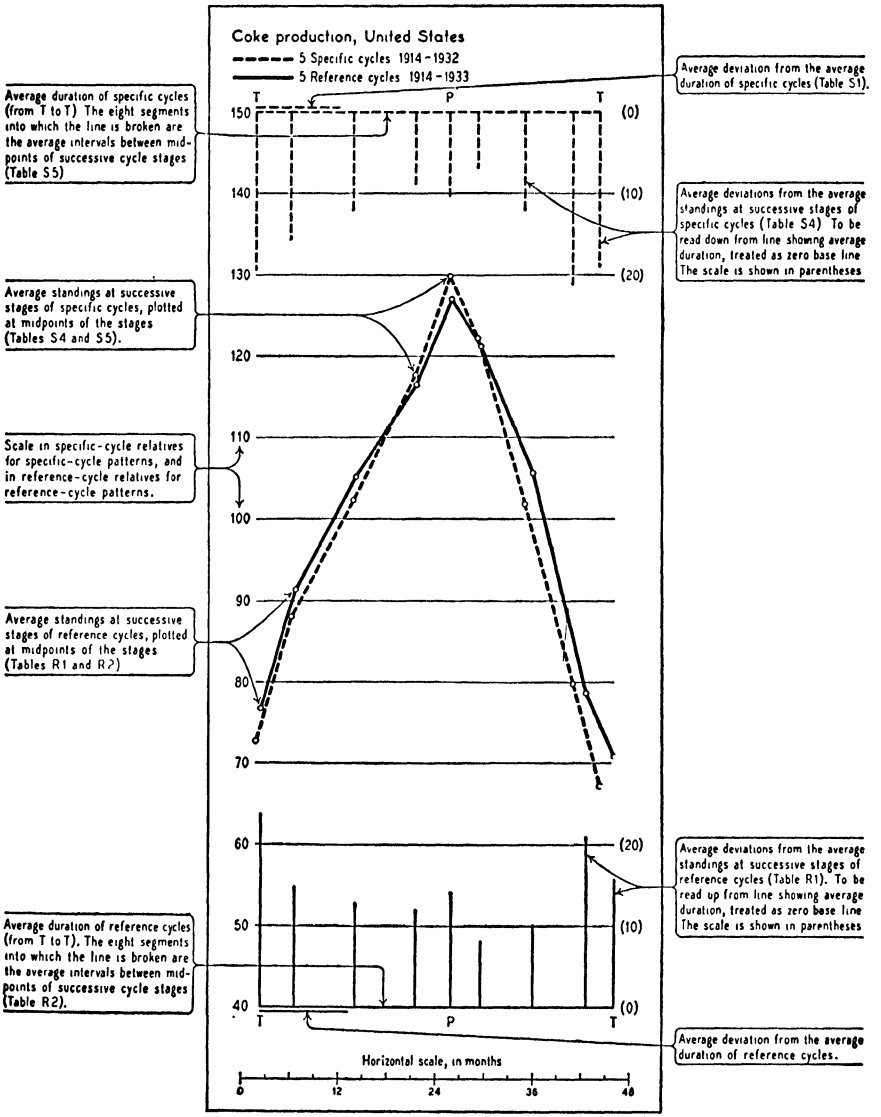
[4] See A. F. Burns and W. C. Mitchell, *Measuring Business Cycles*, pp. 203 ff.

[5] *Ibid.*

CHART 11

Sample Chart of Cyclical Patterns*
As Developed by the National Bureau of Economic Research



T represents the trough stage (I or IX), P the peak stage (V). For explanation of how the line representing the average duration of specific cycles is placed in relation to the line representing the average duration of reference cycles, see Ch. 5, Sec. VIII.

* Reproduced by permission from A. F. Burns and W. C. Mitchell, *Measuring Business Cycles* (New York. National Bureau of Economic Research, 1946), p. 35.

Similar measurements are made for the "reference" cycle of each series. The same data and methods are employed to compute the reference cycle, but the peaks and troughs of general business cycles, instead of those in the particular series studied, mark the initial and terminal dates in the reference cycles. In Chart 11, the average specific cycle of coke production is shown by a dashed line, the average reference cycle by a solid line.

Measurements of this sort have been developed for well over a thousand series, but few of the resulting measurements have been made available. The purpose is to provide information on cyclical movements in a vast array of data which may be woven together into a theoretical account on how business cycles run their course. Chapter VIII compares this method with others now being pursued to discover business-cycle truth. Since so few of the measurements are available, little is added to our perspective for the time being. The methods will at best improve our evaluation of business-cycle history. They do not aid in making current business-cycle measurements needed for sizing up the economic outlook.[6]

Our major concern is with methods which provide current measurements. For this purpose, there is no substitute for the conventional procedures outlined in the preceding section. These procedures were not found to provide effectively all of the desirable isolations of component changes, but a method which cannot be employed until the full cycle is completed is no alternative. However, the National Bureau method is important as a basis for studying the past history of the business cycle.

3. MECHANICAL ADJUSTMENT FOR THE STUDY OF TIMING

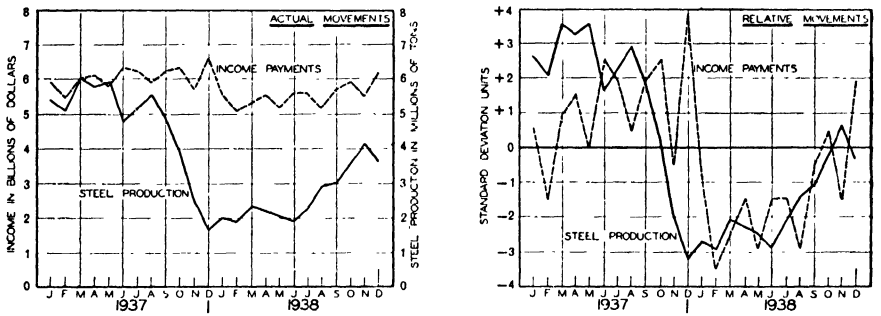
As will be pointed out in later chapters, all series of data do not have the same violence of fluctuation over the business cycle. The production of some short-lived consumer goods fluctuates but slightly, while the production of most capital goods makes a rather violent fluctuation. Since this difference in violence actually exists, a comparison between series should take it into consideration.

[6] Edwin Frickey has developed another method of decomposition of time series applied to the period 1866–1914, but an analysis of the method is beyond the scope of the present book. In brief, he develops the pattern of the business cycle by use of link relatives and shows it to apply to other important series with slight adjustment for timing. The trend is then measured by eliminating the business cycle, exactly the reverse of the conventional procedure discussed in Section 1 above. Frickey's methods, like the National Bureau's, are developed as a first step in the discovery of truth about economic change and, like the National Bureau's, do not lend themselves to a measurement of the current business-cycle change. Frickey's business-cycle pattern for 1866–1914 is reproduced in Chart 16, Chapter X. Edwin Frickey, *Economic Fluctuations* (Cambridge, Mass.: Harvard University Press, 1942).

The only comparison which can be made readily between plotted cycles of widely different amplitude is between the violence of fluctuation. For the purpose of detailed analysis of the difference in movement of the cycles of two series, it is advisable to make comparisons other than that between the violence of fluctuation. It is not easy to compare their timing, to see which series first moves up out of depressions, or to see which series first moves down away from prosperities. It is not even easy to tell, by examining the plotted comparison, whether the two series are moving in an approximately similar fashion over short periods, because the one series always moves relatively so much more than the other. A slight movement in one series may be

CHART 12

EFFECT OF DIVIDING SERIES BY THEIR OWN MEASURES OF DISPERSION*
Comparison between Steel Production and Income Payments, 1937–38



* Reduced to deviations in standard deviation units from the arithmetic means of each series. Income payments are as reported by the Department of Commerce; steel ingot production as reported by the American Iron and Steel Institute.

typical, while a wide movement occurs in another. A slight variation in the consumption of food, for example, is likely when a large variation occurs in the production of automobiles or factories.

The cyclical fluctuation of two or more series can be made comparable by dividing each series by a measure of its own dispersion. The resulting measurements are said to be in dispersion units or in units of the particular measure of dispersion employed, such as standard deviation units or average deviation units. An illustration of the results obtained by such a division is shown in Chart 12.

It is easy to understand why this technique of dividing each series by its own measure of dispersion equalizes the average amplitude of fluctuation of the cycles of two series. If one series shows but narrow fluctuation, its measure of dispersion will be small. Dispersion is a measure of the amount of variation about the average, and hence slight variation means small dispersion. On the contrary, the series

with a wide fluctuation will have a large measure of dispersion. Dividing the narrow fluctuation by a small number will increase it relatively to dividing the wide fluctuation by a large number.

4. DEFLATION TECHNIQUE

All exchanges take place in terms of value. Most of the figures arising as a by-product of exchange are stated in terms of value. Hence, by far the larger proportion of available data involves a price element. For many purposes, however, the study of economic change can best be made by means of physical quantity series. Such a series can be derived from a value series if there is available a corresponding price series. Value equals price times quantity. Therefore, if we divide value by price we obtain quantity. The process of dividing a value series by a price series to obtain a quantity series is called a *deflation technique.*

The application of the deflation technique to the reported value of a commodity is immediately obvious. If corn is selling for 50 cents per bushel, and the seller receives 20 dollars for a load, simple arithmetic shows that there were 40 bushels on the load. When sales value and price are reported for individual commodities month after month, the physical quantity involved is readily derived in this way. If the price moves steadily upward, the deflated series will be farther and farther below the value series as time goes on. If the price series moves steadily downward, the deflated series will be farther and farther above it. Should the value figure include products with a degree of differentiation—that is, if the product is not quite homogeneous—the derived quantity is likely to incorporate a certain degree of error. The greater the differentiation, the more serious the error is likely to be. In actual practice, however, the major consideration is the extent to which the value series deflated is comparable in make-up to the price series used as a *deflator.* Building contracts awarded are often divided by a construction-cost index to obtain a physical measure of building, but no construction-cost index adequately represents all of the materials and services used in building. The result may have value for many purposes, but an element of inaccuracy is involved. The most important application of the deflation technique is to an over-all measure of activity, such as GNP. In this case, deflation is sometimes achieved by dividing by an Index of Consumer Goods Prices (formerly called cost of living), but the result is quite crude. An improved method is to deflate by sections, using a more nearly comparable price series for each section or division of GNP.

A deflated quantity index is sometimes more valuable than directly recorded quantity data if the quality of the product changes substantially over the business cycle. The deflation may achieve a type of

weighting not readily obtained when physical quantity data are combined into an index. A good illustration is provided by shoe production. Poorer quality shoes are sold when economic conditions are bad than when they are good. Therefore, a count of the total number of shoes produced is not a good measure of the amount of shoe service which has been created. This has been well described by the National Resources Committee:[7]

> In many cases, variations in quality which cannot be easily reflected in physical terms are so great that a deflated value unit is preferable to a physical unit. Thus, in the case of shoes, variation in the average quality of shoes produced is so great from year to year that no simple physical unit appears satisfactory as a measure of shoe output. Certainly the mere number of shoes produced is not an economically significant measure of output when year-to-year production is to be compared. However, a quasi-physical figure of shoe output can be obtained by taking the total value of shoe output in each year and dividing this by an index of shoe prices. By this method, if the proportion of shoes of different qualities produced remains constant, but the number of pairs of shoes produced increases, the index of output will rise. Likewise, if the number of pairs of shoes produced remains constant but the proportion of high quality shoes increases, the index of output will rise [assuming that the shoe price index has fixed weights with respect to different quality shoes]. Thus, variation in both quality and quantity can be partly reflected as a variation in output.

5. METHOD OF MECHANICALLY ELIMINATING ERRATIC FLUCTUATIONS

Many series of data show such erratic fluctuations that it is difficult to discover the significant variations by an examination of the data. Any series which might vary greatly from month to month is likely to show erratic fluctuations. In foreign trade, for example, there is a large erratic fluctuation, since the variation in exchange rates and sea storms shifts shipments from one month to another. In such cases the erratic fluctuations may be eliminated so that the other variations can be studied. The process consists in taking a 3- to 5-month moving average. In a 3-month moving average the data for the first 3 months are averaged and the average obtained is centered opposite the central month (the second). Then the first month is dropped and the fourth month added to obtain the second average, which is centered opposite the third month. This process is continued until the moving average computation is completed.

The use of a 12-month moving average has been suggested to eliminate the seasonal and erratic fluctuation when a measure of the business cycle is desired. It is clear that a 12-month moving average will eliminate any consistently recurring seasonal, but such an average

[7] National Resources Committee, *Patterns of Resource Use* (Washington: Government Printing Office, 1938), p. 78.

will also eliminate other variations. For instance, many series of data showed a decline in several succeeding summers in the twenties' decade. In many of these cases, the declines were unrelated and would not be eliminated by an adequate measure of the seasonal. Neither were they purely erratic fluctuations; yet a 12-month average would almost entirely eliminate them.

6. MECHANICAL SIGNIFICANCE OF TIMING RELATIONSHIPS

One of the most useful of statistical measurements is that of lead or lag, that is, the number of months from the time a lead series has a turning point until the lag series has one.[8] The timing difference represented is important in forecasting business-cycle change and is helpful

TABLE 3

HYPOTHETICAL ILLUSTRATION OF LEAD OF FIRST DIFFERENCE SERIES

Year	Quarter	F-Series	First Differences
I	1	50	
	2	51	1
	3	53	2
	4	57	4
II	1	63	6
	2	70	7
	3	74	4
	4	76	2
III	1	77	1

in tracing business-cycle effects. The best way of deriving this measurement is by simply counting the number of months from the cyclical peak or trough in one series to that in the other. In case of flat tops or bottoms, the last month is counted as the peak or trough. Such leads vary substantially from cycle to cycle and tend to change as time goes on, so that the information is difficult to summarize.

It is frequently useful to classify leads according to their mechanical character. Many timing differences in economic data are analogous to those between the cosine and sine curves. These are mathematical curves which produce perfectly smooth periodic cycles. The cosine curve leads the sine curve by a quarter cycle because it represents the

[8] Twenty years ago the accepted method of determining lead was to compute correlation coefficients between the series with various assumptions as to length of the lead. The highest coefficient was taken to give the best lead. The difficulties with this method are that the lead is not the same at the peaks and troughs, and time differences at all points in the cycles get equal weight in indicating the best coefficient.

infinitesimal differencing of the sine curve. We are interested in finite rather than infinitesimal differencing, but the relationship between cosine and sine curves is interesting because it represents a mathematically pure form of the relationships developed in Table 3. It is assumed that a Y-series is recorded at successive quarterly values from a cyclical low to a cyclical peak. It will be seen that the difference series begins to fall at the third quarter of the second year, when the amount of increase in the Y-series begins to decline.

The significance of the characteristic developed in Table 3 arises from the fact that certain series are, by their nature, in the order of differences of other series, as illustrated by the accompanying tabulation:

Difference Series	Summation Series
Production of a good	Inventories of the good
Capital formation	Supply of capital
Rate of price change	Price movement
Bank debits	Bank deposits
Current savings	Accumulation of savings
Bonds floated minus bonds called for payment	Outstanding bonded indebtedness
Births minus deaths	Population level

Inventories represent an accumulation and not a flow month by month as does production. The capital built in a year represents an addition to the previous capital investment. Bank debits are the amounts currently paid out of checking accounts.

It is important to be on the lookout for the distinction between summation and difference series because some leads are thereby explained. Also, a difference in relative fluctuation may be explained in the same way. In Table 3 it will be seen that the first-difference series rises 600 per cent while the Y-series rises only 40 per cent (from the second quarter of the first year to the second quarter of the second year). This greater fluctuation also means in practice that the difference series moves much more irregularly. The disadvantage of such irregularity in forecasting is highlighted by the fact that the Brookmire Economic Service formerly *cumulated* (added to make a summation series) its forecasting line before attempting to use it.[9] By cumulating the barometer, the steadiness of movement was greatly improved, and a turn could be counted on to represent a cyclical reversal rather than an irregular movement.

It is clear, therefore, that we cannot forecast series simply by dif-

[9] See description of Brookmire Barometer No. 9 in Ray Vance, *Business and Investment Forecasting* (New York: Harper & Bros., 1925), or C. O. Hardy and G. V. Cox, *Forecasting Business Conditions* (New York: Macmillan Co., 1928).

ferencing them. *The difference series would not lead unless the series itself slowed down before reaching its peak.* While few series are rising most rapidly at the peak, the first differences of almost all series will move so erratically that they are of little aid in forecasting.

Perhaps it should be said as we close this chapter that statistical measurements are essential in following current economic changes, and they provide the basis for checking hypotheses and for developing clues as to how the business cycle operates. Measurements used to follow the current economic situation are described in Chapters XV, XVI, and XVII.

REVIEW QUESTIONS

1. Why are monthly data most frequently used for making measurements of business-cycle changes?
2. Compare the method used for measuring the business-cycle influence in a series of data with the customary method of making statistical measurements.
3. It is correct to say that components which should be divided out bear a relative relationship, while those which should be subtracted out bear an additive relationship. Draw a rough graph illustrating a series of data having a relative relationship between the seasonal and cycle, an additive relationship between the cycle and trend, and an additive relationship between the seasonal and trend.
4. For the series described in Question 3, write the equation of relationship from which the method of eliminating the trend and seasonal can be determined.
5. Draw a rough graph illustrating the cycle obtained by an incorrect measurement of the long-time trend.
6. What effect on the measurement of the business cycle results from the fact that our method of measuring the seasonal obtains the typical, not the specific, seasonal?
7. Does measuring the business cycle presuppose a forecast of the trend and seasonal?
8. Why is it ever desirable to divide a series of data by its own measure of dispersion before charting it against other series?
9. If the value of a product and its price are available, how can we derive the quantity of the product?
10. What factors tend to create short, erratic fluctuations in: (*a*) the weekly number of people visiting Atlantic City, (*b*) the daily quantity of fish caught along the Atlantic coast, (*c*) the monthly quantity of coffee entering the United States?
11. Explain how the comparison between cosine and sine curves represents one characteristic of the comparison between production and inventories.
12. The basic characteristic of the acceleration principle discussed in the following chapter involves the summation and difference series comparison between the demand for a product and demand for capital to build the product. Show which of these series is of the order of a difference series of the other.
13. What order of difference do the current additions to capital represent in comparison to accumulation of inventory of the final product?
14. Explain why the difference-series idea is not an effective forecasting tool in all cases. In forecasting, is it desirable to classify series as to whether they represent the order of difference series relative to others employed?

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CHAPTER V

FACTORS RESPONSIBLE FOR THE CYCLICAL NATURE OF BUSINESS

THE business cycle is composed of recurrent periods of upswing and downswing, each of which last an indefinite number of months. The upswing and downswing movements are dependent upon the cumulative nature of economic forces and the interaction between them. Recurrent upswings and downswings, viewed in sequence, form what may be called a *self-generating cyclical movement* or *oscillation*. The forces producing cumulation and interaction which are jointly responsible for this oscillation are analyzed in Section 3 of the present chapter. The process by which the cumulation is generated is taken up in the following chapter. The upswings and downswings do not proceed without temporary variation, but empirically they are clearly obvious in the past record.

In addition to the self-generating oscillation, the business cycle is dependent upon *originating causes* which instigate change and keep business from settling down at the line of secular growth. They are of two general types: (1) those which are sporadic in their effect and have no lasting influence on the economy; (2) those which leave a lasting structural change. Weather conditions well illustrate the first type, while technological changes illustrate the second. Some changes, such as those effected by new laws, are difficult to classify. Only after they have been in effect for a long time is it possible to determine their permanency. Such a problem is paramount in the analysis of growth, as we have seen in Chapter III, but it is not central here. The significant fact is that forces of an upsetting character do arise at frequent intervals. It makes little difference whether or not the changes effected are permanent. It is important that these forces arise from without the business system; they are not links in the cumulative chain of events which produce the upswing and downswing. Since they act independently, they are called *originating causes*. They affect the cumulative movement but are not themselves *currently* influenced by it.

Originating causes must be differentiated from the self-generating cyclical movement. Originating causes administer impulses to the self-generating cyclical movement so that adjustments do not have

time to work themselves out completely enough for the self-generating cyclical movement to disappear. In broad outlines the business cycle can be explained by originating causes and the self-generating movement. The originating causes introduce new forces, and these forces acting in a business system where responses react upon one another produce endless upswings and downswings. The causal significance of the confluence of these two sets of forces will become clearer after they are analyzed in some detail.

The business cycle is not precisely comparable to many other types of cycles. The word cycle is frequently used in the physical sciences to imply periodicity, to signify a uniform length of time from the occurrence of one phase to its recurrence. Slightly less rigidly, a tendency toward periodicity is sometimes accepted to produce a cycle. Such a tendency arises when the period from the occurrence of a phase to its recurrence varies but always tends to move back to its average length.

John C. Merriam's "Conference on Cycles" in the early twenties, however, decided that a cycle "denotes a recurrence of different phases of plus and minus departures, which are often susceptible of exact measurements."[1] There is no implication of periodicity in this conclusion.

W. C. Mitchell quotes the Merriam definition with approval. A recurrence of phases and susceptibility to measurement are applicable to the business cycle. Related to the secondary trend, the business cycle necessarily produces a recurrence of plus and minus departures. Care should be exercised, nevertheless, in defining the business cycle so as not to draw the limits of variation more closely than the existent forces imply or than appears likely from empirical evidence. There is nothing in the forces causing the business cycle which makes periodicity essential. Business-cycle history, later detailed, does not indicate periodicity.

Many persons experience difficulty in differentiating between a periodic movement and a cycle. It may be fair enough to make this distinction on the basis of the difference between periodic recurrence and mere order of recurrence. All periodic movements are cycles, but not all cycles are periodic movements. The term business cycle is widely employed, but some other expression, such as business fluctuation, may be employed on occasion if absence of periodicity is to be emphasized. The persistent fluctuation which occurs is a recurrent, but not periodic, expansion and contraction.

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[1] "Report of a Conference on Cycles," *The Geographical Review*, XIII (October, 1923), Special Supplement, pp. 657–58. W. C. Mitchell comments on this in *Business Cycles: The Problem and Its Setting* (New York: National Bureau of Economic Research, 1927), pp. 377–78.

The cyclical movement can be most clearly traced in industrial production. Agricultural production, although related to it, does not fluctuate consistently with the business cycle. It may be that the cyclical movement in the performance of services, as opposed to that in the production of goods, is principally caused by the cycle in production.[2] As will be pointed out in the chapters on business barometers, our measures of the amount of current services performed are relatively poor.

The business cycle is a characteristic of total economic activity. It is this integral movement, not the movement in specific industries or processes, for which an explanation is developed. The cycle in the individual industry or process may involve individual characteristics of greater or less importance as well as the effect of the general business cycle. The cycle in an individual industry or process is called a *specific cycle* by Mitchell to distinguish it from the business cycle.[3]

1. ORIGINATING CAUSES

The originating causes of business cycles prevent production from taking place at secular-trend levels. It is worth noting that such causes do not necessarily drive production away from the secular trend. If production is above or below the secular trend, some originating cause *may* enter to drive production back in its direction. Originating causes, influential in creating the business fluctuations of the past, include the following:

1. War and threat of war
2. Cyclical movements and rapid industrial or agricultural development in foreign countries
3. Weather—in creating variation in crop yields, floods, and earthquakes
4. Cultivation of new wants by the consumer
5. Commercial utilization of inventions and discoveries of new or improved processes and of new goods; shift in the favorable place of production
6. Changes in the legal rules governing the method of doing business, such as new tariffs, changes in the banking system, or sumptuary legislation
7. Government spending

War. War drives industrial production away from balanced levels in two ways. First, goods produced for war purposes are wantonly

[2] This point has been argued by Leonard Ayres. See his *The Economics of Recovery* (New York: Macmillan Co., 1933), pp. 169 ff. The case for the cycle in services, being largely the resultant of the cycle in production of goods, rests mostly upon facts later developed, as follows: (1) The performance of services appears to be on a less competitive basis than the production of goods. (2) The most violent cyclical fluctuation is in durable goods, while services, by their very nature, are transient. (3) The principal originating causes appear to react more directly upon the production of goods than upon the creation of services.

[3] See A. F. Burns and W. C. Mitchell, *Measuring Business Cycles* (New York: National Bureau of Economic Research, 1946).

destroyed rather than consumed in the normal economic processes. Second, wars are almost invariably financed by inflation.

Production of goods for war use creates an unwonted scarcity of an abnormal pattern. In diverting a major part of total activity to building special war plants and to producing munitions, the production of residences, consumer durable goods, and civilian factories is greatly limited. After the war, vast deferred demand appears. The making-up of this demand abnormally stimulates industry. The building boom in the twenties arose in this way as a result of World War I. Very great stimulation is being experienced in industry today because of World War II. A small-scale model of deferred demand is found in every prosperity, developing from limited production in depression.

Major wars are to a large extent financed by borrowing from banks and individuals and to a lesser extent by increased taxation. There are two major results: (1) The price of consumer goods is driven up during and immediately after the war. (2) Large savings are accumulated in the form of cash, bank deposits, and government bonds. Price inflation produces on an exaggerated scale the kind of influence price variation typically has in the business cycle. The price structure becomes distorted, and price declines occur in the process of readjustment.

The accumulated funds resulting from war saving provide the basis for deferred purchases. The liquid form in which these savings are held makes such use readily possible, but the influence can be exaggerated because a large part of the savings occur in the upper-income groups, where current savings are normally large. Partly, the influence is in encouraging smaller current savings in the postwar period. The war savings are looked on as rainy-day reserves. The effect of smaller current savings is the same as use of the accumulated funds. Consumer expenditure tends to be large for a protracted period. Unlike deferred demand and price rise, the accumulation of funds is not an enlarged model of what happens in the business cycle. The funds piled up during the war come from high activity which does not occur in depression.

An illustration of the way the influences outlined in the above paragraphs operated at the end of the recent war is provided in Chapter XIV. These forces are currently so important and so widely discussed that the general nature of their influence is commonly understood.

War produces many other types of originating causes, all of which cannot be catalogued here. The birth rate is abnormally stimulated, increasing consumer expenditure and especially adding to housing requirements. Government spending remains high. The unusual war demand for foodstuffs shortly, but not immediately, leads to a depres-

sive influence. Food prices are very high immediately at the end of the war because of curtailed production in many parts of the world. As production rises in the war-torn areas, pressure is reduced and food prices decline. In both World War I and II food production was greatly expanded in the United States and in other parts of the Americas. In World War I large increases in planted acreage occurred, making contraction difficult or impossible when the requirements declined. In World War II a substantial part of the expanded production came from unusually favorable weather conditions, which cannot be expected to continue for an indefinite period.

The very threat of war often is an originating cause of some significance. Usually its influence is on the unfavorable side. A war will upset normal economic relations, and hence may change the outlook for many ventures being planned. One of the first economic effects of a war in some countries may be a wholesale liquidation in the security markets. Funds are needed for repatriation and for additional working capital which may be desirable with the outbreak of war. Liquidation may take place to avoid heavy war taxes likely to be imposed or because of the general uncertainty attached to a war. Anticipation of this liquidation is itself a large factor in the liquidation because it is likely to lead to a closing of the markets and to a period when the securities are relatively illiquid. It should be pointed out that once a war gets under way feverish activity develops. This knowledge will not prevent the unfavorable reaction to threat of war. The war may never develop to the stage which assures high activity, and even if it should, a nationalization of industry may reduce the value of securities. In any case, the forces which create liquidation can be counted on to arise first, and it is in the interest of the speculator to anticipate an imminent price decline rather than a distant and uncertain price increase.

Business Conditions in Foreign Countries. Secondary depressions have always occurred concurrently in all capitalistic, industrial countries. The business cycle proper, however, has moved with some independence in the various countries. An opposite phase of the business cycle in most other countries will act as an originating cause on our own cyclical condition. Assume that we were in a depression and that most of the other countries of the world were in a prosperity phase. Prices would be high in these foreign countries but low in our country, and therefore exports would be stimulated, while imports would be discouraged. An outlet for additional goods at present prices would thus be provided, and this situation would tend to drive us back to secular levels. If we were in a prosperity phase, but most of the rest of the world were in depression, our exports would be discouraged, but our imports would be encouraged. Under these conditions the

foreign-trade situation would be a drag on further upward movements of production. We may profitably note that the cyclical variation in imports into the United States merely roughly reflects business conditions in this country, but the variation in our exports reflects business conditions in foreign countries.

Rapid industrial or agricultural development in foreign countries serves to lower prices, and therefore acts as a disturbing factor on the same industries in our country. The disturbing effect is especially pronounced if these industries in our country customarily have a large export balance, since under these circumstances it is difficult to lend temporary protection by such a device as a tariff.

In the case of manufacturing industries, foreign competition may reduce prices and require contraction. Such contraction releases forces of production for use of other industries but nevertheless tends to drive production down for the time being. The released resources will not be transferred automatically.

If, on the other hand, improvements occur more rapidly in our country, our industry will be stimulated. Our prices in the industries experiencing rapid improvement may decline faster than theirs, and foreign countries may provide expanded markets. A similar situation will arise if we move into a depression while foreign countries are in prosperity. These are, of course, only first effects. If we should rapidly flood foreign markets with our goods, a downswing might be initiated there.

Weather. The production of any agricultural crop may vary either from a shift in the acreage planted or from a fluctuation in the yield per acre. In practice, the principal variation in most crops is due to a change in yield. Theoretically, this might result from a variation in the amount of fertilizer used, but this factor is not of major importance for most crops in the United States. Variations in yield are chiefly caused by weather conditions. Many students, notably Stanley Jevons and H. L. Moore, have attempted to explain business-cycle variations solely on the basis of the yield of agricultural crops.[4] If the yield is above average, the prices will be below average—in fact, more than in proportion for most agricultural crops, since the demand for them is usually very inelastic. With lower agricultural prices, the costs of industrial concerns are reduced, their profits are increased, and they are encouraged to expand. There is an opposite result when yields are

[4] Stanley Jevons' theory has been summarized in many places. For the original papers see W. Stanley Jevons, *Investigations in Currency and Finance* (London: Macmillan & Co., Ltd., 1884). For H. L. Moore's theory, see his *Economic Cycles: Their Law and Cause* (New York: Macmillan Co., 1914) and *Generating Economic Cycles* (New York: Macmillan Co., 1923). See also Chapter VII, Section 1.

below normal. When agricultural production is abnormally small, it is accompanied by high prices. Manufacturing costs are therefore increased, profits are reduced, and manufacturing production tends to fall. There is, however, an opposite tendency in both cases. When agricultural production is large, farm prices are reduced to such an extent that the total gross income of the farmer is reduced, and therefore he cannot buy as much as before. Whether the restrictive influence of reduced agricultural purchases or the expansive influence of lower costs of agricultural products exerts greater influence is an unsettled point.[5]

Variation in the yield of agricultural crops sets up important originating causes of business-cycle variations if the yield happens to differ greatly from that which is occurring in foreign countries. On many occasions in American history, notably in 1879, 1897, and 1924, a powerful force which tended to drive up production was large agricultural yields at home with abnormally small yields in the rest of the world. This situation resulted in a large agricultural production at a high price, creating an abnormally large purchasing power in agricultural districts. A low yield here, with a large yield elsewhere, has an opposite effect, but less powerful since we are an exporting rather than an importing nation for most agricultural products. Agriculture will not likely provide as potent an originating cause in the future as it has in some cases in the past because of its declining relative importance in our economy.

Cultivation of New Wants by the Consumer. The shift of consumer demand from one product to another tends to make production rise or fall, depending upon the situation. The demand for miniature golf during the Great Depression created a new use for capital funds, which exercised a minor influence tending to increase production. Of more importance was the employment of capital funds necessary as a result of the legalization of beer and liquor industries. Reduced use of corsets in the prosperity period of the twenties was a dampening factor tending to reduce business activity because no other industry automatically took its place. The influence was minor, however, since the industry was small and a prosperity period existed.

Utilization of Inventions and Development of New Goods. It is difficult to disentangle the shift of consumer demand from the commercial utilization of inventions and discoveries in the development of new goods and in the perfection of old ones. Indeed, it is not necessary to do this, since both factors tend to make production rise or

[5] There has been considerable argument on this point. See particularly Louis Bean, "Short-Time Interrelationships between Agriculture and Business," published in J. L. Snider, *Business Statistics* (1st ed.; McGraw-Hill Book Co., 1929), pp. 107 25.

fall in a similar way. The development of demand for the radio and for the automobile in the twenties shifted purchasing power from older industries, such as furniture. The capital required for the new industries has a highly stimulating effect, as developed in Chapter VI.

The development of new goods requiring much capital will tend to drive production upward. The development of new goods or services, competing with established industries, however, may tend to drive production lower, if these new goods or services require practically no capital. The development of bus and truck transportation had an expansive effect in the late twenties because it contributed to the development of roads and required the production of many new trucks and buses for rapidly expanding lines. In the Great Depression, however, the continued development of trucking probably tended to reduce total activity. Practically no new capital was required, since trucks used in industry during the prosperity period were released for the purpose. The labor service required was not much greater, at least in the case of short hauls, than would have been necessary if the transportation service had been performed by the railroads. But this decrease in volume of service allotted to the railroads exerted a very unfavorable effect on them.

The commercial application of improved processes in the production and management of industry results in an increase in output-per-man-hour,[6] frequently called an increase in productivity. Such an increase, if sizable, results in vast increases in the potential output of goods without any increases in the labor power. If the demand for the good is inelastic, or if the manufacturers decline to make reasonable decreases in the price of the good, much labor will be displaced. In time, this displaced labor will be taken up in new industries, or in re-employment in the given industry. If the increase in productivity occurs in the early part of a prosperity period, vibrant demands for new capital goods or for consumer durable goods will probably be great enough to absorb the displaced labor force. Profits will be increased and production will tend to rise rapidly under these conditions.

If the increase in productivity occurs at the peak, when the demand for capital goods is increasing less rapidly, the displaced labor will not be so readily absorbed. If the increase in productivity occurs in a depression period, profits may increase and thereby encourage capital investment, tending to increase activity.

Changes in the Legal Rules. A tariff or other foreign-trade restriction, such as import quotas, exchange control, import monopolies,

[6] An excellent detailed analysis of this process will be found in Harry Jerome, *Mechanization in Industry* (New York: National Bureau of Economic Research, 1934).

and linked-purchase regulations prevent full and open competition. However, the existence of the restriction is not of itself an originating cause of business fluctuations. It appears that business can adjust itself to almost any foreign-trade arrangement. But the adjustment takes time, and constant tinkering, such as occurs in modern nations, never permits it to work itself out until new tinkering begins.

The effect of such tinkering depends upon concomitant conditions, and the diverse possibilities are almost innumerable. The effect depends upon the export balance of a country. If a country has a net export balance of "invisible" items and a net import balance of commodities, the fixation of a higher tariff schedule is less successful than when the type of balances is reversed. In other words, raising the tariff in a creditor nation has more deleterious effects upon international trade than would be true if a debtor nation resorted to these tactics, since all other nations combined must ship a net export balance of goods to creditor nations. Markedly lowering the tariff in a creditor nation, if tariff rates had been fixed at such a level as to prevent the normal balance from being paid, might be expected to result in large and immediate imports of foreign goods. The extent of the disruption caused by flooding the markets with foreign goods would depend upon local business conditions at the time and upon the extent to which the industries protected by the tariff are the ones in which production will occur with the greatest comparative advantage. Typically, the disruption may be expected to be considerable.

Lowering of tariffs early in prosperity may increase goods at a time when prices are tending to rise too rapidly and reduce profits in highly favored industries, serving to dampen excessive optimism. Prosperity might be prolonged. Raising tariffs at the very trough of the depression might raise production, but in practice it is difficult to be certain the trough has occurred until the upswing is under way, and if we could so locate the trough other less costly remedies could be applied. Raising the tariff during the downswing is likely to be ineffective, since a temporary improvement in our "favorable" balance of trade may not be strong enough to counteract other forces moving production lower. Before we have reached bottom, foreign nations will probably have taken retaliatory measures which will reverse the situation.

It seems almost impossible to classify the ways in which many other types of legislative changes may act as originating causes of business fluctuations. It is clear, however, that such legislation at times will make immediate enough changes in the rules of doing business to shift the balance of production. Compulsory unemployment insurance, if the employer is a contributor, will produce a temporary increase in real wages. Repeal of sumptuary legislation, such as repeal of prohibi-

tion of alcoholic beverages, will require an immediate increase in the capital equipment for the industry. Minimum wage laws, if enforced, may result in a geographical redistribution away from low wage-rate areas. The possible legislation which may shift the balance of production is almost endless.

Government Spending. Government policies aside from new laws may affect general business. For example, the amount of money spent by the government may be greatly increased or decreased. In 1937, decline in government spending was one of the factors which led to a downturn in business. During most of our past history, government spending has been too small and steady an item to be of consequence as an originating cause, but, beginning with the late thirties, government expenditure has come to represent a major and vacillating part of the total.

Government spending bears a close relationship to war as an originating cause, because much of the influence war superimposes upon the economic system grows out of the high war expenditure. War expenditure, however, is in a special category, not only because of its magnitude, but also because of the influences of wanton destruction and patriotism which accompany it. Government spending in peacetime has come to be one of the most widely considered proposals for controlling the business cycle. Its influence as a control in past business cycles and as a proposed measure for control is discussed at various points in the book.[7]

Summary. The originating causes noted here are by no means an exhaustive list. The discovery of gold mines at times in the past has had a significant influence on prices. This is a notable omission from the point of view of past history but is not likely to be of any importance in the near future. As we shall see in Chapter VII, some theorists have held that the business cycle is due to variations of solar activity. If one takes this position, he will wish to recognize sunspots as an originating-cause factor. There are borderline cases. Credit control exerted by central banks, for instance, will become essentially a part of the self-generating cyclical movement if the action is regularly predictable from business changes which have occurred. If, on the other hand, a wide range of bank action is readily possible with a given economic situation, the force is essentially an originating cause. The question is whether or not causal forces move both ways.

Many of the originating causes are properly so classified because they do not grow out of the *current economic situation.* War, for instance,

[7] For discussion of the measurement of this influence, see Chapter XVI, Section 10. For analysis of business-cycle control by this method, see Chapters XXI and XXII.

may be partly caused by past depressed conditions, but the current business situation is not likely to be responsible for war.

The reader should note carefully that most of the events which occur from day to day are not properly called originating causes. They are merely links in the chain of economic oscillations which arise in the self-generating cyclical movement. Several illustrations will make this more obvious. A change in interest rates reflects the demand for and supply of funds. It is easily seen that changes in the availability of funds are integrally related to changes occurring in the business system. Increase and decrease in prices represent similar occurrences. Change in the use of all types of resources, including both labor and capital, usually are as much caused by the oscillation in the economic system as they are causes of further change. Exceptions occur, of course, when activity is artificially induced by increased government spending of funds appropriated for the purpose. Capital construction usually arises from within the business system itself, representing the typical reaction of the businessman to increases in market demand. It is also related to technological changes, however, inasmuch as these may make a new type of capital equipment desirable. Technological changes are most often originating causes, but it is thinkable that some might come to be classified as responses within the business system. Scientific research has come to be regularly conducted on a large scale in commercial companies. Some new developments fit into, and arise naturally out of, day-to-day business activity.

In bold outlines, the difference between events which mark originating causes and those which mark responses within the business system contrast clearly enough. Questions arise most frequently with regard to capital construction. The uncertain character of technological developments arising from direct application of organized research is discussed in the paragraph above. The building of capital equipment is not always a business response in the self-generating cyclical movement. The role of innovators in building capital equipment is that of an originating cause. Usually, however, market demand is the most important factor in convincing an enterpriser to build additional capital. In this case, his decision represents a response to conditions existent in the system.

Originating causes can be used synonomously with exogenous forces, and the self-generating cyclical movement synonomously with endogenous forces. On the other hand, the distinction currently employed between autonomous and induced variables in some statistical work is different. An induced variable is one whose movements can be predicted from the correlation relationship with total activity, while an autonomous variable is one which cannot be so predicted. Most consumption expenditure, except durable goods, is thought to

represent induced variation. Investment expenditure is generally accepted to represent autonomous variation. The self-generating cyclical system, however, is driven along in both consumption and investment activity. Originating causes act on both. As noted above, investment activity tends to be greatly influenced by originating factors, and this accounts for the fact that it is not readily predictable from the movement of total activity. More stable activity is less directly affected by originating causes, and it has come to be classified as induced variation. Both induced and autonomous variables represent a part of the self-generating cyclical movement, while originating causes are outside forces influencing these variables but not influenced by them.

2. GENERAL CONSIDERATION OF THE CAUSAL POSITION OF VARIOUS FACTORS

Originating causes do not produce a business cycle. Many of the originating causes which exist today existed before the dawn of capitalism, but there were no business cycles before capitalism.[8] In those early times there existed famines, catastrophes such as floods and earthquakes, and pestilences. But as soon as people ceased dying from the famine or the plague, business proceeded as it always had.

Originating causes, in and of themselves, would act in our modern system in much the same way as in the Middle Ages, when they were temporarily disturbing. As soon as their operation was discontinued, business conditions would return to customary levels. This is very nearly the conception students had of "crises" in the nineteenth century. Economists thought of business as varying only slightly from equilibrium levels until a crisis occurred. A business depression, as we term it today, was called a crisis. Some students saw a hundred years ago that the excesses of a prosperity period were inevitably related to an ensuing depression,[9] but this analysis was not co-ordinated with economic principles.

Originating causes do not create business cycles, but business cycles would not exist without them. If originating causes did not drive production from the line of secular growth, activity would move steadily along this line. The responses of the business system to originating causes create the business cycle. As will be noted in the chapters on theory, various writers have attempted to trace the entire responsibility for the business cycle to some particular characteristic of the business process. True, the business cycle would not exist without any

[8] This is developed in Chapter XI. See further, W. C. Mitchell, *Business Cycles: The Problem and Its Setting* (New York: National Bureau of Economic Research, 1927), chap. ii, and especially pp. 75 ff.

[9] In 1837, Lord Overstone held that the "state of trade . . . revolves apparently in an established cycle." See references given by W. C. Mitchell, *Business Cycles: The Problem and Its Setting* (New York: National Bureau of Economic Research, 1927), pp. 10–11.

one of several characteristics of the business process. The business cycle as we know it would not exist without emotional aberration, or without the existence of money and credit, or without the uncertainty involved in business processes, or without profits, or without savings, or without the existence of consumers. These statements are not facetious; their meaning will become clearer after we have examined the nature of the self-generating oscillation.

A rather similar array of causes could be posed for almost any complex phenomenon. The interrelation of the business system creates a rather peculiar problem, but the apparent paradox of many causes is largely explained by the logic of both *necessary* and *sufficient* conditions. Money and credit do not produce a business cycle and neither do profits, but the business cycle would not exist without them.

To gain perspective, let us assume that large groups of people were vitally concerned in the determination of *the cause* for rain water flowing into a lake. Someone says the cause is the existence of oceans, since there would be no rain in clouds without oceans. Someone else ridicules this idea saying that water flows into a lake only because of gravity. Someone else says that the law of gravitation is partly right, but that the real reason for water flowing into a lake is that the lake is lower than the surrounding territory. Then someone else proposes the sun as the cause, since it draws the water from the oceans. And so explanations multiply in endless confusion.

This type of approach is not fruitful. To understand the business cycle, we must conceive of the business system as a *process* of interrelated factors. Building a theory which centers all change on one process or factor exaggerates its influence too much to provide a rounded view. The most common reason for picking out one factor in whose terms the cycle is to be explained is to provide a basis for control. Control is best considered against a background of some understanding of the cyclical process. The hunt for factors amenable to control involves the almost irresistible temptation to exaggerate since a course of action is at stake. The stage where one becomes an advocate and turns deaf ears to all other theories is readily reached. Examination of the extent of conflicting theories brings a realization of the undue influence of wishful thinking.

Students now generally recognize that concepts of single causation are much less fertile than they were once thought to be. Especially in the social sciences is it essential to recognize the mutuality of causation. Adequate understanding of the extent to which factors in the economic situation are caused by other factors as well as being partially responsible for still other factors would reduce the overemphasis on single processes. All originating causes and processes in the self-generating cyclical movement may not be equally causal, but it is

best not to presume in favor of one or another because of a convenient hypothesis. Certainly it is not too much to ask that everyone recognize the importance of both necessity and sufficiency. Both originating causes and a self-generating cyclical movement are necessary conditions, but neither is sufficient to explain the business cycle without the other.

There is an important difference between various types of relationships. The most rigid is the idea of primary causation where A is a sufficient and necessary condition for B. Except for virtual identities, such a relationship is rare in social phenomena. Functional relationship is a type common in the physical sciences. Two variables are always related in a certain way, which may be described by an equation. This type of relationship leaves room for a wide range of causal possibilities. Some other variable or variables may cause both of the variables functionally represented. For example, the humidity of the air inevitably rises as the mercury column rises in the thermometer, but neither one causes the other. Gasoline consumption increases as the flow of fresh fruits to the markets increases, but there is no causal relationship. The trouble is that the absence of a causal nexus is not always so obvious. Complicated mutuality is possible and likely in economic data. Functionality of relationships is only incompletely known in the social sciences. It is, however, a plausible ideal toward which we may well work. Most of the relationships known are of a purely empirical character. These may be the result of qualitative or of statistical facts. One process tends to be correlated negatively or positively with another, but the facts are drawn from a limited period of history, and the relationship may not apply to other periods.[10] In any one period, there is a considerable scatter about the line of relationship. For this reason the interpretation of relationships is difficult in the social sciences. If no relationship is very close, it is easier to substitute another relationship which is equally close. These facts may well be borne in mind while an attempt is made to explain the business cycle.

3. CONDITIONING CAUSES OF THE SELF-GENERATING OSCILLATION[11]

The upsetting influence of originating causes merely tends to change the direction of movement of business activity. From this point it is

[10] The most illuminating analysis to date of the meaning of causation when applied to economic change is provided by F. R. Macaulay in *The Movements of Interest Rates, Bond Yields, and Stock Prices in the United States since 1856* (New York: National Bureau of Economic Research, 1938), pp. 179 ff. Macaulay points to the need for an explanation of the exceptions to the general relationship.

[11] The use of conditioning causes in this sense was suggested to the writer by Professor Edgar Z. Palmer of the University of Nebraska.

tempting to apply the first law of motion in all of its elegant simplicity and say that business activity will continue to move in the direction in which activity is started by an originating cause until other originating causes occur to change this direction. But the oversimplification is too great to be of any significant value. Increases and decreases in economic activity have nothing in common with the physical motion of a body in rarified space, except in so far as changes in activity relate to changes in equilibrated balance. Business-cycle variation is a variation which is only indirectly related to the secular line of growth.

The major problem, therefore, is to explain why movement tends to be perpetuated in an upward or downward direction and how the reversal of direction comes about, even without the intervention of an originating cause. The basis for this is a self-generating oscillation which inheres in our type of economic system. It rests fundamentally upon a set of characteristics of our system which are discussed in detail in this section.

The general direction of movement perpetuates itself, even though it may differ greatly from the line of secular growth, because of a momentum which arises. The momentum of change grows out of the cumulative effects of any changes which occur, even though the changes may be but links in a long chain of previous cumulation. The high interrelationship of the business system sets up a delicate type of balance which makes changes accumulate in either an upward or a downward direction. The peculiar type of momentum which characterizes the self-generating oscillation in business activity is dependent also upon several other causes. For easy reference, these conditioning causes are listed below:

1. Interrelationship of the business system —
2. Principle of macroeconomics
3. Principle of innovation
4. Period of gestation
5. Recurrent peaks of replacement
6. Acceleration principle
7. Investment multiplier
8. Credit expansion and contraction
9. Changes in cost and efficiency
10. Accelerated variation in long-term interest charges
11. Dampened fluctuation of short-term real interest rates

Interrelationship in the Business System.[12] The universal leveling effect of the market and the intricate division of labor are re-

[12] Perhaps the most important study of the effect of interrelationship upon the business cycle is given by Mitchell in *Business Cycles: The Problem and Its Setting* (New York: National Bureau of Economic Research, 1927), pp. 100–5. His study is drawn upon in the analysis presented here.

sponsible for the high interaction existent in the economic system. Every payment made becomes consumer demand and adds to the total supply of goods and services which will be taken. Every product or service, with the rare exception of those which are not placed on the commercial market, must compete for its share of consumer income. If the workers in one industry get less money, all industries will be affected because these workers will decrease the amount spent for products of other industries. The effect may be infinitesimal or it may be sizable. If it is sizable, a new chain of effects begins with the industries whose sales are curtailed. Changes in the business system are transmitted endlessly to other spheres because of the influence any change has on total market demand.

Lines of interdependence can be traced through the raw materials and services which industries supply each other. Almost all extractive products are raw materials which some other industry must incorporate in its finished product. This fact applies to agricultural products as well as products of the mines. A raw material such as coal is consumed by the railroads, the steel industry, and the power industries. Steel is in turn a raw material of most durable goods industries. Freight transportation and electric power become an inseparable part of most finished products.

Financial interdependence is an important characteristic of modern industry. Any type of credit stringency can be seen to exert an influence even at very remote spheres. Restriction of credit lines results in forced sales and tends to reduce prices, affecting the profitability of enterprises far removed from those originally involved. The extension of credit traces an opposite type of influence. Mitchell says "on this financial side of their operations, the banks bear a relation to all other enterprises not unlike that which the railways bear on the industrial side; most enterprises need bank credit not less than they need freight service."[13] The extension and contraction of bank credit carries the influence of changes to every part of the economy.

An intricate maze of interlocking ownership has arisen in modern industry through the exercise of powers inherent in the corporate form of enterprise. The result has been that many nominally independent enterprises have come to be organized in a community of interest so that unity of action is greater than nominal independence would indicate.

Division of labor makes interdependence far-reaching. Few of us consume any important part of the product or service we help to create. We depend upon the market in which these goods and services

[13] W. C. Mitchell, *Business Cycles: The Problem and Its Setting* (New York: National Bureau of Economic Research, 1927), p. 102.

may be sold. The market sensitively transmits any general influences, and thus the fortune of the economy as a whole is rapidly transmitted to all of the parts. Within a period of a few months there is little alternative. Each worker has his little niche and seldom is worth as much in a different type of employment. In fact, we have reached the point in many industries where workers remain idle for an indefinite time waiting to be called back to work by the companies they have served. The market influence now pervades the farm much more than it formerly did. The farmer has come to be a specialist in the sense that he produces raw materials for sale and buys the finished product he wishes to consume. When his work was self-sufficing he was much less affected by general economic changes.

If such high interdependence did not exist, changes arising at one point might often be compensated for by changes somewhere else instead of tending to cumulate in one direction. If interrelationship were slight, a condition arising in one industry would tend to be confined to a narrow sphere of influence for an indefinite time. Later, a change in a different direction would likely occur elsewhere, and when the two influences reached common industries, they would tend to cancel each other. As it is, the change occurring first is almost immediately felt to a greater or lesser degree in the total economy. The effects carry themselves along in a cumulative fashion. A later change cannot cancel this effect because it already has pervaded *all* industry. New influences may be restrictive from a *future* point on, but that is a different matter. The movement already under way may actually prevent opposite effects from arising because all industry moves more or less in sympathy. A momentum is built up which reinforces and cumulates movement in the preponderant direction. Minor tendencies in the opposite direction may be overlooked or disregarded when decisions are to be made because they are clearly eclipsed by the major movement.

Principle of Macroeconomics. Macroeconomics is the opposite of Robinson Crusoe economics; instead of starting with the isolated transaction as the unit action in the economy, individual action is taken as dependent upon the level of total activity. This is the logical extension of the principle of interrelation of the economic system: if change in one area quickly influences all others, there must be a close relation between the total and its parts. The opposite principle—microeconomics—is much less true of modern industrial economies, for total activity is not derived by adding up unrelated parts. If it were, there would be no important general business-cycle influence, although there might be relatively unrelated cycles existing in different indus-

trics. Microeconomics is the proposition subscribed to by the Standard Statistics Service in the late twenties. They saw no pervading business-cycle movement because of its dampened variation. After the downswing began late in 1929, this position was abandoned, for the changed movement in total activity made it untenable.

Stability in the structure of production provides a major reason for assigning total activity determining influence. Where there is a close interrelation in production, the demand for the product is joint demand: a demand for automobiles is a demand for steel, a demand for manufactured products is a demand for their transport. During the recent war, joint demand was found to be much more pervasive than had been thought. Many items were never rationed (for example, clothing) although individual saving was abnormally large. One reason why excess funds were not employed to bid up the price of unrationed commodities appears to be that they are demanded jointly with commodities which were unavailable. Joint demand is another way of characterizing a stable structure of production. If all major products are jointly demanded, it necessarily follows that the proportionate distribution of demand is predictable for any level of total activity. The structure of production is stable only for relatively major commodity and service groups. At the detailed level where one minor commodity competes with another, competitive conditions determine which of the commodities is bought.

On the basis of the principle of macroeconomics, much work is now going forward to classify expenditure as to whether it is induced from the level of total activity or is autonomous. Most items of consumer expenditure have been found to vary closely with the level of total activity, that is, to be induced expenditure. It is perhaps a mistake to expect the statistical relation between the demand for individual commodities classified as of the induced type to hold too rigidly under all conditions. However, the fact that close relationships have been found to characterize their movement relative to total activity in the past represents empirical verification of the principle of macroeconomics. The level of total activity to an important extent determines the level of the parts. The business cycle is a general, pervading phenomenon.

Principle of Innovation. Adapting the economy to progressive change plays an important part in producing the business cycle. If the secular movement of total industry were horizontal, it is possible that relatively static conditions would persist. Improved methods, new products, and geographical readjustments force constant change. Some activities decline while others progress. We have already considered the type of interrelation which keeps such changes from being

self-canceling. Schumpeter, however, has explained why the very process of progress tends to move in waves.[14] This is because of the nature of innovation.

Inventions and technological improvements may proceed along a relatively smooth line, but their industrial adaptation will not. The industrial application of new developments requires enterprise. The possibilities are not completely evident until they have been proved "practical" by application in actual business operation. Only the more intelligent and more daring enterprisers exploit new developments. At this stage, new products or new methods appear visionary to the average enterpriser. When the profitableness of such operations is driven home by actual demonstration, a flood of imitators is attracted. The result is a very rapid rise in activity. Feverish capital expansion arises to accommodate the new developments that almost all enterprisers now attempt to exploit. Overdevelopment along the line of the new products or improved methods necessarily occurs. The market each enterpriser sees is also observed by many others. Many of them see the same demand, and total expansion plans overshoot the market.

Schumpeter holds that the law of progress is described by waves of innovation. The cyclical characteristic is determined by what is taken to be the pattern of entrepreneurial action. It is logical to believe that innovations develop slowly at first and reach a phase of overly rapid acceleration. If this is true, a period of readjustment will eventually arrive. Such a readjustment will take time, and new methods and commodities will have become ripe for exploitation, and the process will start all over again. We take the principle of innovation to be one of the conditioning causes of the business cycle.

The Period of Gestation in the Production of Capital Goods.[15] The characteristic of the period of gestation rests upon the fact that the production of capital goods is not evenly distributed over the cycle but is concentrated at certain points. As recovery gets well under way, two important things become clear. First, the demand for consumer goods is, and has been, increasing very rapidly. Already there are many industries which simply cannot supply the current demand at the old price, and this results in a feverish initiation of the production of capital goods. Second, there is a rush to produce capital goods because the prices of materials and labor are rising, and producers

[14] J. A. Schumpeter, *Business Cycles* (New York: McGraw-Hill Book Co., 1939) and *The Theory of Economic Development* (Cambridge, Mass.: Harvard University Press, 1934).

[15] The word gestation implies an analogy which is overrigid in this use, but no more convenient expression appears to be available. The most careful descriptions of the process, notably by Pigou and Robertson, have used this terminology. See references at end of Chapter VII.

rightly believe that these prices will continue to rise. It is cheaper to add to capacity now than it will be a little later.

A large increase in labor and material used for the production of capital goods at such a point reduces the potential supply on the market, increasing the competitive advantage, and hence drives up the price of consumer products. The increase in investment activity adds to the income paid out which is available to buy consumer goods. At the same time, however, there is no similar increase in the supply of goods available to consumers. Producing capital goods does not bring an immediate supply of consumer goods to the market. Since the production of many capital goods is just being begun, no consumer goods can yet flow from them. The result is an increase in purchasing power without any increase in the available goods. This increase produces an upward shift in the demand for consumer goods.

Ultimately, the large quantity of capital goods whose production was begun at about the same time in recovery is completed.[16] On completion, a large supply of labor is released from the investment industries. It may take no more current labor to operate an average plant than to build it. Theoretically, an increase might occur in the demand for the raw materials used in the production of consumer goods, but this would be offset by a discontinuance in the demand for raw materials used in building new plants. With the completion of the plants, a large increase occurs in the potential supply of consumer goods to be placed on the market. But, unless wage rates are increased markedly, there will not be enough purchasing power to buy these additional goods. There is nothing in the facts to indicate the probability of an increase in profits at such a point, and therefore the enterpriser is unlikely to raise wage rates. Labor has all at once become superabundant. Either the prices of consumer goods must decline or their rate of production must decrease, both of which choices will drive business conditions down.

With the "birth" of new capital goods, the period of gestation has been completed. The sanguine expectations present at the time of their conception are replaced by abject despair after their birth.

Recurrent Peaks of Replacement.[17] Because there is some regu-

[16] Attention is called to the fact that this statement of the case is oversimplified. The period over which the expansion programs were initiated on a large scale will cover several months or even years. The time it takes to complete them will vary greatly. At some one point, however, there is likely to be a maximum effect. Or, if not, realization that the high activity cannot last will produce the same result.

[17] Although his claims are probably too large, the standard work on reinvestment cycles is Johan Einarsen, *Reinvestment Cycles and Their Manifestation in the Norwegian Shipping Industry* (Oslo: University Institute of Economics, 1938). He gives an excellent list of references, pp. 13–34. See also his recent article "Replacement in the Shipping Industry," *Review of Economic Statistics*, XXVIII (November, 1946), 225–30. Joe S. Bain furnishes a

larity in the length of life of durable goods and because periods occur when capital construction is unusually large, reinvestment cycles tend to occur. If a sizable proportion of the existing equipment of any kind was built at about the same time, marked pressure for its replacement would be felt when the bulk of the equipment wore out. If a large proportion is replaced at about the same time, need for another major replacement period would be established. Under these conditions, a replacement cycle equal to the length of the life of the good occurs.

There is no doubt but that replacement cycles have a certain degree of reality. They are of greatest significance where the life of the good is relatively short. In such cases replacement cannot be long postponed. A marked influence in the recovery between 1935 and 1937 was the replacement of automobiles.

Replacement cycles are much less regular than they otherwise would be because the life of durable goods is elastic rather than fixed and rigid. In prosperity, replacement is made abnormally early; in depression, it is made abnormally late. If a good has a long enough life, needed replacement can scarcely end a depression. The old units can be used a little longer, and the least efficient of them need not be used because the low rate of activity calls for only a part of available capacity. Replacement will await the prosperity period when it would have occurred anyway. The perspective as to length of life shifts, and replacement is speeded up as prosperity arrives. If a peak of replacement need is reached, however, the prosperity may be greatly strengthened. The prosperity of the twenties, for example, fed partly on the residential building boom, which got started because of abnormal need for replacement.

The life of organic products is much more rigid than the life of manufactured equipment. Cycles have been found to exist in the production of cattle, horses, hogs, apple orchards, and other organic products.[18] The demand for such products does not vary greatly over the cycle, and their life does not vary according to the phase of the cycle. Replacement peaks exert a much more certain effect than in the case of man-made capital.

Replacement cycles may, at times, exert an important influence on the self-generating cyclical movement but can seldom be a predomi-

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very valuable critique in "The Relations of the Economic Life of Equipment to Reinvestment Cycles," *Review of Economic Statistics*, XXI (May, 1939), 79–88. For statistical data on the length of life of durable goods, see E. B. Kurtz, *The Science of Valuation and Depreciation* (New York: Ronald Press Co., 1937).

[18] The best descriptive material on these cycles will be found in various articles in the *Journal of Farm Economics* and in *Department of Agriculture Department Bulletins* and *Technical Bulletins*. See also N. J. Silberling, *The Dynamics of Business* (New York: McGraw-Hill Book Co., 1943), pp. 166–74.

nant influence. Goods whose life is under ten years may give the depression a major fillip because replacements cannot be long deferred. Produced goods of longer life will have an important influence only when a large replacement deficit is found to exist as recovery gets well under way. Replacement need for organic products can be counted on to recur at regular intervals, but seldom will the effect produced be great enough to shift the business cycle significantly.

The Acceleration Principle.[19] The demand for durable goods is a derived demand, since the *service* of durable goods is desired. A factory is used in making products, an automobile provides transportation service, a furnace provides heat. Any durable good has the nature of an accumulated inventory of services which may be withdrawn over the period of its life. The fact that the service is wanted, while nothing less than a full unit of the durable good can be installed, leads to a characteristic reaction in a dynamic society known as the acceleration principle. According to this principle any fluctuation in the demand for short-lived goods or services leads to a magnified fluctuation in the demand for durable goods. The extent of the magnification depends upon the amount of the service-inventory accumulated when a durable instrument is installed and therefore upon its life. The longer the life, the longer service will be available without further installation. The major assumption made is that the demand for durable goods originates with demand for the service or the product flowing from the durable good; thus, a factory will be built only when the current market demand for the product it will produce warrants it.

The characteristic tendency for the derived demand for durable goods to have intensified fluctuations can be demonstrated most readily by means of a concrete illustration. Consider the need for looms to produce cloth. The loom represents the durable good, and the cloth represents the product. Make the following assumptions.

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[19] There is an extensive literature relating to this idea. For the origin of the idea see Gottfried von Haberler, *Prosperity and Depression* (Geneva: League of Nations, and New York: Columbia University Press, 1941), p. 82. Haberler's analysis, pp. 80–98, is one of the most useful. J. M. Clark's emphasis of the idea has added to its influence; see especially his early article "Business Acceleration and the Law of Demand," *Journal of Political Economy*, XXV (March, 1917), 217–35. For attempts to test the principle statistically, see Simon Kuznets, "Relation between Capital Goods and Finished Products in the Business Cycle," *Economic Essays in Honor of Wesley Clair Mitchell* (New York: Columbia University Press, 1935), pp. 209–67, and J. Tinbergen, "Statistical Evidence on the Acceleration Principle," *Economica*, May, 1938. Terminology synonymous to acceleration principle is "intensified fluctuations of derived demand for durable goods," or "magnification of derived demand," or "the relation." R. F. Harrod in *The Trade Cycle* (Cambridge, England: Oxford University Press, 1936), pp. 53–58, has been chiefly responsible for the use of "the relation" to express the idea. Relationships between short-lived and durable goods other than those incorporated in the acceleration principle are analyzed in the next following subsection on the multiplier principle.

The average life of a loom is 10 years. A loom will produce one million yards of cloth per year. All looms are operating at full capacity in the first year considered; the average age of the looms is 5 years, with looms well distributed through all ages. All old looms are fully used before creating new capacity. There is no piling of cloth inventories. Then, by choosing hypothetical figures for the annual consumption of cloth, we can illustrate the acceleration principle as in Table 4.

TABLE 4

HYPOTHETICAL ILLUSTRATION OF DERIVED DEMAND

(*a*) Year	(*b*) Assumed Cloth Consumption (Unit = One Million Yards)	(*c*) Total Looms in Use	(*d*) Looms to Be Replaced*	(*e*) Other New Looms Needed	(*f*) Total New Looms Needed
1	1,000,000	1,000,000	unknown	unknown	unknown
2	1,000,000	1,000,000	100,000	none	100,000
3	1,200,000	1,200,000	100,000	200,000	300,000
4	1,320,000	1,320,000	120,000	120,000	240,000
5	1,200,000	1,200,000	132,000	−120,000	12,000

* The replacement is computed on the basis of the looms in use at the beginning of the year, and 10 per cent is taken each year. The large production of looms in years 3 and 4 leaves an unusual proportion of new looms, and therefore the replacement need becomes less than 10 per cent. The appropriate adjustment would change the result very little and would introduce an unnecessary complication. See footnote 20, however.

It will be seen that when the demand for cloth increased 20 per cent, the demand for new looms increased 200 per cent; when the demand for cloth *increased* the following year by 10 per cent, an increase somewhat less than the 20 per cent of the previous year, the demand for new looms *decreased* 20 per cent;[20] and when the demand for cloth dropped about 9 per cent, the demand for new looms dropped 95 per cent.

The importance of this principle lies in the fact that it partially explains why the production of durable goods fluctuates more than does the production of short-lived goods. The explanation for the proposition arises essentially from the fact that we can use durable goods without currently creating them, or at least for a protracted period. Hence, the force of the principle depends upon the durability

[20] As pointed out by Ragnar Frisch, a slower increase in the demand for the product will not invariably lead to a decrease in the demand for the capital. Assume much of the capital built is relatively new. For a time few replacements are needed. Later, needed replacements will increase, and this may offset a decline in the need for added capital. See Frisch's "The Interrelation between Capital Production and Consumer Taking," *Journal of Political Economy*, XXXIX (October, 1931), 646–54, as well as discussion between Frisch and Clark in the three following issues of that journal. This concerns depreciation. As Kuznets points out, change in the rate of obsolescence over the cycle may be an important factor changing the rate of replacement. "Relation between Capital Goods and Finished Products in the Business Cycle," *Economic Essays in Honor of Wesley Clair Mitchell* (New York: Columbia University Press, 1935), pp. 244–45.

of the good. If a good must be replaced in a year or two, the irregularity of production made possible is not great; the time is limited until the goods now in use will no longer produce. On the other hand, goods with a very long life leave a large reservoir which can be called into service at any time of slack demand without building additional units.

The dependence of the acceleration principle on the life of the durable good can be illustrated by varying the assumption as to life of the looms considered in Table 4. If the life of the loom were 5 instead of 10 years, the replacement demand in both years 2 and 3 would be 200,000 instead of 100,000; the new demand would remain the same, and the total demand for looms would rise from 200,000 to 400,000 instead of from 100,000 to 300,000 in these years. The increase in demand for looms becomes 100 instead of 200 per cent. If, on the other hand, the life of the loom were 20 years, replacement demand would drop to 50,000 in both years 2 and 3, and the total demand for looms would rise from 50,000 to 250,000.

Not only capital goods are subject to intensified fluctuations; all consumer goods of long life can be used to almost a normal extent without current production. For example, the production of passenger automobiles in 1929 in the United States was 4.6 million, while the production in 1932 was only 1.1 million. Use of automobiles was about the same in the two years, however, as evidenced by the fact that gasoline consumption was about the same. There were slightly fewer cars registered in 1932, but the use of each car averaged slightly more than in 1929.

The limits set on consumer durable goods by the acceleration principle in depression are less remote than those set on producer goods. Capacity is likely to become excessive for producer goods in depression, so that even replacement demand can be satisfied out of old equipment. Furthermore, when demand for the product or service begins to rise in recovery, the resulting new demand for equipment can frequently be filled from unused capacity. The use in depression of existing consumer durable goods is much more complete than of capital goods, so that some continued production is necessary for replacement, and activity tends to rise substantially early in recovery. This is notably true of residential building.

An examination of Table 4 will show that the demand for looms decreased before the demand for cloth. The reason for this is dependent upon the relation of the comparable processes of making products by employing the total supply of capital and adding an increment to the capital supply. The relation is that between level and difference series, developed in Chapter IV, Section 6. The capital built is one

of the factors in the change in total capital supply. The total capital supply is employed to make the current product for consumption. A difference series leads a level series. The lead is determined by the point where the rate of increase in the level series slows down. In Table 4, the increase in the demand for cloth slows down from 20 per cent, between years 2 to 3, to 10 per cent between years 3 to 4. The demand for looms reaches its peak in year 3.

Consumer durable goods have shown some lead in the business cycle in the past. Producer equipment has turned down with total business activity instead of preceding it, for the lead indicated by the acceleration principle is offset by the time it takes to get producer equipment financed, under way, and completed; perhaps also by the tendency of optimism to keep expansion plans high.

The acceleration principle contains an important element of truth, but the actual relation between the demand for a product and the derived demand for additional capital varies substantially from the pattern shown in Table 4. The life of a durable good is not so rigidly determined as assumed; it tends to shorten in prosperity and increase in depression; the speeded-up replacement required in prosperity provides another reason for wide fluctuation in capital goods. On the other hand, an offsetting influence is the fact that as the proportion of new capital increases during prosperity less depreciation replacement will be required than indicated by the table.

Seldom does replacement represent the simple duplication of the old equipment; this complicates the problem but may not materially change it. Capacity is never so rigidly set as a simple illustration seems to imply; production can rise by using stand-by equipment and thus not necessitate great increases in capital expansion. Capital expansion is not limited by the acceleration principle; in fact the optimistic or pessimistic reaction which enterprisers take may have as much to do with wide fluctuation in investment as does the mechanical relation dependent upon the life of the capital.

The Investment Multiplier.[21] The acceleration principle traces the influence of consumption on investment. The investment multiplier traces the influence of investment on consumption. If we assume that all consumption expenditure is induced by total income and that investment expenditure is autonomous, that is, independent of the level of total income, total income will be determined by the level of investment. In discussing the principle of macroeconomics above, it was pointed out that these are the general tendencies but not the complete truth. We shall return to this question later.

[21] For a simple development of this problem, see Joan Robinson, *Introduction to the Theory of Employment* (London: Macmillan & Co., Ltd., 1938). For other references see Chapter VIII.

If consumption is completely induced by total income, a predictable proportion of total income will be spent. This proportion will, under these rigid conditions, precisely determine the extent to which an increase in investment will increase total income. The mathematical relationship is not difficult. If individuals spend two-thirds of any increased income produced by investment, three times as much as the original investment will be added to total income over a period of time. The expenditures resulting from investment must immediately produce an equal amount of income in order for the investment to produce a primary increase in income equal to its amount. Of this income two-thirds will be spent, and two-thirds of *this* expenditure will produce income at the next round of expenditure, and so on indefinitely. Stated in a mathematical series, we have $1 + 2/3 + 4/9 + 8/27 + \ldots = 3$. If only half of the increased investment is spent at each round, the increase in total income will be only twice the increased investment. If 3/4, it will be 4 times; if 4/5, it will be 5 times; if 5/6, it will be 6 times. If the total is spent, the mathematical series shows that income will permanently remain at the level achieved with the added investment. In all other cases, further new doses of investment must be made to keep income from falling.

The proportion spent is called the *propensity to consume*, and the proportion saved is called the *propensity to save*. Whatever the propensity to save, the dollar amount saved out of the expenditure created by an investment will equal the original investment in every case. If 2/3 is spent, obviously 1/3 will be saved, and the amounts saved may be developed by applying the propensity to consume at each round of expenditure: $1/3 + 2/9 + 4/27 + \ldots = 1$. If half of the income derived from the investment is saved, the series will be $1/2 + 1/4 + 1/8 + \ldots = 1$. The larger the proportion saved, the sooner saving and expenditure derived from the original investment get down to insignificant proportions.

Whatever the propensity to save, the amount invested will induce an equivalent amount of saving over a period of time. Only the investment comes out to be important. The level of investment will determine the level of total income or output. But this is merely the assumption with which we started: only investment is autonomous; all consumption is induced. Actually, the expenditure for consumer durable goods is not always predetermined by the amount of total income, notably when deferred demand plays a major role or when markets for major durable products become saturated. Luxury items are not at all times determined by the income level. On the other hand, some investment programs appear to move approximately with the level of income. The relationships assumed represent an oversimplification.

Nevertheless, the investment multiplier is a useful tool because it differentiates between the part of income for which the consumer directs the production process and the part for which he does not. The latter represents his saving and in the real world the amount set aside for saving bears little relation to the amount the enterpriser invests. Investment is not decided on automatically by the consumer in the administration of his income, but his expenditures for goods are. Investment comes to represent an influence on economic change out of all proportion to the relatively small part of total output going to investment. The investment multiplier traces the influence investment exerts on income under these conditions. The weakness of the idea is involved in the fact that consumption is not wholly induced by the level of total income: propensity to consume is not nearly so rigidly predetermined as the above illustrations imply. Therefore, a given amount of investment will not so completely predetermine the level of income, although a general tendency is indicated.

The investment multiplier analysis is of value for still another reason. It provides a model of the way dwindling cumulative effects are carried along. This is helpful in describing the cyclical process and in evaluating the influence of government spending, the purpose for which the investment multiplier was originally devised.[22] An attempt was made to show the influence on activity of public works expenditure made in the Great Depression. The emphasis on public works expenditure or public investment is unnecessary in this connection. As will be shown in Chapters XVI and XVIII, funds set aside by the individual for saving are absorbed by any government expenditure which is not matched by increased taxes. The critical point is not so much the type of government expenditure but the fact that it is made. If the expenditures are made in the area of public investment, support is lent to the durable-goods industries which are most depressed. This is a minor point, however, compared to the question of the extent to which the government expenditure will have a multiplied effect analogous to that produced by the propensity to consume when private investment rises. The initial government expenditure must produce an equal amount of income. At the successive rounds of expenditure the income created by the second-removed government expenditure will be indistinguishable from any other income. It is, of course, possible that some decline might occur in the consumption function because of uncertainty as to how long the government expenditure might be maintained. The important point is that government expenditures which do not increase taxes are "autonomous" in the same

[22] See R. F. Kahn, "The Relation of Home Investment to Unemployment," *Economic Journal*, June, 1931.

sense that private investment is: they both add to expenditure independently of the amount the individual spends for goods out of his income.

The multiplier is potentially a more effective force in depression than the acceleration principle. In so far as investment is concerned, the acceleration principle tends to be inoperative in depression because of the existence of excess capacity in comparison to the current level of the consumption market. But the multiplier will be more powerful in depression than in prosperity because at the low-income levels the individual tends to spend a relatively large proportion of his income to maintain his standard of living. Thus, the multiplier is more influential in producing upturns during depression; the acceleration principle is more influential in producing downturns during prosperity.

Credit Expansion and Contraction. Credit expansion makes possible capital overexpansion, overaccumulation of inventories, and installment buying. The building of capital fluctuates much more widely over the business cycle than does the production of most consumer goods. The expenditure for capital reaches an abnormal proportion of total expenditure. The extent to which such capital overexpansion arises from credit extension is now a debated question, as will become clear in the business-cycle theory chapters. The possibility is granted by all persons.

By the creation and depletion of inventories, credit can be expanded and contracted in the production of short-lived goods. Businessmen may feel that prices are going to rise. Their funds may not be adequate to buy a large supply of raw materials and goods in process and to maintain an excessive stock of finished goods, but by use of credit they can accomplish this. Because of physical storage-space limitations it is not usually possible to pile up inventories for more than a few months ahead. Prosperities reinforced by substantial inventory accumulation lead to a rapid and relatively short downswing.

Consumer credit has come to be one of the most important areas of cyclical credit expansion. Credit extended to the consumer will have the same effect of expansion and contraction as that arising in credit extended to business. Similarly, added government spending without increased taxation is a type of credit expansion by the government. It has the same type of influence on the economy as does credit extended to business or to consumers, but it may be used in depression instead of prosperity.

Credit contraction produces the reverse effect of credit expansion. In all cases, except government spending, cyclical increases in credit inevitably lead to cyclical decreases.

Looked at in the proper perspective, credit merely provides the funds upon which the investment multiplier operates. It makes little difference where these additional funds come from so long as they are net additions to recurring income; they will produce a series of dwindling expenditures at successive rounds as determined by the propensity to consume. Credit expansion produces autonomous expenditure because it does not arise from the expenditure of income received in preceding activity. The latter expenditure is appropriately thought of as induced. The first-round effect is equivalent to the amount of credit extended. *Credit multiplier* might therefore be a better term than *investment multiplier*. In fact, investment produces the effect only to the extent that it is not matched by current saving.

In addition to business and government credit, an important influence will arise from consumer credit. The application of the investment multiplier should be extended to cover consumer credit as well as government and business credit considered in the investment-multiplier section. Credit extended to the consumer will result in a multiplied effect precisely analogous to that extended to business and government.

Changes in Cost and Efficiency. Changes in efficiency result from five separate factors: (1) change in the efficiency of workers as individuals; (2) differing proportions of the most inefficient workers who are employed; (3) differing proportions of the most inefficient capital equipment which is used; (4) individual plant efficiency related to the extent full plant capacity is used; (5) change in efficiency because of replacement of capital equipment by more (or by less) efficient capital equipment, or by more or less efficient industrial management. The first four of these factors are closely related to cyclical change, while the last is most closely related to secular development.

It is impossible to measure the separate effect of these influences at the present time, but we may surmise certain tendencies. Opportunity for alternative employment is scarce in depression, and therefore employees take their work more seriously. The proportion of inefficient workmen who remain employed is smaller. On the whole, it is the more efficient plants which remain in use because costs are lower in these plants. Efficiency continues to increase as recovery gets under way. Industrial equipment of more efficient design is installed to replace a small part where the differential between the new and the old is the greatest. The efficiency of individual plants rises until a most efficient rate of operations is attained. As conditions continue to become prosperous, efficiency tends to decline. Workers become aware of alternative employment, and they are likely to take their work

somewhat less seriously. Less efficient workers are added and less efficient plants are brought into use. Managements become more lax because profits are good and more attention is given to dangers of spoiling the market.

A study of this pattern of effects shows that change in industrial efficiency operates with the movement of activity in the early upswing and opposite to it in high prosperity and during a moderate downswing. It operates to produce a downturn in prosperity and tends to produce an upturn in depression. There is a reasonably close relation between industrial efficiency and costs. Costs rise and efficiency declines when resources are quite fully used; costs fall and efficiency rises when resources are less fully used. Increases in industrial efficiency tend to decrease costs, while decreases in efficiency tend to increase them. Material costs move up rapidly late in prosperity when industrial efficiency tends to decrease; they drop rapidly in the business decline when efficiency is increasing.

Overhead costs tend to increase in prosperity and to decrease in depression. The movement is very much in line with that in industrial efficiency. As conditions improve in early recovery, overhead costs per unit of output decrease because of fuller use of capacity. Late in prosperity, when less efficient capacity is brought into use and office expenses are not scrutinized too closely, the movement is reversed. During a business decline, overhead costs tend to decline because of the retirement from production of inefficient plants and because of the failure of inefficient businesses.

Thus, it is seen that changes in efficiency and costs are influential in prolonging an upswing and in finally bringing a downturn. Increasing efficiency and declining costs are of consequence in producing an upturn. If a secondary depression occurs, however, the rise in efficiency is reversed as activity continues to decline. Very low operating rates for individual plants produce disorganization and poor co-ordination of various parts of the plant. Labor can no longer be used in so specialized a fashion, and its operation loses effectiveness. Unwillingness to accumulate inventories makes for production runs which are so small as to be inefficient, and transportation becomes less economical because of smaller-sized orders.

Accelerated Variation in Long-Term Interest Charges. When a company borrows money to invest in capital, the rate of interest agreed on becomes a particularly significant item in the amount which must be paid. In fact, if the interest rate declines at all when the cost of the capital declines, capital charges for bonds floated at the new low interest rate will be reduced by a greater proportion than the capital cost. And if the interest rate increases with increasing capital

costs, capital charges will rise more than proportionately. In other words, variation in interest rates produces an accelerated variation in interest charges when compared to capital costs.

If the cost of all materials and services dropped by 20 per cent, it might seem that the cost of the capital would decrease by 20 per cent. If the capital is borrowed, however, and if we are thinking of the current charges which must be paid on this capital, the decline in costs is by much more than 20 per cent. This can be seen most readily by means of a hypothetical illustration:

Cycle Phase	Cost of Capital	Interest Rate	Interest Charge
Prosperity	$100,000	5%	$5,000
Depression	80,000	4%	3,200

It will be observed that the cost of the capital good is assumed to drop by 20 per cent, and that the interest rate is assumed to drop 20 per cent, that is, one point out of five. The total interest payments which must be made each year have dropped from $5,000 to $3,200, a decline of 36 per cent.[23] No allowance has been made for the wearing-out of the capital, and therefore the proportionate decline in required interest charges cannot be accepted as significant, unless the capital will last and be economically useful forever.

If, in the above illustration, we assume that the life of the capital is 50 years, we must charge off 2 per cent per year. Adding 2 per cent of the cost of the capital in both prosperity and depression, we obtain yearly charges of $7,000 and $4,800, respectively. This decline amounts to 31.4 per cent. It is easily seen that the proportionate decline will always be less when depreciation is taken into account, since by this procedure a factor which declines by precisely the proportionate rate of decline in the original cost of the capital is now added in as part of the charge each year.[24] Table 5 shows the reduction in capital charges with various assumptions as to capital life.

It will be seen that the shorter the life of the capital, the more nearly the proportionate decline approaches the decline in the cost of the capital. If the capital is obtained by floating common stock, it is not borrowed, and therefore long-term interest is not paid. The price at which common stock can be floated is roughly dependent upon some yield demanded in the capital markets; but other factors, such as risk

[23] Let a equal the proportionate decline in interest and b equal the weighted average proportionate decline in all other costs; then the proportionate decline in yearly interest charges equals $1 - [(1 - a)(1 - b)]$.

[24] Straight-line depreciation is assumed.

and speculation, are so important that we cannot place much significance on the cumulative effect of a change in the yield on common stock. In fact, since profits vary so violently, there is no regularity as to the movement of common stock yields over the cycle, although there is some tendency for yields to *increase* in depressions.[25]

The financial structure of many corporations today is composed entirely, or almost entirely, of common stock. Nevertheless, the type of security which will almost invariably be used in early recovery is a bond. At such a time, recovery is dependent upon an increase in the

TABLE 5

INFLUENCE OF LENGTH OF LIFE OF CAPITAL ON THE INTEREST CHARGE

Assumed Life of the Capital (Years)	Current Charge When Capital Costs $100,000 (5% Interest)	Current Charge When Capital Costs $80,000 (4% Interest)	Relative Saving (Per Cent)
50	$ 7,000	$ 4,800	31.4
40	7,500	5,200	30.7
30	8,333	5,867	29.6
20	10,000	7,200	28.0
10	15,000	11,200	25.3
5	25,000	19,200	23.2
2	55,000	43,200	21.5

production of durable goods. An increase in the production of capital goods in this phase may be dependent upon the flotation of bonds. We see that the flotation of bonds is made much more attractive to the producer in depression when long-term interest rates are low.

Dampened Fluctuation of Short-Term Real Interest Rates. Real interest rates may be defined as the difference between the amount of goods the borrowed money will buy at the time it is borrowed and the amount of goods the repaid money will buy at the time it is repaid. In addition to the quoted interest rate, any change which takes place in the price of the goods the borrowed money is used to purchase must also be considered.

It is clear that variation in price differs for various goods. The variation in the general price level will, however, indicate the average effect of price on real interest rates. Typically, average prices rise in prosperity periods and invariably they fall in depression periods. Price variation tends to offset interest-rate variation. If the interest rate dropped from 6 to 2 per cent, it would seem that an important decrease in costs had taken place. But, if at the same time, the general

[25] Yields, when dividends are the denominator, tend to be high in depressions since dividend rates are more stable than prices; but yields on earnings often are very low in depressions since earnings tend to drop more than stock prices.

price level dropped 10 per cent, the combined situation would look very different. With a 10 per cent decline in price, the goods which must be repaid because of the price decline are about 11 per cent greater than the goods which were borrowed.[26] Added to a quoted rate of 2 per cent, the real interest rate would become 13 per cent.

It can be seen that in a similar way a rise in the interest rate in a prosperity period tends to be offset by an increase in the price level. For example, this would be true if prices rose by 5 per cent during a year when a 6 per cent interest charge had to be paid. Because of the change in the price, about 4.8 per cent less goods needs to be repaid,[27] but because of the interest charge, 6 per cent more goods needs to be repaid. The net total, therefore, is 1.2 per cent more goods to be repaid than borrowed. This is a real interest rate far below the quoted rate. Rising or falling interest rates may not be an important incentive in the short-term markets. A commodity may be bought speculatively even though interest rates are high if prices are expected to rise. Similarly, it will not be bought because of low interest rates if prices are expected to drop. Because prices and interest rates move in a correlated fashion, real interest rates decline less than quoted rates in depressions, if indeed they decline at all. They rise less than quoted rates in prosperities, if they rise at all.

Many people have pointed out that short-term interest charges amount to a very small proportion of the costs of most businesses, and therefore their variation is not an important force over the business cycle. But the variation is less important than would be indicated by the small proportion of costs involved, for the real interest rate does not vary as much as the quoted rate, unless it moves in a direction opposite to the quoted rate.

Real interest rates make clear the much greater importance of a variation in prices than a variation in short-term interest rates. The variation in price is important. Not only does commodity price tend to eliminate the reduced costs, which a drop in quoted interest rates might otherwise produce, but it influences the carrying of all inventories and goods in process, whether they are carried with borrowed money or not.

To the extent that a drop in prices is felt to be permanent and not merely temporary, the characteristic of real interest rates applies equally to long-term interest rates. If prices are going to be lower when the bond must be repaid, then a real interest rate much higher

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[26] If the price declines to 90 per cent of the old level, 100/90, or 111 per cent as many goods, can be purchased with the same money as before.

[27] If $100 buys one unit at a 100 price level, $100 will buy 100/105, or 95.2 per cent of one unit, at a 105 price level. The purchasing power has declined by 4.8 per cent.

than the quoted rate will be paid. Inversely, if the price level is to be higher when the bond must be repaid, the real interest rate will be less than the quoted rate. In actual practice, these considerations probably are not important. In the flotation of bonds, a company is concerned principally about the possibility of paying the interest currently over the next few years. The interest so paid will be at the quoted and not the real rate.[28]

REVIEW QUESTIONS

See end of Chapter VI

SELECTED REFERENCES

See end of Chapter VI

[28] The relation between price and interest-rate changes has been the center of a great deal of attention by many students of business cycles. The work is brilliantly analyzed by F. R. Macaulay in *Bond Yields, Interest Rates, and Stock Prices in the United States since 1856* (New York: National Bureau of Economic Research, 1938), chaps. vi and vii.

Chapter VI

FACTORS RESPONSIBLE FOR THE CYCLICAL NATURE OF BUSINESS—*Continued*

THE forces of cycle generation come both from within and from without the business system. Those emanating from disturbances external to the business system are called originating causes. The most common types were catalogued in Chapter V. The forces originating from within the system are self-generating in the sense that they represent successive links in a chain of mutual causation. As a group they create a self-generating oscillation. Separable forces which play a part in generating and perpetuating this oscillation were described in the last section of Chapter V. It is the purpose of Chapter VI first, to analyze the operation of the self-generating forces in combination, and second, to draw summary conclusions regarding the nature of the business cycle.

The self-generating oscillation is made up of two major influences: (1) limiting forces, and (2) reinforcing forces. The course of the self-generating oscillation depends upon the comparative strength of these two sets of forces. The reinforcing forces furnish propelling power in that they are the forces which keep business moving in the direction in which it has started. They are the forces which drive business up while the upswing is under way and which drive business down while the downswing is under way. The limiting forces furnish the braking power in that they operate to reverse the current direction of movement. They tend to reverse both the upswing and downswing while each is under way. The limiting and reinforcing forces are opposing and tend to counteract each other. When the upswing reaches the stage where the limiting forces overbalance the reinforcing forces, a downturn occurs. In like manner, when a similar stage is reached in the downswing, an upturn occurs.

These statements must not be taken to imply that business moves continuously upward during an upswing or continuously downward during a downswing; the business cycle is constantly beset with minor variations. The relation of these minor variations to the general business-cycle oscillation is discussed in a later section of this chapter. Of

fundamental importance is the general direction of momentum and the way it is generated.

1. REINFORCING FORCES DURING THE UPSWING

The point in the oscillation at which we begin makes little difference as long as the explanation is carried to the recurrence of this point. Recurrence of the movement and the way it generates itself are the characteristics to be explained. We may conveniently begin at the point where an upturn occurs. Explanation of the upturn may best be deferred.

Assuming that the upswing has gotten under way, how do the reinforcing forces perpetuate it? These forces are relatively weak at first, but they build up momentum as the upswing attains headway. The early part of the upswing is dependent upon accidental occurrences which would be unimportant a little later. An originating cause of minor order might sharply reverse an incipient upswing. The likelihood of this situation depends upon the sharpness of the initial upturn. If the angle is sharply upward, continuance of the upswing is much more probable. Any sizable increase generates an impetus which will be widely felt.

Reinforcement of the upward movement depends upon the cumulative and spreading effect of business increases. Several processes which move in an upward spiral may be identified. The one which is likely first to show itself is the *production-employment-purchasing-power spiral*. An upturn is synonymous with a general increase in production. An increase in production necessitates an increase in employment. This increase may be merely an increase in the hours of those already employed, rather than an increase in the number of the employed, but at least it will result in an increase in purchasing power. The increase in purchasing power will be used to pay debts and to buy additional goods. Purchase of additional goods will require a further increase in production. At this point the spiral starts all over again.

Other upward spirals typically get under way later in the upswing. A *credit spiral* is readily identified in most periods of business improvement. If we assume credit to be advanced, purchasing power additional to that obtained in the processes of production will become available. An increase in total demand results, that is, the demand curves shift horizontally to the right. The greater demand makes the need for credit greater than ever. When credit is further increased, money demand is further increased. This leads to rising prices, which accentuates the need for credit, because the money needed to buy the same amount of goods is now greater. The process tends to get out of hand when resources become fully employed. At such a time, in-

creased credit will drive up prices and press submarginal resources into use.

The *credit spiral* usually is a factor in the *price-inventory-accumulation spiral*. As prices rise, or as they are expected to rise, businessmen begin to anticipate future needs by accumulating inventories. The inventory accumulation withdraws part of current production from the market and increases demand. The increased demand drives prices up farther, which, in turn, encourages additional inventory accumulation. If credit is used, as it likely will be, demand is artificially stimulated from the increased purchasing power it supplies as well as from the decrease in supply resulting from inventory accumulation. If the credit spiral were left to itself it might indefinitely attain increasing strength. The *price-inventory-accumulation spiral* will not. Businessmen soon become aware of the fact that a disproportionate share of working capital is tied up, and available storage space is limited.

The *credit spiral* is also related to a *spiral of stock-market speculation.* Stock prices rise and further rises are looked for. In such a case, some people are certain to buy stocks as a speculation. They may sell other assets, draw down cash balances, or borrow. Credit, in one form or another, is the most likely source of major speculation. The speculative buying of stocks increases the demand for them which drives the prices up farther. The price rise adds encouragement to the belief that prices will go still farther, thereby attracting additional purchase, and the spiral goes merrily on its way. There is scarcely any limit to the distance it can go.

The *spiral of land speculation* is an analogous type. Before the twentieth century it was much more common than stock-market speculation. Rising prices for land induce speculation, which drives the price indefinitely upward, because it always seems that someone else will pay yet higher prices.

All of these upward spirals are related to the *spiral of emotional response.* Money is spent and borrowed freely; inventories are accumulated; land and stocks are bought speculatively only because of confidence in the future. As the upswing proceeds, enterprisers become more and more confident. They constantly reappraise the future, and it comes to look brighter and brighter. Actually, they are revising their views on the line of secular growth. Levels of activity which appeared fantastically high at the pit of the depression soon seem to be unreasonably low. The businessman usually has no independent basis at his command for judging the secular growth, either of total industry or of his own industry. He depends on the information the market gives him—quantity sold and prices. Seldom does he realize that this is a temporary demand, artificially affected by inventory accumula-

tion and credit extension. He tends to project recent increases into the future, and these anticipations shortly reach unreasonably high levels.

The *spiral of emotional response* is closely related to the *capital-building spiral*. As soon as it appears that capacity will shortly be inadequate, a magnified demand for equipment is seen, as the acceleration principle shows. While capital equipment is being built, the added demand for resources drives up the price of consumer goods. Resources used in producing capital equipment result in wages and dividends, much of which are used to buy consumer goods. Since this demand does not add substantially to the quantity of goods for sale on consumer markets until the capital expansion is completed, demand is artificially stimulated. With rising prices, enterprisers become still more optimistic and are likely to add further to their expansion programs. This spiral is a powerful one. Because of duplication by competing firms, there is almost no limit to the need for equipment which enterprisers think they see. Each firm may try to provide for all of the anticipated growth in the industry, and the anticipated growth is probably too large. As the period of gestation demonstrates, this process tends to reach a point where the consumer market will appear inadequate. This inadequacy arises because a major proportion of the capital equipment is completed at about the same time. When this point is reached, the process becomes limiting instead of reinforcing.

The analysis of each spiral separately is artificial. Cumulation works through all of the processes. The nature of the reinforcing forces is better understood if an attempt is made to view them in combination. The student can readily see that these forces can be combined in almost endless ways. The pattern differs in every recovery. Certain typical patterns of combination may be described, and if they do not invariably apply to all upswings, they may at least serve to illustrate the type of thing likely to happen. Details not readily separated from the stream of reinforcement can be noted.

While production is generating further production through the *production-employment-purchasing-power spiral*, overhead charges become less onerous because they do not increase proportionately with increases in volume. The reduction in per-unit overhead costs results in an increase in the profit margin or a reduction of the loss, which makes enterprisers more optimistic. It also provides funds which may be used to make replacements which have been deferred during the hard times. The making of these replacements provides a powerful impetus at this point. They do not add to the goods placed on the consumer market, but the wages paid in making them provide purchasing power to be used on this market.

Other initial stirrings begin to be felt in the investment market.

Bond prices have reached high levels because investors wish a safe medium for their funds. Companies take advantage of the demand for bonds and refund their outstanding issues to bonds carrying lower coupon rates where possible. Costs are reduced, and profits tend to increase. The atmosphere is conducive to the installation of labor-saving machinery. So long as business was declining, capital investments were deferred on the chance that still lower costs might be available. Furthermore, enterprise had become paralyzed with fear of the future. The enterpriser, however, finds a renewed interest in cost reduction, and, as business begins to improve, he is ready to go ahead with installations where the cost reduction is extremely obvious. Some increase in productivity results so that costs are reduced. Particular interest is felt in improved methods of industrial engineering; the routing of materials and the application of labor is improved in many of the existing plants. The early part of the upswing is more conducive to improvement in efficiency than any other phase of the business cycle.

Investment, although minor in amount, has powerful repercussions early in the upswing. It adds to purchasing power without increasing the flow of commodities to the consumer market for the time being. At this time the propensity to consume is high because basic standards of living have become endangered. Hence, the investment and credit multipliers exert maximum effects since the propensity to consume and the multipliers vary together.

As conditions improve, enterprisers become convinced that recovery is under way. They then begin to take more positive action. Higher material costs may be anticipated. Inventory accumulation begins. This situation, as we have noted, is doubly reinforcing in that it adds to the demand for commodities, but does not increase the supply available on the market. Large expansion programs reach a formative stage. Replacement of obsolete equipment when newer types show major increases in efficiency are made without hesitation. Capable enterprisers are unusually alert to new products and improvements in process.

As the income of consumers increases, anxiety about a sufficient supply of short-lived goods is greatly reduced, and the purchase of durable goods begins to show marked increases. Their purchase has been most restricted during the depression, and increased activity in them exerts a major influence. Workers attached to companies making durable goods have represented a disproportionate part of the unemployment. It is for the purchase of durable goods that the consumer is most likely to use credit.

In these ways, the momentum of the upswing attains increasing

strength. The improvement tends to spread and intensify itself. The business response generated by each turn of any upward spiral is not merely an improvement tending to continue the spiral; it spreads improvement in all directions. Increased purchasing power not only tends to increase production and thus further increase purchasing power; it also generates optimism, strengthens prices, induces people to borrow, encourages expansion, and prepares the ground for increased speculation. These results apply to any one of the upward spirals in equal measure.

Reinforcement of the upswing is to some extent dependent upon time lags, that is, differences in the time it takes different processes to respond to recovery impulses. Wage rates do not rise as fast as the selling price for manufactured goods in the early part of the upswing. Labor was plentiful and wage rates were supported more effectively than prices as the pit of the depression was reached. Manufacturers may have sold at prices so low that they were just covering out-of-pocket expenses as business was receding, but they will not do so long when orders are increasing. The lag in wage rates is an important reinforcing influence early in the upswing. As we shall see, the relationship tends to be inverted late in the upswing and to become limiting in nature.

Most of the lags which occur are not so clear-cut. It is correct to designate any of the delayed responses arising in upward spirals as lags. Purchasing-power increases generate further increases after a lag. Inventory increases tend to generate further increases for a time. The fundamental characteristic involved is not a lag, however, but the *cumulation and spreading* of effects. Aside from time differences in the taking effect of different exchange rates, as typified by the lag of wage rates after manufactured goods prices, the lag has little to do with reinforcement of the upswing. The fact that an effect is built up cumulatively in an upward spiral has a great deal to do with it.

The spreading of increases to other processes is partly caused by the high interrelationship of the business system but is more fully explained by the relationship between economic processes. Consumption and investment react on each other. Production changes lead to price changes, price changes lead to shifts in the emotional response and to changes in speculative activity. Changes in outstanding credit have repercussions on all types of economic activity.

As the upswing reaches prosperity levels, the effect of changes in the *level* and *distribution* of income becomes of increasing importance. Incomes which have reached new high levels tend to carry a fringe of erratic expenditure. A shift to a higher standard of living, with a better residence and all that goes with it, is not quickly made. Instead,

many whims are satisfied by making purchases which bulge market demand. Because the enterpriser tends to accept market demand as a faithful indicator, he is driven to overexpand. The tendency is reinforcing up to the point that major shifts in basic standards of living begin to appear, and then the market for gadgets of many kinds becomes disappointing.

Shift in the distribution of income as the upswing continues is dependent mainly upon successive increases in profits. Since profits go to a relatively small group, income distribution tends to become more concentrated. Higher concentration of income results in greater savings. The greater saving is reinforcing in one way and limiting in another. It keeps the cost of investment funds low for a longer period. Hence, the interest rates at which investment funds can be obtained do not become high rapidly enough to prevent emotional aberration from reaching a point where the rate is disregarded. On the other hand, increased saving draws funds from consumption and retards activity for the time being *if as great investment would have been made from credit extension.* This is the lesson of the investment multiplier.

If the prosperity lasts long enough, saving probably will quit increasing and begin to decrease for several reasons. Scarcity of labor drives up wage rates, thus increasing income disbursements at the broader level of income distribution. Laborers save a smaller proportion of their income. Saving of all groups tends to be reduced relatively because reserves for a rainy day have become more adequate, and shifts to higher standards of living leave a smaller margin for saving. Finally, large speculative gains come to be counted on as recurrent and are spent on consumption.

The student will note that the momentum of the upswing depends upon the extent of investment activity. The production of short-lived goods does not swing through nearly so wide a range as does the production of durable goods. Except in booms, when inventory accumulation becomes exceptional, overproduction of durable goods is the center of instability. The forces which carry the upward movement forward are not independent of those which combine to turn business down. Before considering this problem, the forces which limit the upswing should be examined in detail.

2. LIMITING FORCES DURING THE UPSWING

Industry reaches an approximate dead center before turning upward. Minor influences, possibly of an accidental character, start activity upward. Reinforcing influences are very weak, and characteristic limiting forces do not appear at all until later.

Decreasing Inventory Accumulation. After the recovery attains prosperity levels inventory accumulation slows down unless commodity price increases get out of hand. Higher interest rates increase the expense of carrying inventories. Managements realize that it is dangerous to have too much working capital tied up. When the accumulation reaches such a point that a drop in prices would strain the financial resources of a company, further accumulation may be made slowly, if at all. A larger part of the current production of consumer goods must then be sold on the market, and the outlet for goods is narrowed.[1] The effect on the markets is the same as if consumption declined by the amount of difference in inventory accumulation.

Some increase in inventories is always necessary in prosperity to take care of the rising volume of business. Should commodity prices become inflationary, inventory accumulation will proceed much farther than it otherwise would. The increased value of the inventory makes accumulation tempting, and if the increases are marked enough, discretion may be thrown to the winds. Nevertheless, the time must arrive when accumulation will slow down or be cut off entirely. Physical storage space is definitely limited. For this reason, inventory accumulation cannot go beyond a few months' supply in the case of most commodities. If it goes far beyond normal limits as it did in 1920, for example, a very unstable situation is created. In such a case, inventories become limiting less quickly but act more powerfully when they do.

Rise in Variable Costs. After business activity has reached such a high level that efficient resources are quite fully employed, costs rise rapidly with further improvement. Resources are being bid away from those already using them, in which case the whole effect is to increase costs; or less efficient resources are brought into use, in which case the price of the efficient ones is driven up. The increases in cost apply to both labor and raw materials. Wage rates rise rapidly when there is no efficient labor reserve to draw upon. Raw-material prices must rise when less efficient sources of supply have to be used. Credit comes to be called upon to a greater and greater extent, and interest rates rise.

At the same time, barring a speculative inflation, prices of finished goods do not tend to rise as readily as they did earlier in the upswing. Several factors are responsible. Smaller inventory accumulation exerts a dampening influence. Unless the prosperity is protracted, savings increase so that the purchasing power directed to the purchase of consumer goods is somewhat restricted relative to the level of total out-

[1] The influence of inventory accumulation is principally in consumer goods. Raw material inventories, in a considerable number of cases, tend to become largest in depression. See Chapter XVI, Section 2.

put. The near completion of the period of gestation in the production of capital goods depresses the consumer markets.

Rise in Overhead Costs. As efficient capacity comes to be completely used in the major industries, additional production will increase the overhead cost per unit. A plant is most efficient operating at something less than full capacity, 85 to 90 per cent representing maximum efficiency in many industries. Less efficient plants must be brought into use, or new plants must be built. The cost of building new plants is high in prosperity because of high wage rates and the high prices at which raw materials sell. Furthermore, all of the capacity of a new plant often cannot be used. To run it at less than its maximum efficiency is expensive.

The effect of rising costs and flattening prices for manufactured goods is often misunderstood. It *tends* to narrow the profit margin but does not necessarily narrow it on the upswing. The anticipation that the margin will be narrowed may be sufficient, together with other limiting forces, to initiate a downturn. It is possible, however, that the margin of profit per unit of output may be narrowed while the upswing lasts. The total profit may not be decreased, for this is likely to be timed with a downturn. A company scarcely will produce more if the management realizes a reduced net return will result. It is perfectly possible for total profits to increase for a time even if the margin of profit is reduced. The profit made on the added increment of business may be enough to make up for a slight reduction in the rate of profit on the same amount of business. However, the anticipation of a reduced rate of return is in itself a sufficient cause for reduced optimism.

Reduced Efficiency. The change in costs results partly from bidding against limited resources and partly from an actual reduction in efficiency. The reduced efficiency arises from lower productivity of *added* workers and equipment, on the one hand, and from a sagging of the productivity of the *total*, on the other. The lower productivity of added workers and equipment is merely an application of the law of diminishing returns. Unemployed workers are, on the whole, less efficient than those at work before peak prosperity is reached. In general, the more efficient capital equipment is used first.

The efficiency of all workers tends to decline in the atmosphere of high prosperity. Work is easy to get, and the competitive drive is somewhat reduced. Incomes reaching new highs tend to shift attention from efficient work to ways in which the increased income may be spent. Managements tend to be less exacting. Greater indifference is possible when large profits seem assured. Industrial management tends to become more lax so that efficiency in central offices tends to be reduced.

Pinch of Inefficient Organizations. There is a time relatively early in the upswing when the rise in prices is sufficiently faster than the rise in costs to encourage the taking of chances. It also encourages the organization of inefficient businesses. Valor is the only indispensable characteristic of a successful businessman for the time being. When costs begin to rise faster than prices, highly inefficient enterprises face bankruptcy. Also, those dependent upon ideas which proved ineffective are likely to find the going too difficult when the markets turn against them. The looming on the horizon of business failures exercises a powerful influence on the psychological attitude of the business community. Business failures are certain to have wide repercussions. Those who have granted credit to the vulnerable enterprises find it prudent to curtail it, and the vulnerable enterprise must, in turn, curtail any credit granted to others. The curtailment of credit at such a time is embarrassing. The financial position of many business enterprises may not be very liquid, a sizable proportion of working funds being tied up in inventories of finished goods and of goods in process. Liquidation of the finished-goods inventories throws large quantities of goods on the market for what they will bring and reduces prices at a time when the semimonopolistic price structure is not very strong. Falling prices, if general, initiate tendencies likely to produce a downturn.

Completion of Capital Goods. Since the building of capital goods tends to be begun at a high rate after the upswing has gone far enough to generate considerable optimism, large additional capacity often becomes available within a short period as peak prosperity is reached. Labor is no longer needed to build the capital, and, at the same time, the potential supply of consumer goods is increased. Purchasing power is lessened and market supply is increased. This has been called the ending of the period of gestation in the building of capital goods.

Limiting forces are negative responses of one type or another to reinforcing forces. A decrease in inventory accumulation is but a reversal of the reinforcing inventory accumulation. Costs rise and inefficiency grows as the favorable conditions of the early upswing disappear. In addition to these negative situations, it is necessary to recognize characteristics which make the system increasingly sensitive to shocks as the upswing reaches higher and higher levels.

3. THE DOWNTURN

Although the upswing *may* be brought to a close at any time by a sufficiently powerful originating cause, it is quite unlikely to occur, if reinforcement has attained considerable momentum, until limiting forces have grown to importance. In this interval the originating

cause would almost instantly have to exert a depressing influence of significant extent on the total economy.

There is no mathematical function which will locate the time a downturn will occur. As described by Nicholas Kaldor, prosperity is like a difficult steeplechase where a horse has to overcome a series of hurdles and is almost certain to fall at one of the obstacles.[2] To extend the analogy, the hurdles become more and more difficult as time goes on, the horse more careless, and an unexpectedly steep hurdle (originating cause) may arise at any time. As the upswing reaches higher and higher levels, it becomes more and more vulnerable. After all efficient resources are employed, further increase at a rate more rapid than normal growth can occur only by calling upon submarginal resources. Since they are more costly to use, prices are driven up. Many of the new activities merely bid resources away from others and hence bid up the price without producing a net increase in activity.

Actually, a complete use of efficient resources is never reached for total industry because the meshing of various types of activity is inaccurate. *Bottlenecks appear.* Efficient resources are completely used in some industries and in some localities before absorption is complete for industry as a whole.[3] For instance, capacity to make raw steel ordinarily is completely used in prosperity, but the capacity to make fabricated products is much greater and therefore is incompletely used. Labor may be fully employed in certain industrial centers, while the slack existing elsewhere is not readily absorbed because of labor immobility. Inability further to increase production in key industries and in important localities will drive up prices and pervade the whole economy. If higher prices are required for additional production, an improvement in conditions will necessitate exceptionally responsive markets. As long as nothing prevents the payment of higher and higher prices, improvement may continue by drawing in less efficient resources and by the creation of additional capacity, but the vulnerability of the situation is apparent.

As prices rise, credit becomes increasingly unstable. *Credit instability* indicates another vulnerable situation. Unless the monetary system is very inelastic, there is no fixed limit to credit expansion. Interest rates are driven up, however, and as they become higher and higher, excessive optimism must be constantly present to prevent a decline. Further, as soon as any major financial difficulty arises, the credit bubble is pricked.

[2] Nicholas Kaldor, "Stability and Full Employment," *Economic Journal*, December, 1938.

[3] The Brookings Institution has provided the best statistical evidence on inadequate meshing. See E. G. Nourse and Associates. *America's Capacity to Produce* (Washington: Brookings Institution, 1934).

Slowing down of inventory accumulation may react unfavorably on the profits of important companies.[4] In many cases, an important part of the profits recorded come from inventory appreciation. If the inventories already held are marked up with price increases, such profits from appreciation may accrue even without further accumulation. Appreciation is dependent upon price increases regardless of how the records are kept, and when prices level off profits look less favorable.

Vertical maladjustments are an important basis for vulnerability. If capital building has become excessive, durable goods are produced at a more rapid rate than they are used up. Both producer and consumer durable goods are built with abnormal rapidity. A depression is the only way realignment can be effected. The production of short-lived goods cannot be speeded to catch up with durable goods production because resources are already in relatively full use. Any curtailment in the activity in durable goods industries will start a chain of depressing effects leading to excessive curtailment, which is the essential characteristic of the downswing. The greater the heights which durable goods industries reach, the more vulnerable the situation becomes. High activity in these industries builds up excessive capacity, which reacts unfavorably on prices in consumer markets.

Horizontal maladjustments become important in that activity in industries producing goods lasting about the same length of time is not kept in a ratio comparable to that of use. This situation is not likely to occur to any important extent in the case of short-lived goods, but it is likely to become important in construction programs. Investment activity is much overdone in certain industries. The most important type of unbalance is both a horizontal and a vertical maladjustment. Investment activity proceeds too rapidly in certain industries. The maladjustment is horizontal inasmuch as the amounts of investment in different industries are out of line with each other. It is vertical in that investment as a total is out of line with the output of short-lived goods. As soon as many important industries are being overdeveloped, the rate of investment becomes too high for industry as a whole. Vertical maladjustment in total industry is likely to become important when horizontal maladjustment becomes important.

The further the prosperity proceeds, the greater is the extent to which custom and long standing become the major considerations in placing patronage. It becomes harder and harder for new firms to get a start. Less attention is paid to the prices charged, for profits are high and consumer incomes are at peak levels. Consumers become less

[4] The situation described in this paragraph is elaborated in more detail in G. E. Putnam, "What Shall We Do about Depressions?" *Journal of Business*, April, 1938; Henry B. Arthur, "Inventory Profits in the Business Cycle," *American Economic Review*, March, 1938.

discriminating. More attention is paid to the extra income, the amounts over and above that to which they have become accustomed. The spending of the part which just maintains basic standards of living becomes habitual. Competition is much less effective than at earlier levels of the upswing. Industrial organization becomes fixed and loses its plasticity. Industry loses its power to adapt itself to technological changes. Managerial effort goes more to attempts to bolster the *status quo* instead of adjusting organization to desirable changes which slowly appear. It is a losing battle. In time the progressive methods win, and then the attempts to stabilize collapse.

The inevitability of the downturn is founded on the fact that improvement in the upswing is not adapted to secular progress. Almost invariably production increases at an abnormally high rate until submarginal resources have been brought into use. After this has occurred, the level of activity has become vulnerable and limiting forces have attained strength. Even if by some miraculous coincidence the upswing should proceed for a while at exactly the rate of growth of industry, there is little hope that the condition might long prevail. During the upswing, reinforcement almost certainly would have depended upon reinforcing forces which, as we have seen, tend to initiate limiting forces. Furthermore, the occurrence of originating causes would tend to shift activity above or below the secular trend.

4. REINFORCING FORCES DURING THE DOWNSWING

When the general momentum shifts to the downside, the downswing is under way. As was similarly noted regarding the upswing, this does not mean that activity in general will constantly decline. It means that the general direction of movement will be downward even though interrupted occasionally by minor variations. Downward spirals are quite analogous to upward spirals. The chief difference lies in the fact that the downward spiral tends to act more quickly. In the upward movement, positive decisions and venturesomeness are essential. In the downward movement, only indecision is necessary. Unless a crisis stage is reached, when financial considerations force the enterpriser's hand, expansion programs already under way are likely to be completed. Additional expansion, however, depends upon positive decision. The characteristic tendency is a waiting attitude which can result in very rapid contraction.

The influences of the *production-employment-purchasing-power spiral* tend to spread more rapidly in the downward movement. Lower production results in a decrease in employment. A decrease in employment reduces available purchasing power. Reduced purchasing power will be most serious if the unemployment happens to occur to people

who have been buying goods on credit. Many people will have accumulated funds on which they can call. Of course the necessity of calling on savings is frightening and few persons will plan to spend more than their current income. If securities have to be sold in calling on savings, the security markets will be weakened. If bank balances are decreased, the bankers must sell securities or look over their loans and not renew the weakest ones. A resultant decrease in purchasing power brings a further decrease in purchases, a greater decline in production, bringing further unemployment, still less purchasing power, and so on in an endless chain.

Credit contraction acts in a *debt-deflation spiral.* The forced payment of debts necessitates market liquidation, which overbalances the markets, forcing down prices. Price declines reduce the equities on more conservative loans, and, if large credits have been extended, each successive margin of selling drives the prices involved down sufficiently to catch another margin so that liquidation proceeds almost without limit until all vulnerable debts have been liquidated. The process can best be illustrated in case of the stock market, although it applies equally well to cases where excessive inventories have been built up on the basis of credits. As stock prices drop, the thinnest margins will bring additional selling. The greater the amount of stock put up for sale the farther prices drop. The farther prices drop, the less adequate wider and wider margins of ownership become.

The *inventory-deflation spiral* is less dependent upon credit than is the *inventory-accumulation spiral,* although the deflation will be much more serious if credit deflation is involved. As prices decline and losses on inventories become larger and larger, the enterpriser is almost certain to sell his inventories before making further purchases. An additional reason for his doing so is that the lower level of activity does not necessitate as high a level of inventories for efficient operation. Whether credit deflation is involved or not, inventory depletion produces a deflationary effect on business activity. Sales are made to a considerable extent out of inventory accumulation instead of from goods purchased. Goods purchased on the market do not, therefore, produce proportionate productive activity. The purchasing power paid out from productive activity is less than the purchasing power currently used on the market to buy goods. This reinforces the *production-employment-purchasing-power spiral.*

Of most importance in the downswing is the *spiral of emotional response.* Whipped-up optimism cannot prevent the advent of other downward spirals, but it may partially delay their effect. If prosperity is thought to be "just around the corner," liquidation will be put off for as long as it is humanly possible to do so, even though great chances

must be taken. Bankruptcy may be prevented by invoking emergency legislation. Industrial expansion may be encouraged, as it was early in 1930. Even though prices were artificially high, the market indicated no need for additional capacity, and growth possibilities were too poorly understood to guide expansion into the most profitable channels. Such action does not prevent the downswing, but merely slackens the rate of decline and prolongs it.

If widespread pessimism emerges early in the downswing and accumulates rapidly, the decline is speeded up. *Hoarding*[5] may deflect a part of the current purchasing power, accentuating the *production-employment-purchasing-power spiral.* Part of the purchasing power currently paid out is not used as it normally would be to buy goods, thereby slowing down production, increasing pessimism, and leading, in turn, to further hoarding. Liquidation is taken quickly before losses become larger. Failures are expected. Expansion programs appear out of the question.

The major determinant of the rapidity of decline is the rate at which the building of durable goods falls off, although this is affected to a large extent by emotional aberration. The production of short-lived goods holds up fairly well even in the worst of depressions, inasmuch as they are quite necessary to maintain basic standards of living. Consumption can go on about as ever whether additional durable goods are currently built or not. Current output depends upon the use of the equipment already available. The amount of the purchasing power available to buy such output, however, depends partly on the rate of activity in the building of durable goods. These industries not only generate current purchasing power, but conditions in them spread to short-lived goods industries. Since expansion programs are dependent upon an optimistic outlook on the future as well as upon expanding markets, it is natural for investment activity to be curtailed rapidly in the downswing when neither of these conditions is present. Construction activity tends to hold up fairly well during the completion of programs begun while markets were still expanding. When these are completed, the basis for expansion becomes less and less clear. The drop in market demand makes the existing capacity more and more adequate. Replacements may be made quite fully even after demand for the product to be produced has dropped materially. If the decline goes far enough, replacements will be made only in a few situations where the need is fairly evident. Even the making of repairs may be discontinued if the level of activity becomes low enough.

The character of the combined processes in the downswing should

[5] In this connection, hoarding means planned economy in current expenditure on consumer goods and thus increase in planned saving.

be fairly evident. In Haberler's words "a fall in demand leads to a fall in prices, to the disappearance of the profit margin, to a reduction in production, to a decrease in the velocity of money, and so to a contraction of credit, a further drop in demand, pessimism, hoarding, etc."[6] The pervasiveness and momentum of the downswing can be understood readily enough. The question soon shifts to how and why this downswing ever ends.

5. LIMITING FORCES DURING THE DOWNSWING

Limiting responses to the reinforcement of the downswing arise much as they do in the upswing. Some of the reinforcing influences are definitely limited in their total potency, while others tend to be met with a limiting reaction after a time.

Depletion of Stocks of Manufactured Goods. Since inventories could have been accumulated only to a limited extent, the time must arrive when inventories have been so depleted that consumption must be fed entirely from current production. Sales create their own purchasing power because all of the goods sold must be produced currently, and purchasing power must be paid out for the production. Consumption might continue to decrease, but discontinued inventory depletion would level off production. This may be shown by a simple illustration (figures in billions of dollars):

Month	Consumption	Production	Decrease in Inventories
1 .	110	105	5
2.	105	105	0

If the downswing has been focused around inventory depletion, or if the other limiting forces attain momentum simultaneously, the shift from use of inventories may be sufficient to produce an upturn.

Reduction in Variable Costs. A general depletion of inventories does not occur in the case of most raw materials. Raw materials are produced on the farms at the same rate in a depression as in a prosperity, but their industrial use is greatly curtailed in a depression, and inventories become successively larger. The same indiscriminate production seems to occur in the case of many natural resources, such as oil, copper, zinc, and minerals used for fertilizer. The large inventories bring a disproportionate drop in the price of these products, which reacts on the costs in manufacturing industries. While the prices are

[6] *Prosperity and Depression* (Geneva: League of Nations, and New York: Columbia University Press, 1941) p. 107. Haberler uses this statement in connection with a description of the debt-deflation theory.

dropping rapidly, many companies will be forced to take huge inventory losses. When prices level off, as they must in the end, this source of loss disappears. Other things being equal, business will come to be conducted on a more profitable basis.

Low prices for raw materials also exert a limiting influence from another direction. Raw materials comprise part of the cost of manufactured products. Since prices of raw materials drop more than those of manufactured goods, the profit margin is widened, and the decline tends to be limited. When the low prices of raw materials level off, purchases of them may increase slightly. This steadying effect might result in slight rises in raw-material prices, which would lead to profits from inventory appreciation.

The amount of short-term interest paid is reduced in a depression because of a reduction of outstanding credit and a decline in interest rates. As far as businesses are concerned, payment for interest is proportionately small in most cases, and, therefore, this effect usually is not very great. Smaller interest payments for installment credit release a considerable body of purchasing power, although this is almost wholly due to fewer consumer loans outstanding.

Decline in wage rates has been an important factor in putting businesses back on a profitable basis in the past. Wage rates usually have been fairly well maintained early in the downswing, but as the level of activity dropped significantly, wage rates were cut. Laborers found employment more important than the level of hourly wage rates. With the present tendency to resist cuts in wage rates by legislation and social pressure, the reduction in wage rates likely will be more delayed. Ultimately cuts will probably come, however, if a depression lasts long enough because the lower prices increase the real wage rate. Laborers want employment with a reasonable return instead of an unreasonably high return on uncertain employment. If the break is long delayed, it may be unusually severe when it arrives. This decline may be so violent, as it was in 1932, that purchasing power shows a substantial decline for a time.

Reduction in Overhead Costs. After the decline has proceeded far enough to make profits disappear in a major part of industry, strenuous efforts are made to cut costs wherever possible. Office expense is one of the first costs to be examined. In the lush period of prosperity, inefficient or unnecessary employees may be retained. Cost reduction can be effected by dropping these employees. If the business decline becomes great enough, office salaries may be reduced. Under the current conditions of rigid wage rates, salaries may be cut sooner than wage rates.

Under the easy-money conditions existing in depression it is often

possible to refund bond issues at lower rates of interest. Expired leases may be renewed at more favorable rents, or rents may be reduced by bargaining with the landlord in case of long-term leases. In some cases a substantial reduction in expenses may be effected.

If the costs do not otherwise decline, business failures will reduce the capitalizations on which an interest return must be paid and hence widen the profit margin. Failure usually strikes the companies operating the less efficient equipment, and this may be entirely withdrawn from production when failures occur. Average per-unit costs are thus reduced.

Increased Efficiency. One reason for reduced costs is increased efficiency, which arises in two general ways. The less efficient laborers and the less efficient equipment are withdrawn from production. The individual workers who are retained tend to become more efficient. Alternative employment is not available, and they take their work more seriously. Managements reorganize the layout in their plants if this will achieve increases in efficiency with little outlay. The product in some cases is of higher quality than before the depression, producing an invisible decrease in price. The extent to which more efficient labor and equipment adds to product quality is largely undetermined.

Progressively More Favorable Financial Markets. Those persons who are on fixed-money incomes save more than ever before in depression. They pay less for the goods they buy, and hence there is more left over for savings. They save rather than increase their standard of living because of the fear of unemployment and because of the essential conservatism of all spending in a depression. Their accumulated funds press for investment. This helps drive up the price of high-grade bonds. As the price of such bonds goes up, a favorable financial market is created. Investors may look with a critical eye at any new bonds offered, but if the new bonds have assured financial merit, a high price will be paid for them. The company floating the bonds obtains funds at a low rate of interest, which has a very significant effect on current capital charges. At first, it may be that the favorable financial markets are used merely for refunding operations at lower rates rather than to obtain funds with which to create new capital. Such refunding operations in themselves act as an important limiting force. The resulting reduction in current capital charges widens the profit margin. At the same time, the refunding operations throw as much capital onto the market as they take from it. Such operations have no tendency to weaken the favorable market. When the point is reached where sizable quantities of capital goods are being created by means of the funds obtained from the favorable financial markets, recovery will be well under way.

Growth of a Reserve of Investment Requirements Resulting from Depreciation and Obsolescence. Depreciation proceeds apace during the depression. This results partly from the fact that the consumption of short-lived goods tends to decline relatively little, and capital goods must be used to produce them. It results also from the fact that depreciation does not depend solely upon use. In fact, some capital rusts so fast if it is not used that depreciation is accelerated. Since much of the capital is currently of no value, little care or attention is given to it. At such a time, unused freight cars are run off to the siding, left in the open weather, and virtually forgotten. Even under the best conditions, weather and time leave their mark on capital goods.

Much capital becomes obsolete as the downswing proceeds. In the period of prosperity, technical improvements were made if they seemed to be certain profit-makers, but any technical improvements which would make obsolete and worthless large quantities of the existing capital were largely avoided. With the depression, business managers may reach their wits' end and be ready to try anything which promises a profit. If they find a way to produce goods at a much lower cost, they are likely to do it if the necessary capital funds can be obtained. The use of inventions makes obsolete some of the existing capital equipment. If the invention makes a marked saving, the old equipment may even be costly to use no matter what its state of repair may be. It is profitable to replace capital equipment under such circumstances, and any marked replacement of capital equipment produces an upturn.

Financial markets become favorable as the decline continues and need for investment becomes obvious after a time. These are powerful limiting forces.

The limiting forces described in this section act oppositely to the influences reinforcing the downswing. The way in which the system becomes more responsive to expansionary influences so that an upturn results is considered in the following section.

6. THE UPTURN

The quantity of efficient resources sets a limit to the upswing, but no similarly effective force sets a limit to the downswing. It is for this reason that a business-cycle downswing may initiate a secondary depression. The range of forces which may be held responsible for a secondary depression were considered in Chapter III. These forces may delay the upturn for a time, but they do not prevent it. Actually, the greater danger in secondary depression is that recovery may

be abnormally slow after the upturn occurs. The problems of policy that the secondary trend imposes are taken up in Chapter XXII after the range of stabilization proposals has been presented. The problem at the present point is how business-cycle recovery gets under way, whether or not a secondary depression occurs.

We can perhaps best proceed by first analyzing those conditions which tend to make the system responsive to expansionary influences when low levels are reached. Stated in this general way, the limiting forces detailed in the preceding section are, of course, involved. There are also certain characteristic resistances in the system, entirely aside from responses to reinforcing influences, which appear when low levels are reached.

Maintenance of Basic Living Standards. Although there is no such thing as an "irreducible" standard of living, there are basic standards which will be maintained if at all possible. If a person finds himself unemployed, he may have to make an entire rearrangement of his habits of consumption, but many unemployed people are enabled to live much the same as ever by means of relief payments. The purchase of consumer durable goods is greatly curtailed in severe depression, but habits of consumption may be quite well maintained by using the old units a little longer. In the case of short-lived goods, production drops but a slight extent. Where prices are too well maintained, purchases may fall off markedly if a substitute can be found or if the good is not too vital an element in our habits of living. Probably it is true that our habits of life depend upon some, possibly slightly variable, minimum quantity of goods.

The relatively good maintenance of living standards is at most a potential force. Everyone would like to maintain his consumption, and it is painful to see it decrease. But we must have purchasing power and not just desire to purchase in order to maintain consumption. It seems, however, that people will go to almost any limits before they will make that entire rearrangement of habits which is entailed in a marked decline in the consumption of goods. If they have held out against the reduction of an exchange rate—such as a wage rate or a commodity price—in which they are vitally interested, a threat to their living standards may make them reconsider. If they see a reduction of living standards to be certain if the rates are not cut, they may be ready to take whatever chances are necessary in cutting them.

The limits to which the production of durable goods may go provide the most variable element. Their production is not necessary to maintain standards of living fairly well for the time being. How soon replacements will be required depends principally upon the life of the goods. The life can be stretched somewhat under depression condi-

tions, but the time will arrive when the old unit no longer can be used with any satisfaction. If the depression lasts until any important part of the durable equipment must be replaced, maintenance of living standards will mean increased production instead of minimum levels.

Population Growth during the Depression. Since the population continues to grow during a depression, an increased number of people must be provided for. Entry into the activities of adult life may be deferred for a time, but the need is greater the longer it is deferred. The first tendency is for those wishing to enter adult life to meet delay if a downswing is in progress. After the group becomes large and the delay becomes a matter of years, a pent-up need of considerable proportions is accumulated.

Like basic living standard this force is merely potential. It represents a desire for goods but does not in itself create any purchasing power for buying them. It tends to create a desirable frame of mind, however. Conditions currently possible come to be accepted regardless of the conditions obtainable in the past. These forces stimulate recovery but do not feed it.

Breakdown of Monopolistic Situations. Monopolistic situations are not eliminated in depression, but there is a clear tendency for those which get in the way of recovery to be corrected. It is possible, although unproved, that industry is becoming less competitive as a long-run tendency. If this is true, we cannot expect as competitive conditions to be attained as we encounter later depressions.

Whatever the long-run tendency may be, there is definitely a tendency for conditions to become more monopolistic as high levels are achieved in prosperity. Many prices and wage rates are fixed and, as a matter of experience, appear to be little endangered by competitive forces as long as the prosperity holds. Many customers loyally buy from one source without regard to price or quality. It becomes difficult for new firms to get a footing in many industries even if they might be able to effect important new economies. Changing conditions are met with resistance. A depression tends to break down this resistance. Buyers seek out the best possible price because they must stretch reduced incomes as far as possible. Firms are driven to seek business wherever they can. When adequate business was available, it was all right to agree not to encroach on the preserves of others, but in depression each firm tends to look for additional volume from any source so long as it helps pay out-of-pocket expenses.

Correction of Production Unbalance. Another maladjustment which low levels of activity correct is overproduction, which may have arisen either from inventory accumulation or from excessive production of durable goods in the prosperity. If production has been in

excess of consumption only because inventories have been accumulated, adjustment will come swiftly in the depression. Inventory accumulation just cannot represent many months' use and therefore is soon depleted.

Adjustment may not come so swiftly if durable goods have been produced at a rate far more rapid than their depreciation and obsolescence. In addition to the extent of overproduction, adjustment depends upon the life of the equipment concerned and the steepness of growth in the industry. If no growth is taking place, the correction of overexpansion is wholly dependent upon the wearing out of the equipment and the extent to which it becomes obsolete. If the good has a long life, this may take a considerable period; if it lasts only a few years, replacements will soon be needed. However, when growth is very steep in the industry concerned, new demands will soon require the use of all available capacity, no matter how long the equipment may last.

Many industries experiencing a relatively slight growth find adjustment of overdevelopment difficult. Capacity which appears excessive in every light in which one may examine the problem is an important deterrent to recovery. It is true, of course, that in time replacements will be required however great the overdevelopment, but this may be a matter of a great many years if the equipment has a long life.

There is no reason to believe that such overproduction will be completely corrected in every specific instance before recovery begins. Some of the equipment may be dismantled, and in this way capacity may be brought to conform more closely with demand. Some of it may be adapted to other uses. If neither of these situations occurs, recovery will not necessarily be prevented. Need for equipment exists in other industries. When it is built to a significant extent, recovery will occur in general, although a few industries of slow growth and great overdevelopment may expand little, if any, throughout the prosperity which follows.

Investment activity finds less obstruction in new industries and in industries where obsolescence has been unusually rapid. While the correction of overexpansion does not proceed smoothly or swiftly in the case of many industries, clear need for investment activity great enough to end the downswing remains. The number of new industries experiencing rapid growth is still large, and technological change is making the obsolescence very high in many cases.

Resistance develops at low levels of activity. Although the resistance acts through a wider range than that arising at peak levels, limiting forces attain great enough momentum to produce an upturn. Credit contraction is met with substantial liquidation, with the using up of

inventories, and with the shift of securities to outright ownership. The drop in production is principally dependent upon a decline in the activity in durable-goods industries, and this is met after a time with need for replacements, repairs, and the development of new industries. The upturn cannot occur until readjustment to a business basis is effected. After a time, costs are reduced more than prices of finished goods, and profit prospects are improved. The emotional response becomes more positive and initiates some activity in durable-equipment industries. Increased efficiency, or potential increases through possible improvements in production methods, lay the engineering basis for ever higher levels of production.

Less potent resistance at low than at high levels is partly made up for by the tendency of the downswing to be rapid. Rapid credit contraction, rapid inventory depletion, rapid drops in prices, or the hoarding of a disproportionate share of income is likely to shift to a slower movement before a long time elapses. Any such shift tends to increase the purchasing power used on the market. For instance, when less is used to pay off debts, purchasing power is released. The other situations are similar. If the shift in direction results from these factors, activity may rise from low levels as rapidly as it approached them.

An upturn obviously is closely related to an increased use of purchasing power on the market. The upturn may arise in many different ways. When the downswing is rapid, an upturn can be expected before a great many months have passed. Limiting reaction to reinforcing influences develops a positive braking effect. Necessary adjustments cannot fail to be made in a period of rapid contraction.

The reinforcing forces of the downswing may be more intractable if the decline was slow and hesitant. In such cases, the limiting reactions to reinforcing forces arise more slowly and may be less effective. In time, however, ownership and exchange rates will be readjusted if people have the will to maintain their basic living standards. Such readjustments, involving violent realignments in the most stubborn cases, will put business on a potentially profitable basis. The problem is closely related to that of the secondary trend.

7. FACTORS DETERMINING PERIODICITY

As will be demonstrated in the history chapters, the business cycle has averaged about 3 1/2 years in length. Statistical verification of this fact is measurably weakened because a considerable dispersion is found to exist about the average length. Statistical consistency is nevertheless great enough to establish the factual presence of the oscillation beyond all doubt.

Statistical verification and logical explanation are different matters, however. The problem at this point is whether or not the business

cycle shows any consistent tendency whatever as to length. If it did not, the explanation provided here would lose much of its significance. If a variation which is as likely to be 50 years as 4 years in length were held to occur, the variation would be so great as to leave room for much ambiguity. If the variation were not increased, but the length were shifted to 50 years *instead* of 4 years, the business cycle would take on a very different meaning. Is there any basis for an oscillation of somewhere near 4 years in length?

It is advisable to avoid any question of periodicity. There is no indication that the business cycle is, or tends to be, periodic. The question is not: Why will the business cycle average 3 1/2 years in length. Further, it is unrelated to any tendency for an extra long cycle to be followed by an extra short cycle, or vice versa. The question is: Why is 3 or 4 years a *predominant* length.

Analysis of the way business-cycle forces tend to produce an oscillation of 3 or 4 years is necessarily somewhat more conjectural than an analysis of the general way these forces operate. The time required for various reactions to set in is difficult to establish with the present state of our knowledge. The fact of the matter is that such reaction times will vary somewhat with the circumstances. For instance, it may take much longer for inventory accumulation to reach a critical position when hand-to-mouth buying policies do not predominate.

Nonetheless, there are unquestionably definite limits to the length of period the inventory-accumulation spiral can operate. In time, either the limits of storage space or standards as to the amount of working capital which should be so tied up will act as a deterrent if any cyclical accumulation occurs. This point may be approached more quickly if prices rise very rapidly, but it is not likely that very many years would be involved in any case. Inventory accumulation is not likely to be the major determinant of the length of the upswing in most business cycles, however. If prosperity reaches a stage of wide-scale investment activity, the leveling off of inventory accumulation may not produce a downturn. The ending of the inventory-deflation spiral is more determinate than the ending of an inventory-accumulation spiral. Inventories will probably be depleted very rapidly under the conditions of a downswing. Prices are declining, pessimism is growing, and the cost of carrying inventories is always rather high. Inventory depletion is likely to induce an abrupt emergence of a limiting force.

In contrast to the influence of inventory variation, capital building tends to set more definite limits on the upswing than on the downswing. After a period of rapid expansion, it may be brought to an abrupt halt by the ending of the period of gestation, by decreased indications for derived demand when a leveling off occurs in market

demand, and by sudden realization that overexpansion has taken place in certain lines. It probably is true that the capital-building spiral will generally require a fairly uniform length of time to work itself out. The great momentum developed by this spiral becomes so important in most upswings that it may well determine the length. It is well known that some period of time is required to plan an expansion after its execution has been definitely decided upon. It is further known that most expansion programs take time—that a considerable period of time is required to complete an expansion program once it is begun. On the other hand, capital contraction has no definite limits. Once capital contraction gets under way, so great a decline occurs in consumer demand that available capacity is more than adequate. Of course the life of the capital sets some limit, but it is very indefinite since the average estimate of its useful life is increased as the depression continues.

If inventories represent the major variation, both the upswing and downswing would appear to fall within limits which make the four-year predominant cycle length appear plausible. If capital building is the major variation, the length of the upswing would appear to fall within such limits, but the length of the downswing might not be so narrowly restricted. In such a case, a secondary depression would seem to be a reasonable possibility. These conclusions certainly are very rough. The only precise conclusion available is that the evidence points to the reasonable possibility of the predominant length which is found in practice.

As explained in the theory chapters which follow, some analysts have attributed the length of the business cycle to an originating cause. The common impression has been that an originating cause must have a recurrence equal to the cycle length to be eligible. This is untrue. The originating cause might create a constant force such as occurs in connection with the phases of the moon. If the self-generating oscillation is taken as given, external factors might occur often enough to end both the upswing and the downswing. For the present, however, analysis of the forces operating in the self-generating oscillation appear to be more promising in explaining the predominant length.

8. SHORT-PERIOD VARIATION

Upward or downward momentum set the general direction of movement but do not carry it forward at a steady rate. Even the belief that such a steady movement is going to occur would likely defeat it. Enterprising individuals would tend to anticipate further increases, and drive activity up rapidly for a time, only to induce a reaction from such excessively rapid improvement. Overreaching would upset the steady rate.

Although a steady rate of increase or decrease is not actually anticipated under realistic conditions, temporary overreaching and its emotional response is representative. Through inventory accumulation, this situation could arise in the *production-employment-purchasing-power spiral.* In other words, inventory accumulation may go by spurts. The principal reason would be price vacillation. We have ample evidence that prices do vacillate. The tendency for stock prices to react recurrently in a general upward movement and to rally recurrently in a general downward movement, is well understood.[7] A similar movement appears to occur in the prices of all speculative commodities. Price rises induce speculators to bid prices up to the point where they can go no higher for the time being, and then speculators sell to take their profits. If business is improving, it will soon become clear that prices can be expected to go no lower for the time being, and buying drives prices up. A similar vacillation occurs in the downward movement. Prices go down until it becomes clear that they will drop no farther for the time being, and then both an exhaustion of the selling pressure and some speculative buying drive prices up temporarily.

Vacillation in prices has a much wider influence than that resulting from a variation in inventory accumulation. Price rises induce optimism and encourage the initiation of expansion programs. Higher prices make available increased purchasing power and induce people to dishoard. As the movement reverses itself, a major portion of the people become somewhat more cautious. The market is the deciding factor in our economy.

Seasonal factors produce a movement which cannot be completely isolated, as was pointed out in Chapter II. A seasonal effect is therefore imposed on business-cycle measurements. This difficulty arises because the seasonal eliminated is the average seasonal, while the specific seasonal occurring at any time is above or below the average. For total industry the problem is even more difficult. There is no homogeneous seasonal pattern in total industry such as that which occurs in many individual industries. When total industry is considered, seasonal variation is the resultant of the combination of many seasonal patterns, some of which are positively correlated and some of which are negatively correlated. It is easy to see that the sum is necessarily a varying pattern which produces a certain degree of variation in the cyclical movement.[8]

A third important factor responsible for the undulating appearance

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[7] For an analysis of rallies and reactions in the stock market, see Chapter XIX.

[8] Jan Wisniewski places a great deal of dependence on the relationship between the seasonal and cyclical movements. See "Interdependence of Cyclical and Seasonal Variation," *Econometrica,* II (April, 1934), 176–81.

of the business-cycle movement is the occurrence of minor originating causes. A law may be passed which produces a short period of uncertainty, but after the first shock the momentum of the upward movement may greatly outweigh its influence. The threat of war may upset the markets, but the effect may be slight after the first shock has spent itself. A fad, such as miniature golf, may give business activity a slight whirl for a brief interval. If the relative importance of such an originating cause is not great enough to reverse the general cyclical movement, it will at least tend to introduce a slight variation. The variation will be in particular evidence if the originating cause acts oppositely to the general direction of movement.

The business cycle is just not a smooth movement. Minor variations occur almost constantly. These are best thought of as a part of the business-cycle movement when total industry is under consideration. Statistically, they are inseparable for total industry, and the forces which create them are of major importance in the complex of forces which produce the business cycle.

9. SUMMARY

The forces responsible for the business cycle fall into two groups: (1) originating causes arising from without the business system, and (2) self-generating, oscillatory forces operating within the system. A satisfactory explanation of the business cycle must provide a pattern showing the working of the forces which can be grouped in these two classes.

The model provided is expansible enough to fit any business cycle which may arise. It is conceived that any one of an indefinite number of originating causes may arise at any time and exert an influence on the business-cycle movement. Originating causes vary greatly in their inherent potency. The less powerful ones arise many times within any one business cycle; the more powerful ones may be expected at any time but in practice arise much less frequently. These forces provide never-ending disturbance so that the self-generating oscillation is always furnished with outside stimulation.

The self-generating oscillation traces the cumulation, spreading, and negative reactions resulting from the way a change affects processes within the business system. Reinforcing forces operate to continue a movement which is under way. Negative reactions limit the movement. At high and low levels the system becomes quite responsive to negative stimulation. The direction of movement is more certain to become vulnerable at high than at low levels. Secondary depression results when the system fails to become responsive at low levels.

Limiting forces increase toward the end of the upswing and downswing, and therefore the system becomes more responsive to a change in direction. The occurrence of an originating cause whose influence is in opposition to the general direction of movement has much greater critical significance at such a time than it would at a point nearer the middle of the movement. The proximate cause of the upturn or the downturn may thus be an originating cause, although so great a relative influence at the middle of the movement is quite unlikely. Thus, chance enters, not only in connection with the number and inherent potency of originating causes, but also in connection with their timing in the cycle.

Emotional response within the forces creating the self-generating oscillation may obey psychological laws; but if it does, these laws are as yet too obscure to be of any value for the purpose of explanation. The emotional response must, therefore, be accepted as a chance result for the present. Most of the other self-generating forces can be seen to be subject to a reasonable degree of regularity in their action. However, a statement of relationships would be extremely complicated. It scarcely appears to be feasible to attempt any such complicated formulation until the general characteristics of these forces is better understood.[9]

Every business cycle, as will be developed in the history chapters, has been unique in that the combination of forces is never the same. About the same set of forces occurs every time, with the exception that there is a great variation in the type of originating causes which arise. This fact, taken in connection with the probability that there is a steady shift in certain characteristics of the cycle over time, recommends the general scheme of explanation used here instead of a more rigid theory. The chance characteristics, noted in the immediately preceding paragraphs, are of fundamental importance in making each cycle unique.

No great gain is possible in attempting to classify business cycles in any detail in the present state of our knowledge. Differences according to two general types of upswing should be noted, however. Most upswings have centered around capital-building activity. In a few cases where rapid price increases have been the major factor of momentum, the central process has been inventory accumulation.

When the upswing centers around capital-building activity, the business-cycle process is closely related to the attainment of progress. Increases in capital equipment increase capacity. If new methods and new processes are involved, dynamic factors are introduced which

[9] See references in Chapter VIII to the work of Tinbergen and others who have made attempts to solve this problem.

make change necessary. Changes, or at least their market effects, are resisted as long as satisfactory results can be maintained. The increasing pressure of change helps to break the prosperity, and the needed adaptation is made in depression when the existing condition is unsatisfactory.

The analysis of the forces responsible for the business cycle presented in this and the preceding chapter must be viewed as a scaffolding. All of the succeeding chapters may be thought of as filling in the details. The theory chapters which follow examine the position of various processes in more detail. The history chapters fill in the known facts about past cycles. The barometer chapters fill in many detailed facts regarding the operation of the processes with which it did not seem wise to burden the general description. The relation of the forecasting chapters is evident. The chapters on stabilization proposals analyze what we can do about it.

REVIEW QUESTIONS

1. Distinguish between cyclical and periodic movements.
2. Outline the ways in which war drives business activity away from balanced levels: (*a*) during war prosperity; (*b*) in the postwar period.
3. What would be the effect on balanced levels of production in the United States if a very large acreage of cotton should be raised in South America within a few years?
4. What will an excessively large potato crop do to (*a*) the purchasing power of potato growers, (*b*) the purchasing power of laborers in cities?
5. Are new inventions which will make obsolete a great deal of present capacity more likely to be installed in prosperity or in depression?
6. Explain the general way in which business cycles take place.
7. In this problem, in order to illustrate the question in hand, the following assumptions are made. There is a war in India. Elephants only are used for dragging guns in war. The average productive life of an elephant should be figured at 50 years. One elephant can drag one gun 1,000 miles in 2 years. All elephants are fully employed at the start and well distributed through the various ages. Find the indicated derived demand for elephants for the following years.

Years	Miles Guns Must Be Dragged	Indicated Demand
1–2	1,000,000	
3–4	1,000,000	
5–6	1,200,000	
7–8	1,200,000	

8. In producing product X the following assumptions are made. Manufacturing plants have a life of 20 years. Each plant makes 1,000,000 units of product a year. All plants are fully employed at the start, and the average age of plants is 10 years. Find the indicated derived demand for building plants to produce product X.

Year	Retail Takings of Product X (In Billions of Units)	Indicated Demand
1	200	
2	220	
3	230	
4	210	
5	240	
6	250	

9. Work problem 8 assuming plants have a life of (*a*) 30 years, (*b*) 10 years, (*c*) 5 years.
10. Assume that a plant costing $1,000,000 is to be built in a depression, at a bond interest cost of 5 per cent, or that the same plant is to be produced in prosperity with *all* costs increased by 20 per cent. What would be the proportionate increase in the amount of yearly bond-interest payments required?
11. Assume that, as business conditions decline, a merchant decides to carry his inventory of sugar because he can sell it for only $1,000, and because it can be carried for one year at an interest rate of 1 per cent. If, at the end of the year, sugar prices have so declined that the inventory is worth only $800, what "real" interest rate has the merchant paid?
12. If the production of capital goods were equally distributed over the cycle, could the period of gestation in their production produce ill effects?
13. Durable goods typically represent a larger proportion of total output in prosperity than in depression. Is this consistent with the principle of macroeconomics?
14. Would the principle of innovation operate without the existence of originating-cause factors?
15. Compare the characteristic recurrent peaks of replacement of durable goods with those occurring in the seventeen-year cicada or locust cycle.
16. Differentiate between the credit multiplier and the investment multiplier in terms of (*a*) installment credit, (*b*) government spending, (*c*) inventory accumulation, and (*d*) capital building.
17. Draw a rough chart showing the movement of efficiency compared to business activity over a business cycle which grows into secondary depression. Label the changes taking place in each of the factors responsible for changes in efficiency at each of the turning points in the curve.
18. Compare the limiting forces in the upswing with the limiting forces in the downswing. Are these forces opposites in every case?
19. Without the intervention of originating causes, will self-generating forces ultimately produce recovery?
20. Many students distinguish between *ex ante*, that which is expected, and *ex post*, that which has happened, in their effects on the decisions of enterprisers. (*a*) Classify the reinforcing forces during the downswing according to these two types. (*b*) Classify the reinforcing forces during the upswing.
21. What happens to the investment multiplier when the propensity to consume equals unity?
22. What is the relation between the correction of monopolistic maladjustments and the correction of overproduction in depression?

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CHAPTER VII

CLASSIFICATION OF BUSINESS-CYCLE THEORIES

THE outstanding classifications of business-cycle theories have been presented by W. C. Mitchell,[1] A. H. Hansen,[2] G. Haberler,[3] W. M. Persons,[4] and W. G. Fritz.[5] All of these classifications had as their purpose discovery of the truth in each theory and discovery of the extent of agreement among them. Mitchell, Persons, and Fritz conduct the investigation by differentiating between processes according to whether they originate in natural or physical conditions, in human nature, or in various economic institutions. Both Hansen and Haberler give little attention to natural or physical processes as an independent cause of the business cycle. Their classifications are principally limited to human factors and institutional conditions.[6] Haberler "tentatively assumes that, for the explanation of the fairly regular swings of the economic system (just as for those of the rocking chair), it is more important to study the peculiar structure of the system and its responses to outside shocks rather than to look for regularities in the occurrence of these shocks."

Hansen and Haberler fit theories principally into classifications

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[1] *Business Cycles: The Problem and Its Setting* (New York: National Bureau of Economic Research, 1927), chap. i, especially pp. 49–53.

[2] *Business-Cycle Theory* (Boston: Ginn & Co., 1927), especially pp. 10, 191–96.

[3] *Prosperity and Depression* (Geneva: League of Nations and New York: Columbia University Press, 1941).

[4] *Forecasting Business Cycles* (New York: John Wiley & Sons, 1931), pp. 210–42. This part is reprinted from the *Quarterly Journal of Economics*, November, 1926, pp. 94–128.

[5] *Contributions to Business-Cycle Theory* (Ann Arbor: Edwards Bros., 1934), especially p. 10. Friedrich A. Hayek's classification presented in *Monetary Theory and the Trade Cycle* (New York: Harcourt, Brace & Co., 1932) is often mentioned, but he has so forced theories into monetary and nonmonetary classifications to fit the development of his own theory that it has little general value. Malcolm P. McNair's general presentation in *Business and Modern Society* (Cambridge, Mass.: Harvard University Press, 1938), pp. 191–233 is worth mentioning. See also A. L. Macfie, *Theories of the Trade Cycle* (New York: Macmillan Co., 1934).

[6] Hansen holds that he has omitted this classification only because he has not found it useful to his purpose. He holds that "only in so far as the impact of . . . fluctuations in nature's generosity is brought to bear upon the complex mechanism of the modern capitalistic order with its exchange and money institutions do they generate or modify, as the case may be, industrial or business fluctuations." Hansen's principal purpose was to compare major theories with those of Foster and Catchings. See *Business Cycle Theory* (Boston: Ginn & Co., 1927), pp. 10–11.

centering on money and credit and investment activity. Hansen's three major categories are capitalistic economy schools, exchange economy schools, and money economy schools. Haberler's attempt is to move from the simplest to the complex in order to "gather together various hypotheses of explanation, to test their logical consistency and their compatibility with one another and with accepted economic principles," as a first step in providing a comprehensive explanation. He starts with purely monetary theory and from there moves to over-investment theories, which receive major attention. More briefly, changes in cost, horizontal maladjustment, overindebtedness, under-consumption, and psychological theories are then taken up in order.

In contrast, Mitchell and Persons classify their theories into three major groups: physical processes, emotional processes, and institutional processes.[7] Both give major attention to institutional processes. Mitchell's development is most concerned with lack of equilibrium arising from the inequality between various processes: disbursing, spending, and producing; producing and consuming; consuming, saving, and investing. Instead of beginning with purely monetary theory, in accordance with Haberler's scheme, Mitchell ends his classification with this theory. He is also more concerned with the processes which stand out in the theories than in a classification of writers. In this respect he analyzes ten processes: (1) weather; (2) uncertainty; (3) emotional factor; (4) innovations, promotions, and progress; (5) saving and investing; (6) construction work; (7) generalized overproduction; (8) banking operations; (9) production and flow of money payments; and (10) role played by profit making.

Business-cycle theories reflect the economic conditions prevailing at the time of formulation. At any particular time most theories will consider relatively the same factors, while at another time the factors treated may differ substantially.

Few present-day writers would adopt an extreme position with respect to any particular process as the primary causation of the business cycle. The business-cycle process is a working mechanism with various processes involved. Emphasis is given to certain stands principally as a basis for control or as a method of showing the implausibility of control schemes believed to be unsound. The most extreme positions on the part of any writer should therefore be viewed with considerable skepticism. Many of the stands have been taken to emphasize aspects of business-cycle analysis which the theorist believes to have been neglected. An understanding of the various possible positions gives us a more catholic view.

[7] The statement of Persons' classification is a division according to emphasis on factors other than economic institutions or emphasis on economic institutions, but the first group includes Mitchell's first two classes.

Some theories provide a much clearer basis for action than others. A basis for action can be more clearly perceived the more nearly a theory is *definitive*. A definitive theory may be defined as one which states the responsible processes and the precise part played by each, both in general and under restricted conditions. A satisfactory definitive theory would make possible accurate forecasting.

In the following classification, division is made between exogenous theories, or those based on one or more originating causes, and endogenous theories, or those based on the self-generating cyclical processes. An outline is presented at this point for purposes of easy reference.[8]

I. Exogenous theories
   1. Weather
   2. Sunspot
   3. War
   4. Innovation
   5. Population
   6. Episodic

II. Endogenous theories
   1. Profit motive
   2. Overcapitalization of profits
   3. Psychological
   4. Monetary and credit
   5. Monetary overinvestment
   6. Nonmonetary overinvestment
   7. Underconsumption

1. EXOGENOUS THEORIES

Proponents of exogenous theories more or less fully recognize that the time-consuming upward and downward movements carry forward because of interdependence existent in the business system, just as proponents of endogenous theories know that the variation is subject to outside shocks. But when emphasis is placed on the one set of influences, the other is considered to be of secondary importance. It is easily seen that exogenous and endogenous theories never meet on common ground.

Weather Theories. W. S. Jevons was a famous economist in the 1870's. One of several reasons for his fame was his theory of business cycles. He traced the business cycle to the effect of the weather cycle in agricultural production. H. L. Moore adopted a similar theory at about the time of World War I and worked out the logic of the case in some detail, as well as carried forward a detailed statistical analysis of the relationship between weather and business cycles by use of periodogram analysis. Moore's argument is that the variation in yield is

[8] Footnote references are not given in the following presentation if the reference can be found readily in the list of selected references at the end of the chapter.

the principal factor in the total amount of the harvest since the acreage planted changes little from year to year. It therefore follows, he believes, that the variation is principally the result of weather conditions. Since the demand for agricultural crops is inelastic, variation in the supply produces large variations in the price. Agricultural crops provide the food for workers in factories and the raw material for many industrial concerns. When their prices are low, real wages tend to increase because less has to be paid for food, and profit prospects are improved because the cost of materials is reduced. The idea is that large agricultural crops create prosperity, and small crops result in depression.

Some such effect as Moore describes is unquestionably a factor, but its influence has become successively less since our dependence on agriculture is rapidly decreasing. It is to be doubted if the influence ever was as great as his theory implies. Moore's work was to some extent mathematically unsound.[9] Furthermore, it was necessary to study weather variation principally in terms of rainfall data within restricted areas, while rainfall is only one element of variation in the weather, and data taken from other areas show different results. Most important, however, is the fact that the causal forces between agriculture and industry work from both directions. If the large crops result in a lower total farm income than that resulting from small crops, or if the larger income is not enough to make up for the additional expense of handling a larger quantity, the manufacturer finds his farm market restricted. This influence has become successively more important since the farmer has become less and less self-sufficient. L. H. Bean has shown that statistically there are good reasons for believing that the principal cause of variation in farm prices is the variation in business conditions, not the variation in the weather.[10] It is just as plausible to believe that agricultural prices vary because of shifts in industrial demand as to believe that industrial demand shifts because of variation in agricultural prices. It is, of course, true that a variation in supply resulting from weather conditions will affect the price, but it will not necessarily greatly influence the condition of the farmer. The elasticity of demand for agricultural crops is not far from unity,[11] which means that the farmer gets somewhere near the same total income whether the crop is large or small, in so far as weather variation is concerned. This fact has led Hansen to the conclusion that agriculture is the "football of business."

[9] See Mark H. Ingraham, "On Professor Moore's Mathematical Analysis of the Business Cycle," *Journal of the American Statistical Association*," XVIII, 759 65.

[10] L. H. Bean, "The Agricultural Situation and Its Effect on Business in 1931," *Journal of the American Statistical Association*, XXVI (March, 1931), Supplement, 235-43.

[11] See G. F. Warren and F. A. Pearson, "Interrelationships of Supply and Price," *Cornell University Agricultural Experiment Station Bulletin No. 466* (March, 1938).

Ellsworth Huntington has traced the business cycle to weather variation through the channels of emotional response. His position is essentially that the business cycle is directly due to mental attitudes caused by changes in health, which in turn result from weather conditions. Adequate evidence to support this chain of reasoning is difficult to obtain since both mental attitudes and health are difficult to measure. In connection with psychological theories, almost insuperable difficulties must be overcome in order to trace all of the major processes to mental attitudes.

Those who believe that the business cycle arises because of seasonal variations accept weather variation as partially responsible, but not necessarily as entirely so, because seasonal variation results from custom as well as from weather variation. J. Wisniewski presents evidence to show that the disturbance set up by seasonal variation influences the cyclical movement. Fritz Machlup suggests that the variable demand for short-term credit throughout the year produces a source of inflation which is unavoidable since no precise calculation can be made of seasonal credit requirements. The intricate relations between the seasonal movements and the cycle have not been adequately traced, but it is hardly likely that the cycle is to any important extent the cumulative effect of seasonal movements.

Sunspot Theories. Aside from the bizarre theories promulgated by proponents of astrology, there are important theories tracing the cycle to conditions in our planetary system. H. L. Moore suggested the hypothesis that the conjunction of the earth with Venus might be ultimately responsible for the cycle since the conjunction takes place every 8 years, in conformity with the predominant cycle length he found by periodogram analysis. Actually, there is no good evidence that the predominant length is 8 years, as Moore's methods led him to believe.

Theories tracing the relationship to sunspots are much more deserving of our attention at the present time. W. S. Jevons explained the weather cycle by this theory. When he wrote, the discovery of the sunspot cycle with a period of 10.45 years was sensational. A quick computation showed that the five crises from 1815 to 1857 averaged 10.5 years apart. An extension of the period tended to corroborate this conclusion. His sunspot theory was born. In spite of later evidence which raised serious doubts concerning the validity of some of his early data, Jevons appealed to his initial evidence in a fashion which is not typical of his work in general.[12] Later, it was found that the length of the sunspot cycle is something over 11 years. Jevons' son,

[12] Jevons' almost unbelievable attitude in this respect is well described by F. R. Macaulay in *Bond Yields, Interest Rates, and Stock Prices in the United States since 1856* (New York: National Bureau of Economic Research, 1938), pp. 212–15.

H. S. Jevons, adapted his father's sunspot theory to fit the new facts. He held that business cycles may be either 7 or 10.5 years in length. It was his impression that meteorologists had demonstrated a 3.5 year period in solar radiation and barometric pressures. Agricultural data seemed to him to show the same length period. Whatever the sunspot cycle, he felt he had traced the business cycle to solar variation by the same general route as that used by his father.

Until recent years these solar theories were nearly forgotten except as an illustration of the whimsical and fantastical. In 1934, Carlos Garcia-Mata and Felix I. Shaffner published the results of a careful and impartial investigation into the relation between solar activity and business cycles. They found a startlingly high relationship between the *first differences* of the total area of "bright spots," or an inclusive measure of sunspots, and industrial production for the period 1875 to 1930. Exceptions to this high relationship were found only during the depressions of 1903 to 1904 and 1913 to 1914. In both of these cases an enormous quantity of volcanic dust was blown into the upper atmosphere by major volcanic eruptions, in the first by Mount Pelée in 1902 to 1903, and in the second by Mount Katmai in 1912 to 1913. Furthermore, the relationship has remained close in most of the period since 1930. Sunspot numbers dropped rapidly from 1929 to 1931, rose rapidly from 1934 to 1936, began a long decline in 1937, and began to rise rapidly again in 1945.[13] Complete failure of correspondence between sunspot differences and business conditions occurred only for the World War II period from 1939 to 1945.

Startling as this evidence is, the fact that it is wholly statistical and therefore empirical should not be overlooked. Two characteristics of the statistical evidence somewhat reduce its significance. The figures used are yearly, and marked variations in the business-cycle picture take place within the period of a year. The fact that first differences were used makes the relationship found subject to a technical interpretation which is not nearly so simple as if the correlation had been more direct.[14]

Before much faith can be put in a statistical relationship, a logical explanation is necessary. Garcia-Mata and Shaffner show quite conclusively that exhaustive and impartial analysis of the data will not support the old theory that the connection arises through weather and crops, because the relationship between sunspots or business activity and agricultural production is very low. They suggest two possible hypotheses which are both of a biological character reminiscent of

[13] See H. T. Stetson, "Sunspots and Business Activity," *Dun's Review*, October, 1946; E. R. Dewey and E. F. Dakin, *Cycles* (New York: Henry Holt & Co., 1947).

[14] For a discussion of first difference and level series, see Chapter IV, pp. 90–92.

Huntington. First, there is a cycle in the magnetic activity of the earth similar in length to that of solar phenomena. The apparent fact that nerve energy is electrical in nature suggests that a direct biological effect may result from the variation in the magnetic activity of the earth. Second (and this hypothesis has been given more publicity), the bright areas on the sun are directly related to the amount of ultraviolet rays reaching us. The fact that ultraviolet rays have a direct effect on the human organism naturally leads to the suggestion that the judicious use of ultraviolet ray lamps could stabilize business![15]

All in all, the evidence is not such that we can rate the theory very highly until more convincing logical evidence is available. If one is inclined to believe that depressions are the visitation of the wrath of God as a result of the sinfulness of man during prosperity, as some do, he would find a sunspot theory an appropriate mechanism of explanation.

War. No general theory of business cycles in terms of war merits our consideration. One hears many observations that wars lie at the root of the trouble, but detailed explanations are only partially coherent. A more thoughtful observation is often heard to the effect that World War I lay at the basis of the depressed conditions of the thirties. This observation is based partly on logical deduction from the knowledge that war finance is usually unsound, that war demands are largely extraeconomic, and that these situations leave much unbalance. It is based partly on statistical evidence which shows that major depressions tend to follow major wars.

Leonard Ayres analyzed the statistical information on this subject. Using such data as were available for the United States in the nineteenth and twentieth centuries, he concluded that a relatively uniform series of cyclical movements typically follows a war.[16] The sequence is described as (1) commodity price inflation, (2) farm prosperity and speculation in farm land, (3) price deflation and a short primary postwar depression, (4) a period of city prosperity and widespread speculation, and (5) secondary price deflation and a long secondary postwar depression. The sequence is logically plausible, but it rests principally on three wars—War of 1812, the Civil War, and World War I. This is scarcely an adequate record on which to place a great deal of faith, unless the logic can be made convincing and compelling rather than merely plausible.

[15] In all fairness, it should be stated explicitly that the writer has not seen this suggestion made, but it follows naturally from the hypothesis.

[16] It should be noted that Ayres fully recognized that his result is empirical. He says: "It is an interesting fact, rather than an important one in economics, that in this country each one of our major wars has been followed by a major business depression ten years later." See *The Economics of Recovery* (New York: Macmillan Co., 1933), pp. 16 ff.

Innovation Theories. Theories of innovation, invention, and discovery are particularly well represented by Schumpeter's theory. The basic idea is that the business cycle is a necessary concomitant of progressive development. This idea appears to be essentially correct. If economic arrangements were completely static, that is, if there were a constant supply of capital and labor, no technological or organizational changes, and no variation in demand schedules, then adjustment to influences that upset equilibrium would be prompt. Without these limitations, however, adaptation to change is uncertain and ready restoration of equilibrium unlikely. Under actual conditions, waves of innovation, or progress, can promote cyclical fluctuations.

Schumpeter holds that the innovators are copied and the general atmosphere of prosperity brings development, the new arrangements being absorbed during the adjustment occurring in depression. The theory calls on the self-generating mechanism but places major emphasis on innovation as a causal factor. Only recovery to balanced levels is held to be possible without innovation. Beyond the balanced level it is held that the upward movement must feed on progressive achievement.

This conclusion appears to be of fundamental importance. There are many processes which are a sufficient cause of the cycle in the sense that if they could be eliminated the business cycle would not occur—notably the division of labor, the credit and price system, the capitalistic system—but progress is the only such exogenous factor. The forces within the business system which are sufficient single causes are an integral part of it, and their complete elimination would cause drastic changes in our way of life. Such a cure is like amputating to be rid of an infection. On the other hand, the turning of our backs on progress is stabilization with a vengeance and perhaps at too great a price.

Whatever particular technique is used in giving cognizance to progress, its relationship to the business cycle should not be overlooked. In times such as we are now experiencing, we are not well advised to take progress for granted. Any theory worthy of serious recognition as being relatively complete and satisfactory should give progress explicit recognition whatever the method of incorporation may be.

Population Theories. August Lösch has promulgated a population theory of the business cycle which he has tested statistically on German population figures. He traces the beginning of the variation in population growth to wars. During the war there is a decline in the birth rate and an abnormal increase in the death rate because of the number of men who are kept in the armed services and because of the number killed. After the war, the birth rate increases. Lösch believes that the statistical data demonstrate that these variations repeat

themselves for an indefinite time, but that the degree of variation lessens as it gets farther away from the original war influence. Outlays for capital equipment and durable goods of all sorts, the production of which is the essential characteristic of the business cycle, are held to be closely related to changes in the population.

The slowing down of population growth in the years preceding and during the Great Depression led to theories which have attributed a shortage of investment to this factor. A substantial part of the housing demand, for instance, has been attributed to *increases* in population. Schiff has provided evidence, however, that the demand for housing may be greater with small than with large families, a decrease in the size of which is an important factor in the slackening of population growth.[17]

The rapid increase in the birth rate during and especially immediately after the recent war makes Lösch's theory appear as worthy of some consideration at the present time. This rapid shift in the birth rate has made it necessary to revise upward projected population trends just as they were revised downward during the Great Depression.

Episodic Theories. Separate business cycles are sometimes thought of as unique and completely unlike those which precede or follow. In its most extreme form this doctrine is unacceptable because of the known similarity of cyclical movements. If this fact is kept in mind, we can say with Mitchell, "like all historical phenomena, each cycle is, strictly speaking, a unique phase of human experience." More mistakes are probably made by doctrinaire appeal to typical cyclical sequences than by recognition of changes in conditions. Many of the characteristics of the business cycle change with time. The most significant changes are those which take place slowly over a long period. Successive cycles may appear to be entirely different because the conception of the business cycle maintained is not elastic enough to comprehend the various forms which the oscillation may take.

While strikingly different originating causes often are present in different cycles, similarity of originating causes appears to be more characteristic than differences, as will be detailed in the history chapters. It is impossible to explain business cycles solely by a separate originating cause in each case, or by a separate set of originating

[17] Eric Schiff, "Family Size and Residential Construction," *American Economic Review*, XXXVI (March, 1946), 97–112. One of the best statements of the thesis on stagnating effect of population growth is Hansen's essay reprinted in *Readings in Business-Cycle Theory* (Philadelphia: Blakiston Co., 1944), pp. 366–84, and good criticisms are found in M. V. Jones, *Secular Trends and Idle Resources* (Chicago: University of Chicago Press, 1944), and George Terborgh, *The Bogey of Economic Maturity* (Chicago: Machinery and Allied Products Institute, 1945).

causes. The facts offered a greater temptation to do so in the late thirties than in any other recent period of history. Because of the disorganization of the period and the predominance of governmental influence, there were times when the characteristic cyclical responses seemed weak by comparison.

A more subtle, and intellectually more acceptable, theory on episodic lines is one which attributes the cyclical movement wholly to the chance occurrence of many exogenous factors. The most notable work of this character is that done by Eugen Slutsky. He shows the similarity of the cumulation of a chance curve to the curve traced by English business cycles from 1855 to 1877. This type of demonstration would appear to indicate that the business cycle may result from the operation of chance factors. Originating causes are, of course, largely chance results. The cumulative character of endogenous forces is not chance. But Slutsky, like others who have worked in this field, may obtain an approach to the true situation when he performs successive summing of the chance curves, which may connect the separate items much as the cumulative cyclical processes do. Cumulation is invariably used before chance curves are compared to business-cycle movements.[18]

Ragnar Frisch has given emphasis to erratic shocks as a source of energy in maintaining oscillations, as well as the cumulative nature of the self-generating cyclical processes. Shocks intermittently produced by exogenous factors keep the variation from being lost in the processes of self-adjustment of the system. This concept is precisely parallel to the development presented in Chapters V and VI. The general nature of the problem was well described by Holbrook Working in commenting on the frequency distributions obtained by W. C. Mitchell in relation to the business cycle:

> The form of several of the distributions (of length and amplitude) is precisely what one should expect if business cycles result in considerable measure from a cumulation of the influences of mutually independent chance factors. We have too much evidence of the interaction of economic forces in business cycles to accept such a theory as a complete explanation, but there may be more truth than is now generally admitted in the "episodic" theory of business cycles, as thus revised.[19]

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[18] Schumpeter's comment is interesting: "Any series undulating with sufficient regularity will be amenable to approximate reproduction from any random series, provided the period be suitably chosen. Let us assume, for argument's sake, that all our series moved in regular sines. Then the proof that these sines may be produced by cumulation of random causes, however interesting in itself, is not only no proof, but even no reason to suspect, that they are so produced. Else all sinelike processes would have to be." *Business Cycles* (New York: McGraw-Hill Book Co., 1939), pp. 180–81.

[19] Holbrook Working, "Review of W. C. Mitchell's Business Cycles," *Journal of the American Statistical Association*, XXIII, 89–94.

The statistical demonstration of the fact that cumulated random causes will trace a pattern similar to that obtained by various business cycles is of great value. An empirical verification of the general proposition that the business cycle results from an interaction of originating causes and a self-generating cyclical mechanism is thus provided. In this form, episodic theory establishes the general mechanism but leaves it elastic enough to allow for the variable relationship between processes which is likely to occur. The result is a theory which checks with the fact that different processes appear to have had very different importance in different cycles.

2. ENDOGENOUS THEORIES

The existence of originating causes is quite obvious, and the slightest reflection will convince anyone that they will influence the variation of business activity. Their effects become hopelessly intertwined with processes in the self-generating mechanism once they have occurred. For this reason, it is impossible to make a clear-cut distinction between theories relating to the two major groups.[20] The effects of innovation and various other types of structural change are best understood if the derived effect on the business system is traced in some detail as is done by Schumpeter. Cumulative chance factors are best understood if one takes a comprehensive view of what happens after the first effect of the outside force, as Frisch does. The other theories discussed above take self-generating forces largely for granted. In contrast, the theories analyzed in this section tend to take originating causes for granted or to minimize their influence.

Profit-Motive Theories. W. C. Mitchell's name is most often linked with the profit-motive theory. In the 1913 volume on *Business Cycles*, he views the processes of the business cycle from the point of view of their effect on profit possibilities.[21] This point of view involves

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[20] Haberler raises the following question: "Is monetary theory, which explains the business cycle in the light of certain actions or a certain policy on the part of the banking authorities, to be regarded as exogenous or endogenous? If the banks lower the rate of interest, thereby inducing a credit inflation, their action will presumably be regarded as an exogenous factor: but suppose they do not raise the rate sufficiently in face of a rising demand for credit (due, e.g., to inventions) with the same result in the shape of a credit inflation—is that the operation of an exogenous factor?" *Prosperity and Depression* (Geneva: League of Nations, and New York: Columbia University Press 1941), p. 8. When government controls come to exert a continuous control over the cyclical changes in the economy, many of the government actions will have an endogenous force. Whether or not they are actually endogenous will depend upon the extent to which they are regularly influenced by the cycle as well as influencing it.

[21] The theoretical part of this volume was reissued by the University of California Press in 1941 under the title *Business Cycles and Their Causes*. Mitchell now promises us a forthcoming volume showing us his present theoretical position.

only the simplest and most obvious assumptions. In an economy such as ours the decisions of enterprisers are important in establishing the rate of activity, and these decisions are affected by the estimate of profit possibilities. If profit margins are expected to widen, businessmen are optimistic. Their optimism generates an atmosphere in which consumers spend freely, and enterprisers expand their plant and equipment on an accelerated scale.

Variation in costs and prices, shift in investment activity, and conditions in the money and credit market can all be analyzed in terms of their effects on profit prospects. In this way, profit prospects may be made central in the analysis. Increased costs are depressive and may produce a downturn unless prices are increasing still more rapidly; reduced costs in the depression are reassuring if prices have declined by a lesser amount. High profits provide an incentive for expansion. This desire for expansion arises not only because there are extra funds with which to begin expansion, but because the enterpriser thinks he can increase the already high profits by expanding his market. He asks for more credit for extended periods if prospects are improving. When these lines of credit are called, profit possibilities tend to be reduced. The psychological effect of contraction of credit leads to the forced sale of goods.

This theory is sometimes criticized because profit margins may widen until business actually declines. Interpreted prospectively, however, the effects described might be produced by anticipating declining profits, even though actual profit margins were continuing to widen.

If we grant that activity is wholly dependent upon profit possibilities, many questions remain unanswered. Such an explanation of the processes of change will be completely satisfied by many different theories. One might accept it in its entirety and still hold that variation in business activity is wholly due to emotional aberration. In fact, the theory does not conflict in any important way with any of the other theories which emphasize self-generating forces. Profit prospects provide only a clue and do not establish the relative significance of various cyclical processes. However, they give explicit recognition to many processes which some of the theories take for granted.

Even as a clue, this theory is questioned by Keynesians who hold that consumer expenditures rather than profit prospects are of central importance. They believe that as long as consumer expenditures remain high enough activity will be maintained, which of course would be a truism if producer expenditures were included. It is stated that the businessman may visualize high profits with prices rising too fast to maintain volume and avoid recession. If a recession occurred, profits would decline. In reality, the criticism is that under certain

circumstances businessmen will not properly evaluate the significance of profits. The advocates of the maintenance of consumer expenditures frequently would go farther and propose that wage rates be increased without raising prices in order to increase consumer incomes. If the volume of expenditure increases, it is held that profits would be satisfactory. Actually, the essential validity of profits rests on the fact that profits influence producer expenditures, which are essential if total expenditures are to be maintained.

Overcapitalization of Profits. The profit theory may be applied somewhat more definitively if more rigid hypotheses are made. A noteworthy theory of this character was developed by Thorstein Veblen. Special emphasis is placed on the relationship between profit prospects and capitalization of enterprises. As profits become higher and higher in prosperity, a higher valuation is placed on common stock. Self-interest leads to the bidding-up of equities if the income derived from them increases. The current market is accepted as the final arbiter, and the fact that high profits are a temporary prosperity phenomenon does not enter into the valuation process. Furthermore, still higher profits are anticipated and the current market tends to discount them, as well as to reflect the speculative expectation of higher prices.

The exigencies of profit making are held to overcapitalize profits which are in themselves abnormally high. When the time is reached that costs gain on prospective selling prices, anticipated margins of profits are narrowed. This narrowing will act to produce a downturn in the securities market because the inflated stock prices will collapse. No analogous explanation of the upturn is provided. Veblen explained the upturn by the accidental occurrence of some favorable originating cause. One might, of course, hold that equity valuations are driven too low even with respect to the abnormally low profits existent in depression, and a favorable cost-price relationship makes them rise.

Tracing the profit-making process through market valuation will increase the definitiveness of profit theory, but the general applicability of the theory will be reduced in about the same proportion. Overinflated valuations readily occur in the atmosphere of prosperity, but they are obviously a major factor only in periods of great speculation. Most students would readily agree that a drop in valuation accentuates the decline in business activity, once the downswing is occurring, but they would account for the decline in some other way.

Psychological Theories.[22] Pigou's emphasis on emotional aber-

[22] On psychological theories, besides A. C. Pigou, *Industrial Fluctuations* (London: Macmillan & Co., Ltd., 1927), see F. Lavington, *The Trade Cycle* (London: P. S. King & Son, 1922); and J. M. Keynes, *The General Theory of Employment, Interest and Money* (New York: Harcourt, Brace & Co., 1936).

ration in his earlier work is famous. Optimistic and pessimistic error once under way are held to generate themselves in an endless chain.

Aftalion has laid some emphasis on the long period of time which elapses between the decision to increase capital equipment and the actual fulfillment of this decision. The uncertainty introduced is one of many existent in the economic system as we know it today. Psychological theories are based on uncertainty. It is uncertainty which leaves room for optimistic and pessimistic error.

Expectation of what will happen is the principal guide. High expectations lead to the accumulation of inventories, advancing prices, and expansion programs. Pessimism regarding the future leads to inventory depletion, declining prices, and stagnation of investment.

Lavington compares the psychological influence in business cycles to the attitude of skaters on a lake. With only a few skaters, a feeling of uncertainty pervades the group; but as the number of skaters increases, contagious confidence spreads, even as the safety decreases.

The businessman's responses become stronger than would occur if actual changes were evaluated objectively. A difficulty is, however, that once the community has been infected with optimism, prices and investment show abnormal rises, with the result that what actually happened is not free from the effects of optimistic error. In turn, the inflated prices are projected into the future. "When demand and prices have continued to rise, people get into a habit of expecting more and more confidently a further rise of equal or approximately equal extent—that is to say, they project current experience too confidently into the future."[23]

The existence of cumulative errors of judgment in expectations can scarcely be denied. Such a fact does not provide a definitive theory, however. It does not in itself explain the turning points. Pigou made use of other processes than those of emotional response in explaining them. Like profit motive, a psychological theory of the type developed by Pigou is in agreement with many theories.

Monetary and Credit Theories. Many writers have held that the business cycle results from monetary or credit movements. Everyone, of course, recognizes that these movements do occur, for prices vary with the business cycle, and the volume of credit outstanding also rises and falls with it. R. G. Hawtrey best illustrates the monetary theory. He holds that the business cycle is a purely monetary phenomenon, that monetary and credit movements are necessary and sufficient causes of the cyclical movement. His theory is not complicated by

[23] This is Haberler's statement in his summary of psychological theories, *Prosperity and Depression* (Geneva: League of Nations, and New York: Columbia University Press, 1941), p. 148.

considerations of variation in investment activity as is the *Monetary Overinvestment Theory* considered next.

The business cycle, which is characterized by monetary inflation and deflation, according to Hawtrey, is caused by money flow, that is, by changes in expenditure for goods and services. The increasing expenditure in prosperity is due to a rise in MV (money in circulation and bank deposits times their rate of use); the falling expenditure in depression is due to a drop in MV. The principal change in expenditure is attributable to bank credit. The business-cycle upswing is motivated through the application for bank loans by traders and producers anticipating a rising demand for goods. The banks are encouraged to expand deposits up to the limits set by legal reserves. V tends to increase[24] with an increase in the rate of expansion of M. These forces, however, act back of the scene in which the proximate cause of change in activity is a shift in consumer income and expenditure. This shift is important in understanding the part played by V, which is an important factor in expanding MV, or total expenditure, at the time when M is increasing at an accelerated rate.

The increased expenditure or money flow in the upswing is initially the cause of the increase in bank credit, but subsequently in the upswing the increased rate of activity, attributable to bank credit, increases incomes and money flow. The relation among expenditure, bank credit, and income flow may be explained by the effect of the lag of the interest rate behind the profit rate. In the upswing, prices show a tendency to increase, which greatly improves profit expectations and encourages businessmen to expand their scale of operations.

As business begins to expand, funds are plentiful and the interest rate is not bid up, although the profit outlook is rapidly improving. In a period of decline in business, profit prospects quickly deteriorate, but interest rates drop slowly because the pressure for funds increases with liquidation. Activity is stimulated by the ability to get a higher profit return than the cost of borrowing money in the upswing; it is dissuaded by the contrary movement in the downswing. The lag in relative movement of the interest rate is one of the most famous doctrines in monetary theory and has been held by many writers. Hawtrey applies it to transactions of the merchant and, by ignoring the long-term money market, avoids the complicating arguments pertaining to the wide fluctuations in durable goods as a factor responsible for the business cycle. This procedure also gets around the objection, to his view, that a slight reduction in interest charged on bank loans is an unimportant item in the profit-and-loss account of the

[24] V represents income velocity in Hawtrey's theory, contrasting with transactional velocity in the monetary overinvestment theory described in the following subsection.

average businessman, whereas, the merchant is held to be very sensitive to small interest-rate changes in accumulating inventories. He buys and sells large quantities of goods with little of his own capital, and a small change in the cost of money is a major factor in his narrow profit margin. As the merchant accumulates inventory and increases his bank loans, based on the inducement of a favorable interest rate, he increases M, which, in turn, adds to the rise in prices which initially promoted the increased profit expectation. Such price rises provide the most powerful inducement of all for increasing inventories.

Credit expansion in the upswing can last only so long as it is permitted by the reserve limits set by the banking system. At some point in the cumulating upswing, cash may be drawn out of the banking system, causing a tight credit situation. This credit stringency occurs only after the upswing has proceeded for some time and after there has been an opportunity for considerable credit expansion and also a substantial rise in wage rates. The credit stringency increases the circulation requirements for M and reduces reserves. The reaching of this inelastic limit produces a more rapid rise in interest rates than in profit rates, thereby eliminating less profitable operations and leading to a downturn.

The downswing is the reverse of the cumulative process of the upswing. The downward tendency of prices reduces profit prospects so that a lowered interest rate is not stimulating. The merchant draws down his inventories because, with falling prices, he expects them to fall farther. Finally, a point is reached where the interest rate has declined to an abnormally low level, and the liquidation of loans has built up bank reserves. Hawtrey holds that there are almost always some few people who wish to increase their borrowing, which, under the circumstances described, will produce an upturn. If the trough is not ended for this reason, central bank purchases of securities in the open market will increase bank liquidity still further, and the pressure of liquidity under the favorable circumstances described will start an upswing.

Hawtrey always recognized the remote possibility that these forces might fail to produce an upturn in a reasonable time and believes this eventuality occurred in the Great Depression. This he calls a "credit deadlock," a situation in which even exceedingly low interest rates fail to evoke a new demand for credit because of the "application of deflationary measures at a time when there [is] no serious inflation to justify them."[25] An aggravated, vicious circle of deflation arises. In such a case, Hawtrey deviates from his purely monetary approach and

[25] Hawtrey's essay on the "Credit Deadlock" in A. D. Gayer's *Lessons of Monetary Experience* (New York: Farrar & Rinehart, 1937), p. 132.

advocates a cautious policy of deficit spending and public works.

Hawtrey holds that the elasticity introduced into the banking system since the establishment of the Federal Reserve System has changed the character of the business cycle in the United States. Depressions and prosperities are still caused by monetary expansion and contraction, but they have lost their relative uniformity of length. The business cycle was held to be essentially periodic because of the recurrent encounter of the inelastic limits set by the credit system, and some evidence can be garnered for this position. Under the National Banking System, prosperities almost invariably reached the limit of credit expansion permitted by the banking reserves available. If the student turns to Chapter X, he will find that a large proportion of the cycles from 1870 to 1914 were 3 to 4 years in length. On the other hand, he will also find that all of the cycles in the 1920's, when the Federal Reserve System was in operation, had a 3-year length. Hawtrey holds that cycles now have an irregular length and amplitude because the extent of credit expansion is uncertain.

The obvious remedy, if the business cycle is merely a "dance of the dollar" [Irving Fisher's expression], is to stabilize the money flow. Hawtrey would do this by having the central bank take credit measures which keep the interest rate from varying from the prospective profit rate. The criterion by which the authorities in the central bank can determine the extent to which this has been accomplished is the stability of wage rates. Since consumer income is the proximate source of consumer expenditure, it must be stabilized. The way credit expansion produces the upswing is through an increase in consumer income. Increases in consumer income are desirable in so far as they reflect increases in the number of wage earners or a proportionate shift to more highly skilled work but not when they reflect increases in the average wage rate. With rising productivity, this means a falling price level. The arguments on the problem presented by a falling price level are summarized in Chapter IX.

Controlling the interest rate at which banks will lend money certainly will have less effect on the economy today than it would have had before World War I because of the present tendency to hold low inventories and to buy on a "hand-to-mouth" policy—changes made possible by improved transportation. Also, large cash reserves held by businesses have made them relatively independent of the banks. Even before the war the cash holdings of business had reached a point where most large companies did not use banks for short-term credit. The large reserves accumulated during the war made for a still smaller dependence. It becomes more and more difficult to believe that the business cycle originates with bank loans to merchants.

Another difficulty in tying the movements down to credit expansion arises from the possibilities of increase in V. The banks certainly play a part in the increase in bank deposits, but the reasoning is less obvious when they are held responsible for an increase in their rate of use. Take the situation following World War II, with a greatly expanded level of bank deposits. Can commercial bank loans which represent only a sixth of demand deposits determine the rate at which these deposits will be spent?

Monetary Overinvestment Theory. The members of this school hold with Hawtrey that the elasticity of the volume of circulating media "forms the necessary and sufficient conditions for the emergence of the trade cycle."[26] They believe, however, that Hawtrey errs in failing to give proper attention to the effect of monetary variation on capital goods. The relatively wide fluctuation in the building of capital goods is, of course, a characteristic feature of the business cycle. The overinvestment theory recognizes the wider fluctuation in capital than in consumer goods as the major cyclical disturbance. The business cycle is held to produce *vertical* maladjustments, not *horizontal* maladjustments. These maladjustments have to do with the structure of production, or its distribution among different kinds of products. Vertical maladjustment occurs when the structure of production does not correspond with spending and saving decisions. In other words, the output of capital goods is either too large or too small in comparison with the amount consumers set aside for saving out of their income. In contrast, horizontal maladjustment arises when the distribution of the output fails to correspond with different plans on the same level of consumption for goods of the same average durability, either because there is a failure of product output to be distributed in accordance with consumer demand or a failure of capital building to be distributed in accordance with business requirements. The overdevelopment of a particular branch of industry is a horizontal maladjustment, while over- or underinvestment, in general, is vertical maladjustment.

The theorists in this school belong to the "Austrian School" of economic thought and employ concepts peculiar to that school. The most important representatives are Hayek, Machlup, Mises, and Strigl.

These theorists attribute the business cycle to a shortening or lengthening of the process of production, which consists of a number of stages. The process is thought to lengthen in prosperity and to shorten in depression. The stages of production are called higher the

[26] F. A. Hayek, *Monetary Theory and the Trade Cycle* (New York: Harcourt, Brace & Co., 1932).

farther they are removed from ultimate consumption. The time from the first application of resources at the highest stage of production to the appearance of final consumer products is called the "period of production." If the period becomes longer, the "roundabout process of production" is lengthened, that is, more "capitalistic methods" are being employed. If the period of production becomes shorter, the roundabout process of production is said to be shortened, that is, less capitalistic methods employed. Unfortunately, the vagueness of these expressions has produced some misunderstanding. Just what do these theorists mean when they say that the roundabout process of production is lengthened in prosperity and shortened in depression? There are no more "stages" in the production of most goods in prosperity than in depression. In fact, the actual process of production is seldom changed much in a short period of time because the stock of capital is large compared to the net additions to capital. Neither is the total stock of capital diminished in any except the most severe depressions. The structure of production is, nevertheless, an important concept in reflecting the shifting distribution of output between durable and nondurable goods. In prosperity a much larger proportion of total expenditure is for investment than in depression. We shall assume that this shifting distribution of output represents the essential meaning of longer or shorter roundabout processes of production or the extent to which capitalistic methods are employed in so far as business-cycle changes are concerned. The shifting distribution of output between consumer and capital goods must conform to consumer spending and saving to avoid vertical maladjustment.

The monetary overinvestment theorists follow Hawtrey in making use of the concept of abnormally high or low interest rates. They, however, think in terms of a discrepancy between the actual and equilibrium rate of interest rather than of a lag between the interest rate and prospective profits. The equilibrium rate of interest is defined as that rate which will effect equality between the flow of savings and their investment in capital goods. This involves the idea of the interest rate as a price which equates the supply of savings with the demand for them in making capital goods.

The discrepancy between the actual and equilibrium rates of interest is held to be the cause of economic change. When the market rate of interest is below the equilibrium rate, there is an incentive for enterprisers to expand the scale of operations and to utilize bank credit in the process. Horizontal maladjustments are held to be unimportant since it is believed that no cumulative disturbance arises when resources are shifted from one employment to another in accordance with shifts in demand for goods of the same average durability. It is

believed that vertical maladjustments, which are important, would be avoided if the volume of circulating media were not permitted to vary. With bank deposits and money maintained at a fixed level, credit would not be available for increasing investment beyond the level of voluntary savings. If the demand for savings were high, the interest rate would be driven high enough to equate it with supply just as occurs in the price of any good. Similarly, it is thought that the interest rate would drop low enough to equate demand with supply if the demand for savings declined. The interest rate thus should guide savings to those uses where the effective demand is the greatest.

For these reasons, voluntary savings would be expected to cause little or no cyclical variation. In the first place, voluntary savings fluctuate only as a result of variation in total income and result from the business cycle instead of causing it. In the second place, even if something happened to force a rapid change in voluntary savings, the interest rate would quickly rise or fall to redirect resources. No cumulative movement would arise.

Starting with a discrepancy of the market rate and the equilibrium rate of interest, credit extension can initiate a cumulative cyclical movement. If the market rate of interest is below the equilibrium rate, it is profitable to add credit funds to voluntary savings, and the additional supply of funds limits the net increase in the market rate of interest. At all times it is conceived that there are innumerable investment opportunities. The bulk of them remain impracticable, however, because they do not promise a high enough return to cover interest costs. With a slight reduction in interest rates, the most promising of these investment opportunities becomes practicable. It might, for example, be electrification of the railroads, or it might be more elaborate housing and feeding arrangements for livestock. The market would bring out the proper investments. It is important to note that the credit influence is felt primarily in durable goods; the more durable the goods, the greater is the interest cost. Part of the influence of a relatively low interest rate is thought to direct production to still more durable capital.

Now, if investment activity is overstimulated and if resources are already fully employed, resources will be bid away from the production of consumer goods. To show the effect which follows, it is unnecessary to begin with full employment of resources, however.[27] Unused resources will be absorbed predominantly into the industries

[27] Although the theorists under review almost invariably begin with a condition of full employment of the means of production, the theory is strengthened by broadening the assumptions. See Gottfried von Haberler, *Prosperity and Depression* (Geneva: League of Nations and New York: Columbia University Press, 1941), pp. 63–64.

making capital goods because of the attractive interest rates. When full employment is finally reached, a maladjusted expansion of investment has already occurred.

With the attainment of full employment, the use of more resources in capital building means reduced resources for producing consumer goods and higher prices for these goods. This shift is effected by forced saving. Because, with the relatively low interest rate, investment is attractive, higher prices are offered in the investment area, and resources are bid away from the making of consumer goods. The rise in prices without an equivalent increase in consumer income makes the consumer dollar go less far; the rise in prices forces him to save in terms of real income to an extent he had not intended. Objections have been made to this concept in that the making of additional capital goods must of necessity pay out consumer income.[28] But there may be a lag in the rise of consumer income, a shift in income distribution toward profits, or a shift in income distribution toward wage earners in the capital-goods industries.

As resources are bid away from the making of consumption goods, the producer finds his ventures more costly and much less profitable than he had expected. Capital goods produce profits only to the extent that they are employed to make consumer goods. An unsatisfactory consumer market results in a downward revaluation of profit prospects and a lowering of the equilibrium rate of interest. Still lower market rates of interest are necessary to draw in enough investment activity to continue to absorb the labor and materials used in the recent past. To make this possible, the banking system must speed up credit expansion. But there is always a limit to the willingness or ability of the banking system to continue such expansion. Consumer goods cannot take up the slack because the abnormal structure of production is supported by the artificially low interest rates. If the artificially low interest rates are discontinued, the increased cost of funds will limit demand for capital goods. The only theoretical possibility of avoiding a downturn after conditions have come to this pass is for consumers to increase their voluntary saving enough to support the large expenditure for capital goods. This change consumers are unlikely to effect, and the capital-goods industries therefore will contract due to an insufficiency of saving.

The downswing involves a lengthy and painful readjustment as the structure of production is shifted back to a pattern consistent with the voluntary division between consumer expenditure and saving.

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[28] See Fritz Machlup's excellent discussion of the various ideas forced saving has represented in his "Essays in Honor of Joseph A. Schumpeter," *Review of Economic Statistics*, XXV (February, 1943), 26–39.

Workers are released from capital-goods industries faster than they can be absorbed in consumer-goods industries, and the cumulative process carries activity to a point below the appropriate distribution between capital and consumer industries. After such low levels are reached, it will be harmful to stimulate the purchases of consumer goods, no matter how low the production of them may be, because the trouble centers around the disproportionate decline in capital goods. The need is held to be a restoration of the normal structure of production. An increase in the production of consumer goods would further distort the structure at the trough, just as an increase in the production of capital goods would further distort it at the peak.

Hayek may be taken to represent these theorists in his position that the business cycle could be avoided by "neutral money." Essentially, this amounts to keeping constant MV (or money and bank deposits times their transactional velocity). This does not necessarily mean keeping M constant, because V may vary; if V varies, opposite variations in M should be permitted to counteract it. Also, increases in M must be made (1) for what Hayek calls a change in the "coefficient of money transactions," or a shift in trade from areas where money is used little or not at all to areas where it is used more; and (2) for an increase in the proportion of foreign trade. However, no increases would be permitted because of growth in population[29] or increases in productivity, because these changes are nonmonetary in nature. If monetary causes are to be removed, money must be kept constant except for adjustments to counteract purely monetary changes. The result would, of course, be declining prices. The problem of declining prices is summarized in Chapter IX.

In criticism of the monetary overinvestment theory, the question can be raised regarding the effectiveness of interest rates in equating savings and investment. Many economists have long felt much uncertainty regarding the extent to which high interest rates increase savings. In saving to produce a given income for old age, for example, reduced interest rates may make greater savings necessary. On the demand side, there is much evidence that the enterpriser builds capital when he sees large consumer demand, with little regard to the level of the interest rate. Also, in high prosperity the enterpriser tends to float stock to obtain funds for capital building rather than sell bonds, because investor optimism has forced stock prices to high levels.[30]

An essential part of the theory turns around the forced saving pro-

[29] Other monetary theorists agree with Hayek except for population increases. They would permit sufficient money increases to allow for population increases.

[30] See Hayek's recent emphasis on shift in profits in *Profits, Interest, and Investment* (London: George Routledge & Sons, 1939).

duced by rising prices in prosperity. There is reasonable doubt as to whether the theory will explain effectively the failure of continuing prosperity when prices do not rise—such as occurred in the late twenties.[31] The fact that productivity increased in this period without an increase in prices is not to the point according to the theory. Productivity changes are nonmonetary; what is needed is neutral money, not money which counteracts nonmonetary influences.

The theory appears unrealistic in light of the fact that consumer-goods expansion has continued as long as capital expansion in almost all prosperities for which we have recorded data. The assumption that output of consumer goods must decline follows from an unrealistic conception of the type of full employment possible in peacetime. During wartime, consumption of some goods is reduced with the great expansion of the munitions industry but not principally by the application of competitive forces. However, it may be held that consumer-goods industries expand much less than they otherwise would because resources are bid away by the capital-goods industries if the interest rate is considered to have major importance.

Actually, the structure of production changes in prosperity, not only because of the increased output of capital goods, but also because of the increased output of consumer durables. The financing of consumer durables by installment credit will probably be one of the major uses of credit in the near future. Slight reductions in the interest rate, however, do not make the use of consumer durables more profitable. Rather, the extent of their purchase depends on the level of consumer income and income expectation.

Residential building, representing a good of much longer life and usually classified as investment rather than as consumer durable goods, does offer a major field for the application of the principle of decreasing market rates of interest. A major part of the consumer cost is interest. Reduced rates of interest should make possible expansion of this industry, probably not without limit, but somewhat according to the pattern conceived by the monetary overinvestment theorists for investment in general.

Nonmonetary Overinvestment Theory. Another type of over-investment theory has been developed by Spiethoff.[32] According to this theory, the impelling factor causing the business cycle is not credit variation but the wide fluctuation of durable goods.

The cyclical movement is held to be a characteristic only of the

[31] See Haberler, *Prosperity and Depression* (Geneva: League of Nations, and New York: Columbia University Press, 1941), pp. 52 ff.

[32] Unfortunately there is no English translation of Spiethoff's ideas, but a summary will be found in Haberler, *Prosperity and Depression* (Geneva: League of Nations, and New York: Columbia University Press, 1941), pp. 72–85. Also, Cassel's early ideas correspond closely. Frisch develops some similar points. See selected references at the end of the chapter.

durable-goods industries, and changes therein are not thought to be attributable to variation in the demand for short-lived consumer goods. Spiethoff does not hold the unrealistic position of the monetary overinvestment theorists to the effect that there is a tendency to restrict consumer expenditures in the boom. Generally, the output of durable goods, and most importantly capital goods, is held to decline before short-lived consumer goods. Since durable goods expand in prosperity so much more than short-lived consumer goods, a disproportion develops in the structure of production. The increase in durable goods activity is held to be due to the use of savings which are pressed into investment. The savings may result from the lag in the rise of wage rates or from the application of technical innovations and improved methods in industry. Expansion of credit, however, is not a necessary part of this saving process.

The disproportionate production of durable goods leads to a paradoxical situation. Sooner or later the point is reached at which forces promoting the production of durable goods no longer operate. A capital shortage then exists. The rate of technological improvement slows down, fewer savings are available; wage rates sink; and there is a shift away from profits. This capital shortage is viewed in terms of the labor and consumer goods which together with raw materials and equipment produce more capital equipment and more consumer durable goods. When these resources are used up in short-lived consumer goods, they are not available to support the high level of activity in the durable-goods industries. This deficiency is due to a failure to divert labor and materials in adequate supply to the durable-goods industries. Because demand is complimentary, the expansion in the supply of consumer goods means a shortage of capital goods. Insufficient demand subsequently develops for short-lived goods because the level of total activity is not supported, and the supply of these goods has risen too rapidly while the capital-goods industries were in full operation. As Haberler points out in the references cited, Spiethoff insists that the cause of change is not inadequacy of additional bank credit, as the monetary overinvestment theorists would hold. Instead, he believes that many factors conspire to prevent the maintenance of the disproportionately high level of activity in producing durable goods. The high price of construction work in peak prosperity and a slowing down in the application of improved methods appear to play a part. The lack of funds for investment merely reflects the unavailability of materials and labor in the durable-goods industries; it does not cause it.

The nonmonetary overinvestment theory assumes a lead in capital goods at the downturn; otherwise no shortage would have arisen in

this area while activity remained high elsewhere. While we found that the acceleration principle would logically require such a lead, the time it takes to finance capital flotations and to complete investment activity once it is started offsets this tendency. Statistical data do not indicate that activity in the capital-goods industries leads at the downturn.

Underconsumption Theory. Some variant of the underconsumption theory represents the most widely accepted explanation of the business cycle. The proximate cause of any downswing is alleged to be insufficiency of money income or of consumer expenditures from such income. Leaving aside primitive ideas, which fail completely to envisage the circular flow of funds and its relation to net income payments, two major types of underconsumption theory may be distinguished: (1) pure oversaving and (2) underinvestment. The first emphasizes that too much of the current income is saved and too little is spent on consumer goods due to an extreme inequality of income distribution. The second emphasizes a persistent propensity to hoard due to insufficiency of investment outlets. The underinvestment type will be taken up in the following chapter because it represents an important characteristic of the Keynesian analysis.

The pure oversaving theory is essentially a type of overinvestment theory, but, in contrast to the theories considered above, it holds the cause to be due to excessive saving and insufficient consumption expenditure instead of to excessive consumption expenditure and insufficient saving. Basically, the difficulty, implicitly or explicitly, is conceived to lie in a maladjustment in the same structure of production visualized by the overinvestment theories. The cyclical upswing leads to a disproportionate output of durable goods. The cause of this situation, however, is not thought to be an artificially low interest rate or a shortage of capital but insufficient consumption due to a disproportionately low output of consumer goods.

Foster and Catchings, whose analysis was very famous twenty years ago, hold that any saving whatever will produce a business cycle. At first the saving will be inflationary because it will be used for investment goods which take time to complete. Applying the period-of-gestation concept, they hold this use of saving will result in consumer-income payments without a compensatory flow of product from the finished capital. When the capital goods are completed, the familiar effects of the ending of the period of gestation—a glut in the market for consumer goods—will set in. This glut in the market for consumer goods will react on the market for producer goods. As a matter of fact, however, such a result is dependent upon a rising amount of saving (investment) in the upswing. If this were not true, investment goods

would be completed recurrently and thereby offset the stimulating effect produced by the investments which are being initiated. But a rising investment is caused by the cycle; therefore the explanation assumes the cycle.

John A. Hobson had previously developed a more acceptable variation of the underconsumption theory, although it should be noted that in addition to the point developed in the preceding paragraph, Foster and Catchings accepted most of Hobson's theory. The difficulty, according to all underconsumption theorists, arises from the fact that too large a proportion of total income is saved. This is caused, of course, by inequality in income distribution. A small proportion of the population receives a disproportionate part of the total income available and can therefore save a substantial part of it. This saving results in an overdevelopment of the capital-goods industries. So much plant and equipment are built that in time consumption expenditures cannot absorb the products which would flow from the capital if full-employment activity is to be maintained. Although Hobson thought that perfectly flexible interest rates and commodity prices would bring the flow of products into adjustment with consumer demand, he believed that the type of rigidities which have grown up are so firmly entrenched in our institutional system that they cannot be eliminated.

Emil Lederer and R. E. May have emphasized the tendency for income distribution to become more unequal during the upswing. Wage rates lag behind prices, making for a reduction in the real wage rate and a rise in profits. At first, wage-earner income will continue to rise substantially because of increased hours and re-employment. But the time will come when employment is relatively full, and the chief change in earner income will result from wage-rate changes. Profits rise in the upswing, and profits are either retained in the business and turned directly into investment or paid to the upper-income groups. Those receiving low incomes save relatively little and their share successively decreases; those receiving large incomes save a large proportion and their share successively increases. Savings increase with the result that a disproportionate part of the product comes to consist of capital goods.

The theory that lagging wage rates and rising profits in the upswing produce underconsumption is intriguing but difficult to demonstrate. Statistical data show the lagging wage rates and rising profits but do not clearly indicate the extent to which they produce increased saving. The upper-income groups undoubtedly save more in prosperity, but statistical data do not provide a satisfactory measure of the increase. The lowest income groups save nothing in depression, and probably save something in prosperity.

Whatever disproportionate saving is contributed by the rich, it stands to reason that it is much less today than before World War II because of the high graduation in the income tax. In fact, this graduation is so great that it is reasonable to ask whether possible disrupting influences of income distribution before the war could have similar importance today. Could we expect the present high graduation, or an even higher graduation, to prevent a downturn?

The underinvestment type of the underconsumption theory points to a major weakness in the theory we have been considering—the assumption that saving automatically flows into investment. This more recent type of underconsumption theory, which has played a critical role in some of the recent thinking on the business cycle, is considered in the following chapter.

REVIEW QUESTIONS

1. Why is it hard to believe that the weather provides a complete explanation of the business cycle?
2. If the chief fluctuation over the business cycle occurs in the production of durable goods, and if the production of durable goods is initiated by innovations which come in waves, with imitators adding to capacity where the shrewd first see it is needed (like the building of filling stations), until too much capacity is created in vital industries, cannot we say that the cycle is completely explained by the introduction of new inventions and discoveries?
3. Does each cycle have a different set of causes?
4. Does uncertainty cause the business cycle?
5. If we do not save enough relative to investment, in prosperity, as Tugan-Baranovski has held, is it possible that we save too much relative to consumption in prosperity, as Hobson has held?
6. If the production of durable goods is the chief fluctuation over the business cycle, is it not true that a successive lengthening and shortening of the production process quite well explains it?
7. List in parallel columns the advantages of using each of the following factors as the focal point in studying business-cycle change: profit making, sufficiency of demand, emotional aberration, and monetary variation.
8. (*a*) List as many factors as you can which are necessary conditions of the business cycle, giving brief reasons; (*b*) list as many factors as you can which are sufficient conditions of the business cycle, giving brief reasons.
9. Many people have held that business-cycle theory would be vastly enriched if the theorists themselves would fairly evaluate contending theories. Most experts hold that Hawtrey made such an evaluation in *Capital and Employment*, while he holds to his own position all the more tenaciously. Write out a set of procedures you would follow to study this problem.
10. Compare Spiethoff's logic of capital shortage with the more general idea of a limiting factor.
11. Is there a middle ground with regard to sunspot theory? Is it possible that the sunspots have some influence on economic change and yet provide no complete explanation?

12. Since wars represent so powerful an originating cause, would a good war theory make a contribution?
13. List the possible types of episodic theory.
14. Why does Hawtrey emphasize the short-term interest rate?
15. Compare the "credit deadlock" with the theory of secondary depressions developed in Chapter III.
16. Explain forced saving.
17. Compare the "equilibrium rate of interest" with the "profit rate."
18. Differentiate between vertical and horizontal maladjustments.
19. If in deep depression the whole trouble is that the structure of production has so shifted that the proportion of capital goods made is abnormally low, what will the provision of relief expenditures do?
20. Use the investment multiplier concept to explain th monetary overinvestment theory.
21. Must an overinvestment theory be monetary?
22. Would Hobson's position be correct if investment were limited only by saving?
23. How does the nonmonetary overinvestment theory differ from Hobson's or Lederer's underconsumption theory?

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CHAPTER VIII

RECENT DEVELOPMENTS IN BUSINESS-CYCLE THOUGHT

EFFORTS to explain the business cycle have been moving in three principal directions. The first of these is called "Keynesian analysis" from the stimulus given by Lord Keynes, although some of the positions were never personally taken by him. The second is "econometric analysis," or a method which reduces all assumptions to mathematical equations. The third is "statistical analysis," which is directed largely at the discovery of empirical facts. It is the purpose of the present chapter to summarize briefly developments along these three lines and to draw the major contrasts among them.[1]

1. JOHN MAYNARD KEYNES

The writings of Lord Keynes have exerted a wider and deeper influence on economic thought than those of any other individual since Alfred Marshall. Unlike Marshall, however, Keynes directed his attention principally toward the problems of economic change. It is, therefore, useful to summarize briefly his ideas pertaining to the business cycle.

In his *Treatise on Money*, published in 1930, Keynes espoused an overinvestment theory of the business cycle. Major emphasis was placed on the discrepancy between savings and investment. In prosperity investment was held to exceed savings; in depression the positions were reversed. Overinvestment was held to arise in the upswing because of a lag in the actual long-term interest rate behind the equilibrium rate.[2] Equality between savings and investment represented equilibrium and was effected by movement of the market rate of interest into equivalence with the equilibrium rate.

[1] In order to reduce complicating footnotes, the device of referring the reader to the list of references at the end of the chapter, employed in Chapter VII, is continued in the present chapter in so far as expedient.

[2] Following Wicksell, Keynes used the term "natural rate of interest" but defined it as the rate at which savings and investment are exactly balanced. This is similar to the "equilibrium rate" of the monetary overinvestment theorists. To avoid additional expressions, equilibrium rate is used here. The term itself does not differ materially from Hawtrey's "profit rate." The treatment given by Keynes differed from Hawtrey and others in that emphasis was placed on the long-term interest rate.

Consumer-goods prices and profit margins were determined by the relationship between savings and investment. If investment were in excess, prices and profit margins were high because consumer expenditure attributable to income earned in the production of investment goods would add substantially to total demand.

In broad outlines, the theory was essentially that of monetary overinvestment. No great emphasis was placed on monetary variation as the cause. Keynes believed that bank control would be relatively ineffective in view of the fact that the long-term instead of the short-term interest rate should be equal to the equilibrium rate. Most importantly, he felt that the main problem was not the avoidance of overinvestment in prosperity but the avoidance of underinvestment in depression. With low interest rates, adequate investment activity would develop. Keynes also thought there was a major danger that the equilibrium rate might decline through several business cycles. This appeared to him to be a plausible explanation of the downward drift discernible in the long cycle of prices. Commodity prices would tend to decline in line with this theory if long-term interest rates failed to drop as rapidly as the equilibrium rate. In the 1930 book, he presented a plea that every effort be made to reduce long-term interest rates as the major hope for avoiding continued depression for an indefinite period.

With the publication of the famous *General Theory of Employment, Interest, and Money* in 1936, Keynes presented the major structure of the theory for which he will always be remembered. In outlining his position in the *General Theory* and in later writings, the present instead of the past tense will be employed to differentiate from the position he took in the *Treatise on Money*, as summarized above. Note should be made, however, of a private conversation over a year before he died in 1946 in which Keynes stated that, if he were a young man now, he would not be a Keynesian; that the whole truth is never contained in any one doctrine. The intention was not to indicate a major shift in position but to point out that other lines of thinking have promise and to make it clear that he was not accepting responsibility for everything which passes for "Keynesian."

The *General Theory* adopts an underconsumption position. The declaration made in the *Treatise on Money* regarding the danger of a long-term decline in the equilibrium rate relative to the interest rate was a step toward an underconsumption thesis. In the *General Theory*, however, underconsumption is no passing affair related to the long cycle in prices. It is an outright underconsumption, underinvestment position, not the underconsumption, overinvestment viewpoint of Hobson. The difference is that Hobson held unbalance to be produced by too much investment in prosperity, while Keynes holds that the

key difficulty lies in the failure of investment ever to become truly adequate. Hobson never questioned the automatic and immediate flow of saving into investment; with Keynes this is the problem.

Keynes carries over from the *Treatise on Money* the relationship between the interest rate and the equilibrium rate but with a slight change in terminology. The equilibrium rate now becomes the "marginal efficiency of capital," which is defined as the ratio to its cost of the expected return of an investment expansion program over its life. Just as in the monetary overinvestment theory, when the expected return is more than the interest rate, investment will increase. The Keynesian position, however, is that under modern conditions the expected return is seldom likely to be greater than the long-term interest rate. Investment opportunities, with a few exceptions, promise an exceedingly low return, perhaps less than 2 per cent. But 2 per cent is about as low as interest rates can go. The reason for this minimum interest rate is developed below.

The key relation is still that between savings and investment. A distinction is made between past savings and investment and planned savings and investment. Past savings and investment total to the same amount in a manner not dissimilar to the equality of debits and credits in accounting. They are two alternative summations of the same process. Planned savings and investment diverge, as conceived in the *Treatise on Money*, but with the difference that investment is alleged to be almost continuously below savings. If planned investment falls short of planned savings, the excess of savings will not be spent to create economic activity and will be removed from the circular flow of income. Therefore, the income level will be reduced to such a point that savings will be equal to investment. This equivalence of past savings and past investment and the tendency toward a dissimilarity between planned savings and investment to effect such changes in the level of income that equivalence between them can be restored depends on the conception that total income and total expenditure are equal in any accounting period.

In any one period part of total expenditure is for consumption and part of it is for investment. At the same time, part of income is consumed and part of it is saved. The difference between total expenditure and consumption is investment; the difference between total income and consumption is savings. Savings and investment must add up to the same total for the given period to make the statistical tables balance. These relations can be put into equational form. Consumption + investment = total net expenditure. Consumption + savings = total net income. Investment = savings.

This elusive relation between savings and investment brings out pointedly and explicitly the difference between the record of past

occurrence and the present expectation of future developments. Planned savings do not equal planned investment except in the rare situation in which consumers propose to allocate for savings out of their income exactly the same amount that enterprisers, in large part a different group, propose to invest. If planned savings came out to be exactly equal to planned investment, income and expenditure in period $t + 1$ would equal income and expenditure in period t.

An effective distinction between occurrence and expectation for savings and investment has been made by Stockholm theorists, notably as recorded by Myrdal and Ohlin, through the use of the terms *ex post* and *ex ante*. *Ex post* savings or investment represent occurrence, that shown by recorded history; *ex ante* savings or investment represent expectation, that for which decision-makers plan.

If planned or *ex ante* savings should equal planned or *ex ante* investment, Keynes holds that the economy would be in equilibrium, the only kind of equilibrium the economy is likely to experience. It is an unfamiliar type of equilibrium, for it implies no conditions regarding the level of employment. In fact, it is likely always to be an underemployment equilibrium because the marginal efficiency of capital (the anticipated percentage return) is expected by Keynesians almost always to be under the long-term interest rate. The result is an inability of the economy automatically to achieve conditions of full employment and an ever-present tendency toward stagnation or failure to make full use of our resources. The stagnation thesis has developed into a considerable controversy and is analyzed separately in Section 4 below.

Economic change is largely determined by the amount of investment and its relation to savings. Consumption rises with rising income, but not proportionately, because the propensity to save increases.[3] We saw that some of the overinvestment underconsumptionists held this position. But, unlike them, Keynes holds the resulting difficulty to be attributable not to overinvestment but to an insufficiency of investment to absorb the increased savings. Consumption always promotes economic activity, whereas planned savings will not do so if hoarded and not invested. Savings are unlikely to be an important factor in the cyclical expansion since investment can proceed from credit if savings are not available. Since savings are thought to be always more than adequate at the highest levels of activity, the determining factors of economic activity are consumption and investment. Consumption is relatively stable and is readily predictable, given the total level of income. Investment is uncertain and likely to move capriciously. The marginal efficiency of capital cannot be neatly

[3] This view is the common interpretation, but actually Keynes said no more than that the absolute gap between consumption and income would widen.

calculated. There are too many uncertainties. The enterpriser comes to be largely guided by psychological reactions such as Pigou describes. The problem being what it is, many decisions are reached by hunches, as the result of "animal spirits."

Not only is the rate of investment activity uncertain, but planned investment is likely to be less than that required by the rate of planned savings. The marginal efficiency of capital is likely to decline as activity rises, because costs increase, and the market for consumer goods rises less rapidly than total activity. Perhaps not over 2 per cent return can be expected for the less promising part of the capital required if all planned savings are invested at high income levels. Long-term interest rates can scarcely sink this low because the risk involved will perhaps require something like 2 per cent. Furthermore, investors have a strong desire for cash. Keynes calls this liquidity preference, which arises from the need to hold money until additional income is received—"income and business motives," that needed to provide for contingencies—"precautionary motive," and that wanted in order to take advantage of the changes in the prices of goods and other assets—"speculative motive." The problem of insufficient investment opportunities is accentuated by the requirement on the part of investors for a rate of interest which is too high in relation to the marginal efficiency of capital.

Recognizing the importance of investment, Keynes makes much of the multiplier principle. Any amount of increase in investment activity will, over time, produce a multiple increase in total activity. In view of his belief that private investment is likely to prove inadequate, Keynes recommends widening the area of public investment. He also suggests that it may be necessary to force interest rates down so as to get them below the marginal efficiency of capital and increase private investment.

Keynes's theory is essentially one of secular stagnation produced by underinvestment and oversaving. If the conditions making for a business cycle should arise, the theory would principally revert to that in the *Treatise on Money*. In other words, if planned savings should fall substantially short of planned investment in prosperity, overinvestment would develop. Unless this occurs, no true prosperity takes place at all, and the problem of the business cycle is not faced directly. Harrod, however, has developed a theory of the business cycle to fit the underconsumption framework Keynes set up.

2. HARROD'S TRADE CYCLE

R. F. Harrod published his book on *The Trade Cycle* in 1936 concurrently with *The General Theory*. Harrod's theory depends on a set of dynamic determinants which, in general, tend to create variation

and upon a set of static determinants which, in general, act as stabilizers and offer resistance to the dynamic determinants.

The dynamic determinants are (1) propensity to save, (2) shift to profit, and (3) amount of capital used in production. Propensity to save indicates the proportion of total disposable income the consumer sets aside for savings. Keynes concerns himself with the same problem, but he approaches it from the relationship of consumer expenditure to total disposable income—the propensity to consume. Harrod holds that the propensity to save rises in prosperity due to the nature of the motives for saving, with the result that the amounts spent for consumption do not increase proportionately with the increase in income.

By shift to profit Harrod means that profits increase in prosperity. A primary reason for the shift is that prices in the upswing increase faster than wage rates. Harrod holds that increased profits lead to increased corporate savings and also to increased dividends, which, in turn, lead to increased individual savings.

The first two dynamic determinants increase the proportion of the income which will be saved as the upswing rises. The first increases individual savings and the second, by increasing the ability of corporations to provide directly for their investment requirements, makes more difficult the absorption of individual savings.

The third dynamic determinant—the amount of capital used in production—tends to act as an offset to the first two. As the upswing progresses, the amount of capital per unit of output may increase. Increase in the use of capital, which can absorb the savings effected by the first two determinants, occurs only if the marginal efficiency of capital remains high relative to the interest rate. In other words, the prospective return must be above the cost of the money. This is the familiar mechanism of Keynes and the monetary overinvestment theorists.

The dynamic determinants establish the conditions necessary for continuous high levels of output and employment. They imply that the cyclical fluctuation is attributable to shifts in the amount of savings and to the difficulties involved in providing a sufficient amount of investment to produce balance. As pointed out below, the acceleration principle complicates the problem of savings absorption when prosperity tends to level off.

The static determinants, comprised of forces influencing prices, play the role of stabilizers. These are (1) plasticity of prime costs; (2) the law of diminishing returns; and (3) the law of diminishing elasticity of demand. In theory, prime costs, comprised of wage rates and prices of raw materials, decline in the downswing as workers and enterprise units compete for the reduced amount of business and as businesses

endeavor to lower costs to restore more profitable operations. Prime costs tend to rise in the upswing and to act unfavorably on profits. Diminishing returns also cause cost increases in prosperity. Both prime costs and diminishing returns at the upper turning point theoretically restrict the operation of the dynamic determinants. Harrod places little faith in them at the present time because of the stickiness of prices with our kind of business organization.

Harrod holds that elasticity of demand diminishes in the upswing. In prosperity, the world having become richer is less willing to vary its consumption of goods in response to a given price change, that is, a bigger price change is necessary to induce it to vary consumption by a given amount.[4] Competition becomes more monopolistic. Consumers buy through established trade channels even though competitors may offer a small price advantage. Producers take advantage of the situation and maintain or increase prices. Producers are able to profit from the restriction of output. The marginal efficiency of capital declines because expansion programs are less desirable with the restricted levels of output and with the limited promise for new enterprisers to enter old fields of activity. The shift to profit is accelerated because consumers are less discriminating. Thus, saving is increased and investment is discouraged. Activity is driven down.

The dynamic determinants indicate the difficult but necessary conditions for ever-rising advancement through the investment of ever-increasing amounts of capital; the static determinants affect the operation of the dynamic forces and insure that any cumulative movement initiated by such forces will not continue indefinitely. These two sets of forces produce instability, which puts in operation the acceleration and multiplier principles that Harrod thinks are directly responsible for the business cycle. The acceleration and multiplier principles operate only when instability exists. On the basis of such instability, however, Harrod believes that their joint operation is responsible for the business cycle.

As soon as the rate of increase in consumption slows down in the upswing, investment must decrease because of the acceleration principle. Investment has been producing a multiplied effect on consumption in accordance with the multiplier principle, but as soon as investment declines because of the acceleration principle, consumption suffers because of the withdrawal of the multiplied effect. Harrod believes that a substantial decline in investment at such a time will drive activity to the bottom of a "full depression." This bottom is reached when planned saving once again equals planned investment

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[4] R. F. Harrod, *The Trade Cycle* (Oxford, Eng.: The Clarendon Press, 1936), p. 18.

—a level not much above zero. Once a decline starts, the only salvation is for income to be spent almost entirely on consumer goods because net investment fades rapidly in the downswing and is not in a position to absorb savings. Harrod holds that the attainment of an equilibrium between savings and investment is facilitated by the partial destruction of the capacity to save.

The wearing out of capital and the reaching of a more favorable relation between the marginal efficiency of capital and the interest rate means that a recovery will start once the deflationary effect of saving has been eliminated. The cyclical movement starts all over again.

Harrod believes that his explanation points the way to the prevention of a cyclical downswing. He claims a "breathing space" or a short period of time for application of control measures will be available just as investment begins to decline due to the influence of the acceleration-principle effect. At this point in time, what is required is supplemental public investment to balance the excess of planned saving. As long as planned investment activity is large enough to cover planned saving, a downswing will not occur. Even a small additional investment in public works might be sufficient to offset the deflationary effect of a decline in private investment. It all depends on how large the decline in private investment has become. After it has attained major proportions the program of public works would have to be impracticably large, and a complete recession would therefore become unavoidable. It should be noted that Harrod has failed to take full consideration of the part the acceleration principle plays in the development of the breathing-space concept. As soon as the *rate* of increase in consumption slows down, private investment will decline. The building of public works would have to expand sufficiently to maintain the *rate of increase* in consumption. Harrod does, however, cover the same problem in connection with a future depression. He states that the rate of increase in consumption attained in the upswing movement from a depression involving heavy unemployment is usually too rapid to maintain indefinitely.

Harrod has little patience with either psychological or monetary theories. On the point of psychological influence he is completely consistent. This is evident in his mechanical application of the acceleration principle, while most students of the business cycle recognize that its operation will be at least partially modified by psychological influences. On monetary theory he disavows basic causation, but he employs the idea of divergence between marginal efficiency of capital and the interest rate; he suggests that the banks could contribute to cycle control by varying the interest rate. In contrast, Keynes lays

much emphasis on psychological forces and puts monetary variation in a somewhat more central position.

In his basic ideas, therefore, Harrod follows most of the positions taken by Keynes. His is the most representative underconsumption, underinvestment business-cycle model framed along Keynesian lines.

3. THE CONSUMPTION FUNCTION[5]

Perhaps the most important concept of the Keynesians is propensity to consume. This concept is used in analyzing the tendency of planned savings to exceed planned investment before the upswing reaches satisfactory levels. Planned savings tend to become large in prosperity because the propensity to consume decreases as income rises. There is a lag in the timing of increasing expenditure in the extent to which the income produces changed standards of living. Keynes calls this a fundamental psychological law.[6] Harrod holds that the motives causing saving account for it. As pointed out in Chapter V, the influence of the multiplier principle varies directly with propensity to consume.

With so much importance attached to this concept, its measurement has received widespread attention. The measurement is called the "consumption function" or "saving function," and the relation is traced statistically between consumption or saving and disposable income, gross national product (GNP), or some other measurement representing total activity. Disposable income is total income received by individuals, less taxes. Consumer expenditures plus saving equals disposable income. Since consumer expenditures are about 80 to 95 per cent of disposable income, a correlation between consumer expenditures and disposable income would necessarily be high because the total is being correlated with the major part of itself. Since consumer expenditures represent 60 to 70 per cent of GNP, this correlation will also necessarily be high.[7]

Chart 52, appearing in Chapter XVIII, shows the relationship of consumer expenditures to disposable income. If savings instead of

[5] See particularly Louis Paradiso, "Retail Sales and Consumer Incomes," *Survey of Current Business*, October, 1944; W. S. Woytinsky, "Relationship between Consumers' Expenditures, Savings, and Disposable Income," *Review of Economic Statistics*, XXVIII (February, 1946), 1–12; "Five Views on the Consumption Function," *Review of Economic Statistics*, XXVIII (November, 1946), 197–224.

[6] Actually, Keynes stated no more than that at higher levels of income the absolute gap between income and consumption will be widened. The principal motives Harrod holds to exist for saving are: (1) to provide for unusual expenditure and old age; (2) to provide for regular income from property; (3) to acquire prestige and power.

[7] Available data for measuring propensity to consume are described in Chapter XVI, Section 9; Section 8 of the same chapter describes the relationship between GNP and various income measures. Past data are presented in Appendix A.

expenditures are related to disposable income, the relationship is found to be much less close. Savings are only a small part of disposable income instead of almost all of it as in the case of consumer expenditures. The expenditure to income method is much more frequently employed. This is partly because the point usually emphasized is the stability of consumer expenditure. An important reason for not employing the saving to disposable income or GNP relation is that the saving measurement is less satisfactory than the expenditure measurement. Savings are estimated by taking the difference between disposable income and consumer expenditures and are liable to contain the error originating in both series.

Many unsolved difficulties are now recognized to be involved in the measurement of the consumption function. Satisfactory data are available for only a short period of time—fairly satisfactory back to 1929, somewhat less satisfactory in the twenties, and quite unsatisfactory for earlier years. The secular and cyclical change in the consumption function are different, and a scatter diagram which relates consumer expenditures to disposable income without first adjusting each series for trend produces an average equational relationship that includes the effects of both trend and cyclical change. The difficulties faced in adjusting for trend (described in Chapter IV) are so formidable that unadjusted data are usually employed. Undeflated data are used, but if there is a rise in income and no price increase, savings should change differently than they do when there is a rise in income accompanied by a price increase. The same can be said with regard to variation in tax rates.

It is clear from the equational relations developed that the secular trend change in propensity to consume has been horizontal or slightly rising. There are many reasons for secular change, and their separate influences have not been satisfactorily isolated. Urban families save less than rural families in the same income bracket, and with a movement of the population to the cities, saving has tended to decrease. The influence of the trend in age distribution to the older ages and a trend toward smaller families is somewhat uncertain.

The statistical data make it reasonably clear that the propensity to save rises in the upswing, although they do not provide a satisfactory measurement of the increase; neither do they demonstrate that given an extended prosperity a decrease will not set in. Saving is forced to a low level in deep depression because the low-income levels will scarcely buy necessities for most of the income receivers. As income rises, most people can again save part of their income. Various equational relationships show projected savings at prosperity levels from less than 10 per cent to more than 20. The evidence would be much

clearer if the consumption function could be more satisfactorily applied to trend-adjusted data.

The propensity to save in the twenties and the thirties appears to have been about the same, if adjustment is made for the lower levels of capacity operation in the thirties as compared to the twenties. This is important, as Bean points out, because the low level of saving in the thirties is the principal statistical foundation for his hypothesis of a secularly declining propensity to consume.[8] The thirties were an abnormal period due to the low level of the secondary trend; it is dangerous to project into the future relations existing at that time.

Even if the past statistical relation between consumer expenditures and disposable income gave a better basis for future projections, a good deal of uncertainty as to applicability would still be involved because of major changes produced by the war. The tremendous increase in accumulated liquid saving may change the propensity to save out of current income. The high graduation of income taxes, resulting in a disproportionate reduction in the disposable income of the high-income classes, may also reduce current saving because a large proportion of this saving comes from these classes.

4. THE STAGNATION THESIS

In projecting the deficiency of planned savings relative to planned investment, the Keynesians hold, on the one hand, that planned savings will be excessive because of a declining propensity to consume and, on the other, that planned investment will be deficient because of inadequate investment opportunities. The Keynesians are not worried about the absolute size of investment opportunities but only about their size with relation to planned savings. In fact, it has become customary in Keynesian circles to speak of "savings offsets" instead of investments and thus to emphasize the function of investment as an absorber of savings.

The level of investment is generally held to be determined by the relationship between long-term interest rates and the marginal efficiency of capital or the expected return over the future years relative to the cost of the capital. As we have seen above, many overinvestment theorists have used this or a similar mechanism, but they have held that interest rates lag in comparison with the marginal efficiency of capital and that therefore there tends to be too much investment in prosperity. Such a theory produces a business cycle, but the Keynesian thesis that investments are inadequate in prosperity does not lead to a business-cycle theory; it leads to a theory of stagnation. If investment

[8] See Louis H. Bean's essay in "Five Views on the Consumption Function," *Review of Economic Statistics*, XXVIII (November, 1946), 197–224.

is inadequate in prosperity, prosperities never fully develop because the excess of planned saving is deflationary. Under these conditions, dynamic forces do not so much make for variation as for indefinite depression. Harrod's thesis is an exception. It develops a business-cycle pattern because he does not assume that savings offsets will necessarily be too small until a cyclical force—the acceleration principle—begins to curb investment.

The controversy over the sufficiency of savings offsets has reached major proportions in America. For the moment, the tremendous requirements necessary to restore war damage in Europe have made the controversy over there an academic affair. The position of Keynes, it will be remembered, is that, since the return on investment cannot be very promising, the marginal efficiency of capital for a part of the savings offsets is likely to be as low as 2 per cent, which is so low that the risk element in interest-rate return together with liquidity preference will lead people to hoard their savings. The American economist, Alvin H. Hansen, has developed some reasons for believing that the marginal efficiency of capital may be disturbingly low.[9] The issues involved are assuredly complicated and have not been fully resolved. No more than a brief summary can be presented here. The following major arguments are summarized below:

1. Influence of population growth
2. Risk element in luxury-type industry
3. Disappearance of the frontier
4. Dearth of new industries
5. Investment of the capital-saving type
6. Aging of the population

Investment opportunity is held to depend largely upon population growth. Both Hansen and Keynes estimate that from 40 to 60 per cent of total investment was dependent upon this factor alone in the United States since 1800. This is an intricate problem. Certainly, a rapid population increase expands investment requirements by adding to the growth of the economy. Essentially, therefore, the problem is whether or not a sufficient rate of growth of net capital formation for a nonexpanding population is impeded by the absence of demand for capital requirements for additional population. The geometric rate of population growth was steadily declining in the United States throughout the nineteenth century, but Keynes and Hansen do not

[9] See Alvin H. Hansen, *Fiscal Policy and Business Cycles* (New York: Norton, 1941); and criticisms of the stagnation thesis: Martin V. Jones, *Secular Trends and Idle Resources* (Chicago: University of Chicago Press, 1944), George Terborgh, *The Bogey of Economic Maturity* (Chicago: Machinery and Allied Products Institute, 1945), and references cited in these sources.

hold it to have impeded capital development during that period. Except for a temporary slackening during the thirties (during which time population in the *productive* age groups was growing almost as rapidly as ever), the steady decline in the rate of rise has not been accelerated. The stagnationists, therefore, should explain why the continuation of a slackening population growth, which permitted satisfactory per-capita investment to the levels of the twenties, should thereafter impede increased per-capita development. This they have not done.

It is claimed that luxury-type industries require less capital per unit of output than industries producing necessities. Also, investment in such industries is held to be riskier because demand is subject to wider variations. There are three major reasons for a shift in the distribution of demand toward luxuries. Proportionately less has to be spent on necessities as income and productivity rise. With smaller families, more of the income of the breadwinner can be spent on luxuries because it is spread over fewer people. The proportionate part of the population over 65 is rapidly increasing, and old people are held to buy a larger proportion of luxury goods than younger people.

Some question has been raised regarding the consumption of old people. Since most of them receive no current salaries or wages, there is reasonable doubt as to whether or not on the average they can buy a high proportion of luxuries. Since they must be supported by the working population and since their number is increasing, the disposable income of the other age groups will be reduced and, consequently, also their ability to buy luxuries. It is clear on the whole, however, that our economy is becoming richer and that the proportion spent on necessities is declining. It is much less clear that the luxury goods will require less capital. Keynes illustrates this point with personal services, but the secular trend of those personal services requiring little investment may be downward in the United States.[10] Domestic service, for instance, does not seem to be on the increase, but dental service, requiring a great deal of capital, has a strong upward trend.

The critics of the stagnation theory appear to have failed in attempting to show that investment in luxury industries is no more risky than in any other. A product with a postponable and therefore fluctuating demand certainly implies risks in production. The standard of living had risen to such a point by the twenties that the most rapid growth appears to have occurred in luxury industries. Increased risk-bearing will tend to reduce the enterpriser's evaluation of the

[10] See reference given by M. V. Jones, *Secular Trends and Idle Resources* (Chicago: University of Chicago Press, 1944), pp. 2–3.

marginal efficiency of capital and to increase the interest rate required by the saver to part with his cash.[11]

A major point made by the stagnationists is that less housing will be required with a declining population and smaller families. It is true that, by necessity, communities with rapidly increasing population, have swiftly expanded their housing facilities. It is not at all obvious, however, that smaller families and slowing population growth for the *total population* will reduce *total* housing growth. Small families appear to spend more on housing than large.[12] Secular change in family size, like population growth, has continued, but not accelerated, the rate of decline beginning in the nineteenth century.

Another major point is the passing of the frontier. The conquest of the continent required the building of new communities, the setting up of transportation systems and the like, necessitating major capital requirements. Three major points are made by the critics of the stagnation theory. Major settlement of the continent was completed 50 years ago, and the stagnationists do not claim that investment opportunity was greatly curtailed at that time. There is no evidence that old communities were depopulated or that the facilities in them were left idle by people moving to new communities. Capital investment increases most, not at the time land is opened, but somewhat later, when it is industrialized. These points border on proving too much. If the greatest stimulus was not when the frontier was first opened, the influence of the ending of the period of major settlement would have been delayed. That the new community has unlimited capital requirements appears to be obvious; that an older community would have a similar demand may require demonstration. Furthermore, the new community merely requires more and more standard-type goods. The older community is likely to call for a larger proportion of newer types. On the whole, the passing of the frontier appears to reduce the need for investment.

Another point is the dearth of great new industries. It is often said that we cannot again expect the arrival of a new industry like the automobile. There appears to be no good basis for any such statement. In every age people have felt no great further improvements to be possible. Scientific achievements have been very rapid in recent years and were possibly stimulated by the war.

It is contended that investments are moving more and more to the "capital-saving" type. The replacement of an old machine, it is held,

[11] See Louis J. Paradiso's "Classification of Consumer Expenditures by Income-Elasticity," *Survey of Current Business*, January, 1945, which shows that luxury-type goods fluctuate much more widely than nonluxury-type.

[12] See particularly Eric Schiff, "Family Size and Residential Construction," *American Economic Review*, March, 1946.

costs less than the old one did and is far more efficient. Hence, productivity advances are made without even using up depreciation allowances. No saving offsets are provided. Actually, however, capital saving is no new development. It appears to have been going on at perhaps as rapid a rate for fifty years.[13] Thus, capital saving would not slow down recent growth. There is, furthermore, no convincing evidence that the secular trend in investment per unit of output is downward, on the average, for total industry.

It is contended that with an aging population the average age of enterprisers is rising, and, therefore, the enterpriser is becoming more conservative at the very time that the problems of investment are becoming more difficult. This remains a theory. No statistical evidence is available to show either that the average age of enterprisers is increasing or that older enterprisers actually do adapt their productive facilities less effectively than younger ones. Most important, at the present time the war has provided the stimulus necessary to draw in many new enterprisers.

The idea that investment opportunities have been running out has been founded on what now appears to have been a misconception. It was often thought that capital requirements were declining. It now appears that capital formation has, on the average, represented a constant proportion of GNP since 1900.[14] Furthermore, although capital formation in the thirties was a low percentage of GNP, this was essentially cyclical. The projection of past correlation relationships would indicate capital formation at as small a percentage of GNP as actually occurred. The stagnationists have placed great emphasis upon the relatively low capital formation in the thirties compared to the twenties. The evidence, however, does not demonstrate a *secular* decline in investment opportunity.

According to the writer's judgment, the Keynesians have shown two valid reasons for believing there may be some dwindling in investment opportunity: (1) higher risk for investment because of the increased proportion of luxury goods, and (2) disappearance of the frontier. The other arguments, however, generally fail to substantiate the theory of vanishing investment opportunity. All things considered, there appears to be little to support the argument that investment opportunities are running out.

The failure of capital investment in the thirties to match that of the twenties is the subject of considerable analysis by the stagnation-

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[13] See M. V. Jones, *Secular Trends and Idle Resources* (Chicago: University of Chicago Press. 1944), pp. 20 ff.

[14] See Simon Kuznets, *National Income: A Summary of Findings* (New York: National Bureau of Economic Research, 1946), p. 53. See also Kuznets' interpretation.

ists. The point to remember is that the secondary trend was at a low level in the thirties. Harrod's argument that investment is made according to the indications of consumer demand as shown by the acceleration principle appears more plausible for explaining this period than the interpretation implied by the marginal efficiency of capital.

Under prosperous conditions, the acceleration principle is less likely to provide so satisfactory an answer, partly because of the influence of optimism. It appears just as unlikely, however, that most decision-makers will depend on any nice calculation like that presupposed in the concept of the marginal efficiency of capital. Even though investment programs may deviate substantially from the levels indicated by the acceleration principle, it appears that decisions will likely be made on the basis of *current* market demand and not on calculations of secular growth.

This argument applies particularly to the relation of the increasing risk in investment to the marginal efficiency of capital. It might be more accurate to say that increasing risk tends to keep enterprisers from depending on a calculation of expected return for the life of the investment rather than to say that increasing risk reduces the estimated return. A decline in the marginal efficiency of capital has not been demonstrated, but the concept itself may be impractical under present conditions.

In any case, the evidence of this and the preceding section does not appear to point to stagnation arising from the relation between planned saving and planned investment. The propensity to save appears to have experienced horizontal or secular decline, and relative investment requirements appear to have fluctuated around a horizontal secular trend.

5. THE ECONOMETRIC APPROACH[15]

Econometrics represents a method of approach and not a theory. Since Keynesian analysis is noteworthy because it is a theory, the two are not directly comparable, but they mark off two of the three major lines of thinking on business cycles at the present time.

The econometric approach is that of constructing a mathematical model to represent the business-cycle mechanism. There are mathe-

[15] See particularly L. R. Klein, "Macroeconomics and the Theory of Rational Behavior," *Econometrica*, XIV (April, 1946), 93–108; L. A. Metzler, "Factors Governing Inventory Cycles," *Review of Economic Statistics*, XXIX (February, 1947), 1–15; J. Tinbergen, "Econometric Business Cycle Research," *Review of Economic Studies*, VII (1940), 73–90, reprinted in *Readings in Business Cycle Theory* (Philadelphia: Blakiston Co., 1944); J. Tinbergen, *Business Cycles in the United States of America, 1919–1932* (Geneva: League of Nations, 1939); and the references listed in these sources.

matical, economic, and statistical aspects to econometrics. The mathematical aspects have evolved from the pattern established by Leon Walras. Stated in the simplest terms, Walras conceived of equilibrium as determined by a series of simultaneous equations which represented the functional relationship between major economic variables. The equational relationships conceived by Walras represented his economic theory; they stated mathematically the relationships of economic variables as he understood them. This is the economic aspect referred to above and, like the mathematical aspect, the present econometric methods are evolved from the type of procedure Walras applied.

There was no statistical aspect to the Walrasian system. Walras was faced with a paucity of statistical data, and, in any event, he made little effort to fit his equations with statistical measurements. The business-cycle mechanism employed by present-day econometrists gives particular attention to the statistical aspect. This involves giving proper attention to the defining of variables in such a way that measurements are at least possible or, far better, in a way that readily permits the use of statistical measurements that are available.

Within this framework there are infinite possibilities. The analysis can be either macroeconomic or microeconomic. Macroeconomic analysis makes the processes of change in the divisional parts of the economy principally dependent upon the movement of total activity. Microeconomic analysis starts from the other end and makes the total dependent upon the parts. Generally, econometric analysis is neither completely one nor the other, but we shall see that models can be characterized by this division.

The econometrist in setting up his model must constantly choose between simplicity and reality. A small number of equations reduces complexity and makes for a workable system. Actually, however, many economic variables are influential and should be represented.

The length of the time unit employed is also a matter of major difficulty. The use of monthly data results in a great many points and adds to the complexity of the problem. But the use of yearly data misses a major part of economic change because of the degree to which cyclical movement occurs within a year.[16]

Relationships between variables are assumed to be constant or to vary in a manner predetermined by a set of equations. These assumptions can be changed by adjusting the equations, but frequent adjustment makes the problem extremely complicated. Of course, if the operation of causal factors could be precisely described, adjustment

[16] See A. F. Burns and W. C. Mitchell, *Measuring Business Cycles* (New York: National Bureau of Economic Research, 1946), pp. 203–69.

of equations would be unnecessary. Tinbergen says, "Describing phenomena without any sort of regularity or constancy behind them is no longer theory. An author who does not bind himself to some 'laws' is able to 'prove' anything at any moment he likes. But then he is telling stories, not making theory."[17] This draws the line of disagreement on one of the most important issues. Most theorists will agree that some regularity exists, but the question is whether we know enough about the regularity to make precise mathematical formulation practicable.

The econometric system, by necessity, sets up as many equations as unknowns and thus makes a quantitative solution possible. This is of major importance because literary theories seldom become sufficiently definitive about relationships. If causes are precisely determined, relationships must exist to trace out their effects. The only way to be sure that satisfactory relationships have been established is to set up the equations implied; then the system is econometric.

Tinbergen holds the economic objectives of econometric analysis to be:

1. To clarify notions and assumptions of various theories and to localize differences of opinion.
2. To find the complete implications of any set of assumptions, for example, as to type of movement resulting, influence of given types of policy, etc.[18]

In the literary statement a notion can be stated vaguely, but the precise relationship to other variables is clear when put in econometric form. To set down equations, assumptions cannot be ignored; the assumptions are what the equations describe. Since differences of opinion so frequently have turned around poorly stated assumptions, the differences between theories should be made much clearer by econometrics.

Tinbergen holds that mutual causation can be cleared up by econometrics. He says that it might be stated that the variable A in time 1 influences the variable B in time 2, while variable B in time 1 influences variable A in time 3.[19] Often, mutual causation may be known to exist, but the relationships may be very complicated and not precisely known.

Tinbergen holds that the statistical objectives of econometrics are as follows:

1. Either, more modestly, to find such values for coefficients, etc., as are not contrary to observation.

[17] "Econometric Business Cycle Research," *Readings in Business Cycle Theory* (Philadelphia: Blakiston Co., 1944) p. 71.

[18] *Ibid.*, p. 62.

[19] *Ibid.*, p. 73.

2. Or, more ambitiously, to prove, under certain conditions, something to be true or not true.[20]

We shall see in the following section that there is a choice between the econometric method and the statistical method in making statistical measurements. All methods share the ambition to demonstrate truth or untruth. Tinbergen believes that econometric methods prove the acceleration principle to be false.[21] In order to accept his conclusion, however, we must accept both the assumptions he uses and the representativeness of the statistical data he employs.

Tinbergen leans in the direction of microeconomic analysis. He traces the influence of major industries and processes on total activity and shows how this might produce an estimate of the level of total activity. L. R. Klein, on the other hand, is setting up an econometric model based on macroeconomic assumptions. He classifies variables as autonomous or induced. Induced variables are those whose level is determined by the level of GNP, while autonomous variables must be derived independently. Since the major part of GNP is thought to be made up of induced variables, GNP is the major determining variable. The difference in the methods employed by Klein and Tinbergen can be accounted for by the fact that Tinbergen was delegated by the League of Nations to test various theories which were partially stated in microeconomic terms; Klein is starting with the purpose of making an econometric model from the Keynesian system.

A method of model analysis analogous to the equational relationships of the econometrists is illustrated by the work of L. A. Metzler. He is working on the problem of the way in which inventories move in cycles. By making different assumptions with respect to several economic factors likely to influence inventory accumulation or depletion, he traces out the induced cyclical changes in inventories by use of tables which show the way inventories would rise and fall over a period of time. This is an intriguing method which has been looked on with favor by many economists. It makes possible a precise determination of the cyclical movement which would result in a given variable under various specified assumptions. The difficulty is that it attributes the influence to only one major process, and other cross effects covered in a more inclusive econometric system must be ignored for the time being.

The econometric business-cycle model is more promising as an objective for the future than as a reality today. Joseph A. Schumpeter,

[20] *Ibid.*, p. 62.

[21] J. Tinbergen, "Statistical Evidence on the Acceleration Principle," *Economica*, Vol. V (May, 1938).

a member of the Council of the Econometric Society, has made the point in the following words:

> The highest ambition an economist can entertain who believes in the scientific character of economics would be fulfilled as soon as he succeeded in constructing a simple model displaying all the essential features of the economic process by means of a reasonably small number of variables. Work on this line is laying the foundations of the economics of the future and should command the highest respect of all of us. A few immediately valuable results it has produced already. . . . With the same frankness with which I have expressed my high opinion of the future, I must confess to a feeling that at present the premature and irresponsible application to diagnosis, prognosis, or recommendation, of what of necessity are as yet provisional and flimsy constructions can produce nothing but error and can only result in discrediting this pioneer work.[22]

6. THE STATISTICAL APPROACH

Statistical methods, like econometrics, are not bound by any particular cyclical hypothesis. In its purest form, the statistical method presents information with a minimum of assumptions. Unlike econometrics, it is unnecessary to begin with a statement of the character of assumed relationships. Statistical analysis is, in fact, an essential preliminary step in econometric analysis, for it is necessary to make preliminary checks to see whether or not the proposed relationships assumed in the econometric equations have any factual basis.

The statistical approach to business-cycle analysis may, however, be used without any subsequent econometric analysis. The analyst may not be convinced of any particular logical relationship among various economic variables and may prefer to depend on empirical conclusions or to delay for an extended period decision on the next step of analysis. The work of Wesley Clair Mitchell best represents this method. Mitchell has been devoting his major attention to the statistical study of the business cycle for forty years. Since 1920 this work has been carried forward under the auspices of the National Bureau of Economic Research. In his 1913 volume on business cycles, Mitchell set the pattern for business-cycle analysis, and his 1927 volume remained relatively unchallenged for many years.[23] The first companion volume did not appear until 1946, nearly 20 years later.[24] In the meantime the econometric and Keynesian analyses rose to prominence.

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[22] "The Decade of the Twenties," *American Economic Review*, XXXVI, Supplement, Papers and Proceedings (May, 1946), 3.

[23] *Business Cycles* (Berkeley: University of California Press, 1913); *Business Cycles: The Problem and Its Setting* (New York: National Bureau of Economic Research, 1927).

[24] A. F. Burns and W. C. Mitchell, *Measuring Business Cycles*, Studies in Business Cycles No. 2 (New York: National Bureau of Economic Research, 1946). See outline of the method of measurement employed in Chapter IV, Section 2, pp. 84–86.

The method of business-cycle measurement employed by Mitchell is outlined in Chapter IV. His immediate objective is to show the similarities and differences in the average business-cycle movement in as many significant statistical series as possible. The number now analyzed is well over a thousand. One long, statistically adequate series is taken to be as good as any other for the purposes of analysis, even though it may not well measure any economic process as such. The pig-iron production series is much preferred to the steel-ingot production series. The reason is that, although steel-ingot production is a better measure of the steel industry, pig-iron production is available for a longer period. Emphasis on the length of period for which data are available reflects limitations set by the averaging method employed. Too few cycles are available to produce meaningful averages for most series. Under these circumstances, some difficulty may be experienced at the stage of analysis described in the following paragraph when attention is turned to the analysis of separate economic processes. Sooner or later the question of how effectively these series do represent economic processes will have to be faced.

Measuring Business Cycles provides an outline of the method of measurement employed and the statistical checks made to be sure that better results would not have been achieved by alternative procedures. Very few of the averages obtained for the thousand series are as yet available. The averages will now be studied separately to throw light on major economic processes, such as manufacturing production, construction work, transportation, inventories, commodity prices, wages and employment, consumer income and expenditures, formation of new business firms, money and banking, foreign commerce, and international financial relations. It will be impossible to evaluate the effectiveness of the method until the results are applied at this initial stage. Drawing on the information obtained in analyzing the various economic processes, a final volume is projected to weave together into a theoretical account a statement of how business cycles run their course.[25] Little can be said, however, about the effectiveness of the method until some of the results are available.

In judging effectiveness of the statistical approach, attention must not be given only to Mitchell's present ambitious program. In a simpler framework, statistical empiricism is still the most widely employed method in examining business cycles. It is a "middle-course" method. Recognizing the complicated character of the business-cycle movement, the analyst may refuse to commit himself to any precise relationships between economic magnitudes. Failure to set up an econometric system may not reflect ignorance of its necessity if a

[25] We have been promised for the near future a summary preview of this final volume.

definitive theory is to be espoused, but only an unwillingness to espouse any definitive theory for the time being at least. The analyst may feel, as does the author of the present book, that processes which play the major roles in determining economic change vary from cycle to cycle. Many of the conclusions in the present book are statistical, but they do not for the present indicate the outlines of a definitive theory.

One is entitled to hold that failure to develop a definitive theory results from incompleteness of knowledge. A definitive theory would make it possible to lay out the course of future history before us. Few persons sincerely believe that this can be done at the present time.

REVIEW QUESTIONS

1. Point out the major change in Keynes's position from 1930 to 1936.
2. Draw up a description of how a businessman might go about figuring the marginal efficiency of capital.
3. What is the difference between overinvestment-underconsumption theory and underinvestment-underconsumption theory?
4. Explain the different types of market interest rates emphasized by Keynes and Hawtrey.
5. Why is the interest rate so frequently given a central position in business-cycle theory?
6. Why can it be said that Harrod develops a theory of the business cycle and that Keynes does not?
7. How would Keynes's theory differ from monetary overinvestment if planned savings turned out to be deficient in prosperity?
8. Why is *ex ante* investment likely to be equal to *ex post* investment?
9. Compare Harrod's static and dynamic determinants with the limiting and reinforcing forces described in Chapter VI.
10. Compare Keynes and Harrod as to emphasis on psychological factors.
11. How much uncorrelated variation might occur if a high correlation is found between a series and 80 per cent of itself? Give an illustration involving fifteen points in time.
12. Compare cyclical with secular changes in propensity to consume.
13. What is meant by "savings offsets"?
14. List the pro and con arguments for stagnation.
15. If capital-saving investment has been going on for a long time at about the same rate, could it explain stagnation?
16. Should there be, implicitly or explicitly, an equation for every unknown in any theory?
17. Differentiate the statistical from the econometric approach.

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CHAPTER IX

OPPOSING THEORETICAL POSITIONS

IN THIS final chapter on business-cycle theories, brief consideration is given to discordant economic beliefs regarding the nature of business fluctuations. The purpose is not to establish final verities or to solve issues by dogmatic assertion but merely to show clearly the points where the differences are verbal rather than real and to present a tentative interpretation of the differences. A mere statement of the difference of opinion reduced to its simplest terms will not suffice to present the problems clearly to the student. The issues must be resolved, however inadequately, to give the reader insight into the nature of agreement or disagreement.

1. LAWS OF PRICE AND SHIFT IN THE DEMAND CURVE[1]

Market prices are established by the interaction of demand and supply schedules showing the quantity of any specified good which will be furnished and taken off the market at various prices. Statically, this is a rational conception of indubitable merit. When there is a relatively complete employment of resources, other things being equal, the quantity demanded by the consumer will vary inversely with the price. When the extent to which total resources are employed is shifted, this condition is changed. More of most commodities will be taken if the prices remain the same, or even if they increase, when an increase in the total resources employed is occurring. The reverse situation arises when the total resources employed are decreasing. This relationship accounts for H. L. Moore's discovery that the higher the price for steel or pig iron the greater the quantity taken.[2] This illustration definitely does not represent a positively sloping demand

[1] Particularly valuable in this connection is F. C. Mills's *Price-Quantity Interactions in Business Cycles* (New York: National Bureau of Economic Research, 1946), which provides an extensive statistical record of correlated price-quantity variations over the business cycle.

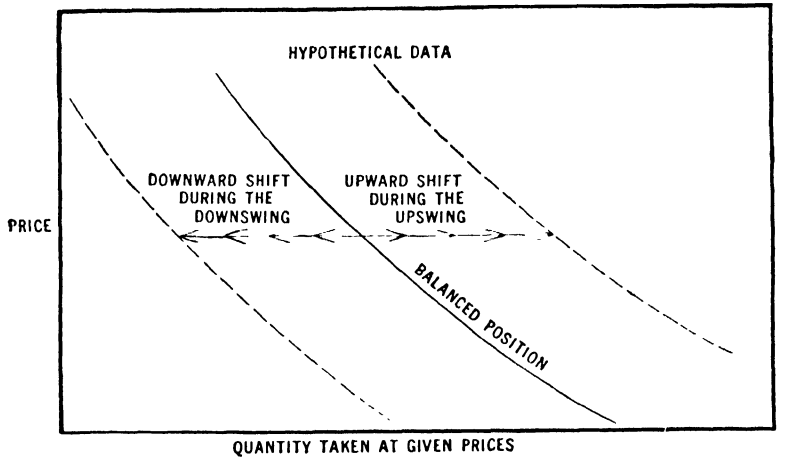
[2] See H. L. Moore, *Economic Cycles: Their Law and Cause* (New York: Macmillan Co., 1914), pp. 110–16. The best work to date on the demand curve for steel has been done by R. H. Whitman and T. O. Yntema. See Whitman's unpublished thesis *Statistical Investigations in the Demand for Iron and Steel* (University of Chicago, 1933); also his article in *Econometrica*, IV (April, 1936), 138–52. Yntema headed a group studying this problem for the U.S. Steel Corporation. See the Corporation's *T.N.E.C. Papers*, Vol. I (New York, 1940).

curve as he first thought, but a shifting demand curve. The type of effect is illustrated in Chart 13.

The course of prices from depression to prosperity will be positively sloping, but only because it represents points on different demand curves shifting farther and farther to the right.[3] The shifting demand-curve effect differs for various commodities. In the case of agricultural commodities, the principal cyclical variation is in the supply curve, and we shall find in Chapter XIX that the demand schedule can be used effectively for forecasting in this case. If the principal shift is in

CHART 13

SHIFT IN THE DEMAND CURVE



the demand curve, as it is in most manufactured goods, the data do not effectively define any particular demand curve. Reasoning in terms of the demand curve may be of value, but the business cycle cannot be explained by it.

As many students have pointed out, one of the most striking things about the business cycle is the positive correlation between quantity of output and unit price. Output and price usually move in the same direction. Since output times price equals value, the value of output varies with the business-cycle movement. The total influence over the business cycle is, therefore, best described by a value aggregate, such as gross national product, but the change in activity is traced best by the quantity output of goods and services only.

[3] Not only does the demand curve shift to the right in prosperity, but, in accordance with Harrod's theory developed in the preceding chapter, it becomes more inelastic, or less flat, the farther it moves to the right.

One of the most difficult problems in business-cycle theory is the extent to which variation in price is a substitute for variation in the quantity of production. In agricultural production, prices vary a great deal, and with the business cycle; quantity of output varies much less, and with weather conditions. It is often contended that the variation of agricultural prices absorbs the business-cycle maladjustments, keeping the quantity of output relatively steady. It is further contended that the same type of adjustment could be applied to manufacturing industry if competition prevailed.

The nature of agriculture makes for marked variation in the supply curve—the scale of prices at which various quantities will be supplied. The farmer plants the land under his control and cultivates the crop. Short of a price so low that harvesting costs (exclusive of his labor) will not be met by market return, he harvests the crop and puts it on the market. The manufacturer is faced with a considerably different situation. Since the factory system grew up, he has set an "administered" price which his salesmen can quote. The specialized nature of his product usually makes it impossible to set prices by open bidding on the market. Any change in price is thus influenced in part by the manufacturer himself, while the change in price for agricultural products is directly determined by the market. The manufacturer usually does not start production so far ahead of maturation as the farmer is forced to do. The manufacturer knows quite definitely what his output will be when he orders the factory to start working; the farmer is quite uncertain because of the vagaries of the weather. Thus, no matter what additional competitive force might be applied to the manufacturer, his situation would still remain quite different from that of the farmer.

In conclusion, it may be stated that there is no reason to believe that price variation is a substitute for quantity variation over the business cycle in the same way that it is in static-demand curve analysis. Statically, a large supply sells on the market at a lower price and the market is cleared. This could happen if there were no business cycle but will not happen if there is one. What is implied, therefore, is an integrated theory of economic change, for example, a monetary theory. If price variation is held to be a substitute for quantity variation over the business cycle, the business cycle may be attributed to price variation. If monetary theory is correct, at least other factors creating variation must be considered, as shown in the preceding chapters.

Another way of stating the major indictment against the price-quantity demand curve as a basis for analyzing business-cycle changes is that it is microeconomic in the sense that the price of each com-

modity is considered to depend upon the quantities of the particular product put up for sale. Total demand is implicitly assumed to remain stable. However, since variation in total demand is the major determinant over the business cycle, just the reverse should be assumed—total demand should be made the independent variable. For this purpose, the value output of individual commodities should be plotted on the y-axis against total disposable income on the x-axis. The slope of the resulting curve is called the *income elasticity* of the product under consideration. It tells how much will be spent for a given commodity at any level of total income. This method will give fairly satisfactory estimates of the demand for individual commodities at an assumed level for total demand. The reason for the satisfactory result is stability in the structure of production: any given level of total output for a given time may be broken down into predictable proportions among major industry groups.

2. MONETARY PHENOMENA VERSUS EMOTIONAL RESPONSE

R. G. Hawtrey has often said that psychological theory is the only serious rival of his monetary theory. Together with the variation in the production of durable goods, monetary variation and variation in psychological reaction do stand out as most important. Emotional response can best be characterized by Pigou's famous expression: "Optimistic error and pessimistic error, when discovered, give birth to one another in an endless chain." If activity rises too high, the explanation might be the psychological excesses of emotional response, or it might be excessive credit.

Emotional response shows itself essentially in price variation. The market response to optimism is a price rise; the market response to pessimism is a price decline. In actual fact, therefore, monetary and psychological variation are closely related. Monetary theory holds that the business cycle would not exist if all prices, including interest rates, wage rates, etc., promptly performed their proper function. But there must be good reasons for the misbehavior of prices. Psychological reaction is a possible way of explaining it. Viewed in this way, emotional response is a more fundamental cause than monetary factors.

As a clue, however, monetary variation is superior because its changes can be measured while psychological forces cannot. Both theories fail to explain the changes in real processes resulting from such factors as weather or improved technological processes. If monetary or psychological theories are held, it must be accepted that real changes set up self-adjusting processes. The part played by technological change in the principle of innovation illustrates a reason for

doubting the sufficiency of the causal conditions provided by either monetary variation or emotional response.

3. FLOW OF FUNDS AND FLOW OF GOODS

Until recently it was universal to consider price only in connection with individual commodities and factors. It was considered necessary to cancel out price variation in order to get at the heart of the business-cycle problem. Goods and services, not money, are produced and consumed. Not uncommonly, economic activity was thought of in terms of a flow of goods and services. The processes of production flow forward and yield an outpouring of goods for consumption.

We have learned more recently that the analysis is significant in terms of a flow of funds. The use of money does not cancel out merely as a medium in terms of which the exchanges are effected. Hoarding and dishoarding arise. At one time all of the purchasing power made available by the productive system is not used to buy goods; at another, more purchasing power is used than currently released by the productive mechanism. Purchasing power can be added to by (1) increased velocity of circulation of funds already in existence, and (2) credit expansion.

The flow of funds is a fertile study, not only because the disposal of funds in general may introduce influences which react on the flow of goods, but also because distributional influences can best be analyzed in terms of the flow of funds. Shifting distribution of income among the recipients according to amount received is a significant influence in the business cycle. It can best be studied in terms of flow of funds. Shifting proportions of the total money amounts paid to various groups reflect the processes of change over the cycle. To study the amount of goods going into each income stream is somewhat unrealistic because in the upper-income brackets a large proportion of the goods indirectly purchased are investments and do not reflect current consumption. Measurement of the shifting distribution of goods is made difficult also because the type of goods purchased by people in the lower-income strata changes to some extent with variation in the total amount of income.

It is one thing to recognize the independent significance of the flow of funds and another to become so preoccupied with it as to disregard entirely the underlying flow of goods. The flow of funds is significant only because of its effect on the flow of goods. The variation in physical activity arising in the business cycle is the process of central interest. If there were no such variation, the business cycle would be of no great importance. It is well to recognize also that variation arises independently in the real processes where technical change is a factor.

The flow-of-funds approach produces a very different conclusion from that of the flow-of-goods in the outlook on long-term price movements. Hayek and other monetary theorists think in terms of the flow of goods and propose a relative constancy of the income stream so that productivity changes will produce secular reductions in the price level.[4] The idea is to keep money "neutral" and to prevent the development of change resulting from increase in the supply of money. Schumpeter and Robertson, among others, hold just the opposite point of view. They contend that a price decline is restraining and that it leads to the postponement of action. If prices drop 2 per cent a year to offset productivity increases, businessmen would often be tempted to delay the making of investments because of the prospective lower costs in the future.

It is hard to believe that the prospective price decline would not be taken into account in business plans. Thinking too narrowly in terms of the flow of goods fails to recognize the influence prospective price changes have on business decisions. It is possible that a compromise position might be the proper one in this instance. The restraining effect of price declines should be recognized, but the need for price declines in consumer products where rapid cost reductions are made possible by technological change should appear apparent. Price declines might be encouraged in all areas where productivity increases are occurring, but not to such an extent that the average price level would decline to any great degree.

4. PROFIT PROSPECTS VERSUS ADEQUACY OF PURCHASING POWER

Enterprisers are governed predominantly by profit possibilities, which provide the guiding hand to economic activity. Profit prospects are principally dependent upon the relation between costs and prices, and the profit margin is the difference between the two. A widening of the margin is expansionary; a narrowing of it is deflationary.

Attention should be called to the fact that the actual or changing width of the profit margin at any time does not measure the *prospective* profit margin. For instance, if capacity operation were being rapidly approached, the margin might be widening rapidly, but the prospect might be for a distinct narrowing as soon as resources were used quite fully. A rise in costs would be anticipated because of the drawing into use of inferior resources, but there might be no similarly good reason for expecting a rise in prices. When the period of gestation in capital

[4] See further the development of this position on page 180 in Chapter VII. Hayek proposes that the supply of money not be increased to allow for population increases, but the other monetary theorists do not follow him with regard to population changes.

production is ending, the profit prospect may differ greatly from the actual margin for another reason. Demand for final products is not likely to show an immediate increase commensurate with the increases in capacity becoming available, and the resources used in constructing the capacity cannot readily be shifted to other uses. Prices tend to weaken on the consumer market, while the rigidity of costs makes immediate adjustments difficult.

In many current conceptions, purchasing power stands directly opposed to profits as a factor of importance in analyzing business-cycle changes. Smooth functioning of the economic system necessitates enough purchasing power in the hands of prospective consumers to enable them to clear the supply of goods placed on the market. As long as people continue to purchase the supply of goods currently being made available, no breakdown will occur. High profits may be definitely in conflict with a distribution of purchasing power adequate to clear the markets. Profits principally flow into the hands of a limited number of people who cannot absorb enough of the quantity output of our facilities to sustain large-scale production. When these profits become too large, an undue amount of purchasing power will be saved. If profits continue to increase, the consumers in the lower-income strata tend to receive a smaller and smaller proportion of the total income. Inadequate purchasing power becomes a limiting factor.

Many students who have placed much emphasis on the part played by profits have nevertheless decidedly disapproved of their role. Thorstein Veblen's position, for instance, is notable in this respect. Thinking of profits as important does not necessarily imply the conception that increasing profits are wholesome. One may logically hold that high profits do absorb an inordinate amount of purchasing power; yet may believe that this is indicative of narrowing profit margins to come which will make for reduced activity. One factor in prospective profits is the extent to which high profits themselves might be retarding.

The same facts can be viewed in terms of adequacy of purchasing power. The amount of purchasing power available to buy consumer goods becomes potentially less and less adequate as profits expand. Direct contradiction between the purchasing-power and profit conceptions arises in terms of recommended action. If purchasing power is accepted as the all-inclusive clue, increasing costs are looked upon as of little moment. Preoccupation is with the adequacy of purchasing power. To expand purchasing power, rising wage rates are favored, even though increased costs result. Rising prices make a given amount of purchasing power go less far on the market, and they are therefore viewed as essentially *deflationary.*

Carried to this limit, the purchasing power conception is decidedly unrealistic. Profits are a major consideration in our economy whatever may be one's moral judgment regarding the desirability of this situation. Rising prices can be expansionary because they lead to the accumulation of inventories, to the making of replacements and repairs, and to the building of new plants. All of these processes result in the pouring of additional purchasing power on the market and may be incorporated in a purchasing-power theory, but the incentive is profit making, and important processes are likely to be overlooked unless this process is given due consideration. Increased wage rates add to costs and thereby make enterprisers hunt for places to pare expenses by lopping off activities not immediately essential. The result is reduced purchasing power. The process could again be incorporated in a purchasing-power theory but not unless a great deal of emphasis were placed on the influence of expected profits.

Purchasing power is markedly inferior to profit prospects as a factor in terms of which business-cycle variation may be analyzed because so many processes react upon it only indirectly. Purchasing power is an end result instead of the center of the processes in the way profits are. Investment activity is the important center of dynamic variation. The prospect for profits is the major consideration in both capital expansion and inventory accumulation. Although purchasing power is the result of the processes, it is a less effective clue than profits. Examination in terms of results is likely to overlook characteristic processes producing the results.

The shifting adequacy of purchasing power over the business cycle is unquestionably a process which may well be given consideration. Emphasis on it in recent years has brought out certain characteristic variations which have often been overlooked when attention was centered on profit prospects. Notable in this respect is the shifting distribution of income over the cycle. Probably it is inadvisable to look at variation exclusively in terms of any one clue. If a decision must be made between profit prospects and purchasing power, the former would appear to rate much higher. It is to be recognized, nevertheless, that statistical data on expenditures provide the best approach to business-cycle forecasting, as developed in Chapter XVIII.

5. OVERPRODUCTION VERSUS OVERCONSUMPTION

The rate of spending reaches its peak in prosperity. This fact has led many to emphasize it unduly as a primary factor in the business cycle. They attach moral opprobrium to the purchase of luxury goods and to installment buying which mortgages future income. Conspicu-

ous waste in consumption, of which Thorstein Veblen made so much, without doubt reaches a peak in prosperity. We are not concerned here with the morals of such consumption. It is an important influence in the business cycle only because such consumption is readily postponable and because it can be reduced in the downswing. In the face of the trying conditions existent in depression, most wealthy people would not dare engage in conspicuous consumption, even if they still had adequate income. Spending which arises only in good times is disrupting. It stimulates activity at times when submarginal resources are already drawn into use.

Installment buying may increase to a critical level the credit position of many individual consumers. This may lend instability if a large group of consumers find that current installment payments attain an unreasonable proportion of income receipts. A likely situation is that installment credit built up to such a precarious level will be rapidly deflated once a downswing gets started for other reasons.

Installment credit makes possible the current spending of future income. Even more important than the credit position to which this may lead is the acceleration in the rate of expansion in output which may result. Credit is used principally in the purchase of durable goods. When installment purchases are being made at a rapid rate, the supply of durable goods is being added to at a much more rapid rate than current income could finance. This is fostered in good times by the scrapping of durable goods at an earlier age and by the rapid addition of new users whose income prospects will permit buying the goods at current prices.

Adding to durable goods, at a much more rapid rate than they are normally wearing out, accelerates the rate of increase in the expansion phase of the cycle and may be truly characterized as overproduction in the sense that more is being produced than is being consumed. The difference transcends the amount desirable for normal growth. The principal reason for general overproduction in prosperity is the excessive rate at which durable goods are produced in relation to the effective capacity to consume. It may be fostered to a certain extent by the accumulation of inventories of manufactured goods. For example, in a prosperity accompanied by a major price rise, inventory accumulation may attain major importance.

In the past, overproduction has occurred predominantly in capital rather than in consumer durable goods. Industrial development has arisen principally in prosperity periods. This development has typically overreached itself. Capital formation has proceeded at a much more rapid rate than could long continue with a comparable rate of output of products. With the increasing importance of consumer durable goods their overproduction becomes a danger. Consumer

durable goods can be overproduced without the use of installment credit. An inordinate part of the increasing income made available as activity rises is used to buy durable products. Such a rate of increase is likely to be higher than can be long maintained.

In one sense overspending ideas are strikingly incorrect. Overconsumption does not occur in prosperity in the sense that we are living beyond our means. A prosperity definitely does not represent a splurge in consumption which must be made good later. More than the amount consumed is currently produced, not less. Even the most ardent purchaser by installment contract does not consume more rapidly than he earns, or, if he does, those granting credits do not operate on a business basis. Installment payments are fixed so that they are *greater* than the rate at which the buyer wears out the good.

Overinvestment enters into many of the theories analyzed in the two preceding chapters. Overproduction is slightly more inclusive, for in addition to construction, producer equipment, and inventory accumulation, it includes durable consumer goods. The structure of production becomes maladjusted because an excessive amount of all durable goods is made. It will be remembered that the position of the early underconsumptionists was also one of overinvestment.

Keynes ushered in the first significant underinvestment theory with the publication of the *General Theory*. This is truly an underproduction theory in that excessive planned saving over investment is held to keep the level of activity continuously below capacity production or full employment. The Keynesians do not, in the manner of the overinvestment theorists, emphasize a maladjusted structure of production as a prosperity difficulty. They do admit that investment programs in prosperity reach higher levels than can be sustained continuously without artificial support, but they do not think the central problem is disproportionate capital expansion. Rather, they believe the problem to be inadequate investment opportunities. They see, of course, that investment is relatively larger in prosperity than at any other time but not sufficiently large to absorb all saving at all times. If the propensity to consume greatly decreases, savings become disproportionately great in prosperity.

6. MARGINAL EFFICIENCY OF CAPITAL VERSUS PRODUCT DEMAND

Marginal efficiency of capital is defined as the ratio of the expected yield or return of an additional capital asset during its life to the cost of this asset. Keynes holds that the marginal efficiency of capital is too low because of inadequate investment opportunity.[5] Actually, how-

[5] See Chapter VIII, Section 4, pp. 199–204.

ever, most enterprisers think only very vaguely in terms of a prospective rate of return. Certainly they should rationally think in terms of the prospective rate of return if they could develop some plan for expected capital needs for the kind of products they are making. As developed elsewhere, this would involve planning according to the secular trend, but such a procedure is not feasible for most companies now because of the danger that the secondary trend will drift indefinitely away from secular trend levels.

It would appear, therefore, that a more realistic method to evaluate the profitability of capital investment is to analyze the current demand the enterpriser sees for the product. Harrod takes this position. If this is representative of the way capital investments are made, there is some approximately constant proportion of total output which should go to capital formation. If capital formation comes to represent too large a proportion of total output, the consumer product demand would not be large enough to sustain it. If, as occurs in the upswing, capital expansion proceeds at a much more rapid rate than does consumer product output, the proportion of total output going to capital formation is constantly increasing. The time will arrive, without any decrease in consumer product output, when the rate of capital formation is too large to appear warranted by the current output of consumer products. The acceleration principle shows that only replacements (no net capital formation) will be required *currently* when output of the consumer product levels off.[6]

If this position is correct, it has important implications regarding prosperity expansion. The expansion of investment reaches a disproportionately high level which cannot be sustained indefinitely. The distribution of product at prosperity levels can be maintained indefinitely by implementing investment programs only if public works replace most of the private net capital formation. The amount of public works required would be so large that a private enterprise economy is not likely to attempt it.

It is possible, of course, that planned saving may tend to be greater than planned investment in future prosperities and will keep investment activity from becoming disproportionately large. Our examination of the consumption function and stagnation thesis in the preceding chapter, however, raised substantial doubt regarding the probability of excessive planned saving in prosperity.

7. THE ROLE OF THE INTEREST RATE

Interest rates appear to play a much less crucial role under current conditions than Keynes assigned to them. This is partly because the

[6] See discussion of acceleration principle, Chapter V, Section 3, pp. 115–18.

marginal efficiency of capital is not a practicable concept to represent motivation in investment markets as long as no trustworthy projections can be obtained of long-period prospects in various industries. Investment programs generally are not "pushed to the point where there is no longer any class of capital-asset of which the marginal efficiency exceeds the current rate of interest,"[7] but they are pushed to the point where investment programs appear out of line with current consumer markets. The author does not propose that this is a rational or desirable situation, but it appears inevitable in all industries where investment programs do not grow out of long-term planning. Interest rates play the part of only a minor yearly cost.[8] The amount of interest necessary to pay on capital built in a current year is a small cost relative to the outlay for building the capital asset.

The interest-rate role is also further reduced by the fact that businessmen do not depend principally upon interest-bearing securities to finance capital expansion in peak prosperity. Flotations shift to stocks and away from bonds. The stock is only remotely related to an interest-rate return because its price is bid up by an oversanguine appraisal of the current demand on consumer markets.

Although it does not appear that the interest rate can play the crucial role it might if long-term planning were possible, brief note may be taken of the controversy growing out of Keynes's liquidity-preference theory of interest. A detailed analysis of the interest-rate controversy is beyond the scope of this book, but very briefly, the classical position was that the interest rate is determined by the demand of and supply for real (dollar deflated) capital. This leads naturally to the position that the rate of interest is determined by the technical and psychological forces influencing the relative urgency of wants for present and future goods. If preference for present goods is relatively strong, technological inventions, etc. remaining the same, the interest rate will be high, and *vice versa.*

More recently, the loanable-funds theory gained wide acceptance. In essence, this theory holds that the interest rate is determined by the demand of and supply for investment funds. This differs from the earlier time-preference type of theory in that the market process is analyzed in terms of dollar amounts of funds for loan rather than in terms of real capital. Demand and supply schedules are conceived to determine the market rate of interest. The shape of the demand and supply curves is quite uncertain. For a considerable range of interest

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[7] J. M. Keynes, *The General Theory of Employment, Interest, and Money* (New York: Harcourt Brace & Co., 1936), p. 136.

[8] See, for instance, F. A. Lutz "The Interest Rate and Investment in a Dynamic Economy," *American Economic Review,* XXXV (December, 1945), 811–30.

rates the consumer may not vary substantially the amount of funds he would provide. If we are correct in the above generalization that the marginal efficiency of capital has but little determining influence, the demand curve is not fixed by a careful calculation of the amount of interest the enterpriser can afford to pay.

Keynes thought of his liquidity-preference theory of interest as separate from the loanable-funds theory, but many analysts have shown that it is an extension of this theory.[9] According to Keynes, the interest rate is determined by what he calls the liquidity preference of individuals and by the quantity of money (cash plus bank deposits) available at any given time. Liquidity preference is defined as the part of total resources a person will desire to retain in money at various interest rates. The motives for holding money are said to be derived principally from the need for funds to take care of current requirements, to provide for sudden expenses, and to take advantage of changes in prices of goods and securities.[10] The demand for liquidity is a demand for funds, just as the enterpriser has a demand for funds. The total demand is the sum of the liquidity demand and the investment demand. The addition of liquidity demand increases the rate required to obtain loanable funds. Since it represents a demand for keeping the funds idle, it means that the rate required to put intended savings to work is relatively high. The liquidity demand tends to increase in periods of uncertainty and therefore tends to drive up short-term interest rates in a period of liquidation.

If these theories are of any practical value, it should be possible to say what the very large bank deposits built up during the war will do to the interest rate. The deposit money is so great that liquidity-preference demand is not likely to have any influence on the interest rate in the near future.[11] After all requirements for liquidity preference are satisfied, the funds available for loan will be relatively large. Therefore, interest rates should remain low if a major increase in commodity prices is avoided. Should planned saving exceed planned investment, the market basis for a pure (all risk elements eliminated) interest rate above zero would disappear under present conditions.

Speaking of *the* interest rate, as is done in a large part of busi-

[9] See J. R. Hicks, *Value and Capital* (Oxford: Oxford University Press, 1939), pp. 153 ff.; W. J. Fellner, *Monetary Policies and Full Employment* (Berkeley: University of California Press, 1946), especially pp. 142 ff.

[10] See J. M. Keynes, *The General Theory of Employment, Interest, and Money*, pp. 195–96, where a fuller statement is given. See also J. M. Keynes, "The General Theory of Employment," *Quarterly Journal of Economics*, LI, 209–23.

[11] H. C. Wallich holds that deposit balances influenced primarily by liquidity preference at the present time may be in the range of 15 to 25 billion dollars, a small proportion of the total. See "The Current Significance of Liquidity Preference," *Quarterly Journal of Economics*, August, 1946.

ness-cycle theory, is obviously an oversimplification. Not one but a complex of interest rates occur. It is now generally agreed that the emphasis Keynes placed on the long-term rate, as contrasted with Hawtrey's emphasis on the short-term rate, is correct. The demand for funds for inventory accumulation is not great, but a large supply of funds must flow into investment if planned savings are to be absorbed.

While the interest rate may not represent a neat balance between calculated return on capital extensions and the rate required by lenders, the interest rate has *symbolic* significance. If, and when, rates rise substantially, either liquidity demand has greatly increased, the banking system is exerting a deflationary pressure, or the demand for funds is greater than the supply of savings. The rise reflects some major factor operating on total activity.

8. EXPECTATION AND OCCURRENCE

At least implicit recognition of the difference between anticipated conditions and recorded facts has always existed in economic analysis. Recent business-cycle theory has laid major emphasis on this difference. Everything we do is controlled by anticipation. Past records are important only because they may aid in the shaping of anticipations by shedding light on the current position and on the course expected. In other words, anticipated action is usually based on levels existing in the present or recent past. Hicks gives this fact explicit recognition in his concept *elasticity of expectations*. He defines "the elasticity of a particular person's expectations of the price of commodity X as the ratio of the proportional rise in expected future prices of X to the proportional rise in its current price."[12] The case where the elasticities of expectations are equal to unity marks the dividing line between stability and instability. "If elasticities of expectations are generally greater than unity, so that people interpret a change in prices, not merely as an indication that the new prices will go on, but as an indication that they will go on changing in the same direction, then a rise in all prices by so much per cent (with constant rate of interest) will make demands generally greater than supplies, so that the rise in prices will continue. A system with elasticities of expectations greater than unity, and constant rate of interest, is definitely unstable."[13] Stated in less technical language, expectation of a continued rise in prices is unstabilizing unless interest rates rise so much as to make inventory accumulation unprofitable. The influence of adding to inventories under these circumstances was examined in Chapter VI.

[12] J. R. Hicks, *Value and Capital*, p. 205.
[13] *Ibid.*, p. 255.

It is not the level of present prices which are most important in producing cyclical change; it is the expected change in price. Similarly, it is not present profits which are determining, as emphasized in previous chapters; it is prospective profits. These ideas are not new but merely have been given new emphasis by explicit statement.

The difference between expectation and occurrence plays a decisive role when expectations prove to be wrong. This aspect of the matter has been most emphasized by A. G. Hart and G. L. S. Shackle.[14] The shock which is produced when results are found to differ markedly from expectations will have a great deal to do with the activity immediately following. The effect is a *surprise*, which leads to a reappraisal of old bench marks and principles of action. As noted in Chapter XIII, the influence of surprises was strong in 1937. A slump was generally anticipated for the summer, but it did not arrive and optimism spread. Also, early in the year, autumn improvement after the projected summer slump had been anticipated. Instead, when September arrived, activity began to decline, and a feeling of uncertainty produced rapid liquidation. These two surprises in 1937, one following immediately after the other, represent an excellent example, but in a less spectacular way, the surprise effect often is important at critical times.

Tinbergen holds that anticipation is represented by the length of time into the future for which the enterpriser computes his profits. This he calls the enterpriser's "horizon."[15] Distress selling represents a shortening of the horizon. Inventories not immediately needed are sold because the enterpriser comes to think in terms of a much shorter period. The actions of businessmen imply longer or shorter periods of anticipation. These periods shorten in times of great uncertainty and lengthen in times of optimism. The horizon idea, then, is a link between psychological reactions and anticipations. In prosperity, a longer period is anticipated with greater confidence. Actions taken anticipate a longer period of activity in that capital is constructed and inventory accumulation may be increased. However, it is doubtful if more explicit attention than this is given to long-term forecasting.

Major attention has been devoted to the difference between expectation and realization in the case of saving and investment. In this case, more is involved than explicit recognition of implicit assumptions. In most economic theory prior to recent years, saving was not assumed to differ in amount from investment, either implicitly or

[14] See A. G. Hart, *Anticipations, Uncertainty and Dynamic Planning* (Chicago: University of Chicago Press, 1940); G. L. S. Shackle, "A Theory of Investment Decisions," *Oxford Economic Papers, No. 6*, April, 1942.

[15] J. Tinbergen, "The Notions of Horizon and Expectancy in Dynamic Economics," *Econometrica*, I (July, 1933), 247–64.

explicitly. Saving and investment were thought merely to represent two different stages in the process of capital formation, and it was thought that all saving automatically flowed into investment. The relationship has been found to be much less simple. As noted in various connections above, expectation is represented by planned or *ex ante* saving and investment; realization, by actual or *ex post* saving and investment. The important concept here is planned saving, for planned and actual investment are not likely to differ substantially.

Brief attention may be given to the possible cases where planned investment may differ from actual investment. One of the problems an enterpriser faces in making expansion plans is that of finding a source of capital, for it can hardly be said that his investment plans have matured until he has worked out this problem. Once these plans are made it seems unlikely that the source of capital will cause any further difficulty under modern banking systems, although the shortage of capital funds at the downturn is employed by the monetary theorists to explain the downturn. A high interest rate could at least theoretically deter the enterpriser, and it might make him give up his expansion program before his plans mature. Similarly, a decline in activity might lead him to reduce the program after it was already under way. These possible differences between planned and actual investment should not be ignored, but they are more nearly causes than effects of the cyclical movement.

Planned saving represents the amounts individuals propose to set aside for saving out of their future incomes. The controlling motives may be the particular purposes for which the saving is set aside, or there may merely be no goods sufficiently attractive at current prices to induce the individual to spend the part of his income set aside for saving. Whatever the motives are, they often bear little or no relation to the motives the enterpriser has in developing investment programs. Such an idea is not new; the interest rate was until recently thought to equilibrate savings and investment. The monetary overinvestment theorists employ the concept of the equilibrium rate of interest to represent the interest rate which would make investment programs absorb savings. Voluntary savings are thought always to be employed, although due to credit extension the market rate of interest may be under the equilibrium rate and lead to forced saving. Using the more modern terminology, we can say that in the monetary overinvestment system planned savings are inadequate. This produces an inflationary situation.

The Keynesian system employs almost the same conception but with a different forecast of future investment. The position is not that difficulty will arise from forced saving, but that it will arise from

failure to use all of the planned, voluntary saving. Saving added to expenditure accounts for all income of the preceding period; if the planned saving is used completely, the income level will be maintained. If the saving is not used completely a "leakage" occurs. Total expenditures, including investments, are not maintained and income declines. Keynes accounts for failure of the investment markets to absorb the total of planned saving by too low a marginal efficiency of capital in comparison to the long-term interest rate, a conception not significantly different from the monetary overinvestment theorists' relation between the equilibrium and market rates of interest.

The novel characteristic of the Keynesian position is involved in planned saving shrinking in the downswing to the amount of investment when transition is made from planned to actual saving, just as the novel characteristic of the monetary overinvestment position is involved in planned saving being augmented in the upswing by forced saving so that total actual saving comes out to be the same as investment. Both systems emphasize the process by which this shift from expectation to occurrence creates the respective deflationary or inflationary situation. In the Keynesian system, whatever is saved prospectively and not invested produces a decline in income sufficient to equate saving and investment. The monetary overinvestment system would produce a similar result if investment turned out to be less than planned saving. The Keynesian system would produce the inflationary situation forecast by the monetary overinvestment theorists if investment opportunities were estimated more optimistically than saving.

The fact that saving comes out to equal investment in realization is not novel; it was the orthodox position when savings were thought automatically to flow into investment. Its truth can be seen by various devices even though planned saving may be greater or less than actual saving. If everyone produced his own capital in a Robinson Crusoe manner, saving and investment would be one and the same process. When the individual saves in a money economy and holds out savings which are not spent on investment, income declines by the amount of the leakage. Thus, whatever was saved prospectively either went into investment or reduced income. But income is the total of consumer expenditure and investment. Income is reduced by whatever the leakage amounts to and realized saving is no more than investment.[16]

In saving-investment discussion, some terminological difficulty arises in describing the timing relationship between saving and invest-

[16] More realistically, if the full force of declining activity on reduced anticipations is taken into account, it should be noted that the process of cyclical downswing will further reduce planned expenditure.

ment. D. H. Robertson points out that income is not saved in the same period in which it is earned, but in the next following period. Defining a "day" as a period in time such that the earning in the first day becomes disposable for saving or spending in the next succeeding day, saving can be made to depend on the change in relationship between the two days. Income of the preceding day equals consumer expenditure plus saving of the current day. Or, saving of the current day equals income of the preceding day minus consumer expenditure of the current day. This is a more realistic concept than that of the concurrent equivalence between income and expenditure and between investment and saving. It brings the change and realization process together in the same equation. It is more complicated than the concurrent assumption, however, and has other disadvantages. The "day" cannot be determined effectively because of the wide variation in the way and time income is received. Therefore, at least for the present, such a conception cannot be represented quantitatively. At most times the disposable income out of which savings are made does not change much from month to month, and usually little error is introduced by comparing income, expenditure, saving, and investment in the same period.

9. DOES THE DOWNTURN START WITH CAPITAL OR CONSUMPTION?

Perhaps the most "practical" question that theory is called on to answer is whether the downturn starts with capital investment or consumption. Of course, resort could be had to empirical data, but the answer provided by such data is quite inconclusive. Empirically, the actual timing appears to be about the same, although it can be argued that, since investment programs take time to finance and to complete, a logical timing lead is reasonable.

The exogenous theories provide no clue which might lead to an answer to this question. Neither do the vague theories on profit or psychological motives. Hawtrey's monetary theory places the initiating change with the consumer-goods industries but with a shift in merchants' inventories rather than with consumption. The overinvestment theory places the center of disturbance in the capital-goods industries. These are thought to have expanded to such an extent that the distorted structure of production cannot be long maintained; there is thought to be too much demand for consumer goods to the very end of prosperity.

In underconsumption theory of the type espoused by John A. Hobson, the difficulty is that so much capital is built that after a while consumption expenditure cannot absorb its full product. Sub-

scription to the period-of-gestation concept by many members of this group means that they see the initial disturbance in glutted consumer markets. In one way or another, they would see the difficulty to lie in inadequate consumer demand, for that is the central point of their theory. In the overinvestment theory people save too little; in the underconsumption theory people save too much.

The Keynesians hold that the difficulty lies in insufficient opportunity to absorb the savings of the community and consequently in too little consumption. In the upswing, planned saving shortly comes to exceed planned investment, and a downturn arises before real prosperity is ever attained. In the Harrod adaptation, the decline is proximately caused by the acceleration principle. According to this principle, durable goods represent a demand derived from sales of the final product so that the initiating change also lies with consumption.

The Keynesian position differs from the monetary overinvestment theory in the outlook forecast. If the facts should demonstrate that planned investment will outrun planned saving up to a true prosperity peak, the framework of the Keynesians would place the proximate difficulty with the capital-goods industries. Savings would be inadequate to continue the capital-goods expansion. Even in this case, however, the Harrod position with respect to the acceleration principle fixes the proximate difficulty with consumer goods. The difference in view essentially would depend on the relative emphasis placed on the marginal efficiency of capital as compared to current product demand. If capital will continue to be built so long as the anticipated rate of return it will produce is in excess of the interest rate, sooner or later the interest rate will have to rise enough to restrict capital demand. If, on the other hand, the demand for capital comes from the indications shown on the current markets for consumer goods, these markets must produce the initiating change. It will not even be necessary, of course, for the consumer markets to fall off because the acceleration principle shows the market for durable goods declining when the rate of rise in the consumer markets is no longer maintained.

Thus, the answer given by the theories as to the source of the initial disturbance depends upon how fully the conditions anticipated by the theorists actually occur or upon how doggedly some one conditioning cause, like the acceleration principle, is rigidly maintained in a central position in the theory. If allowance is also made for psychological factors and the irregular occurrence of originating causes, the initiating cause might conceivably come either in consumption or capital formation. Emphasis also might be placed on the way the processes work themselves out, as in Chapters V and VI.

REVIEW QUESTIONS

1. Compare income elasticity with price elasticity.
2. Could the automobile manufacturers keep up the sale of automobiles by reducing the price of automobiles in depression?
3. Which is a more basic cause of the business cycle: credit expansion or over-optimism?
4. With advancing productivity, should average prices decline?
5. Is there good reason to believe that shift in expenditure because of a narrowing of income distribution in prosperity will be ignored by the enterpriser in making future plans?
6. Compare the timing of overproduction and overconsumption.
7. What does the enterpriser look for in making investment plans?
8. What part does interest rate play in economic change?
9. Explain the elasticity of expectations.
10. What is a "leakage" in the income flow?
11. Why is Robertson's conception of saving more realistic than Keynes's?
12. Classify business-cycle theories as to the area of initial disturbance.

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CHAPTER X

BUSINESS-CYCLE HISTORY: SURVEY

1. THE RECORDS OF BUSINESS CYCLES

IT IS not until the uses of money have reached an advanced stage in a country that its economic vicissitudes take on the character of business cycles."[1] Mitchell lists 13 developments which "have combined to produce the current form of business economy":

1. The commutation of feudal dues into money payments
2. The corresponding commutation of labor and commodity rents into money
3. The development of crafts with exchange of products
4. The rise of towns as trading centers
5. The invention of banking
6. The growth of retail shops
7. The excogitation of business law
8. The organization of joint-stock companies and their rise to dominance in most fields of business enterprise
9. The adoption of accounting as the technique for controlling economic ventures
10. The evolution of special organizations to provide for investment and speculation
11. The differentiation of the whole population into those who live on wages, on profits, on income from investments, or on an income which combines these types
12. The shifting of power from men of prowess or high birth to men of great wealth or marked business ability
13. The discomfiting of those whose talents are not such as to command considerable incomes in a money-making world[2]

Before the advent of these changes, there occurred famines, epidemics, and other catastrophes, but as soon as each crisis was over, industry automatically and almost immediately returned to a normal basis. Getting back to "normalcy" in those days was a matter of removing the unquestioned cause—an external, all-compelling factor. There were no consistent self-generating business responses to these external forces of unbalance. The fact that business cycles did not occur does not mean that life was any more secure in the Middle Ages—in fact, the opposite is true. The feudal peasant had a fair

[1] W. C. Mitchell, *Business Cycles* (New York: National Bureau of Economic Research, 1927), p. 74.

[2] *Ibid.*, p. 74. The numbers are assigned by the writer

chance of dying in any winter, and a very good chance of dying when there was a famine or an epidemic. "Life seems to have been more precarious, economic fortune more fluctuating, in a medieval town than in a modern city."[3]

The recurrence of bad times in the Middle Ages may be correctly described as a series of unrelated crises, but not as business cycles. W. R. Scott, from a minute study of British business records in manuscripts, official reports, books, pamphlets, and newspapers for the period 1550 to 1720, has made a summary report on the condition of trade. His list of crises is reproduced in Table 6. His report does not read like modern business-cycle history; it contains little more than a list of catastrophes, with an origin largely external to the business system in each case. The causes can be classified as famines, outbreaks of the plague, wars, civil disorders, irregularities of public finance, or highhanded acts of the government. Failures occupy a fairly important position, which represents a characteristic business response, but the chain of self-generating business-cycle forces is absent. Scott lists separately 38 years of "depressed trade," but there are 49 years covered by the 30 crises listed. He finds that crises tended to break out indiscriminately in either periods of depressed or prosperous trade. Further, periods of good trade tended to persist if no serious crisis occurred. Minute study of Scott's records shows no existence of the cyclical tendency—a uniform recurrence of phases.[4]

It is not until after the Industrial Revolution that the business cycle begins to attain its modern characteristics. The feudal system of the Middle Ages was largely controlled by hereditary relationships and custom. Under such a system a highly interrelated and delicately balanced business system could not develop. Of most importance, market competition was largely lacking.

The business cycle has not had the same self-generating characteristics throughout history. These self-generating forces seem to attain increasing significance as the division of labor becomes increasingly complex and as the business system becomes more highly interrelated. For this reason, computations of the average length of cycles and the average length of phases would have limited value even if the operation of self-generating forces were not constantly interfered with by originating causes.

No adequate summarization of business fluctuations is available for periods prior to 1560. Indeed, such summarization may not be possible from available records. It seems certain, however, that the

[3] *Ibid.*, p. 75.

[4] *Ibid.*, pp. 74–81. Scott explains the business fluctuations he found by "occurrence of the unforeseen." The typically unforeseeable factors are the originating causes.

TABLE 6

A List of Crises in England from 1558 to 1720*

Date of Crises	Remarks
1558 59	Famine 1556–8.
1560	English bills refused abroad because of financial difficulties of the government.
1563-4†	Plague, interruption of trade with Flanders, famine.
1569 74†	Seizures of English goods in Flanders, followed by failures. Norfolk's insurrection, followed by failures. Bad harvests from 1571 to 1574.
1586–7†	Babington plot, failures, bad harvest in 1587.
1596–7†	Famine in 1595–8.
1603†	Plague.
1616–17	Crisis in the cloth trade, disorganized by manipulations of James I.
1620-5†	Effects of crisis in cloth trade, Dutch competition in foreign trade, default of East India and Russia Companies, bad harvests, plague.
1630†	Famine, tonnage dispute, plague.
1636–7	Depression through the monopolies of Charles I, plague.
1640†	Seizure of bullion and of pepper by Charles I, plague.
1646-9†	Exhaustion of the country through Civil War, great dearth, high taxation.
1652–4	Losses of shipping in the Dutch War, possibly due to effects of the Navigation Act.
1659-60	Losses in Spanish War, especially in cloth trade, strain of continued high taxation.
1664–7†	Dutch War, plague, Great Fire, Dutch Fleet in the Thames in 1667. Run on bankers.
1672†	Stop of the Exchequer, failure of bankers.
1678	Prohibition of trade with France, expectation of war with Holland, run on bankers.
1682	Run on bankers occasioned by state of home politics, foreign trade little affected.
1686	Failure of Corporation Bank in 1685 on news of Monmouth's rebellion, depression in cloth trade, foreign trade still fairly prosperous.
1688	Revolution, run on bankers.
1696–7†	Financial strain of the war, exaggerated ideas of the nature of credit, bad harvests, suspension of cash payments by the Bank of England, failure of Land Bank schemes.
1701†	Tension between East India companies, political situation, run on banks and consequent failures.
1704†	Losses in the war, financial strain, tension between England and Scotland, fears of a French invasion, run on the Bank of England.
1710–11	Financial strain of the war, change of ministry.
1714	Fears as to the succession, run on the Bank of England.
1715	Rebellion.
1717	Walpole's conversion scheme.
1718	Fears of an invasion.
1720†	Panic, following the collapse of South Sea Bubble.

*Taken from W. C. Mitchell's *Business Cycles* (New York National Bureau of Economic Research, 1927), pp. 76–77. Original source: W. R. Scott, *The Constitution and Finance of English, Scottish, and Irish Joint Stock Companies to 1720*, I (London: Macmillan & Co., Ltd., 1912), 465–67. We have abbreviated some of the comments.

†Scott calls these serious crises.

modern business cycle did not exist at any earlier time. Available summarizations from 1720 to 1790 are inadequate. No one has ever been able to give a satisfactory answer to the question: when did the first business cycle occur in any country?[5] And the answer is not important, for the shift into the business cycle was gradual. In Scott's record of business conditions in seventeenth-century England we find business failures generating other failures. This process is characteristic of the self-generating cycle, and we might say that Scott found rudimentary business cycles, although the chief self-generating characteristics do not show themselves in Scott's records.

Willard Thorp has made a minute study of business records, similar to Scott's, but Thorp has collected the record for 17 countries in modern times. His source material consisted of "commercial and trade journals, reviews, magazines and papers, consular and diplomatic reports, and government records."[6] Annals collated in this way obviously express what contemporaries thought of business conditions at the time as distinguished from the actual condition which existed. Comparison of the Business Annals for the United States with fairly reliable statistical records since 1875, however, shows close concurrence between the two types of records.[7]

Thorp's Annals begin with 1790 for the United States and England. The Annals for France and Germany begin around the middle of the nineteenth century and two decades later for Austria. A complete record is available for 17 countries from 1890 to 1931. The record of the general round of business events portrayed is presented in Chart 14. It will be seen that these Annals vividly reflect the cyclical characteristic—a uniform recurrence of phases.

In terms of number of cycles covered, the Annals provide us with the major portion of known business-cycle history. Quantitative records of business conditions are exceedingly meager for any country prior to the last quarter of the nineteenth century. The recorded annual series are much fewer than those available today, and reliable monthly data, except for a few price series, are practically unavailable. Since significant changes often occur in cyclical conditions within a year, it is essential to have monthly or quarterly records. Leonard P. Ayres constructed a monthly Index of Business Activity back to

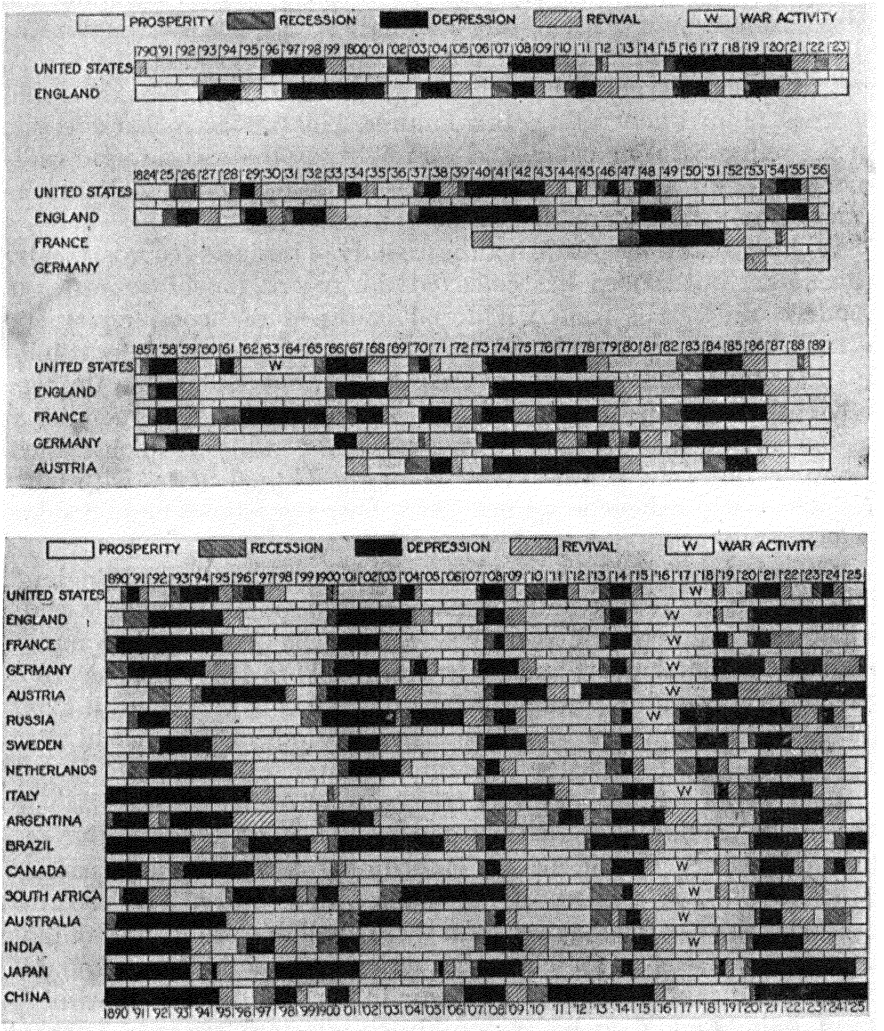
[5] Bouniatian seems to hold that this came in England in 1793. See Mitchell, *Business Cycles*, p. 81. Joseph Schumpeter presents an interesting interpretation in *Business Cycles* (New York: McGraw-Hill Book Co., 1939), pp. 220 ff.

[6] Willard Thorp and W. C. Mitchell, *Business Annals* (New York: National Bureau of Economic Research, 1926), p. 103.

[7] See Mitchell, *Business Cycles*, p. 423. The Annals presented here end with 1925, but have been worked out for 34 countries for the years 1926 to 1931, inclusive. See National Bureau of Economic Research, "The Depression as Depicted by Business Annals," *News Bulletin*, September 19, 1932.

CHART 14

CONSPECTUS OF BUSINESS CYCLES IN VARIOUS COUNTRIES, 1790–1925*



* Taken from Willard Thorp and W. C. Mitchell, *Business Annals* (New York: National Bureau of Economic Research, 1926), pp. 94–95.
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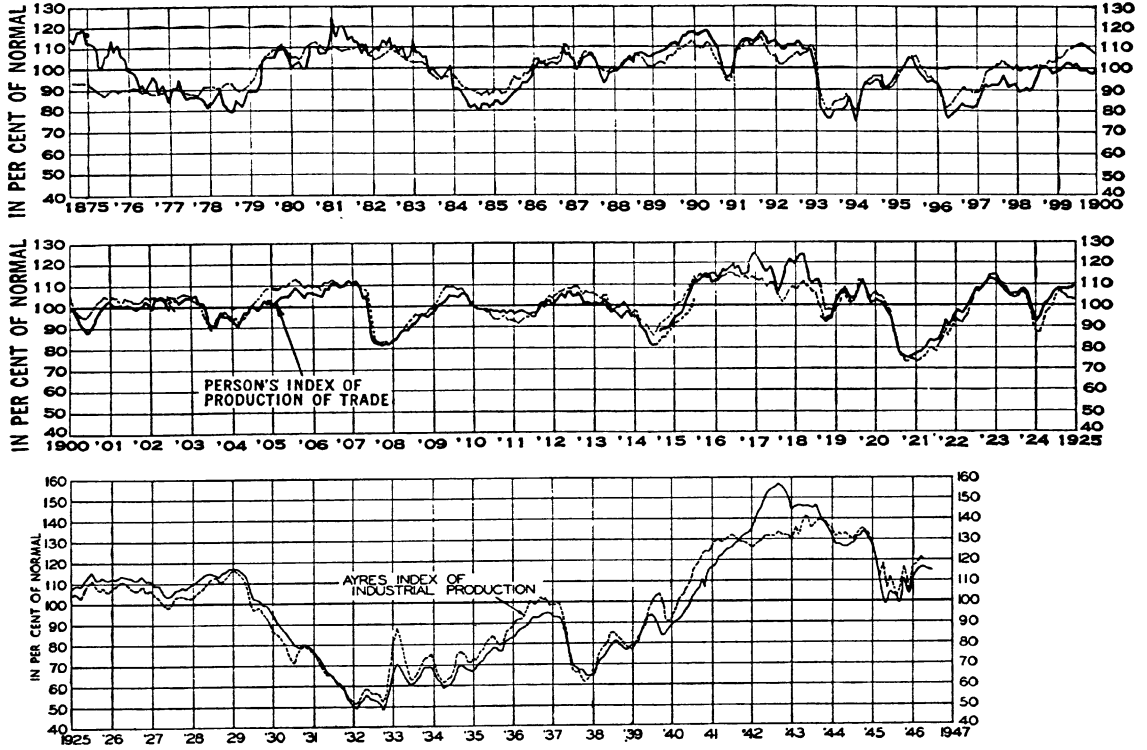
1790. Because of the paucity of the early records,[8] it is doubtful whether such a quantitative record can add much to the information

[8] For the first 65 years the index is based principally on commodity prices, imports, exports, government receipts and expenditures, and ship construction. It is difficult to estimate the accuracy of these data. It is to be noted that the statistical method employed is unimpeachable, representing available data as well as possible. The index and description are reproduced in J. L. Snider, *Business Statistics* (2d ed.; New York: McGraw-Hill Book Co., 1932), facing p. 319.

INDEXES OF UNITED STATES BUSINESS CONDITIONS, 1875–1947*



* Ayres' Index in recent years represents an adjustment of the Federal Reserve Board Index of Industrial Production. Persons' Index is kept up to date by Barron's. The difference between the showing of the Indexes in the seventies is due to the price element in Ayres' Index at this early period.

For description of Ayres' Index, see Leonard P. Ayres, *Turning Points in Business Cycles* (New York: Macmillan Co., 1939) For recent years, a personal request from the Cleveland Trust Company is required. For description of Persons' Index, see Warren M. Persons, *Forecasting Business Cycles* (New York: John Wiley & Sons, 1931); Edwin Frickey, *Barron's Index of Business since 1899* (New York. Barron's, 1943).

available from the Business Annals. We might hope for confirmation of the Business Annals, but the agreement between the two records is not close in the early years.[9] If adequate, the quantitative record could be expected to add information on the amplitude of fluctuation. The distance which business rises in prosperity or falls in depression is not accurately portrayed, however, by the data available for these early years.[10] With all of its shortcomings, the opinion of the people at the time, backed as it is by the then known facts, is probably more reliable in indicating the *time* of prosperous or depressed conditions. But such annals give us very little intimation as to the violence of the movement.

We can put more confidence in quantitative measurements of more recent years. Chart 15 depicts two indexes for the years since 1875. These indexes are as acceptable as any available measurements of the business cycle for this long period, and some confidence can be placed in the *timing* of movements as portrayed by them. Persons' Index is in entire disagreement with Thorp's Annals only in 1875, and is in partial disagreement in 1876, 1878, and 1894.[11] That these indexes give us little intimation of the relative violence of the cyclical movement is evident, however, from an examination of the data upon which it was necessary to base them. For the years 1877 to 1902, the monthly variation of Persons' Index is based solely upon bank clearings in 7 selected cities and upon pig-iron production; in later years, when data are more accessible, the data base is successively widened. The formal statistical techniques used are unimpeachable, but the cyclical variations in the component series do not well represent the total cyclical variation in economic activity.

A similar picture for the period before World War I is shown on Chart 16. The measures represented in this chart were developed by Edwin Frickey.[12] The top line represents no adjustment for secular

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[9] For the 88 years, 1790 to 1877, there are 51 years of close agreement, 24 years of partial agreement, and 13 years of entire disagreement. For 37 years out of the 88 years, or 40 per cent, therefore, there is not close agreement. The disagreement is most marked during war years, no doubt resulting from the major dependence of Ayres' index upon price changes. (Not only do commodity prices get a large weight, but the other components are expressed in price terms.)

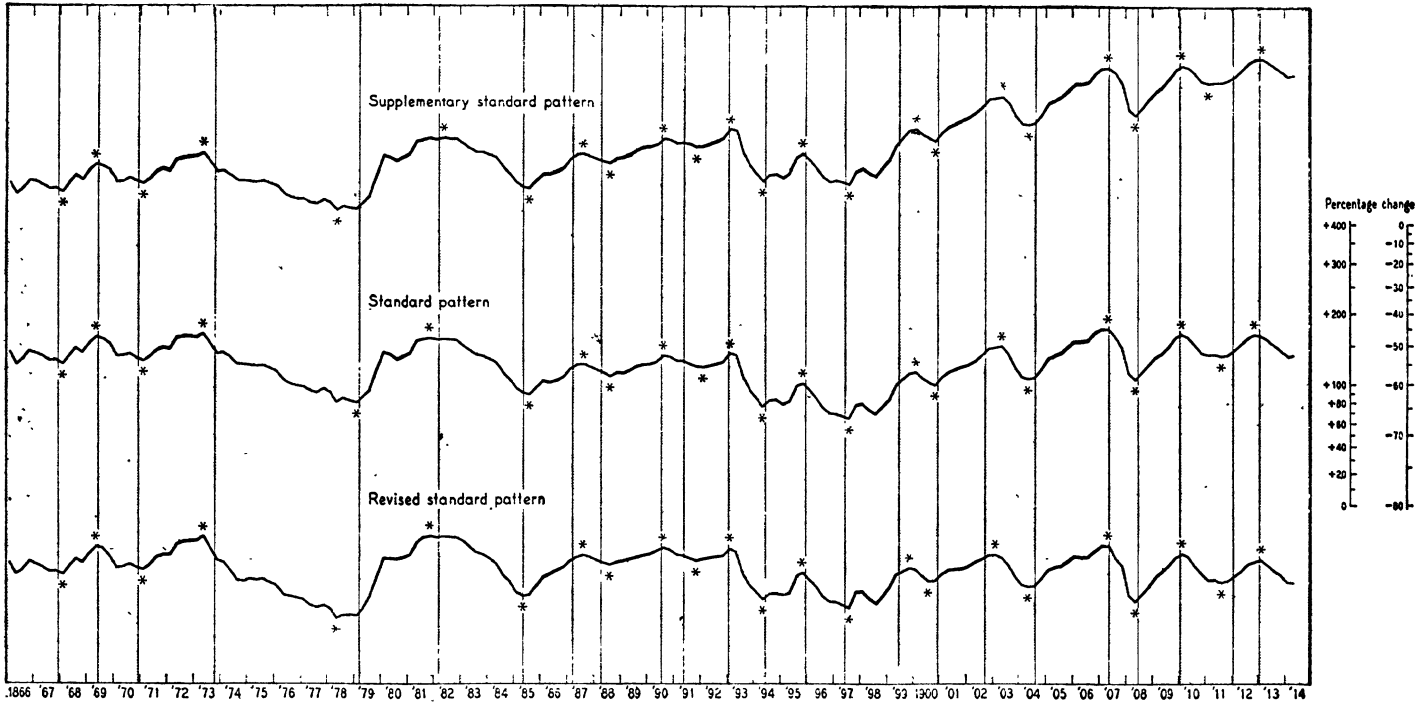
[10] The amplitude, to a considerable degree, is dependent upon the extent of the monthly variations. Commodity prices are entirely responsible for the monthly gyrations within the period 1790 to 1815, and commodity prices combined with security prices are responsible from 1815 to 1861.

[11] The disagreement between this index and the Business Annals in 1875 and 1876 undoubtedly results from the fact that for these two years Persons' Index is based entirely on undeflated bank clearings. The Annals indicate depression for both 1875 and 1876; Persons' Index shows a decline from a peak. Commodity prices showed a marked drop in these years, and agricultural crop production was much higher in 1875 than in 1876.

[12] Edwin Frickey, *Economic Fluctuations in the United States* (Cambridge, Mass.: Harvard University Press, 1942). The series used are clearings in 7 cities outside New York, New

CHART 16

FRICKEY'S STANDARD PATTERN OF SHORT-TERM FLUCTUATIONS IN AMERICAN BUSINESS ACTIVITY, 1866–1914†



† Taken from A. F. Burns and W. C. Mitchell, *Measuring Business Cycles* (New York: National Bureau of Economic Research, 1946), p. 112. Shaded areas represent "reference contractions" as measured by the Bureau, white areas "reference expansions." See description in Chapter IV, especially Chart 11.) Asterisks identify peaks and troughs.

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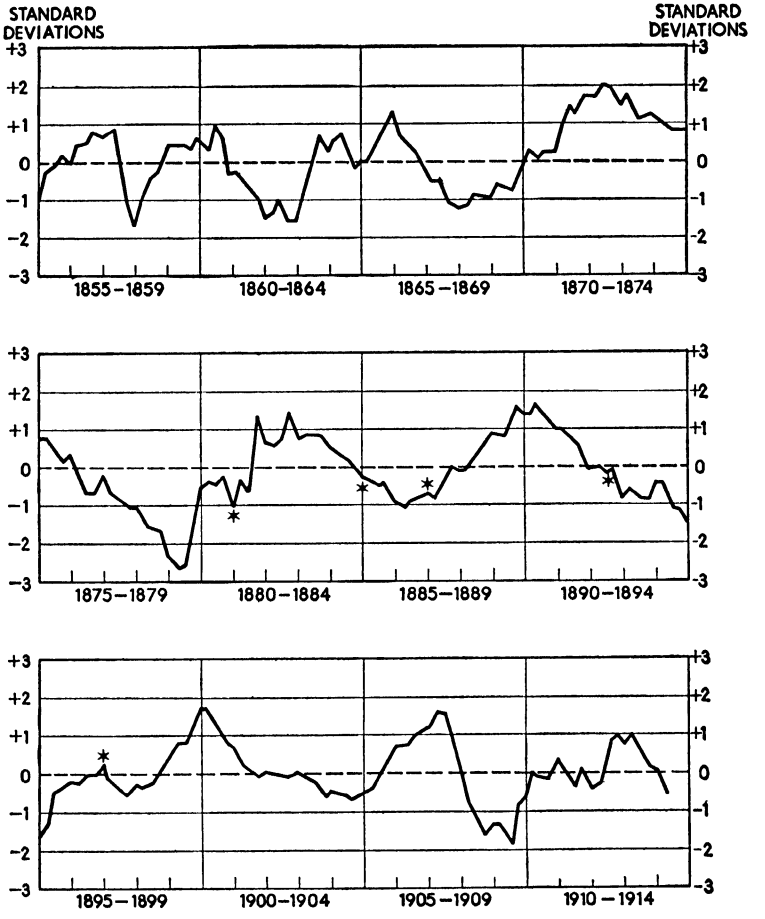
trend, while approximate adjustment is made in the second line and refined adjustment in the bottom line. An interesting characteristic of the business-cycle measurement developed by Frickey is the extent

CHART 17

INDEX OF BRITISH BUSINESS CYCLES†
By Quarters 1855 to June, 1914



†Computed by Dorothy Thomas. See Ogburn and Thomas, "The Influences of the British Cycle on Certain Social Conditions," *Journal of the American Statistical Association*, XVIII (September, 1922), 324–40.

Taken from W. C. Mitchell, *Business Cycles* (New York National Bureau of Economic Research, 1927), p. 301. Reproduced with permission of The National Bureau of Economic Research.

* Change in composition of curve.

York clearings, loans of New York banks, railroad earnings, imports, exports, immigration, sensitive commodity prices, wholesale commodity prices, railroad stock prices, industrial stock prices, bond prices, and commercial paper rates. A slight adjustment was made in this list to compute the bottom line showing the "revised standard pattern." For brief note on Frickey's method see Chapter IV, footnote 6, p. 86.

to which it represents price variation, as is indicated by the series employed. (See list in footnote 12.)

The best available long, quantitative record of English business cycles is provided by the Thomas Index of British Business Cycles presented in Chart 17. This index is available for an earlier period than the Persons Index for the United States but may be slightly less adequate compared with the Business Annals. The Thomas Index disagrees with the British Business Annals in the years 1861, 1862, 1874, and 1875; it partially disagrees in the years 1860, 1863, 1876, 1881, 1884, 1897, 1898, and 1910.

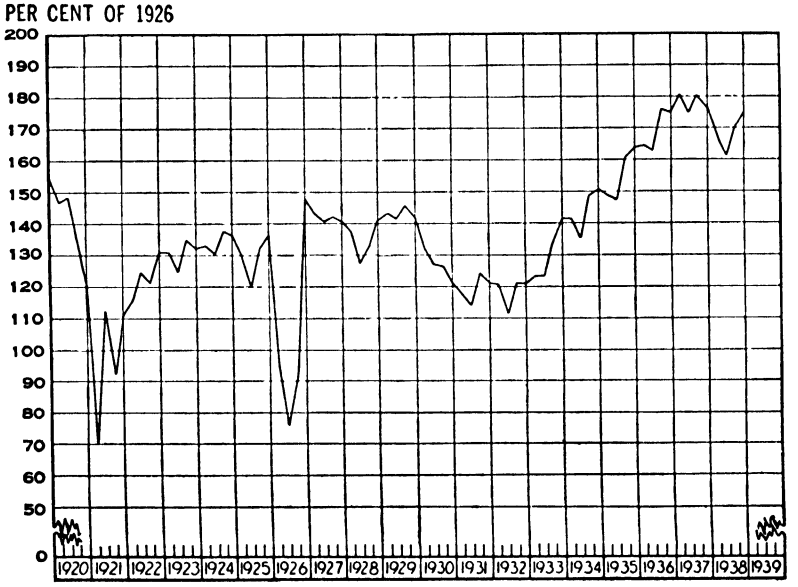
2. AVERAGE LENGTH OF THE BUSINESS CYCLE

Close examination of Charts 17 and 18 indicates that the average length of cycles in England is much longer than in the United States. From the data provided by Thorp's Annals from 1790 to 1925, Mitchell computes the average length of the cycle as 5 3/4 years in England, compared with 4 years in the United States. There has been a clear tendency for the cycles in the United States to average

CHART 18

INDEX OF INDUSTRIAL PRODUCTION IN GREAT BRITAIN BEFORE WORLD WAR II*

By Quarters



* Computed by the London and Cambridge Economic Service. The data are published in the *Royal Economic Society Memoranda.*
Taken from *Standard Trade and Securities,* Jan. 21, 1938, pp. 1–15, and later issues.

shorter than those of any other country. Again, using the data provided by the Annals, Mitchell finds that out of the 17 countries studied for the years 1890 to about 1924, there was the following distribution as to number of cycles: 6 countries had 5 cycles—England, France, Holland, Sweden, Italy, and China; 5 countries had 6 cycles—Austria, South Africa, Australia, Argentina, and India; 5 countries had 7 cycles—Germany, Russia, Canada, Brazil, and Japan; and 1 country had 10 cycles—the United States.

For the period 1796 to 1923, the Annals yield 32 complete cycles in the United States. The frequency distribution of these cycles as to length is shown in Table 7.

TABLE 7

LENGTH OF BUSINESS CYCLES IN THE UNITED STATES, 1796–1923

Length in Years	Number of Cycles of Stated Length
1	1
2	4
3	10
4	5
5	6
6	4
7	1
8	0
9	1
Average 4	Total 32

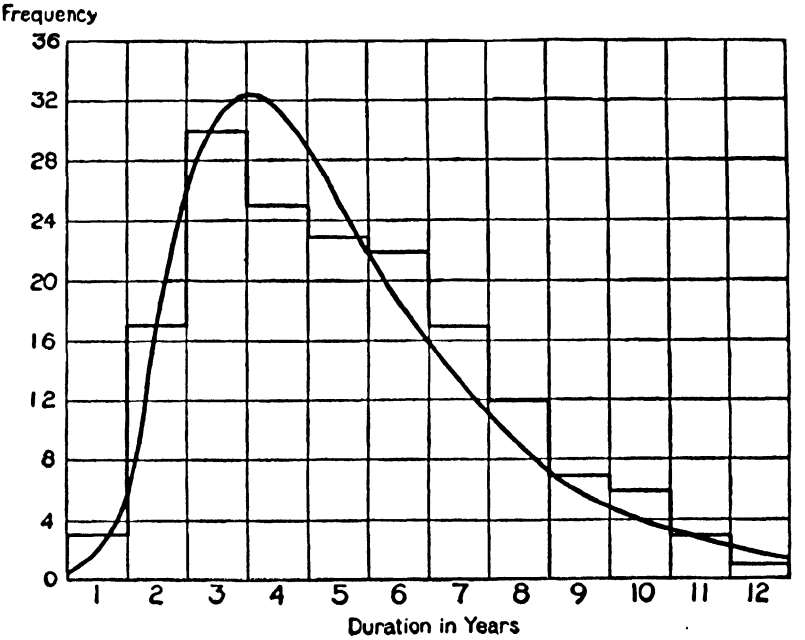
Making use of all of the 166 observations on the business cycle provided by the Business Annals for all of the countries studied, Mitchell has constructed a frequency curve of their length. This curve is reproduced in Chart 19. Mitchell fitted a logarithmic normal curve to the distribution. Although the fit is by no means perfect, it is quite striking.

The precise significance of these measurements on the length of the business cycle is in doubt. Earlier in this chapter, emphasis was placed on two limitations common to all measurements of the average length of the cycle: (1) the operation of the self-generating forces over the business cycle is constantly interfered with by the random occurrence of originating causes; (2) as the business system becomes more highly interrelated, the nature of the operation of the self-generating forces is changed, at least to some extent. To these, there must now be added: (3) the probable error of the available figures on length

for periods earlier than about fifty years ago is important, but its size is unknown. The first weakness is of the type in which the error can be expected to group itself in a random fashion. However, only 166 observations are not enough to prevent the measurement of the average length from being affected. The nature of the other two weak-

CHART 19

DURATION OF BUSINESS CYCLES AS SHOWN BY BUSINESS ANNALS*



* Taken from W. L. Thorp and W. C. Mitchell, *Business Annals* (New York: National Bureau of Economic Research, 1926), p. 70. The fitted curve is a logarithmic normal probability curve. For method of fitting, see G. R. Davies and W. F. Crowder, *Methods of Statistical Analysis in the Social Sciences* (New York: John Wiley & Sons, 1933), pp. 17-19, 303-6.
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nesses is not such as to group the resulting errors in a random fashion.

Of greater importance, therefore, are the measurements of length for more recent years. Making use of Persons' Index for the United States, we find that 15 business cycles occurred between 1878 and 1932. The total elapsed time is 644 months, giving an average length of 43 months.[13] Even during this period, however, important changes took place in the complexity of business interrelationship in the United

[13] This average is in close agreement with similar figures computed by using cycles either from trough to trough or from crest to crest, using American Telephone and Telegraph Index of Business, Frickey's Clearings Index, Snyder's Clearings Index, or Snyder's Deposits Index. See Mitchell, *Business Cycles*, p. 340.

States. We shall have a more homogeneous period if we limit ourselves to the 9 cycles occurring between November, 1900, and June, 1932. There is a total elapsed time of 380 months, yielding an arithmetic-mean cycle of approximately 42 months. From this we cannot conclude that the increasing interrelationship in business may not on the average shift the length of the business cycle, for the operation of originating causes has had much to do with ending the cycle at many times, and 9 observations are too few in which to expect this influence to average out. Neither can we conclude that the future length of the cycle in the United States will be about 42 months.

3. LENGTH OF CYCLE PHASES

For the purpose of presenting measurements of the length of the phases of the cycle in the recent past, it is useful to break the cycle into phases more detailed than the two of upswing and downswing. Typically, the more detailed phases have been named prosperity, recession, depression, and recovery. The difficulty involved in the use of this classification is that the phases have no commonly accepted meaning. Depression particularly is used loosely, meaning lower than secular-trend levels, lower than secondary-trend levels, or merely the phases of downswing and trough. Depression is commonly employed in the first sense in this book. Prosperity may also be used to mean either the period above the secular-trend level or the period above the secondary-trend level. In most business cycles, about the same period has been included above the secular trend as above the secondary trend.

Warren M. Persons developed measurements which are somewhat more useful for our purposes, although the long-time trend he eliminated principally represents the secular movement. This has the advantage of making it possible to compare the length of movements in secondary and business-cycle depressions. Recognizing that he used "normal" to designate what we call the "secular-trend level," we may accept his definition of phases:

Prosperity is that interval of supranormal business beginning with the month in which the index recovers to 100 (after a period of depression) and ending with the month preceding a persistent recession to subnormal business.

Recession is the interval of persistent decline to subnormal business between the terminal month of prosperity and the beginning of the trough of depression.

Trough is the interval of irregularly oscillating fluctuations on a subnormal level in which the month-to-month changes in the index are usually two points or less. The trough comes after a period of recession in which consecutive month-to-month declines of three points or more are usual and previous to a period of recovery in which consecutive advances of two points or more are usual. It may be a short interval lasting only a month or two.

Recovery is the interval of persistent advance to normal business following a trough of subnormal business. During this interval month-to-month advances of a point or more are usual and declines of two points very infrequent.[14]

The trough is the level bottom; the recovery is the upward movement to the trend level; the prosperity is the movement from the trend level to the peak (if there is a level top, to the end of this top); and the recession is the downward movement through the trend level to the bottom of the depression. It is to be noted that the concept of

TABLE 8

LENGTH OF CYCLE PHASES IN THE UNITED STATES, 1878–1932*

PERIOD	LENGTH IN MONTHS				
	Trough	Recovery	Prosperity	Recession	Total Length
Dec. 1878—Nov. 1884†	1	10	44	16	71
Nov. 1884—Mar. 1888†	7	12	17	4	40
Mar. 1888—Apr. 1891	1	3	27	6	37
Apr. 1891—Aug. 1893	1	1	19	7	28
Aug. 1893—Oct. 1896†	7	16	4	11	38
Oct. 1896—Nov. 1900†	1	26	11	11	49
Nov. 1900—July 1904	1	3	28	12	44
July 1904—Jan. 1908	1	3	32	6	42
Jan. 1908—Oct. 1910†	5	14	7	7	33
Oct. 1910—Nov. 1914	15	1	8	25	49
Nov. 1914—Mar. 1919†	2	10	32	8	52
Mar. 1919—Feb. 1921	1	1	8	13	23
Feb. 1921—July 1924†	7	14	5	15	41
July 1924—Dec. 1927	1	4	29	7	41
Dec. 1927—July 1932	1	3	15	36	55
Arithmetic mean.....	3.8	8.1	19.1	12.2	42.8

* Warren M Persons, *Forecasting Business Cycles*, see esp p 198 Persons' material is adapted for this presentation. His judgment is followed on the existence of the phases indicated by his index except for the cycle 1896-1900 Persons lists two cycles for this period The drop to the low in October, 1898, was by only 8 points. Barron's Index of Production and Trade, which is a continuation of the Persons' Index, is used to bring the table to the 1932 low The table is not carried past 1932 because of the uncertainty of the extent to which the severe secondary depression would make the measurements noncomparable with earlier depressions. Eliminating only the secular level, 1937 would not represent a prosperity. Persons probably eliminated a minor part of the secondary trend in the most comparable cases.

† The cycles marked by the dagger contain the trough and the recovery of major depressions.

prosperity in this classification of phases does not precisely represent the portion above the secular trend. In practice, however, the difference between the two concepts is not great since the part of the recession above the trend level usually covers a short period. The length of the cyclical phases from 1878 to 1932 in the United States is presented in Table 8. These measurements are taken from Persons' Index.

[14] Warren M. Persons, *Forecasting Business Cycles* (New York: John Wiley & Sons, 1931), pp. 197–98.

Since 1878 the upswing (phases of recovery and prosperity combined) in the United States has averaged much longer than the downswing (phases of recession and trough combined). The upswing has averaged 27 months, while the downswing has averaged only 16 months. This difference in length gives the cycle the characteristic appearance of a combination of the left half of *V* and the right half of *Y*.[15]

The great variation shown in the length of cycle phases in the United States makes rather obvious the difficulties involved in making any practical use of the average length of the phases. Table 8, however, contains interesting information on the greater length of phases in major or secondary depressions. For the purpose of this measurement, all depressions dropping to more than 15 per cent below the trend line, as measured by Persons' Index, will be classified as major; all others as minor. The minor depression bottoms in November, 1900, and in July, 1924, showed a drop of slightly over 10 per cent below the trend, but no other minor depression has fallen nearly so low. All major depressions have fallen to about 20 per cent or more below the trend line. These amplitude differences must not be taken too seriously because the series Persons used cannot be accepted to provide an effective measure of the amplitude of the cycle; the differences, however, are so marked that they provide a satisfactory basis for classification.

In Table 8, the cycle length is measured from trough to trough. This method of measurement is advantageous for the full cycle since many people think in terms of a new cycle beginning at the trough. For the classification into cycles which contain major and minor depressions, however, it is preferable to study the recession, trough, and recovery of the same cycle. Hence, in Table 9, cycles are measured from the end of one prosperity phase to the end of the next. The average length of the cycle so measured is about the same as from trough to trough. Theoretically, there might be some question as to whether the prosperity preceding or the prosperity following should be included in the cycle with the major depression, but actually there is no significant difference in the average length of these prosperities whichever way they are classified.[16]

Major depressions tend to have a long trough, while, during every minor depression but one, the trough lasted only one month. There

[15] Below the trend line, the decline is no shorter than the advance, but the decline above the trend line is much shorter than the advance above it.

[16] The average length of prosperities preceding major depressions is 17 months, compared to a length of 19.5 months for those preceding minor depressions. Table 9 shows that prosperities following major depressions also average slightly shorter than prosperities following minor depressions.

is a marked difference in the length of recovery in major and minor depressions. For minor depressions, the cluster is good and recovery never has lasted more than 4 months. This length compares with an average recovery of 15 months in major depressions. It is clear that reaching a "dead level" is common in a major depression but unusual in a minor depression.

Recessions in major depressions have been significantly longer than those in minor depressions, although the dispersion about the average

TABLE 9

LENGTH OF CYCLE PHASES RELATED TO MAJOR AND MINOR DEPRESSIONS*

United States Cycles 1878–1933

MAJOR OR MINOR	NO. OF CYCLES INCLUDED	LENGTH OF PHASES IN MONTHS				
		Recession	Trough	Recovery	Prosperity	Total Length
Major:	7†					
Average‡ . .		16	5	15	17	46
Range		6–36	1–9	10–26	4–44	32–69
Minor:	8					
Average‡ . . .		9	1 (mode)	2	21	35
Range . . .		6–15	1–15	1–4	8–32	18–49

* The history since 1933 is not used in this table because of the influence of the secondary trend and the war. If it were, the relationships would remain essentially as shown

† The troughs of 8 major depressions are included, using the 1932–33 trough The recession into the 1878 trough is not included, since the Annals and the quantitative indexes do not agree, as noted above But the recession into the 1932–33 trough is included, making a total of 7 recessions connected with major depressions There are included only 6 total-length major cycles since full data are not employed on the first and last This accounts for the fact that the sum of the average length of phases in the major cycles comes out to 53 months, while the average length for the 6 total cycles is 46

‡ All averages are arithmetic means except for the trough in minor depressions, in which 7 out of the 8 cases are only 1 month in length. This accounts for the difference between the 33-month sum of the phases and the 35-month length of the total cycle.

is large in both cases. Recessions have had about the same length as recoveries in major depressions, while recessions in minor depressions have been much longer than recoveries.

Whether we figure the prosperities before or after the major depressions to be the ones related, the prosperities connected with minor depressions have averaged slightly longer than the prosperities connected with major depressions. The difference in the averages is not great, however, and the dispersion about the average is marked in both cases. Cycles have not differed much in length because of differences in prosperities.

The difference in length between major and minor depressions is substantial. Although the dispersion about the average length of the cycle is marked, the cycles including major depressions have had an average length of 46 months, compared to an average length of 35

months for cycles including minor depressions. This difference is solely the result of the fact that major depressions have averaged longer than minor depressions. If the major depressions locate low points on the secondary trend, abnormally long cycles would be explained by periods when low secondary-trend levels occur.

4. AMPLITUDE OF THE CYCLE

It has been pointed out above that we can know but little about the relative variations over the business cycle. Most indexes are based upon too few series of data. Even those which constitute a weighted average of a large number of component series usually represent but one phase of economic life. For instance, the Federal Reserve Board Index of Industrial Production represents only the production of goods in factories and mines. Yet, as we shall see in Chapter XV, this index is as good as any obtainable for the purpose of measuring the timing and direction of change. Careful thinking will lead one to conclude that such an index cannot represent the violence of fluctuation of economic conditions. It cannot represent the relative violence of various cycles occurring over time if there is an increasing production of services, as has been occurring in the United States.

There is no basis for a comparison of the violence of various cycles. It is impossible to compare a cycle of today with one eighty years ago when the only data available were a few monthly series and a few dozen yearly series. The data available to represent business conditions eighty years ago cannot, by any stretch of the imagination, be expected to represent the amplitude of fluctuation in economic conditions at that time.

Many people have claimed that the thirties' depression is by far the most severe in the history of the world. There is no questioning the fact that certain processes fell to more severely low levels than ever occurred before, but the position of these processes in the economic system has shifted greatly as time has gone on. The fact that the production of iron and steel dropped farther in the Great Depression than in any downswing in the nineteenth century is not pure evidence of the relative severity of these depressions. Growth of the iron and steel industry has changed its characteristic fluctuation. To take a hypothetical case, it would be like saying that a depression in the 1950's would be much more severe than the Great Depression because the production of mechanical refrigerators showed practically no decline in the Great Depression but might show a tremendous decline in the 1950's.

Under these conditions, there is little hope of obtaining significant measurements of the amplitude of business-cycle fluctuations about

the secondary-trend line. It is possible to obtain some rough indication of the amplitude of fluctuations from the secular-trend line in the twenties and thirties by use of the now discontinued New York Federal Reserve Bank's Index of Production and Trade. This is an inclusive measurement, and it therefore comes nearer to representing the amplitude of fluctuation than do most measurements. Gross national product or national income more adequately represents total activity, but neither series is available on a monthly or quarterly basis

TABLE 10

AMPLITUDE OF BUSINESS CYCLE FLUCTUATIONS, 1919–38
As Shown by the New York Federal Reserve Bank's Index of Production and Trade

Date of Crest or Trough of the Cycle*	Percentage Deviation from Trend
January, 1920	+11
April, 1921	−15
May, 1923	+11
July, 1924	− 4
December, 1925	+13
December, 1927	+ 3†
August, 1929	+15
March, 1933	−40
December, 1936	− 4†
June, 1938	−28

* These dates are merely the last months the Index hit the absolute minimum or the absolute maximum.

† Even though the Index shows activity 3 per cent above normal in December, 1927, and 4 per cent below normal in December, 1936, these two dates represent a business-cycle trough and a business-cycle crest, respectively.

for all of this period. Also, the income measures must be deflated, while the old production and trade index was compiled from quantity series.[17]

Table 10 presents the percentage deviation from secular trend at the crests and troughs in the twenties and thirties shown by the New York Federal Reserve Bank's Index of Production and Trade. This table brings out one valuable fact. There is considerable uniformity in the relative distance business rises above the secular-trend level in prosperities, but there is little uniformity in the relative distance business falls below it when secondary depressions are included. The

[17] The New York Federal Reserve Bank's Index of Production and Trade was a weighted combination of all types of goods, of primary distribution, of distribution to consumers, and of miscellaneous services. See Norris O. Johnson, "New Indexes of Production and Trade," *Journal of the American Statistical Association*, XXXIII (June, 1938), 341–48, and "Federal Reserve Bank of New York Indexes of Production and Trade," *Journal of the American Statistical Association*, XXXVI (September, 1941), 423–25. The Index was adjusted for seasonal and trend. It was reported to the end of 1943.

scanty information available on earlier cycles tends to fortify this belief. It is further buttressed by theoretical considerations developed at other points in this book.[18] Aside from the problem of how accurately the New York Federal Reserve Bank Index measures the total volume of trade, we can give only limited acceptance to these measures of amplitude. The secular-trend level employed may not be fully representative. Therefore, the fact that the index shows the height of prosperities in the twenties rising from 11 to 13 to 15 per cent above the trend is not necessarily significant.

5. INTERNATIONAL AGREEMENT OF CYCLICAL MOVEMENTS

Secondary depressions have been world-wide with noticeable regularity. At many other times the relative level of business conditions has been fairly similar in all industrial countries, but in no other phase has there been such close agreement. There are, also, many periods when there has been considerable dissimilarity between the business cycles in various countries.

An excellent impression of the similarity of conditions between various countries in secondary depressions can be obtained by study of Chart 14, which presents business conditions as shown by the Business Annals. By glancing up and down on this chart at the places where the black bars are in vertical line, the dates of deep depressions can be located. Such a method means little up to the time of the American Civil War because the Annals represent too few countries. It will be noted, however, that the two early deep depressions in American history most commented on in literature, the depression occurring before 1820 and carrying on into the twenties, and the long depression period of the late 1830's and early forties, occurred concomitantly with depression periods in England. Depression occurred in the United States, England, and France in 1848, although the depression in the United States was minor. Depression occurred in the United States, England, France, and Germany in 1858, connected with a panic in the United States, but the period of depressed conditions was short-lived in all of the countries. The long depression period of the 1870's and the shorter depression of the eighties in the United States occurred concomitantly with depression in all of the other four countries for which the Annals are available.

There is fairly close agreement in the depression from 1893 to 1894 in all of the 17 countries for which the Business Annals are available, with the exception of Russia and South Africa. Russia had just passed through a depression; large railroad building began in 1893, and the

[18] The upper limiting condition—the physical capacity to produce—fixes a more determinate level in prosperity than does the necessity to consume in a depression.

crops were large in both 1893 and 1894; predominance of agriculture in the Russian economy may have been partly responsible for failure to conform. In South Africa, there was a large production of gold during the period. Gold production naturally increases in a depression. The South African agricultural crop was good, and railroads were being built in that country at the time.

In 10 of the 17 countries, depressed conditions occurred from 1902 to 1903. In none of these countries, however, with the exception of Brazil, does this depression appear to have been serious. Coffee and rubber prices were declining at the time.

Depression occurred simultaneously in 16 of the 17 countries in 1908, but it was short-lived in most cases. The exception was Argentina, and the Annals describe the condition of that country as "mild recession" in 1908. Practically all of Argentina's agricultural crops were large, and the world prices for them were relatively good.

Depression occurred in all of the 17 countries in 1914 or 1915, but it was short-lived due to the outbreak of World War I.

Depression occurred simultaneously in all of the 17 countries, except Austria, in 1921. In Austria, ruinous inflation was under way, and the country was to suffer a very severe depression a few years later.

It will be seen that there is a good case for concomitance of secondary depressions in various countries. It must be remembered, however, that there are some years in which a fairly good case could be made out for international prosperity. The reason that our attention is not attracted to this is that international prosperity does not greatly change the level of prosperity in any given country, while international depression is an important force tending to deepen the depression in each of the countries of the world.

It was pointed out earlier in this chapter that, from 1890 to about 1924, out of the 17 countries for which the Business Annals are available, there is not a close agreement in the number of cycles in each country. During this period, 6 countries went through 5 cycles; 5 went through 6 cycles; 5 went through 7 cycles; and 1, the United States, went through 10 cycles. Thus, the United States is an admirable country with which to compare the concomitance of occurrence of cycles in the other countries. This comparison is made for the beginning of the phase of recession in Table 11. Since the cycle phases follow each other with perfect uniformity; it is adequate to note in this manner the concomitance of occurrence of the phase showing the greatest regularity, and it is much simpler to do so than to trace the similarity of occurrence of all phases.

Examination of the table makes it clear enough that at most times

there is no correspondence between countries as to the phase of the cycle currently existing. There is, nevertheless, a striking relationship between the time of occurrence of the phases of recession which do occur in any limited period. While one cycle took place in England,

TABLE 11

DATES OF THE BEGINNING OF BUSINESS RECESSION, 1890–1925*
Dates in the United States Compared to Those in 16 Other Countries

(1) United States	(2) England	(3) France	(4) Germany	(5) Austria	(6) Russia	(7) Sweden	(8) Netherlands	(9) Italy
1890	1890	1890	1890	1892	1891	1892	1891	1888
1893	.	..	..	1894	...	..	..	...
1896	..	..	..	...	...	..	..	...
1900	1900	1900	1900	1900	1899	1901	1901	1900
1903	...	...	1904	...	1904	.	...	....
1907	1907	1908	1907	1908	1908	1907	1907	1907
1910	..	..		..	..	.	..	...
1913	1913	1913	1913	1912	1914	1913	1913	1913
1918	1918	1918	1918	1918	1917	1917	1917	1918
1920	1920	1920	1922	1922	1923	1920	1920	1920
1923	..	.	1925	..	1925	..	..	..

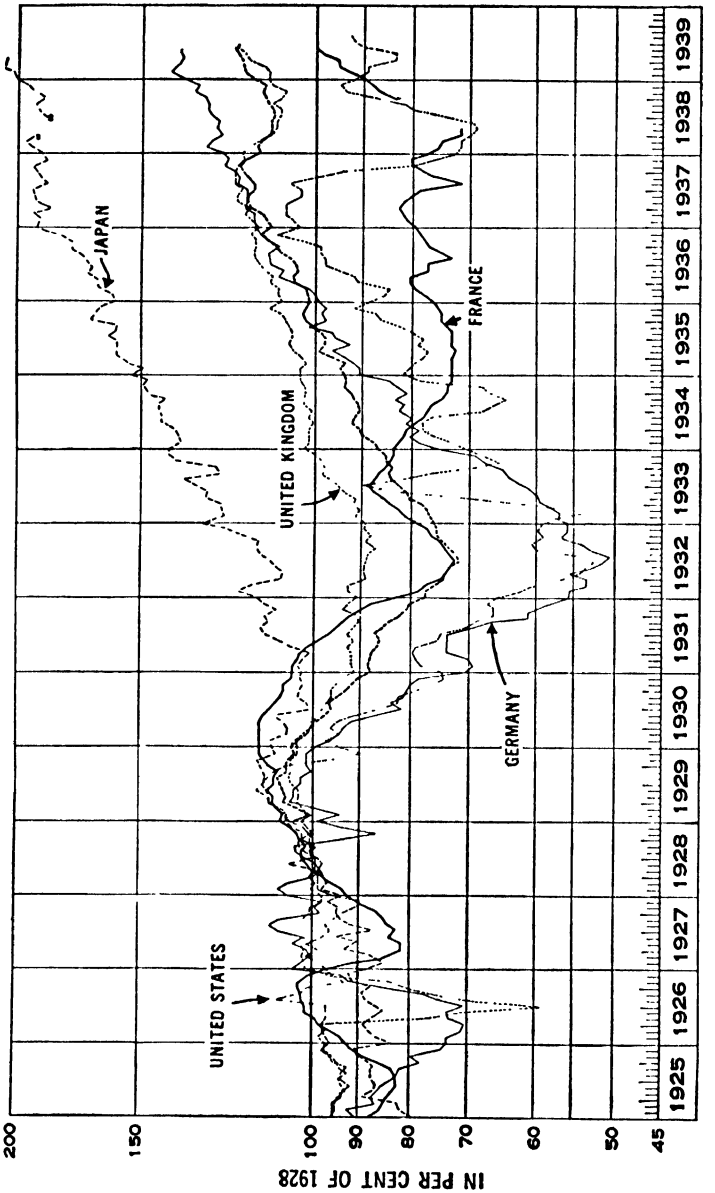
(1) United States	(10) Argentina	(11) Brazil	(12) Canada	(13) South Africa	(14) Australia	(15) India	(16) Japan	(17) China
1890	1890	1889	1888	1890	1890	1889	1890	1888
1893	1892	..	1893	..	...	..	1894	..
1896		1896	.	1895	...	1896	1897	1897
1900	1900	1900	1900	1899	1901	1900	..	1900
1903	..	..		1903	..	..	1905	...
1907	1908	1907	1907	..	1908	1907	1907	1906
1910	1911	..	..	...	...	..	...	1910
1913	1913	1912	1913	1913	1913	1914	1914	....
1918	..	1918	1918	1918	...	1918	1918	..
1920	1920	1920	1920	1920	1920	1920	1920	1920
1923	.	1924	1924	..	1924	...	..	...

* Adapted from the data given in Willard Thorp and W. C. Mitchell, *Business Annals*. This is merely presentation in another form of part of the material charted in the "Conspectus of Business Cycles in Various Countries." See Chart 14.

one, two, or even three occurred in the United States; but *when England was starting in on a phase of recession, the United States was also beginning a phase of recession.* This principle, that the least frequently occurring cycles are common to many countries while the more frequently occurring cycles may take place within the period of the

CHART 20

INDEXES OF INDUSTRIAL PRODUCTION IN LEADING COUNTRIES BEFORE WORLD WAR II*



†These Indexes represent computations by *The Annalist*. Data were taken from various issues and supplied directly by The New York Times Company. The asterisks indicate gaps in the data in 1938.

longer cycles of some other country, is rather generally applicable. The only unquestionable exceptions are in the cases of Germany and Austria in the twenties, and these exceptions are explained by the uncontrolled inflation then taking place in those countries.

Table 12 shows the number of years in which cycles in the United States have agreed with cycles in several other countries. It is taken from Mitchell's computation, and is based on the Business Annals.[19]

TABLE 12

UNITED STATES CYCLES COMPARED TO THOSE OF OTHER COUNTRIES
Extent of Agreement in Phase

Countries Compared: United States and	Period Covered	Number of Years			
		Total	Agreement in Phase	Partial Agreement	Opposition in Phase
England	1790–1857	68	21	28	19
England	1867–1925	59	28	18	13
France	1867–1925	59	23	23	13
Germany	1867–1925	59	21	20	18
Austria	1867–1925	59	18	23	18

United States cycles have agreed most closely with those of England but have agreed almost as well with those of France. There is considerable agreement between the cycles of France and England.

The improvement in agreement as time has gone on is notable. The comparison with England at the two periods is one illustration, but available information shows this improvement in agreement to have been taking place between the cycles of most countries.

Substantial disagreement arose in the 1920's and 1930's, however. Chart 20 shows the comparative movement of industrial production in leading countries before World War II. It will be seen that there are some important differences, but agreement has been much greater than is sometimes believed.

REVIEW QUESTIONS

See end of Chapter XI

SELECTED REFERENCES

See end of Chapter XI

[19] Willard Thorp and W. C. Mitchell, *Business Annals* (New York: National Bureau of Economic Research, 1926), p. 441.

CHAPTER XI

BUSINESS-CYCLE HISTORY, 1784–1929

1. INFLUENCE OF SPECIFIC ORIGINATING CAUSES AT VARIOUS TIMES

EACH business cycle is, as Mitchell says, a "unique historical episode." That which makes each business cycle unique is the particular combination of originating causes and conditioning circumstances affecting it. Over a period of time it is to be expected that there will be some shift in the action of self-generating forces, but these do not shift greatly in their characteristic behavior from one cycle to the next.

As the self-generating forces become stronger and the interrelationships among business processes become more complex, it becomes more difficult to state the precise influence of any particular originating cause. As further attention is given to the problem, undoubtedly economists will find it possible to state more precisely the influence of various originating causes in the past. Since originating causes cannot be forecast, an evaluation of past originating causes must not be taken to imply that their influence in the future will remain the same. Nevertheless, a statement of the influence of originating causes in the past should be of some assistance in interpreting the influence of the same type of originating causes when they occur another time. A brief summary statement is given below of the influence which the most notorious of these originating causes seem to have had on United States cycles.

Depression of 1784–89. A severe depression existed in the last half of the 1780's. The most important factor responsible for the length and severity of this depression was the scarcity of acceptable money at the time. Since there was no adequate substitute, most exchange was impossible without money to effect it. The scarcity of money resulted from the existence of a highly unfavorable balance of trade (the value of exports was only about 20 per cent of the value of imports in 1784) which was caused partly by the following: (1) the peculiar trade relations resulting from the Revolutionary War; (2) the printing of inflationary paper money in the States, which drove

sound money out of the country; and (3) the lack of a central authority upon whose credit other countries could rely.

Prosperity and Depression, 1790–99. With the establishment of the First Bank of the United States in 1791 and the inauguration of a sound fiscal system, prosperous conditions prevailed. European war from 1793 forward prolonged prosperity and lightened depression, at least until the end of the century. The high prices paid for large increases in exports resulted in land speculation, supporting financial excesses. The prosperity continued until 1796. It continued in spite of the handicaps set up by weaker originating causes such as yellow fever and the foreign-trade embargo of April, 1794. The impetus given to our foreign trade maintained prosperous conditions in the agricultural South from 1796 to 1798, in spite of depressed conditions of the North, typified by widespread failures, financial panic, collapse of land speculation, and another epidemic of yellow fever, this time largely concentrated in Philadelphia.

Depression of 1807–10. As an outgrowth of the European war, it is estimated that some 1600 American ships and $60,000,000 worth of property were seized. The blockading policy of France and England enhanced this loss. The situation became so intolerable that a rigid American embargo was declared in December, 1807, bringing an almost complete discontinuance of foreign trade, which resulted in a serious business depression. Trade dried up in the cities. Prices of commodities which had to be imported doubled; prices of domestic goods fell below the cost of production. Conditions improved shortly after the embargo was replaced by Non-Intercourse Acts against England and France in May, 1809, and, with the further lightening of these restrictions, prosperity followed.

Depression of 1815–21. Currency inflation and subsequent deflation played a predominant part in the long depression from 1815 to 1821. The currency inflation at first was the outgrowth of the expiration of the charter of the First Bank of the United States with the resultant overissue of paper money by a rapidly increasing number of state banks (outside of New England). The unsound financing of the War of 1812 also promoted inflation. After the establishment of the Second Bank of the United States in 1816, currency inflation continued because of mismanagement by William Jones, a Secretary of the Navy under Madison. The ultimate currency deflation was not instituted until Jones resigned, and Langdon Cheves took his place in 1819. A boom in the slave trade began in 1819.

According to the Business Annals, there was depression in the United States in late 1815 and during 1816 and mild depression during 1817 and 1818. It is valuable to point out how this depression

could exist during currency inflation. United States manufactures had been protected from foreign competition from the time of the Embargo Act in 1807 until the end of the War of 1812 in January, 1815. With the ending of the war, American manufactures were thrown open to foreign competition. Although a tariff giving partial protection was granted to the textile industries in 1816 and to the iron industry in 1818, quoted commodity prices of domestic manufactures were high compared to the cost of imported goods from the beginning of 1815 to the end of the depression. The currency inflation affected principally the value of bank stock and real estate.

With the institution of a policy that would make possible redemption of paper money in specie, Mr. Cheves found it necessary to call a large quantity of loans, which forced sales and resulted in financial panic and severe depression. About the time the period of forced deflation ended in 1821, the depression ended.

Depression of 1837–43. Deep depression, running almost continuously from 1837 to 1843, as recorded by the Business Annals, was greatly affected by currency inflation and much prolonged by attempts to support unsound speculative commitments. From 1832 to 1836 rapid currency inflation had arisen as a result of the relinquishment of control over credit by the Bank of the United States after it was made a political football in 1832. The inflation was accentuated by the deposit of government funds in Jackson's "pet" banks, since the government thereby lost control of these funds, and speculative banks attained control. This period of American inflation coincided with an inflationary boom in England, arising in that country out of the incorporation of a large number of joint-stock banks, and out of uncommonly free lending by the Bank of England. The extension by the British of large credits to American merchants accentuated the inflation in America.

The inflationary boom was checked in 1836. Jackson issued his "Specie Circular" requiring that payment be made in specie for sales of government land. This action resulted in a tremendous decrease in land sales in 1837, greatly decreasing government revenues. The receipts from land sales had more than paid off all of the government debt by 1836, and it was voted to distribute a large surplus among the states. The government withdrew the money from the banks in large lump sums at a time when government deposits had greatly declined, since government receipts from sales of land had fallen off markedly.

Wheat crop failures in 1835 and in 1836 greatly reduced exports, accentuating the stringency resulting from our short-term borrowings in England. The failure of a large English bank in 1836 had made it

necessary for several English creditors to call their loans. Depression became evident in 1837. An ensuing improvement was short-lived. Unsound speculative positions were maintained, and further speculative positions were being built up. The Bank of the United States in Pennsylvania (now with a Pennsylvania charter) was the bulwark of American credit. This bank became insolvent in 1837, but the condition of its assets was not known at the time and the bank management was protected in its speculative position by the past reputation of the bank. Planters in the South were demanding speculative loans to protect the price of cotton which had fallen disastrously because of an unusually large inventory and because depression had arrived in England. The Bank of the United States engaged in large cotton speculations on its own account and assisted the banks of the South to do so. The number of the banks in the South increased. The export balance remained unfavorable, and it was paid for by the export of stocks and bonds. In addition, English banks made us large loans of gold and silver when they saw the severity of the American position. England was compelled to call these loans in 1839, principally because a short grain crop made necessary large payments on the continent. Meanwhile, a cotton "corner," which had been built up by the management of the Bank of the United States, collapsed in the spring of 1839 when the export of gold made it impossible to support credits further. After this experience, the banks of the South held to a paper basis until the end of 1840, hoping against hope to attain a reversal of the cotton market and to protect speculative positions.

Depression of 1847–48. Depression beginning in 1847 in European countries did not produce severe depression in the United States because of a favorable conjuncture of circumstances. No currency inflation took place in the United States between 1843 and 1847 because the government closely supervised its deposits and finally withdrew them from the banks under the subtreasury system instituted in 1846. Large agricultural crops in America with crop failures in Great Britain and France poured gold into this country in 1847. British financiers, smarting from the losses in 1840, had made small or no commercial loans to America, and hence there were few short-term foreign loans to pay off. British financiers took a large proportion of the federal bonds offered in the spring of 1848, strengthening our financial position. There was little unemployment because of the exodus to California gold fields. Although but little gold actually flowed from California in 1848, there was great promise of gold to come. This promise allayed financial fears and restored confidence.

Prosperity of 1849–53. The years from 1849 to 1853 comprised a rampant period of prosperity which was accentuated by several

originating causes. Vast supplies of gold flowing in from California provided a large increase in the reserve for paper money. Railroad building occurred on an unprecedented scale, furnishing an outlet for these funds and for surplus funds in London. The surplus funds in London arose out of large gold production in the new gold fields of Australia. Cheap laborers were provided for building the American railroads by a very large immigration. There was a large increase in the consumption of luxuries, as typified by the fact that silk imports in 1853 and 1854 were three times as large as in 1846 and 1847. Prices rose rapidly, until by 1853 the price rise was taking place at a spectacular pace. In the latter part of the period, reckless speculation was encouraged by a large number of newly organized wildcat banks.

Depression of 1857–58. A provision in the New York constitution to the effect that no bank could suspend payment under any circumstance seems to have had an important effect upon the crisis of 1857, increasing its severity and shortening the ensuing depression.[1] Business activity which was at a high level in 1856 was accompanied by active speculation in commodities. Commodity prices rose almost perpendicularly from late 1856 to middle 1857, and from there they fell almost as perpendicularly to the end of 1857. This fall in prices was connected with a reduction in tariff rates in 1857. With the break in commodity prices, the New York banks found themselves in a vicious circle of calling loans. Since, by law, they had to maintain specie payments, they found it impossible to moderate the deflation. Many country banks, being called upon for prompt redemption of notes, were forced to close their doors. The banks were unsuccessful in their purpose—the maintenance of specie payments. In addition to the cumulative debt deflation on an augmented scale, currency hoarding became serious for a brief period. Most eastern banks closed in October, 1857. A panic occurred in England in late 1857, and depression ensued there. The depression in the United States lasted only a little over a year, however. The reported 5,000 failures with liabilities of some 300 million dollars in this country were relatively large.

Depression of 1866–67. The National Bank Act of 1863 provided for a 15 to 25 per cent legal reserve of specie or greenbacks against deposits. The creation of a number of national banks, together with the large issue of greenbacks immediately after the war, made possible a large increase in loans. As these loans were approaching the legal

[1] The new constitution took effect in 1846. "The report of the bank department in 1858 states that in September of 1857 the pressure upon the country banks to redeem their notes was beyond all precedent." Robert E. Chaddock, "The Safety Fund Banking System in New York 1829–1866," *Report of the National Monetary Commission* (61st Cong., 2d Sess., Sen. Doc. 581, 1910), p. 342. See also A. B. Hepburn, *History of Coinage and Currency in the United States* (New York: Macmillan Co., 1903), pp. 137 ff.

limit in the spring of 1866, Congress passed the Contraction Law providing for retirement of the greenbacks. This contraction, together with an English panic in May, 1866, was powerful enough to throw the balance to a phase of decline, and depression ensued.[2] The Contraction Law was repealed early in 1868 after the greenback circulation had been contracted from 400 million to 356 million. Repeal removed a deflationary factor and was strong enough to throw the balance to an upswing.

Depression of 1873–79. We chose to make the depression of 1873 to 1879 a long, drawn-out affair. Without doubt this choice was unconscious, as it was also in 1837 to 1843, but nonetheless, the choice was made as a result both of the measures taken and those not taken.

The year of 1873 found American business in an overinflated condition. Railroad building had been occurring at a breath-taking pace. Times were exceedingly prosperous, and many of the farmers in the West had mortgaged their farms to buy permanent improvements at a rate which would make it hard to meet the interest payments if prices should begin to fall. A panic broke in Vienna in May, 1873. Peculiar financial conditions in Europe, growing out of the redemption payments made as a result of the Franco-Prussian War, had brought large investments in America from Germany and Austria but had greatly curtailed them from France and England. Therefore, this panic acted with peculiar force on America, since it cut off a large part of the supply of funds by which railroad building was being financed. By autumn, financial conditions were very bad in the United States.[3]

At this point a first major choice was made. Instead of permitting the panic to run its course, bringing failure and ruin to most of the railroads and many other businesses, the fall was cushioned. Clearing-house certificates, issued in New York, partially took the place of currency and specie in effecting transfers and relieved the reserve stringency. The Treasury bought bonds, pumping money into the market. There was an increase in the issue of greenbacks by 26 million dollars. Rumors were started that gold was coming from London. Hope soon arose in the West and South that Congress would enact legislation providing for inflation of the currency. There was a speculative rise in security prices before the end of 1873, and the 1873 low prices for railway stocks were not reached again until 1876. Successful

[2] Undoubtedly, an important influence in this respect was the increased requirement for Union currency after the close of the Civil War.

[3] A horizontal tariff reduction of 10 per cent in 1872 increased foreign competition, tending to make an unfavorable balance and to draw gold to Europe. This tariff was repealed in 1875. The flow of gold to Europe, however, was to a large extent due to our paper-money standard.

speculation, for the time being, bore no relation to the economic position of the companies, but depended solely upon the reserve position of the banks.

A bill calling for inflation passed Congress in April, 1874, but President Grant vetoed it. In June a law was passed to discontinue issuing more greenbacks. The Resumption Act which became law in January, 1875, provided for a 20 per cent decrease in the outstanding greenbacks and for the redemption of greenbacks in gold on January 1, 1879. Large and vague discretionary powers were left with the executive branch—no provision was made as to how much gold was to be accumulated or how the accumulation was to be accomplished. The bill was passed in the first place as a political measure. People doubted its sincerity. Bills requiring silver inflation showed great strength in Congress. Congress had dropped the silver dollar from coinage in 1873. Because of the discovery of new silver mines, coining on the old 16 to 1 ratio would have been inflationary four years after 1873. There was talk of paying the national debt in silver. The House passed a bill to repeal the Resumption Act in November, 1877, but it did not become law. A law was passed in May, 1878, to discontinue retirement of the greenbacks. In February, 1878, the Bland-Allison Act became law, providing for the purchase and coinage of 2 to 4 million dollars of silver monthly.

Instead of heeding the advice of Horace Greeley, the Democratic presidential candidate in 1872, that "the way to resume is to resume,"[4] resumption was put off for four years, during which time no one was certain that resumption ever was intended or was confident that it would transpire. Some commentators call attention to the fact that there had been too little gold all along to resume, that more gold than the amount produced in California had been flowing to Europe since long before the panic of 1873. Another interpretation, however, is that recurrent fear of inflation and doubt that the greenbacks would ever be redeemed operated to drive gold into socks and mattresses and to Europe. The price of gold dropped to 110 per cent of par in the United States in 1870. In the depression of 1873 to 1878, there was neither the courage nor the unity of purpose to re-establish the gold standard in clear terms as a bold policy, and agreement could not be reached to permit further inflation. It was an excellent scheme for prolonging the depression.

Railroads had been built at such a rapid rate that it was certain many were uneconomic, especially since the determining factor was almost invariably whether the promoters could reap large profits by

[4] Horace Greeley was so quoted at the end of the Civil War. The phrase was used in the seventies by those favoring immediate resumption.

floating the securities. Corruption in the management of the railroads had been so great that scarcely any had a sound capitalization in 1873. Yet foreclosures and reorganizations were delayed for years. Farmers could not pay interest on their mortgages, but an eastern capitalist did not want a Kansas farm, so again there was delay. Collusion among the railroads to maintain rates finally resulted in a price war and almost vanishing revenues, which further increased the uncertainty. Failures in 1873 were not much greater than in 1872, but the number slowly increased year by year until 1878. Savings banks began to fail on a large scale in 1877.

Elections in November, 1878, showed the country to be in favor of sound money. Paper money reached parity with gold on December 17. European investors became convinced that we were sincere in our intention to resume payment in gold, and they were again buying our securities in sizable amounts by the middle of 1879. The crop situation in 1878 was favorable for recovery. Large crops of wheat and cotton were sold at high prices because of a crop shortage in the rest of the world.

Depression of 1883–85. The long prosperity period from 1879 to 1882 was undoubtedly heightened and prolonged, in spite of many minor unfavorable influences, by the rapid growth of railroad building. By 1882, the self-limiting forces on the upswing had become quite strong, and together with a French panic of that year, ushered in a phase of recession. Unlike the depression of 1873 to 1878, commodity prices dropped immediately and violently. With the violent drop in prices, business activity did not get very far below the secular trend for two years. Railroads had been somewhat overbuilt for the time being, but most of them were capable of performing a service, unlike some of the railroads in 1873 which were described by a contemporary commentator as a "large mileage connecting nothing in particular."

This minor depression grew into a major one, however, with a panic in 1884. A combination of the reaction of world-wide depression, a gradually increasing supply of silver coin driving gold to Europe, the exposure of fraud in Wall Street in May, 1884, and stock prices which had failed to decline (since business activity had dropped but little) conspired to drive us into a relatively brief period of deep depression. High-grade bond prices were just beginning to strengthen before the panic struck, and they dropped for only three months. By March, 1885, they were above the previous high of the depression.

The severely depressed agricultural conditions in this deep depression are notable. Kansas farmers burned corn in preference to coal or wood in 1885 because the corn was cheaper fuel. The improvement

of agricultural conditions was not conspicuous in the ensuing period of recovery and prosperity. However, revival brought a marked increase in railroad building.

Prosperity of 1887–90. The prosperity period from 1887 to 1890 began with record railroad building. The Interstate Commerce Act, taking effect in April, 1887, required periodic reports from the railway companies to the government. After the significance of this requirement was fully realized, promoters became discouraged, railroad building decreased, and there resulted a slackening of prosperity. Railroad-rate reductions were made in 1888. This case is one of those unusual ones where we can point clearly to a powerful originating cause, instituted at such a time as to slacken prosperity but not to turn it into a downswing. Business moved up to a prosperity peak in 1889 to 1890.

This prosperity is unusual in another respect. Prices were declining unevenly from 1887 to 1890. With but few exceptions, prices have risen during prosperities. The price decline from 1887 to 1890 was connected with a government surplus which was used to pay off the government debt. As a result of the retiring of government bonds, the banks were forced to contract their bank note circulation.[5]

Depression of 1890–91. By the autumn of 1889, interest rates were high and bond prices were declining. To the strength of the self-limiting forces, there were added two powerful originating causes in 1890. The Sherman Silver Purchase Act, passed in that year, provided for the purchase of 4 1/2 million ounces of silver monthly, to be paid for by semifiat legal tender treasury notes. Gold began to pour out of the country. People were afraid we could not maintain the gold standard. It will be remembered that the Bland-Allison Act provided for the purchase and coinage of a large quantity of silver, but it was only half the amount required by the Sherman Act, and a real need was found for new silver money directly before 1890. The Treasury surplus used to purchase bonds had resulted in a necessary contraction of national bank notes. Silver certificates had replaced the national bank notes. Further, by an act passed in 1886, these certificates had been made in conveniently small denominations. With declining trade conditions after 1890 there was no Treasury surplus with which to retire national bank notes, and the Treasury was now embarked upon the purchase of twice as much silver, which would be represented by legal tender money.

[5] National bank notes could be created against government bonds deposited with the Treasury. Since the national banks tended to print notes up to a prescribed limit of 90 per cent of their holdings of government bonds, the retirement of any government bonds held by them forced the retirement of notes or the purchase of government bonds from private individuals.

In November, 1890, the Baring crisis broke in England. The Baring Brothers, a London banking house, had made large loans to Argentina. Many of these loans had not been invested wisely, and now a political revolution broke out as a result of a poor wheat crop. It became generally known that bank-note circulation had been fraudulently increased and that wildcat banking had grown up on a large scale. Investors liquidated their Argentine securities and Baring Brothers could not stand the strain. In the process of calling American loans by English bankers and the forced selling of American stocks by the English, a financial crisis was engendered here.

The Bank of England took hold of the situation in England and soon restored confidence. This action removed the danger of further calling of loans by English bankers, and hence was a limiting force on the phase of decline in America. There existed in 1890 two other powerful originating causes working in the same direction. First, the McKinley Tariff Act which took effect in October, 1890, gave protection to American industry and was a temporary trade stimulus. Second, a bumper wheat crop in the United States in 1891 and a short crop in the rest of the world made possible the import of gold in the second half of 1891, in spite of the effects of the Sherman Silver Purchase Act. Business began to improve before the end of 1891, and 1892 was a year of prosperity.

Prosperity of 1892–93. In the face of fear regarding the soundness of the currency, the Treasury experienced difficulty during the winter of 1892 to 1893 in maintaining the minimum gold balance of 100 million dollars.[6] New York banks aided the Treasury in supporting this minimum by voluntarily exchanging gold for notes.

The Sherman Silver Purchase Act continued to pump out currency, and the inflationary effect came to outweigh the tendency to hoard gold. The net advance of commodity prices was slight during the prosperity period, but some speculation developed in land and securities. By the spring of 1893 the expansionary influence of the high tariff had largely spent itself.

Depression of 1893–95. The failure of the Reading Railway on February 20, 1893, set off a panic. Fraud of the management in one company after another, especially in the railroads, became known. The fact was uncovered that it had been a fairly general practice to report deductions from income as capital investments, so that losses appeared as big profits. The truth was out and confidence was undermined.

[6] "Public sentiment, based upon Treasury practice and certain incidental clauses of monetary statutes, had fixed on the round figure of 100 millions as the minimum balance consistent with safety." W. C. Mitchell, "Business Cycles," *Memoirs of the University of California* (Berkeley: University of California Press, 1913), III, 53.

Shortly after assuming office, President Cleveland announced that Treasury notes would be redeemed in gold as long as there was any gold at all. But Cleveland found Congress hostile to his program. With difficulty he got Congress to pass a bill repealing the Sherman Silver Purchase Act, thus ending the further issue of Treasury notes. The amount of paper money redeemable in gold was already large, however. Ceaseless attempts were made to pass silver legislation in Congress, and for fear that such legislation would become law, there was a constant withdrawal of gold. Bonds were sold time and again to replenish the gold reserve of the Treasury, only to have it depleted by the exchange of paper money for gold, until finally this process was called the "endless chain." After a year's protection of gold redemption, business began to improve by means of self-generating forces.[7] Foreigners began to buy our securities, there was a marked decrease in the number of failures, commodity prices rose, and business conditions were back to secular levels by July, 1895.

Depression of 1895–96 and Upswing of 1897–99. The prosperity period of 1895 was one of the shortest in history. Business tapered off slightly under the strain of uncertainty created by a renewal of silver agitation until the Democratic convention of July, 1896, when William Jennings Bryan was nominated on a free-silver platform. The drop in business conditions was violent from then until November. McKinley was elected on a sound-money platform, and business began to revive immediately. The upward movement of business conditions in 1897 was assisted by two important originating causes: (1) a good wheat crop in the United States with poor crops elsewhere, and hence large exports of wheat at high prices, and (2) increased production of gold resulting from the discovery of new mines and from the discovery of the cyanide process.

This upward movement of business was interrupted for a few months in 1898 by the fear of war caused by the blowing up of the *Maine* in the Havana harbor, and later by the outbreak of the Spanish-American War. Persons lists this downward movement as the end of a complete business cycle.[8] It could be interpreted as a minor variation. Business had not reached the secular level when the decline began. The decline was relatively slight and lasted only eight months. Business reached the secular level in eleven months after the inception of the decline. Interest rates increased somewhat but for only two months. There was some decline in general commodity prices, but

[7] The final bond issue was made in payment for the delivery of gold from the Morgan-Belmont bank syndicate. The agreement specified that at least half of the gold should come from Europe, and that the syndicate would protect the Treasury from withdrawals of gold for export, as far as possible. But this was in February, 1895, after business had shown considerable improvement.

[8] W. M. Persons, *Forecasting Business Cycles* (New York: John Wiley & Sons, 1931), p. 198.

there was practically no decline in "sensitive" commodity prices.[9] Stock prices fell very little and for only two months. Failures could not have shown much increase, for they were substantially lower in the whole year 1898 than in the year 1897.

Depression of 1900. The depression of 1900 was a mild affair. The only important originating cause affecting it was the German Stock Market Panic of December, 1899. The panic occurred at about the peak of prosperity in the United States, and its influence probably must be reckoned as the added force which turned us into a downswing.

Prosperity of 1901–3. The collapse of the Northern Pacific Corner in 1901 resulted in a temporary decline in the price of marketable securities, in a violent fluctuation in the price of securities for a few months, and in a dampening of the speculative enthusiasm of the general public which was to last for over two years. The history of this corner, briefly, is that on May 9, 1901, it became known that more Northern Pacific had been sold than there were shares in existence. The price skyrocketed, squeezing the shorts who were forced to sell other stocks to obtain funds for covering. These other stocks were weakened by such large sales, and after the corner on Northern Pacific was completed, its price dropped precipitously.

During 1901 and 1902, there was a depression throughout most of Europe, which was also a dampening factor on the prosperity in America. But the European depression and the collapse of the Northern Pacific corner combined were not of sufficient effect to initiate a downswing. Perhaps the prosperity phase was lengthened due to the fact that commitments were more cautious, credit was not so soon overextended, and capital overdevelopment was delayed.

Depression of 1903–4. The "Rich Man's Panic" of 1903 to 1904 was characterized by a marked drop in commodity prices, by a marked drop in the price of securities, by a violent drop in the turnover of bank deposits, but by a very minor drop in physical production. This characteristic is to be explained principally in terms of the large volume of "undigested" securities collected with the banks and insurance companies at the time. Lack of wide public participation in the stock market after the Northern Pacific Corner was a factor. Also, bad conditions in Europe had prevented the making of sizable investments in American stocks by Europeans in the preceding two or three years. This situation was accentuated by our "invasion of Europe," as our large "favorable" balance of trade, shown by currently pub-

[9] A sensitive price is one which tends early to reflect a change in the outlook, and by a violent movement. See Chapter XVI, section 6.

lished government figures, was called. This created a fear of our potential competition in European markets, actually largely unfounded, for the government figures on our trade balance had not taken into account "invisible" items.

Prosperity and Depression, 1905–8. There was a close similarity between the business cycles of the important countries of the world during the years 1905 to 1908. The period comprising 1905, 1906, and the first part of 1907 was in an upswing phase. The ensuing depression seems to have been most severe in the United States. This excessive severity, together with the panic in the last quarter of 1907, is closely related to the practice of trust companies in the preceding prosperity. These trust companies were comparatively unrestricted by law, and they branched out into commercial banking in the period. They kept a woefully inadequate cash reserve, and thus were in a peculiarly vulnerable position at the first sign of impending difficulty. The failure of these trust companies in large number resulted in a first-class panic.

Depression of 1910–11. The United States passed through a trough phase lasting for fifteen months in 1910 and 1911. This was a shallow, minor depression. At the minimum, Persons' Index of Industrial Production and Trade for the United States is only 4 per cent below the secular trend. Such an excessively long horizontal movement in a period of slight depression is to be explained by originating causes.

These originating causes were involved in the government regulation of business which was shifting its form in an uncertain fashion at the time. The Mann-Elkins Act, conferring upon the Interstate Commerce Commission the power to suspend freight rate advances and independently institute rate reductions, was passed in June, 1910. The Act had an important influence upon business from the time it was first debated, however. The railroads hesitated to make extensions and improvements, awaiting developments. This hesitation dampened the effect of the reinforcing forces in the upswing and may have been an important factor in instituting a decline, partly because of the psychological influence on industry in general. During the depression, trust prosecutions were pressed. There was apprehension with regard to the future of the large corporations of the country. This fear was allayed somewhat, when, in the dissolution of The Standard Oil Company and The American Tobacco Company, the Court applied the "rule of reason" in such fashion that the reorganization could be accomplished without heavy loss to the stockholders. There was fresh alarm, however, when suit was instituted against The United Steel Corporation in October, 1911.

On February 23, 1911, The Interstate Commerce Commission re

fused to sanction rate increases demanded by the railroads pursuant to wage increases to railway employees, and investors became apprehensive of the railroads. Although money rates were low and the price of outstanding bond issues remained high, there were few new flotations. Thus, an important source of production of durable capital goods was restricted.

The general apathy was reflected, for instance, by the extremely low volume of transactions on the New York Stock Exchange in 1911. Bankers attempted to place short-term funds in foreign countries where, in general, business was not depressed. After a protracted time, the direction of movement was shifted by the strength of the slowly shifting position of self-generating forces.

Downswing, 1912–14. The peak of business prosperity following the protracted trough was reached in the fall or winter of 1912 to 1913. Business activity moved almost horizontally during the winter, and it is difficult to locate the peak precisely. To the strength of the limiting forces present in the upswing preceding the fall of 1912, there was added the threat of the newly elected Democratic administration to revise the tariff downward. Apparently, prosperity had proceeded too far for this shock to confidence to do more than merely dampen expansion. With the passage of the Underwood Tariff, which radically reduced tariff rates, the downswing was accelerated. Temporarily, imports increased. The Underwood Tariff became law in October, 1913, and October marks the first month under the secular level.

Depression of 1913–15. The depression following in 1913 and 1914 appears to have started out to be a relatively mild one in the United States, although it was world-wide. The declaration of war in Europe in August, 1914, however, added a powerful stimulus to the downward movement. London called the commercial credit lent in New York. A return of stocks and bonds from Europe made it necessary to close the Stock Exchange on July 31. The banks were forced to maintain a rigid cash reserve and could not increase their notes markedly because to do so required the deposit of bonds which were not expansible.[10] The Federal Reserve System was not yet in effect. Loans had to be called, and all of the factors of debt deflation involved in the reinforcing forces in the downswing were under way in an accentuated fashion.

War Prosperity, 1915–20. The downswing did not last long after the occurrence of the accentuated decline. The war, at first acting with the downswing, soon set up much stronger forces acting in the

[10] The Aldrich-Vreeland Act of 1908 had provided for the issue of credit notes by the banks by making deposits of other than government bonds or of commercial paper, but since such issues were to be heavily taxed, they were but little employed in 1914.

other direction. The execution of the war required the procurement of large quantities of war materials, food, and clothing by foreign nations. The United States proceeded to supply a large proportion of these needed goods. Business activity reached the secular level in September, 1915.

Caution is necessary in interpreting the high figures shown by business indexes for these war years. There was a large production of many standardized commodities needed for war consumption. Many industries not so easily represented, such as house building, were operating at low levels. Probably we were producing at unusually high levels after our entry into the war, since there was a play on patriotic impulses and since additional women entered commercial employment. But it is probable that available indexes much overstate the extent of these high levels.

After the war was over, it was to be expected that some time would be required to readjust our economic system to the production of goods for peacetime demands, while it might be expected that production for war demand would fall off precipitously. Business decline began at the end of the summer before the Armistice. It was feared that employment would not be available for the returning soldiers. The government decided to continue the shipbuilding program. The Merchant Marine was doubled from 1918 to 1921. The supplies of merchandise which had been bought by the government were locked up in warehouses. Congress had authorized advances of 10 billions to the Allies after we entered the war, only 7 billions of which had been loaned. The additional 3 billions were loaned after the war was over.

The war produced the typical deferred demand, accumulated savings, and advancing prices, described in Chapter V. The high level of residential building throughout the twenties, for instance, was related to the first two of these influences. From the end of the war to 1920, prices rose 25 per cent, in addition to the major rise taking place before we entered the war. Prices rose only moderately while we were a belligerent. The postwar price rise was reinforced by the government policy of keeping interest rates low. The purpose was to keep down the service charges on the government debt. One method used involved keeping low rediscount rates of the newly established Federal Reserve Banks. This provided the commercial banks with cheap credit for expanding commercial loans. The Federal Reserve Banks had not been given power to vary reserve requirements of member banks.

Depression of 1920–21. The rapid rise in prices led to a very excessive accumulation of inventories. As we saw in Chapter VI, rapid accumulation of inventories can continue for only a limited time. In this case a reversal was partly caused by gold exports. In the last half

of 1919 and in 1920 other important countries were in depression. Their low prices induced them to export a large supply of goods to us. Gold flowing out of the country to pay for excessive imports led the Federal Reserve Banks to raise rediscount rates in order to protect our gold reserve, which led, in turn, to an increase in commercial interest rates and discouraged further inventory accumulation in view of the huge stocks already held on credit.

Inventory liquidation occurred quickly once it got under way. Output dropped rapidly since production had to support only a part of current consumption. Prices fell spectacularly. Once inventories were fairly well liquidated, however, the production required to maintain current rates of consumption shifted activity into an upswing. The decline began in mid-1920 and recovery was under way by mid-1921.

Prosperity of 1922–23. At the very onset of the phase of prosperity the Fordney-McCumber Tariff Act, raising rates, became law. This act was a temporary stimulus to trade and tended to accelerate the upward movement of the prosperity phase. War-debt payments were so large in 1923 as to introduce an important inflationary factor. Gold was shipped to this country in large quantities.

Purchases of securities of foreign countries by the citizens of the United States fell off very markedly in 1923 because of the absorption of large domestic flotations. Exports were largely financed by foreign loans during the period considered, and most commentators believe that the drop in foreign loans accounted for the relatively low level of exports in the first half of 1923. Imports were large because of our prosperity and high prices, so that there was an "unfavorable" balance of trade in the first half of 1923. This condition is closely related to the self-generating forces. When our prices are high, there is a tendency for imports to increase and for exports to decrease.

The reversal of the foreign trade flows leveled off the prosperity in the spring of 1923. The most urgent portion of the deferred demand had been made up, and the limiting forces had become strong enough to produce a downturn in view of these conditions.

Depression of 1924. There was some increase in bank failures in the Middle West in the last quarter of 1923 and in the first quarter of 1924, but the total amount of deposits involved was relatively slight. The overextended position of these Middle Western banks, resulting from land speculation after World War I, was such that the slightest stringency made them fail. Business failures for the country as a whole showed but a very slight increase in 1924, and the liabilities involved were actually less than in 1923.

The depression of 1924 was destined to be short. Because of the debt payments required of foreign countries, monetary stringency was

eased by the inflow of these payments. Instead of investing at home in 1924, as we had done in 1923, we invested abroad. Exports increased over 1923, while imports decreased. Recovery was also hastened in 1924 by the occurrence of a large wheat crop in the United States which could be exported at high prices since there was a short world crop.

Prosperity of 1925–26. The prosperity following in 1925 and 1926 is often noted as a long period of level prosperity. This conception is to some extent a correct characterization but not to the extent indicated by most measurements available at the time. During the period, there was a rapid increase in the production of many types of consumer durable goods, caused partly no doubt by the extension of the facilities for installment buying, but also by the fact that a structural change was taking place in the type of goods demanded. In the case of some of these goods, such as automobiles, there is a reasonably good representation in our measures of business activity, but this is not true in the case of others, such as residential houses and radios.[11]

There was also a large increase in the "service" industries in such employments as garage mechanics, filling-station attendants, and stenographers. Since the increase in such an activity as residential building or attending a garage was more rapid than in the standardized commodities represented in the indexes, business activity increased more than is indicated by these indexes. Current data seemed to show that employment in 1925 and 1926 was less than in 1923, but these data did not allow for the increase in the rapidly growing service employments.

The federal government debt was being paid off at a rate of about a billion dollars a year, but more than this amount was being absorbed by an increase in state and local debts. The state bond issues for construction projects were very large in the period, and the resultant economic activity was not fully counted in our indexes of business conditions.

In spite of many factors which tend to make the appearance of horizontal movement illusory, business activity does seem to have been at a slowly rising level. Commodity prices rose substantially from the middle of 1924 until activity reached the secular trend in early 1925. From then on we had a stable price level until the end of 1925 and a declining price level in 1926. This situation is unusual in a period of prosperity. Level or falling prices always prevent business activity

[11] The residential building boom reached a peak in 1926. Most of the materials used in producing houses are represented in the indexes, so it might seem that the increase in residential housing was well represented. But this is not the case, since the labor required to use these materials in making houses is more inefficient than labor used to fabricate such materials into standardized commodities.

from rising to levels which otherwise would be achieved. A rapid increase in productivity was taking place at the time, making business profitable even at decreasing prices. But no matter how great the increase in productivity, businessmen will tend to defer commitments if prices are falling and if it appears that the commitment could be made at less cost some time in the near future.[12] To some extent, therefore, we would expect the profits made because of increasing productivity during a time of falling or level prices to be deflected from the new capital market to the market for existing securities. There were substantial increases in productivity in 1925 and 1926, and security prices rose very markedly. Furthermore, it is to be noted that rising prices of any kind form one of the important reinforcing forces in an upswing.

The background for level and later falling commodity prices during this prosperity was set by an abrupt discontinuance of gold flow to the United States. Accession of gold by the United States occurred at a stupendous rate from 1915 to 1918 and from 1921 to 1924. This flow of gold ended abruptly in 1924. European countries were stabilizing their currencies. Gold which had flowed from foreign countries because of lack of confidence in these currencies began to return and was assisted in some instances by temporarily artificial arrangements.

The reason for the leveling off of prices in 1925 is easily explained. Gold was being shipped out of the country. There was a further increase in gold certificates placed in circulation. The Federal Reserve Banks sold a large volume of government securities, drawing down bank reserves. Rediscount rates were increased in accordance with these changes.

The principal reason for decline in the general price level early in 1926 seems to be connected with two events: (1) the breakdown of the Stevenson Plan to control the price of rubber, and (2) the settlement of the anthracite coal strike. The prices of the commodities involved dropped spectacularly. Other prices dropped sympathetically, probably because of the weakening of speculative positions. Agricultural output had been large in 1925, leaving these commodities in a vulnerable position, and their prices declined through the first half of 1926.

Perhaps the price decline later in the year resulted from the unsettled conditions created by the British general strike in May and from the collapse of the Belgian franc and the Italian lira in June and

[12] Lionel Robbins, among others, has held that with increases in productivity, prices should fall to maintain balance. See *The Great Depression* (New York: Macmillan Co., 1934), pp. 20 ff. But Robbins does not face squarely the invitation to procrastinate given by falling prices. The problem is analyzed more completely in the theory chapters of this book. See especially Chapter IX, p. 217.

July. Record agricultural output in 1926 resulted in a decline in the price of agricultural commodities.

Downswing, 1927. Business activity reached a peak in the fall of 1926. Although there were overextensions after so long a period of prosperity, no financial stringency was yet evident. Short-term interest rates were not high—in fact only slightly above bond yields— and bond prices were still rising. Stock prices did not decline. Vulnerable financial situations existed only in the Middle West and South. Banks in these sections had too large a proportion of their funds in mortgages, and in many cases the loans were too large for the current value of the real estate. The large crop with its attendant low prices in 1926 seriously impaired purchasing power in the farm sections, especially in the South. Bank failures showed a substantial increase in the fall of 1926 because of these conditions.

Credit became more stringent in foreign countries when substantial progress towards stabilization of the French franc occurred in the fall. A redistribution of gold was taking place. The flow of gold to France was embarrassing to other European countries and created some apprehension in the United States.

The decline in business activity was very slow in the autumn and winter of 1926 and 1927. Prices declined slightly in the early months of 1927, but the fall was less than in the early months of 1926. There was no marked drop in the production of durable goods, no cessation of the offerings of new securities, and bond and stock prices continued to increase. The decline differed little from a minor variation in prosperity. The bank failures in agricultural districts soon subsided.

Foreign credit conditions continued adverse, however. Foreign balances in the United States were being earmarked, and later in the year gold flowed out of the country. The Federal Reserve Board neutralized this situation by reducing the rediscount rates and by making open-market purchase of securities which resulted in a rapid expansion of member-bank credit.

After May, the decline in business activity did exhibit the characteristics of a downswing. Ford went out of production in June, pending the introduction of a new model in December. Automobile production declined, since many people deferred purchase until the new Ford model was available. In a situation already vulnerable, this action was influential enough to shift us into a phase of decline.

The downswing was arrested, however, partly by the activity of the Federal Reserve Board. Weak credit positions were not uncovered by the decline since stock prices did not drop. Commodity inventories were low. General wholesale prices showed no decline after the early months of the year. Bank credit was protected and therefore no one

suffered from the large security loans the banks had made. No significant interruption occurred in the rise in the price of stocks and bonds in spite of the drop in profits. Private corporations with strong cash positions began to make, in the aggregate, large security loans. We were in an incipient boom. Contemplated mergers and refinancing hit an all-time peak in 1927, as indicated by the fact that new security offerings for these purposes were far larger in that year than in any year before or since.

The rapid growth in the use of acceptances together with easy-money policies made it possible to finance a large volume of exports. In spite of no net decline in prices through the year, exports showed an increase over 1926.

The price of agricultural products moved up substantially with the harvest of the 1927 crop (there was a marked decline in the world output), relieving any credit stringency that still remained in the agricultural districts.

The downswing was terminated in January, 1928 with practically no correction of overextensions outside of a few banks in agricultural districts. The depression was extremely shallow.

Prosperity of 1928–29. If most of the "unfavorable" originating causes of 1927 had occurred in 1928, perhaps history would be quite different. Before the end of 1928, short-term money rates had shown a marked increase and bond prices had shown a marked decline. A credit stringency had developed even though the reserve ratio was still very high. The policy of the Federal Reserve Board was to foster the granting of extensions on the basis of business conditions and the price level, rather than on available gold reserves.

Gold flowed out of the country at an accelerated rate in 1928. The rediscount rate was *raised* rapidly. The Federal Reserve Banks sold in the open market. The effect of this selling was almost cancelled, however, by a decrease in the gold certificates in circulation. These conditions continued into 1929. The New York rate was raised to 6 per cent on August 9, the highest in the country, whereas typically the New York rate was comparatively low. The favorable margin between the selling of securities by the Federal Reserve Banks and the retiring of gold certificates amounted to a little more in 1929 than in 1928. There was no flow of gold out of the country in 1929 until after the stock market crash in the autumn.

Of special interest in the 1928 to 1929 prosperity is the horizontal movement of commodity prices. This was the second consecutive prosperity to show this characteristic. The Federal Reserve policies creating an artificial credit stringency helped produce level commodity prices. Funds flowed freely to feed the speculation in the stock

market, almost without regard to their cost. This unrestricted flow of funds undoubtedly made simpler the job of stabilizing commodity prices, since funds were bid away from those who might otherwise have stored inventories.

That which lends special flavor to the "New Era" is not the exceptional level of prosperity. Prosperity was recognizable but business activity was little, if any, more than an average distance above secular levels. There may have been some unemployment, over and above that which was purely "technological."[13] This is what should have been expected of a prosperity which showed no rise in the price level.

The special flavor of this New Era is lent by the belief that there were to be no more depressions. No optimistic soul could lose. Do not sell America short. Look at the favorable position of those hardy souls who bought stocks on thin margins against all odds (and sense and reason) in the unfavorable year 1927. And yet the 1928–29 stock market cannot be dismissed simply by calling it paranoic. Productivity *was* rising at a very rapid rate. The physical basis was created for producing goods at a considerably increased rate. Then why was the Great Depression so severe and protracted? The factors responsible are analyzed in the following chapter.

Before turning to a consideration of the originating causes operating in the early 1930's, however, it is well to summarize our knowledge of the effect of originating causes.

2. EFFECT OF ORIGINATING CAUSES ON THE CYCLE: SUMMARY

Originating causes have had an important effect upon every business cycle in the United States. It is not possible at the present time, at least, to make any quantitative measurement of the effect of these originating causes. The factors considered above are the immediate factors introduced into the business system. Many of these factors are merely the apparent disturbances; actually, they are the results of more indirect originating causes. At many points it has been necessary to trace the sequence of some of the self-generating causes occurring in order to gain perspective in discussing the originating causes. It must be remembered, however, that, on the whole, the discussion of the self-generating causes is omitted. Except in unusual circumstances, a description of the self-generating causes in one cycle is a fair description of such causes in other cycles in the same historical period. The effect which slow evolutionary changes have on the business system

[13] By "technological" unemployment is meant labor displaced as a direct result of the adoption of laborsaving inventions and devices.

is not traced here. When an adequate business-cycle history is written, it will record the changing importance of self-generating forces over long periods of time.

The effect of originating causes could be summarized in many different significant ways. One summary might be made according to the type of action taken at different times. This action has related principally to banking and monetary control and to tariff changes. The struggle for a national banking system played a vital part in the two early deep depressions, 1815 to 1821 and 1837 to 1843. In the early period of American history, overextension of credit during the boom was a chief type of maladjustment. Hence, the institution of the subtreasury system and the action which led up to it was a vital factor in preventing the onset of deep depression in 1847. After the Civil War the struggle over the banking system faded into the background with the establishment of the National Banking Act and was replaced by a struggle over the type of standard money. Resumption of the gold standard was a vital question in the 1870's, and the problem of its maintenance was just as vital a question in the 1890's. The question of the banking system again became uppermost after the depression of 1907 to 1908 brought home the type of crisis which may result from an inelastic banking system. The Federal Reserve Banking System was the result, and the management exercised by it has been a vital influence on the business cycle. The shifting nature of banking and monetary control must be kept in mind if the lessons of business-cycle history are to be properly applied. For instance, although the struggle for the gold standard was a minor current in the 1930's, it has no importance under our modern type of credit system comparable to that of the last quarter of the nineteenth century.

Tariff history shows us that the temporary business-cycle influence of a tariff change may differ substantially from the longer period influence. From the textile and iron tariffs in 1816 and 1818 to the McKinley Tariff of 1890 and the Fordney-McCumber Act of 1922, the influence of increased rates has always been temporarily expansive. Lower rates have acted the other way, as best illustrated by the Underwood Tariff of 1913. This history provides a background for the passage of the Smoot-Hawley Tariff in 1930, which, however, came to grief because the depression outlasted its temporarily expansive influences.

If attention is restricted to major depressions, a study of history is enlightening in showing the serious effect of dilatory tactics. Attempts were made to cure the depression from 1815 to 1819 by inflation of the currency and by avoidance of painful readjustments. The same

general tactics were used from 1837 to 1841. Again, readjustments were largely avoided from 1873 to 1877 when the ultimate currency basis was a matter of debate. There are many parallels between policies adopted in these deep depressions and the policies adopted in the 1930's.

Although the issue of currency to halt depression was one of the first gropings, manipulation by open-market operations is usually thought to date from the control of the Federal Reserve Board. However, Treasury bonds bought in the 1870's depression, pumped funds into the market.

The recall of loans from Europe exercised an important influence in almost every period of decline in the nineteenth century. This factor may well have been important in producing a rapid deflation. It is at least interesting to note that the early stages of the three worst depressions of the century felt the influence of loan recall less than usual. The depression beginning in 1815 followed European war which made sizable American loans impossible. England sent us gold in 1837 to stave off the depression, instead of calling loans on a large scale. Because of European war, only loans from central Europe were available for recall in 1873. Failure of European countries to extend us loans in the years preceding 1847 was an important factor in preventing the onset of deep depression in that year.

The rarity of prosperity without rising commodity prices makes the periods when level prices were experienced of peculiar interest. These occurred only from 1887 to 1890, 1925 to 1926, and 1928 to 1929. It appears that the economy did not stretch itself in any of these periods as it would have done if prices had risen.

The weather has had a peculiarly important influence on inducing an upturn, although apparently fortuitous. An astounding number of cases show the effect of good crops in America timed with short crops abroad. Notable in this respect are the years 1847, 1878, 1891, 1897, 1924, and 1927.[14] This factor cannot have the importance in the future that it had in some of the depressions of the past because of the relative decline in the importance of agriculture in our economy and the major decline in agricultural export.

We can conclude that originating causes do not set the length of the business cycle in any obvious way. A dip into history does not provide evidence for the originating-cause theories which rest the case on some type of influence setting the length of the cycle. Too many different forces have been at work, and the occurrence of originating causes appears to have been quite fortuitous.

[14] H. G. Moulton appears to place undue emphasis on this factor. See *The Formation of Capital* (Washington: Brookings Institution, 1935), pp. 60 ff.

REVIEW QUESTIONS

1. State the way in which each of the 13 developments which "have combined to produce the current form of business economy" has tended to produce a more highly interrelated business system.
2. Why did not business cycles, as we know them, occur in the Middle Ages?
3. Compare the adequacy of Thorp's Business Annals with quantitative measures of business change.
4. State the reasons why we cannot accept the average length of past cycles as indicative of the length of future cycles.
5. Draw a rough chart showing the relationship between countries having long cycles and countries having short cycles.
6. Draw a rough chart comparing the various definitions of cycle phases.
7. Compare the length of recovery out of secondary depressions with the length of recovery out of minor depressions.
8. How many world-wide depressions have there been?
9. Compare the important influences operating in the various major depressions in the United States.
10. Has depression ever continued after inflation got under way?
11. Compare the influences operating in prosperities during which there was a horizontal or declining commodity price level.
12. Discuss the difference between quantitative and qualitative considerations in determining when business cycles first occurred.
13. Classify the outstanding originating causes in business-cycle history according to whether they were beyond human control or induced by human control.
14. Write cases for holding that (*a*) recovery has always been dependent on an originating cause, and (*b*) recovery has been achieved through the operation of self-generating influences while originating causes have been purely incidental.
15. Compare the record with the contention that continuous price adjustment is the only satisfactory economic arrangement.

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Chapter XII

THE GREAT DEPRESSION

THE RECORD during the business cycle of 1929 to 1937 is traced in this chapter, and the factors responsible for its unusual nature are analyzed. There are many points of similarity between our recent debacle and the deep depressions of the nineteenth century: 1815 to 1823, 1837 to 1843, and 1873 to 1878. Most outstanding similarities are the relatively low levels of the secondary trend, public indecision on critical issues, and the presence of a major area of speculation in the preceding prosperity. Other widely recognized deep depressions, notably those from 1883 to 1885, 1893 to 1896, 1907 to 1908, and 1920 to 1922, are shorter and less marked in these respects. In the simpler economy of the nineteenth century, relationships are less difficult to detect, but available information on the 1929 to 1937 depression is far more adequate than can be had on earlier periods. Because of the lessons we draw from recent experiences and their relationship to the present, the Great Depression is of major importance to us.

Unlike the earlier deep depressions, the years from 1929 to 1937 were not predominantly in a downswing phase. As we shall see, the decline from 1929 to 1932 seemed unbearably drawn out, but it amounted to less than half of the complete period. In the other three depressions with which comparison is made, much the greater part of the period was characterized by business decline. The period June, 1929, to March, 1933, is 43 months, which is indeed a long decline. However, the decline in the seventies lasted almost 5 years, and those in the depressions from 1815 to 1823 and 1837 to 1843 may have been over 5 years. The length of recovery in the 1930's was exceptional. It lasted 4 years as compared with less than 3 in the early 1820's, and about one in both the early 1840's and late 1870's.

1. THE PRECEDING PROSPERITY

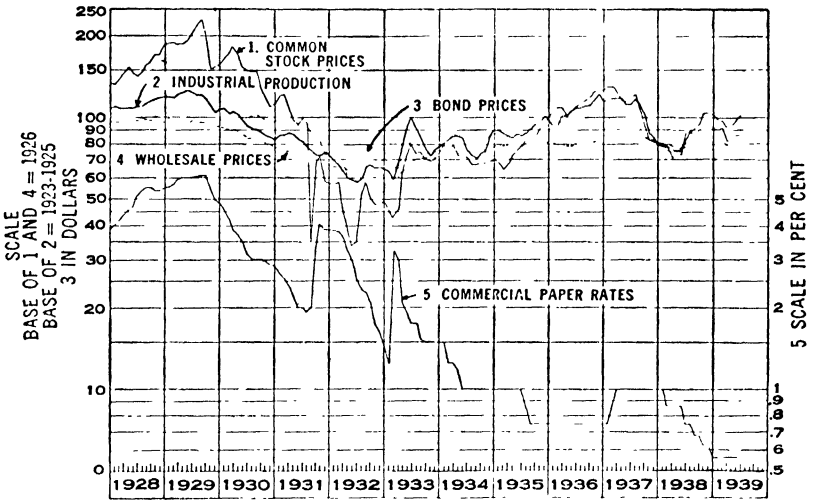
The period ending in 1929 was marked by extravagant speculation, just as were the earlier periods ending in 1837 and 1873. That it was also a period of excessively high activity is at least debatable. The best estimate of unemployment in 1929 is 1.5 million, or about 4 per cent

of the nonagricultural labor force.[1] That employment was not so high as to be inflationary is indicated by the facts that wage rates were not generally increasing and average commodity prices did not tend to rise.

The overproduction which arose in 1929 was not caused by inventory accumulation to any significant degree but by the building of durable goods at a rate considerably in excess of their use. Building construction is a spectacular case. Office space became much larger than the amount used, and residential vacancies reached an excessive

CHART 21

PRICE CHANGES IN THE GREAT DEPRESSION*



* *Survey of Current Business*, standard series; except for stock prices which are represented by the discontinued Standard Statistics 420 stock index and bond prices by the discontinued Standard Statistics 60 bond index.

figure in many communities. The average age of automobiles in use was at an abnormally low figure. Industrial plants were built at a fairly rapid rate, but excessive plant capacity was fairly universal. This condition would appear to indicate that the rate at which capacity was increased was excessive compared to the rate of use.

General overcapacity, of course, indicates the failure of prices to be in adjustment with income. Such overcapacity points to basic maladjustments in terms of the relationship between prices, productivity, and income payments. Prices were moving horizontally, but productivity was advancing rapidly, calling for falling prices or rising

[1] See A. F. Burns, *Economic Research and the Keynesian Thinking of Our Times* (New York: National Bureau of Economic Research, 1946), p. 31.

income of potential purchasers rapid enough to absorb the increasing quantity of goods the economy could produce.

Monopolistic situations reached a critical stage in 1929. Price maintenance was attempted for an impressive range of commodities.[2] In many cases actual maintenance was not attempted, but subversive agreements were entered into to prevent price declines. The function of price is to act as a regulator, but it cannot perform this function when price variation becomes too much impeded. Progressive developments, shifting costs, and the type of products demanded are certain to lead to a critical condition if price adjustment fails. The distorted relationship between prices in 1929 reflected a lack of adjustment which had been developing for some years. In the meantime, uneven development necessitated a realignment.

The minor character of the 1924 and 1927 recessions is the key to the understanding of the major maladjustments which arose in 1929. Overinvestment was of a cumulative character. The long, stable period made people oversanguine. They believed that prosperity would last forever. Two depressions already had been successfully halted. The New Era was born.

The effects of growing maladjustments in the twenties can be most effectively traced in terms of stock prices. The stock market climbed continuously from 1923 to 1929, with the exception of minor reactions which always accompany a bull market.[3] Brokers' and other stock loans reached astounding totals.[4] Many of the stock holdings were owned on so thin a margin of equity that only by continued rises in prices could the positions be maintained. The character of the stock market in 1929 is seen more clearly when it is realized that the upward movement was confined to speculative stocks. The peak level in the price of all stocks listed on the New York Stock Exchange was reached in 1928, as illustrated by Chart 26 (p. 289). In spite of high optimism and rising levels of prosperous activity, the bidding up of speculative leaders was offset after October, 1928, by the decline in the price of less active stocks. Only the speculative urge could continue to whip stock prices up.

Since the character of bank assets played an important part in the downswing, the subject may appropriately be considered here. Com-

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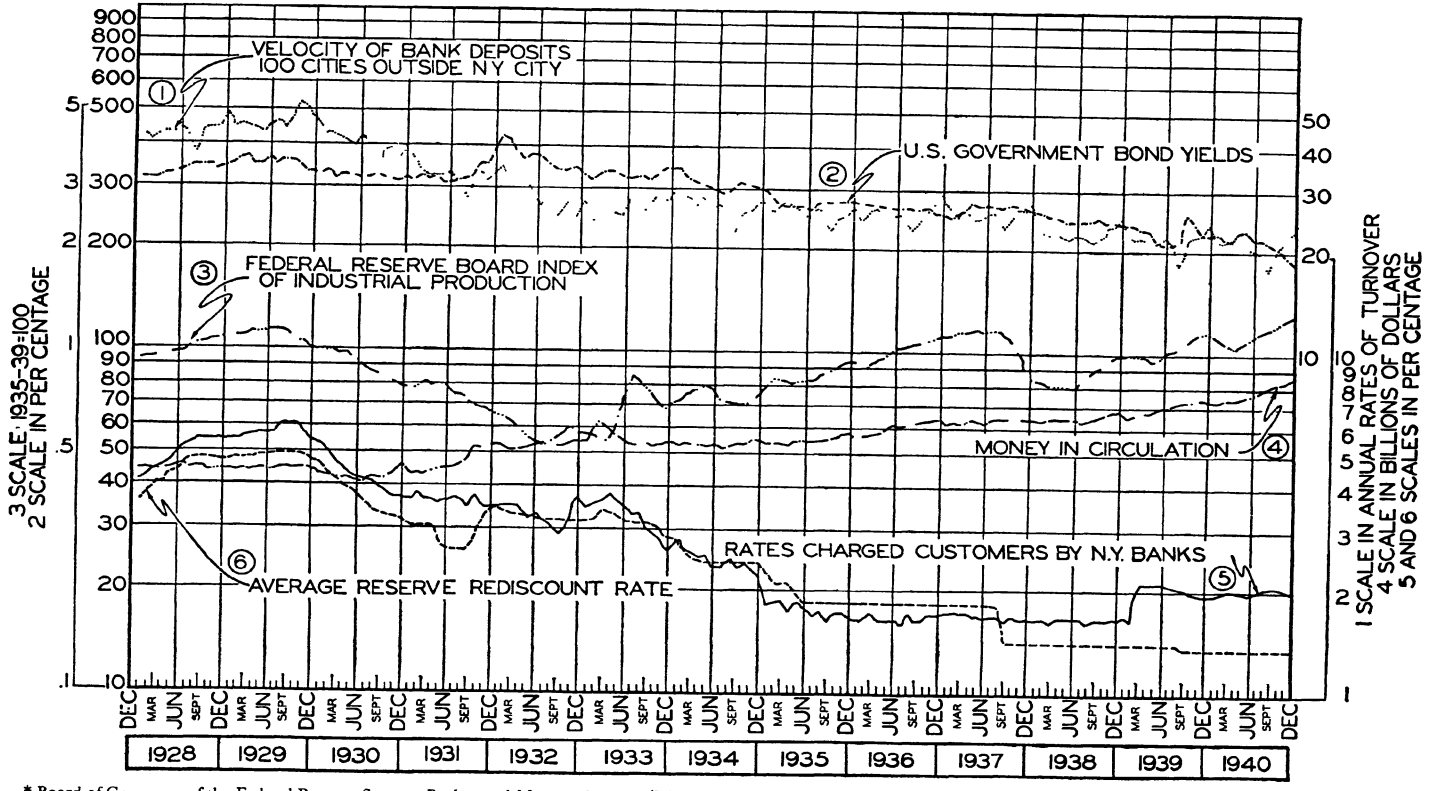
[2] See Jules Backman, *Government Price Fixing* (New York: Isaac Pitman & Sons, 1938); E. G. Nourse and H. B. Drury, *Industrial Price Policies and Economic Progress* (Washington: The Brookings Institution, 1938); Clair Wilcox, *Competition and Monopoly*, Temporary National Economic Committee Monograph 21 (Washington: Government Printing Office, 1940).

[3] For explanation of stock market reactions and rallies, see Chapter XIX.

[4] See particularly Lewis H. Haney and Others, *Brokers' Loans* (New York: Harper & Bros., 1932).

CHART 22

CREDIT CONDITIONS IN THE GREAT DEPRESSION*



* Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics* (Washington, 1943).

mercial companies bought on a hand-to-mouth policy and major corporations built up large cash surpluses, giving them an unwonted independence of the banks. In order to make profitable use of the funds entrusted to them, the banks found it necessary to place an altogether abnormal proportion of funds in long-term investments, principally in securities. Drastic declines in stock prices put some of the soundest of the commercial banks in a vulnerable position. Even loans on mortgages contained explosive possibilities, since a shift had definitely been made from a very long period of appreciating land values to a period of depreciating land values.

Information on savings and their employment would be very enlightening because it is in this area that the flow of funds is most likely to suffer interruption. The student understands that the flow of activity is guided by the flow of funds. To the extent that funds paid out are spent as promptly as in the preceding period, activity will be relatively well maintained because any round of activity is largely in anticipation of demand. These statements apply only to the most inclusive aggregate or average, however, and, if the difficulty in prosperity does not originate in all parts of the economy concurrently, it may be neutralized by many other forces for a time. In such a case, the points of origination may be hidden by the aggregates.

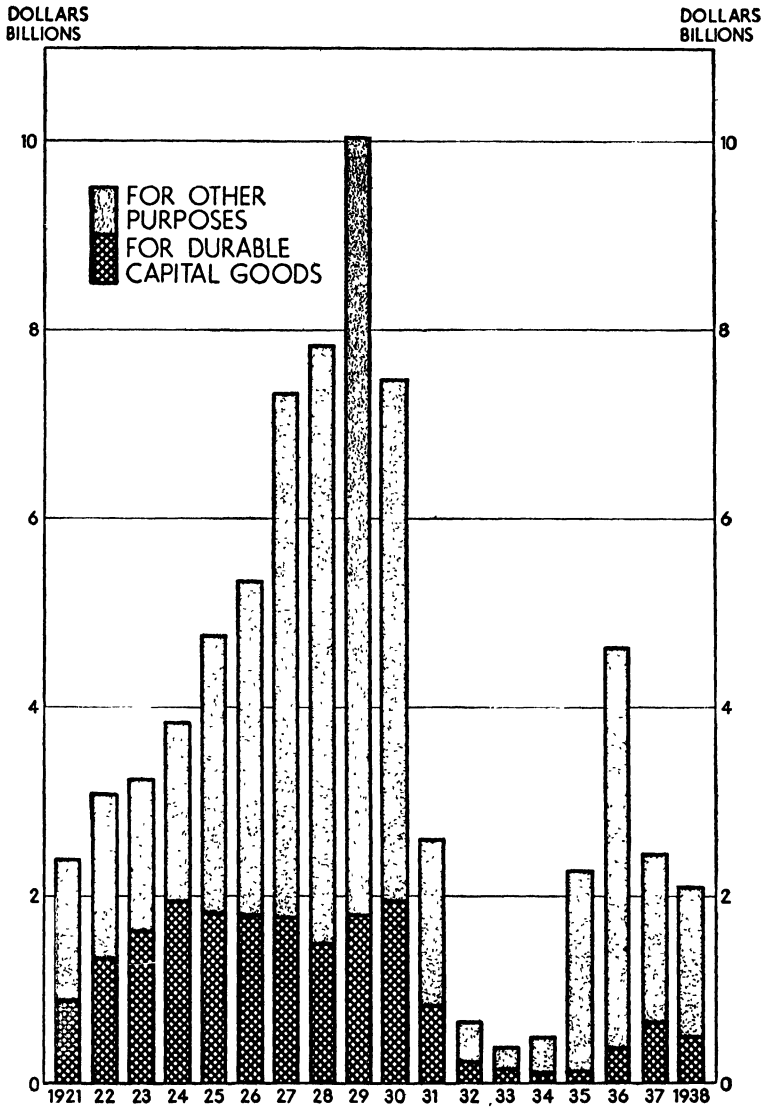
It is important to note that an indeterminate part of the saving in the late twenties was not employed to build durable goods; instead, it was used to finance combinations and financial institutions and to provide working capital. Chart 23, depicting the use of funds obtained by corporate security issues, shows this development very spectacularly. In 1929 a point was reached such that the demand for funds to finance combinations and amalgamations weakened. This weakening of demand helped to overtopple the prosperity.[5]

The major part of savings added to capital formation. Since our measurements of depreciation and obsolescence are of uncertain significance, the relative amount of gross, rather than net, capital formation is shown in Table 13. It will be noted that gross capital formation was a relatively steady proportion of gross national product from 1923 to 1929. Since estimates of depreciation and obsolescence remain close to 10.5 per cent of gross national product for these seven years, net capital formation is estimated to vary between 9 and 13 per cent. Gross capital formation more inclusively represents the unstable area.

[5] We should bear in mind that Chart 23 in no way portrays the proportion of savings going to durable goods. Part of the corporate funds not used to make durable goods were employed to purchase existing assets. In the purchase of existing assets, additional funds are placed in the hands of individuals to purchase more corporate security issues. Hence, the figures are not comparable to net saving made available to corporations.

CHART 23

CORPORATE SECURITIES ISSUED*



*Taken from *Verbatim Record of the Proceedings of the Temporary National Economic Committee, March 25, 1939 to May 29, 1939* (Washington. The Bureau of National Affairs, 1939), III, p. 513.

To gain perspective, it is well to summarize the major areas of maladjustment known to have been in existence in 1929.

The Building Boom. For the country as a whole, combined residential and commercial building moved horizontally from 1925 to

1929. Rises in some regions were offsetting steady declines in others. Vacancy rates were increasing in most parts of the country. On the average, construction costs were increasing compared with a horizontal movement in aggregate wholesale commodity prices. Average residential rental rates decreased 10 per cent from the beginning of 1926 to the end of 1929. Clearly, maintaining the level of construction

TABLE 13

PROPORTION OF TOTAL PRODUCT GOING TO INVESTMENT, UNITED STATES 1919–35*

Year	(1) Gross National Product (Billions of Dollars)	(2) Gross Capital Formation (Billions of Dollars)	(3) Per cent (2)/(1)
1919	69	19	28
1920	83	22	27
1921	66	11	17
1922	67	13	20
1923	78	18	23
1924	79	15	19
1925	83	19	23
1926	89	19	21
1927	87	18	21
1928	90	18	20
1929	94	20	22
1930	83	14	17
1931	65	8	13
1932	47	3	7
1933	47	4	9
1934	56	6	11
1935	61	9	15

* Simon Kuznets, *National Income and Capital Formation 1919–1935* (New York National Bureau of Economic Research, 1937)

activity depended upon greater productivity in building and more selective construction (housing for lower-income groups, for example), neither of which was forthcoming.

Speculation. The price of stocks was high relative to earnings. Ownership became increasingly "weak," shifting to individuals buying on margin or with funds obtained by bank loans and to financial institutions which would become insolvent with a major decline in stock prices. An abnormal proportion of the stock ownership was for trading purposes rather than for investment.

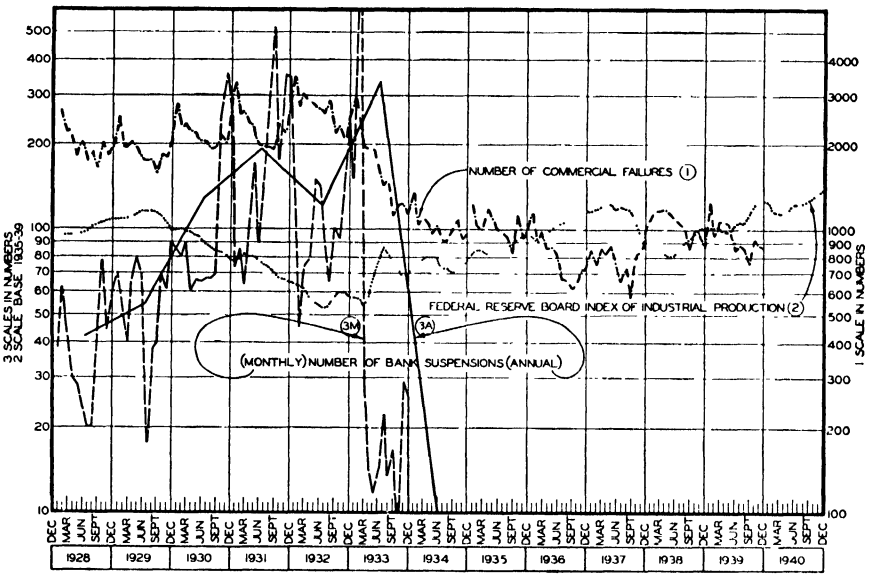
Foreign-Trade Balance. In addition to paying for our exports, foreign countries had somehow to obtain enough dollar exchange to pay an extra-trade debt service growing out of the war. This was accomplished by foreign loans to an important degree. With rising

interest rates resulting from stock market speculation, the New York money market became increasingly attractive, and foreign loans declined.

Demand for Durable Goods. The demand for consumer durable goods held fairly steady at 10 to 11 per cent of the gross national product from 1923 to 1929. Many of the products represented new types, and after a long period of sustained sales the middle- and higher-income markets were near saturation. Substantial price reductions would have been necessary to reach many additional customers in the lower-income groups.

CHART 24

FAILURES IN THE GREAT DEPRESSION*



* Bank suspensions after 1933 are too few to show on the chart

Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics* (Washington, 1943), Standard and Poor's Corporation, *Basic Statistics*, (New York, 1941) Standard series

Declining Population Growth. Slackening in population growth, which was well under way in the late twenties, forced a redistribution of demand. For instance, the demand for standard types of children's goods was not keeping up with total production. The required readjustments added to already needed changes and threatened failures in the declining areas.

Price Rigidity. "Stabilization" or "valorization" schemes were widely attempted in the late twenties—notable cases were coffee,

copper, raisins sugar, tin, and wheat. Pig iron illustrates a price which became more rigid in the sense that the frequency of price change decreased and the monthly variability declined. Growing price rigidity made the clearance of supplies more and more difficult. Also, under such circumstances investment opportunities appeared less promising.

Price Advances. Most prices were stable and a few were declining. Generally, raw-material prices were in better alignment with finished-goods prices than in the first half of 1928, but a few raw materials rose substantially. For example, copper rose from 14 cents early in 1928 to 21 cents per pound in March, 1929.

Inventories. The inventories of most products did not rise significantly. However, the stocks of agricultural products were a third higher than in 1928 and twice as high as in 1925. The stocks of secondhand automobiles had reached an embarrassing level.

Income Distribution. The distribution of income was becoming more concentrated as indicated by horizontal wage rates and rising interest payments and corporate profits. Since the higher-income groups save a larger proportion of their income, consumer markets became more vulnerable.

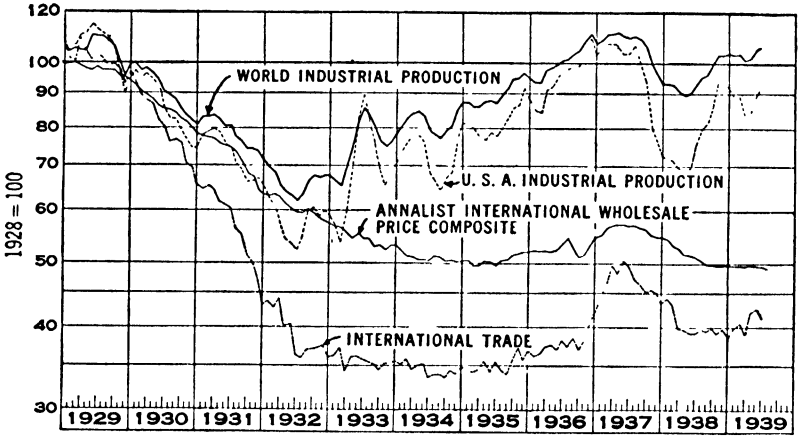
The downturn and the downswing can be explained by the events leading up to the climax and, as the downswing proceeds, by those augmenting the reinforcing forces. If a definitive theory were available, changes could be explained in terms of the movement of some function which predicts the business-cycle variation. The events detailed here could then be shown to result from the causal forces represented in the definitive theory. The framework most frequently proposed for a definitive theory at the present time is Keynesian aggregative consumption-income theory, analyzed in the chapters on theory, forecasting, and economic planning. Aside from the difficulties detailed in those chapters, no short-period measurements of the relationship between national income and consumer expenditures are available for the late twenties. The most satisfactory explanation, therefore, is in terms of the events and their relation to the self-generating cyclical movement, as detailed below.

2. THE DOWNSWING—JUNE, 1929, TO MARCH, 1933

The student can obtain a good idea of the changes which took place in economic processes after middle 1929 by examining the accompanying charts. Such facts cannot be described efficiently in textual material. In the description which follows, only the statistical facts most critically related to the changes which took place are noted.

CHART 25

WORLD CONDITIONS DURING THE GREAT DEPRESSION*

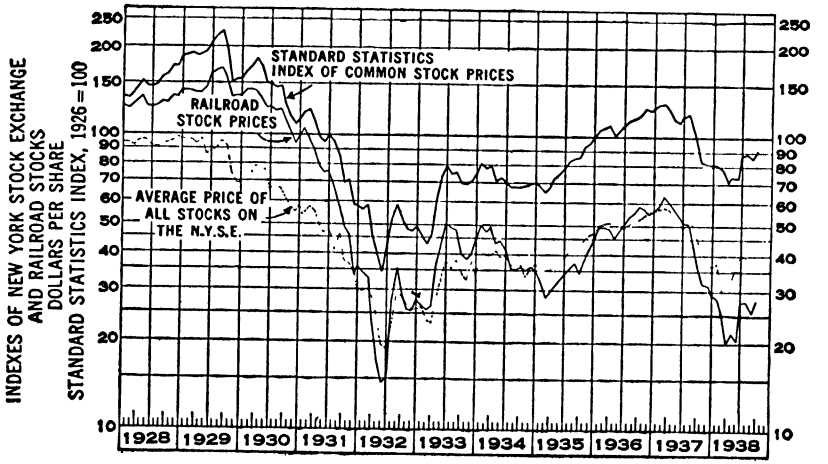


* Indexes prepared or adapted by *The Annalist*.

Autumn of 1929. By the summer of 1929, the stock market had reached a point where the only way a precipitous decline in prices could be prevented was for stock prices to continue to rise. (See Chart 26.) Stocks were owned, to an unstable extent, by holders who had borrowed short-term funds to pay for them. The rate on short-term funds was so high compared to the yields on stocks that it was profit-

CHART 26

STOCK PRICES DURING THE GREAT DEPRESSION*



* Data taken from the *Survey of Current Business*.

able to hold these stocks only if the price continued to increase. Not only was it profitable solely on this basis, but, for many holders, it appears to have been the only possible way the stocks could be retained. The margins against these stocks were so thin that the holders could not long stand the drain of paying out a much larger carrying charge than the return which was currently received. This thin margin would be effective in driving the price down precipitously once the decline began.

Speculative-stock prices reached an all-time high in the first week of September, 1929. After this point, skepticism and apprehension became significant. As early as February, 1929, the Board of Governors of the Federal Reserve System had warned against the further expansion of speculative credit, and it was well known that the Board's intention was to prevent any further increase in speculation. Up to July, government securities had been sold by the reserve banks in the open market at a rapid rate. With the leveling of stock prices toward the end of August, the reserve banks began to purchase government securities so that the stringency of the short-term money market eased slightly at this point. The threat was not removed, however. The New York rediscount rate had been raised to 6 per cent on August 8, 1929. No reduction was made in this rate when the policy was shifted to the purchase of securities in the open market. Since the New York rate was the highest in the country, while it ordinarily is the lowest, the Board was still attempting to exert pressure on the stock market. Actually, however, a reduction of the buying rate on acceptances to aid in financing commercial transactions largely canceled the effect of the increased rediscount rate, as evidenced by a rapid increase in the federal reserve bank holdings of acceptances at this time.

Several unfavorable factors conspired to prevent the prices of stocks from rising above their previous highs after the first week in September. A large number of businessmen were becoming increasingly apprehensive of several unstable factors present in the situation. The conditions which seem to have created the most alarm at the time were (1) the piling up of automobiles in the hands of dealers in the summer of 1929, (2) the overdevelopment of the building industry together with the rising costs in the industry, (3) the alarming growth of brokers' loans, and (4) the high level of short-term interest rates. On September 20, the suspension by the London Stock Exchange of dealings in shares of the Hatry group of companies created a flurry of selling on the London Exchange and reacted on the New York stock market in two ways. A great deal of short-term money had flowed to New York because of the high rate available, and, in order

to protect commitments in a declining stock market, London traders were forced to call many of these short-term loans. Gold had been flowing out of England since early summer, and, in order to bolster its reserve position, the Bank of England raised the rediscount rate to 6 1/2 per cent on September 26. The fact that it became about as profitable to invest funds in London as in New York provided London bankers with another incentive for withdrawing New York funds.

The New York stock market eased off slowly until late in October. On Monday, October 28, the stock market dropped precipitously with a large volume of sales, after the market had shown but little resistance to selling for several trading days. The drop was enough to force margin selling which invited uncontrolled short selling. Short selling was not restricted to sales at increasing prices as later required by the Securities and Exchange Commission. On October 29 the sales of the New York Stock Exchange and the New York Curb Exchange combined were 23 1/2 million shares. The market continued to decline with but slight interruption until November 13, at which point well-known stock market averages were at only about half of the high level of the first week in September.

Everything possible was done to avoid a severe panic, a frequent characteristic of the inception of a depression in the United States in the nineteenth century. The New York Federal Reserve Bank rate was reduced from 6 to 5 per cent on November 1, and it was further reduced to 4 1/2 per cent on November 15. The federal reserve banks bought in the open market at a rapid rate. A bankers' pool, under the leadership of J. P. Morgan and Company, was formed to cushion the declines of the market. The New York banks co-operated to take over the brokers' loans made by "all others," since these loans were being quickly liquidated. The Farm Board announced advances at $1.25 per bushel on wheat. A movement to establish a six months' moratorium on all first mortgages in Philadelphia made considerable headway.

President Hoover called successive conferences with railroad executives, with leaders in industry and agriculture, and with men prominent in banking and finance. At this stage, Hoover tried to prevent a depression by common agreement. He was largely successful in getting leaders to agree not to cut wage rates. He also tried to get leaders to agree not to cease any of the ordinary activities of trade and business. He worked unremittingly to obtain consideration by business leaders of plans for furthering construction and for betterment projects which would insure continued employment and maintain business activity unimpaired, but business leaders had no long-term plans developed for the purpose. In the spring of 1930, the large majority

of the people of the country thought that these endeavors of the President were successful.

The Year 1930. The early months of 1930 comprised a period of mixed tendencies. Industrial production leveled off in January and February, and additional decline was slight until May. The Federal Reserve System eased still further a credit situation which had not been tense since the break in October. The New York rediscount rate was reduced successively until it reached 2 1/2 per cent in June. Gold began to flow back to the United States.

Apparently the business leaders took to heart the conference with the President in the fall and early winter. Bond flotations increased substantially. It is significant, however, that the impetus given to the production of capital goods no more than *maintained* their production at the reduced level. The production of automobiles was disappointing, and there was a marked shift to the production of lower priced cars. Even purchases on installment credit were much smaller than in 1929, and a greater proportion was made up of the financing of secondhand cars. Building activity, especially in residential lines, fell to an exceedingly low level. Production had dropped about as severely in most foreign countries as it had here. In spite of a high level of foreign loans in 1930 and an unprecedented amount of short-term loans on acceptances, exports slumped badly.

The New Era had not yet ended. It was the spirit of the times to believe that a depression could not occur. It is from this belief, rather than from philanthropic tendencies, that business leaders were led to co-operate with Hoover to maintain investment activity. Bankers stepped in to take over accounts of speculators who would otherwise have failed in October. Several of these accounts were closed out before the end of the year, but it is rumored that some were held over into 1930. In any case, the loans of banks for speculation were large and increasing in the early part of 1930. Even brokers' loans made a large increase after the severe deflation in the autumn. By spring, we were again in a stock market boom.

In the face of depressed conditions in foreign countries, a depressed level of imports, and our demands for large payments on foreign debts, the Smoot-Hawley Tariff Bill nevertheless was passed in June. This bill greatly increased tariff rates over their already high levels.

At midyear, with declining production, a continual sagging of commodity prices, and a decline in profits, it became obvious that the rise in stock prices had been overdone. Stock prices dropped rapidly, but did not reach the 1929 lows. Brokers' loans decreased sharply, but loans by banks to individuals on security collateral showed a marked *increase*.

In the face of decreasing profits and a decreasing demand for goods at the prices asked, the decreases in production took on the form of temporary shutdowns for repair of plants and resulted in forced vacations. Hoover's philosophy of maintaining wage rates was generally held to be sound. Cuts in wage rates began to appear in the smaller organizations, but these were frowned upon.

The semimonopolistic condition into which most industries had fallen by the late 1920's, was great enough to make possible a holding of most prices until it became obvious, well along in the depression, that the restricted level of sales merely invited "chisellers" to take an unwonted proportion of the restricted orders. Then, belatedly and begrudgingly, price cuts were made. At times, these price cuts were sizable, but they were merely in forced recognition of changed conditions which had already taken place, and they were not, therefore, of the nature to beget confidence that the absolute bottom had been reached, that no further cuts would occur. It is probable that the "chisellers," ordinarily comprising a small proportion of the total producers in quantity of output, answered such an official cut by a further slight cut below the new quoted level. Hence, the price decline for other than agricultural products was painful and continuous, even though always tardy in recognition of actualities.

In 1930 the weather had an unfortunate effect on business conditions. A large wheat crop was produced, world wheat production was above average, and the visible supply of wheat exceeded the high level of 1929, with a consequent disastrous decline in prices. The decline was augmented by the virtual insolvency of the Canadian Wheat Pool and by the adverse condition of the finances of other large wheat-producing countries. Cotton production was slightly below average, but restricted levels of business the world over reduced consumption; the visible supply showed substantial increases, and the decline in the price of cotton was marked. A severe drought occurred in the Corn Belt. At many places the corn crop was a complete failure, and there was not enough forage harvested to feed the livestock over winter. It was necessary for the government to appropriate funds to relieve the suffering and to prevent the starvation of livestock over large sections, at a time when funds were needed for relief in the cities. The marketing of industrial products over the entire agricultural section was necessarily restricted to an abnormally low level.

At the year end, stock prices declined with renewed vigor. The days of cushioning the drop were over, and finally it was necessary to permit the decline to close out unsound speculative commitments in stocks. So far, there had been but a slight increase in the number of bank failures, but men with important financial connections had

realized that the speculative position of many of the banks was weak and that such banks could not withstand a much greater drop in stock prices. Until November, 1930, stock prices held above the low levels of a year earlier, when accounts were artificially protected. With a decline of stock prices to a point below these levels, banks began to fail in large numbers. The bank failures, unlike those from 1923 to 1924 and 1926 to 1927, were not restricted to the agricultural districts. This time they were caused by the overextension of loans on securities instead of by the overextension of loans on agricultural land. The banks involved were principally located in the industrial and financial sections. In mid-December, the closing of the doors of two fair-sized banks in the East, the Bank of the United States in New York City and the Bankers' Trust Company of Philadelphia, created a mild panic.

At first reflection, it may seem almost unthinkable that these banks could have carried on in this condition for a whole year after the decline occurred. But it was thought that a New Era existed in which depressions could not occur. The experience of the 1920's backed up this belief when weak accounts outlived 1927 unimpaired, becoming relatively strong in short order.

A business decline can be measured by the shrinkage of the total value of output, if part of the shrinkage is attributed to lower prices. From a level of 104 billion dollars in 1929, gross national product dropped to 91 billion in 1930. The major part of this 13 billion dollar shrinkage was due to the following (in billions of dollars): residential building 1.4; consumer durable goods, 2.1; consumer nondurable goods, 3.6; business construction and equipment, 2.2; business inventories, 1.9. Because of the large amount spent on consumer nondurables, reduction in expenditure for them was relatively much less than for durables. Business inventories shrank only 0.3 billion, but this must be compared to an accumulation of 1.6 billion in 1929. The only rising expenditure was for public construction—from 2.4 to 2.8 billion dollars.

The Year 1931. With the opening of 1931, there was some increase in confidence. The prices of high-grade bonds continued to rise. Although still depressed, bond offerings during the first few months of the year showed a marked increase over November and December. There was a slow, steady increase in business activity during the first four months of the year. For a few months after January, the number of bank failures showed a marked decrease. The domestic situation had cleared enough for recovery to have gotten under way during the year. As we shall see, the European situation made this impossible.

Considerable uncertainty remained, as is usual when recovery gets under way. Consideration by the Congress of immediate payment of veterans' compensation created some anxiety, especially because of Mellon's announcement that the necessary bond flotation would disrupt government finances. Commodity prices continued to decline. Because of the unfavorable influences of the 1930 agricultural crop, the prices of agricultural products showed marked declines. Winter killing affected an unusually small proportion of the total wheat acreage. The Farm Board found it necessary to announce that no loans could be made on the 1931 crop. The Farm Board's announcement that it would sell 35 million bushels of wheat abroad did not lend much reassurance. The holdings of the bankrupt Canadian Wheat Pool were overhanging the market.

Credit was exceptionally plentiful. The New York federal reserve rediscount rate was cut to 1 1/2 per cent, a new low level for rediscount rates of central banks in the world. There was a large flow of gold into the country. On February 27, Congress overrode the presidential veto on a bill to make loans at 4 1/2 per cent on veterans' compensation certificates. The loans made on these certificates increased purchasing power by about a billion dollars during the following six months.

Business activity leveled off in April and began to show a slight decline. The increase in production had not been very marked and, with the first signs of slackening, stock prices showed a sharp decline to the low levels of December. This decline was not merely the result of a slackening in business activity, however. *Laissez faire* had broken down more completely in Europe than in the United States. There had been a tendency for a long time to meet crises with resistance; vested interests were protected by postponements. European affairs were to play an important part in shaping economic conditions in the United States in 1931.

European financial conditions were brought to a head on April 14 by England's action in bringing up the issue of the permissibility of a proposed Austro-German customs union. The withdrawal of short-term credits from Austria by French financial interests reached panic proportions. In May the Creditanstalt Bank in Austria faced insolvency. The Austrian Government stepped in with a large loan to save the situation, but the government had to obtain funds for the loan from the Bank for International Settlements.

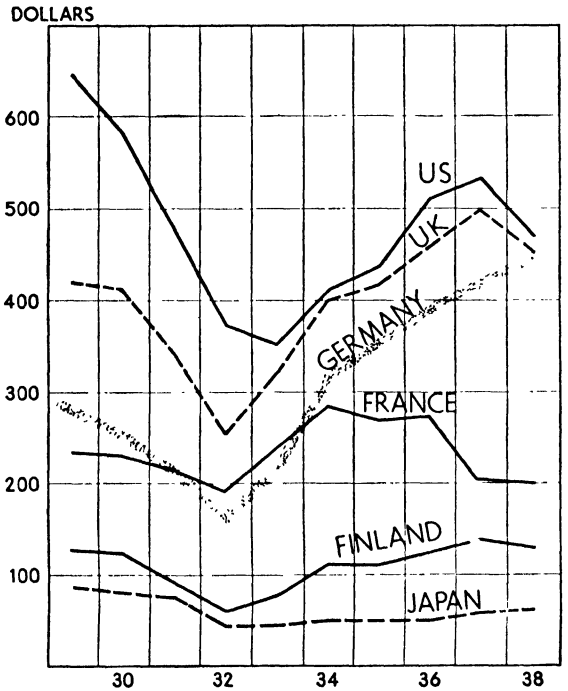
Meanwhile, the withdrawal of short-term funds from Germany by financial interests in all of the important countries of the world was reaching critical proportions. This was caused partly, no doubt, by Austria's difficulties. It was precipitated by the proposal for an Austro-

German customs union. It was accentuated by fear that the National Socialist party in Germany would adopt violent tactics. In any case, increasing difficulties were met in obtaining the *additional* short-term credits demanded.

Repercussions from these European conditions brought a further drop in stock prices in New York. Late in May, prices had fallen to a level far below the low of the preceding December. This drop un-

CHART 27

NATIONAL INCOME PER CAPITA IN VARIOUS COUNTRIES*



*Based on R. F. Martin's estimates and here reproduced from *The Cleveland Trust Company Bulletin*, September 15, 1939, with permission.

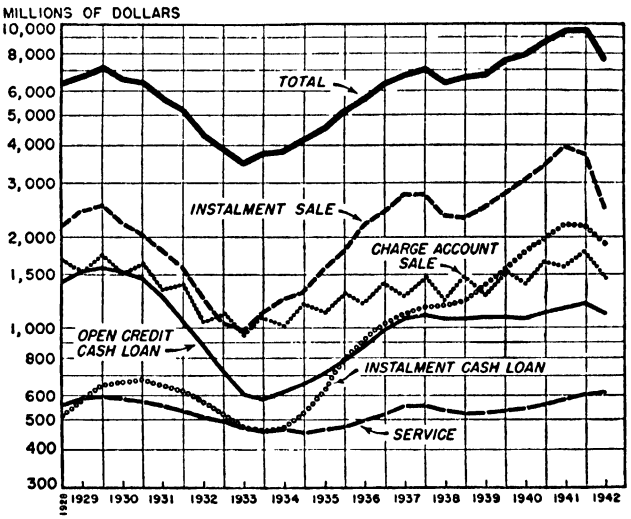
covered security loans which had not yet been liquidated, loans which were sound enough until stocks dropped to such a low level. At this point, stock prices dropped to a level below that of early 1927 for the first time in the depression. The dependence of the banks on security loans has been noted. The closing out of loan accounts brought in its wake a large increase in bank failures. Bank failures had decreased markedly from the end of 1930 until the fresh drop in stock prices to new low levels. The second epidemic of bank failures was more than people could stand with equanimity. Currency hoarding became

marked for the first time in the depression. Fear paralyzed industry. Production fell considerably below the already low levels. And the worst was yet to come.

The depression had lasted long enough so that profits were, and had been for some time, markedly below dividend rates which in early summer were only moderately below peak levels. During the summer it was necessary to reduce or discontinue altogether many of these dividends. It finally became necessary for large corporations to make official cuts in wage rates. The resulting decreases in personal income played an important part in further depressing activity.

CHART 28

DECLINE IN CONSUMER LOANS IN THE GREAT DEPRESSION*



* Taken from the *Survey of Current Business*, November, 1942.

The railroads were embarrassed by the drop in earnings resulting from curtailed activities. During the prosperity period, the Interstate Commerce Commission had denied the railroads large enough profits to accumulate sizable reserves. While the manufacturing industries had been refunding bonds into common stocks and thereby reducing current charges, the railroads, on the whole, had maintained a heavy proportion of bonds in their financial setup. Railroad wages are protected by strong unions, and therefore the only choice was for the railroads to request an *increase* in *rates* which they did in June. But the effects of the situation were already at work. Because of the weakened position of many of the railroad bonds, it was necessary to remove

them from the "savings-bank lists."[6] The savings banks and trust companies found themselves forced to dispose of these bonds immediately, and the price for them dropped precipitously. Commercial banks holding such bonds as investments found themselves in a vulnerable position since hoarding and low stock prices had wrought their weakening effect. Many commercial banks took the precautionary measure of selling these bonds even at a great loss, and thus their prices were driven down still further.

In 1931 the weather partially duplicated the unfortunate pattern of 1930. The wheat and cotton crops reached very nearly all-time records in the United States. The visible supply of these commodities was already embarrassing, and the result was a startling drop in their prices to a point below the already low prices. The income of the farmers was greatly reduced.

With the large withdrawals of short-term funds from Germany, it was clear in early June that the reparation payments due late in the month could not be met. With a sincere intention of easing the situation, Hoover made his famous moratorium proposal, by the terms of which no intergovernment debt payments would be made for one year. But it was already only too obvious that in any case no reparation payments could be made, and certainly this was a very tardy recognition of the part which interallied debt payments had played in strengthening the reinforcing forces of the downward movement.

The Darmstädter Bank, with liabilities of about 500 million dollars, failed on July 13. The whole German banking world was threatened with failure. Many panic measures were taken, including restrictions on the export of gold. Large short-term loans had already been obtained from central banks of other countries and further loans were necessary.

On August 19, the financial world was startled by the revelation of the Wiggin Committee that the total short-term credits owed by German debtors to lenders in other parts of the world were 1 3/4 billion dollars; and that short-term credits, 40 per cent in addition to this amount, had been recalled from Germany since December. This Committee revealed in a set of startling figures the real difficulty in Germany. In the days when the United States was making large loans abroad, Germany had borrowed from foreign sources *more* money than was paid out in reparations. The amount obtained from 1924 to 1930 by both public and private loans from foreign sources was

[6] The laws of New York State, among other states, provide conditions which must be met by investments of savings banks and of insurance companies. Upon these conditions, a list of acceptable investments for such institutions is built up. See A. S. Dewing, *The Financial Policy of Corporations* (Rev. ed., New York: Ronald Press, 1926), pp. 108 ff.

80 per cent more than the reparation payments made during the same time. When the long-term loans ceased, it was necessary to shift to short-term borrowings in order to obtain the required funds. The longer the depression lasted, the greater these short-term funds must become if reparation payments were to be maintained. The depression outlasted Germany's obtainable short-term credit.

A large share of the short-term loans made to Germany came from England. Therefore the decision of the "stand-still agreement," that financial interests in the different countries should undertake not to recall any of their short-term loans for a period of six months from September 17, fell heavily on England. A run by foreign depositors on the London market began late in July. After New York had lowered the rediscount rate to 1 1/2 per cent on May 8, the discount rate of the Bank of England was reduced to 2 1/2 per cent on May 14. Many banking experts point to this step as a mistake, in view of the critical financial conditions in Europe. In any case, when the run by foreign depositors began at the end of July, the Bank of England raised the rate first to 3 1/2 per cent and then to 4 1/2 per cent before the end of the month. The run subsided somewhat in August, with assistance from France and the United States, but was redoubled in mid-September. Nevertheless, the English discount rate was not further raised until September 21 when it was raised to 6 per cent. On the same day, however, the Bank of England suspended gold payments against notes. This action fell like a thunderbolt upon the financial world.

The suspension of gold payments in England had adverse effects upon business in the United States. Gold flowed out of the United States at a wholly unprecedented rate. A large proportion of the civilized world depended on the pound, either directly or by a pound exchange standard. The pound almost immediately depreciated by a third, forming an automatic tariff barrier which gave countries trading in pounds an international trade advantage for the time being.

Foreign selling of stocks occurred and, in September, stock prices in New York dropped below the previous low level. Banks failed at an almost unbelievable rate in September and October. In these two months a total of 827 banks closed their doors, and failures continued at a high rate until the end of February. Currency hoarding reached a level of a billion dollars by the end of 1931. The large outflow of gold and the large hoarding made credit somewhat less plentiful. This stringency was only partially offset by the Federal Reserve system in freeing gold and in purchasing in the open market. The New York rediscount rate was raised from the 1 1/2 per cent established in May to 3 1/2 per cent in the middle of October, and the rise in

commerical interest rates was marked. High-grade bond prices rose to peak levels early in September but dropped spectacularly when England left the gold standard. Business activity dropped violently from the already low levels. Commodity prices continued to drop at about the same rate as earlier in the depression.

Measures taken to combat the evil effect of the European crisis were of mixed character. On September 15, the Comptroller of the Currency relaxed somewhat the requirement that bonds held by national banks should be valued solely according to stock exchange prices. A plan, later to ripen into the Reconstruction Finance Corporation, was worked out to protect smaller banks against sacrifice of their assets. The moratorium question was raised, and, although it was agreed that no renewal would be made in the following June, it was clear enough that the debts would not be paid. A graded increase in freight rates was granted with the provision that the funds raised be segregated and given to the weak roads to save them. With declining prices, such an increase in transportation costs weighed heavily on business.

Aside from England's going off the gold standard, measures taken by foreign countries to offset our high tariffs had become widespread by the end of the year. Late in the year England passed a high protective tariff measure, the first protective tariff in England in nearly a hundred years. In 1932, our exports reached a level not far different in effect from an embargo.

Gross national product shrank from 91 billion dollars in 1930 to 76 billion in 1931. The major part of this 15 billion dollar shrinkage was due to the following (in billions of dollars): consumer durable goods, 1.7; consumer nondurable goods, 5.1; business construction and equipment, 3.3; business inventories, 1.1. The reduction in business inventories by 1.1 billion dollars in 1931 must be compared with a decline of 0.3 billion in 1930. Residential construction declined but little farther below the reduced levels of 1930. Public construction declined slightly, leaving a very minor increase in the output of gold and silver as the only area of increased expenditure.

January, 1932, to March, 1933. The year 1932 opened less auspiciously than did the year 1931. In 1932, production was tending downward from the low levels already attained. Common stock prices in December had fallen to levels even lower than those of September, but these prices showed only the slightest increase early in the year and soon were falling to even lower levels. Bank failures, however, soon tapered off. This was the first time in the depression that bank failures decreased while stock prices fell to new low levels. By mid-1932, when stock prices reached unbelievably low levels, there was

some increase in bank failures, but the level did not approach that of the preceding year end. Weak stock accounts were evidently well liquidated by the autumn of 1931.

Gold export continued on a large scale during the first half of 1932. Currency hoarding decreased slightly until mid-year. There was a slow withdrawal of gold certificates from circulation. After March, the federal reserve banks were purchasing securities in the open market at an unprecedented rate, but during the first three months there was virtually no net open-market purchase. The government deficit grew in size. The New York rediscount rate was reduced to 3 per cent in February and to 2 1/2 per cent in June. In spite of the gold exports, credit was again becoming plentiful and commercial interest rates were rapidly dropping back to very low levels.

The commodity price decline was much less than during the first half of 1931 when production was showing some increase. It appears that the prices of many commodities were so low that if prices were reduced further, no production would take place unless costs could be further reduced.

Two outstanding events of the first half of 1932 were the creation of the Reconstruction Finance Corporation and the passage of the Glass-Steagall Act on banking. The Reconstruction Finance Corporation was granted permissive capitalization of two billion dollars to make loans to financially embarrassed banks and trust companies, building and loan associations, insurance companies, mortgage loan companies, railroads, and a few minor institutions. By this scheme, many insolvent companies which could stand on their own feet once business was again operating on a normal level, were maintained indefinitely as going businesses.

The Glass-Steagall Act permitted the federal reserve banks to substitute government bonds for the required eligible paper pledged against federal reserve notes. Discounted commercial paper had become so small in amount that more than 40 per cent gold reserve against federal reserve notes had automatically become necessary.[7]

After the passage of the Glass-Steagall Act it was no longer necessary to hold more than 40 per cent gold against federal reserve notes. Thus, excess reserves were created which permitted the further purchase of securities in the open market. The effect both of the Reconstruction Finance Corporation and the Glass-Steagall Act was to ease credit further.

The drop in stock prices from the already low levels was truly re-

[7] Certain bonds held by the banks legally could have been used without the Glass-Steagall Act, but to do so would have reduced the liquidity of their assets. See F. A. Bradford, *Money and Banking* (New York: Longmans, Green & Co., 1941), pp. 706-7.

markable. An average of over 400 stocks dropped by the end of June to a level barely over half of that at the beginning of March. Common stock prices had finally reached a point where any existing unfavorable possibilities were discounted. By June, many common stocks were selling on the market for less than the cash plus the government securities in the company's portfolio attributable to such stock. Security prices, the indomitable reinforcing influence throughout the decline, had finally hit bottom. Meanwhile, the price of high-grade bonds was appreciating rapidly, and even the price of lower-grade bonds rose substantially after the first half of April. The increase in bank failures in June was far less than on the two preceding periods of bank runs, although stock prices dropped to a point far below preceding low levels.

From June to September stock prices rose far more vigorously than at any preceding time in the depression. Production increased substantially. The only other improvement in production so far during the period of the depression had been in the early months of 1931. For the first time in the depression general wholesale commodity prices increased.

Business failures decreased until by January and February, 1933, they were far less than in the corresponding months of 1932 and 1931, and only very slightly above 1930. Business failures had not increased to any unusual proportions during the depression, but their number and the liabilities involved rose steadily until the summer of 1932.

Credit again became extremely plentiful. Gold outflow ended at the mid-year, and by the end of the year there was a large flow to this country. Outstanding gold certificates were decreased. The government deficit increased, and substantial funds were pumped out by the Reconstruction Finance Corporation. In October, home-loan banks, with a capitalization of 134 million dollars, went into operation. The purpose of the home-loan banks was to loan money to banks and insurance companies on residential mortgages which were held over financially embarrassed home owners. Money rates sank to levels even far below those of middle 1931.

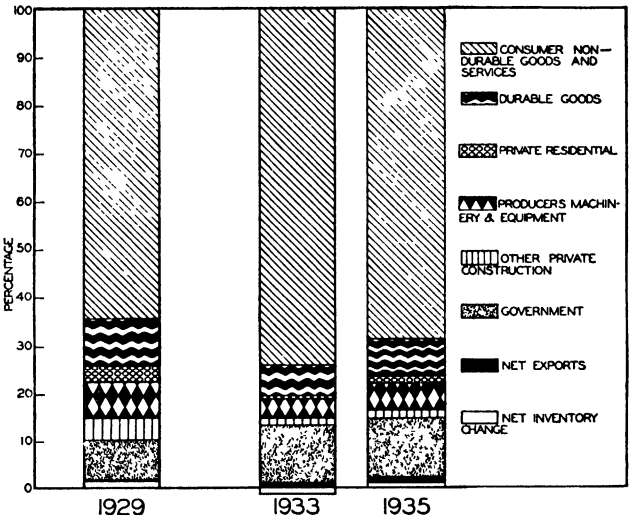
Certain highly unfavorable factors persisted. The Ottawa Conference met in the summer for the purpose of setting up preferential tariffs within the British Empire, a further insidious factor in the chain of consequences set up by our high tariff of June, 1930. By autumn, President Hoover felt impelled to call attention to the duties on sixteen broad classes of products which were not high enough to protect us from foreign competition. As we shall see, what amounted to an unbelievably high tariff was soon to be imposed by revaluing the dollar.

In September, attention was called, in a vivid manner, to the post-

ponement tactics used in attempts to solve the depression. The Coolidge-Smith Committee was called to study means of safeguarding several billions of dollars in second-grade railroad bonds. The Committee was organized upon the invitation of insurance companies, savings banks, and educational institutions holding large investments in railroad bonds.[8]

CHART 29

EXPENDITURE DISTRIBUTION OF GROSS NATIONAL PRODUCT*



* Department of Commerce data.

Typical of the unreasoning attitude of much of the public at this stage was the demand of 14,000 veterans massed at the Capitol to get their bonus. Finally, President Hoover dispersed them with federal troops.

Great political uncertainty marked the last half of 1932. President-elect Roosevelt did little to clarify the program of his prospective administration. President Hoover concentrated his attention (1) on settling the war debt question, and (2) on balancing the budget, issues not focused on the recovery problem. The Democratic Congress was deaf to his pleas.

Gross national product had shrunk from 76 billion dollars in 1931 to 58 billion in 1932. The major part of this 18 billion dollar shrinkage

[8] The Committee was officially called the National Transportation Committee. Statistical findings were made for it under the direction of H. G. Moulton. See his report *The American Transportation Problem, Prepared for the National Transportation Committee* (Washington: Brookings Institution, 1933).

was due to the following (in billions of dollars): consumer durable goods, 1.9; consumer nondurable goods, 6.3; consumer services, 3.8; residential building, 0.8; business construction and equipment, 2.5; public construction, 0.8. Inventory depletion was at the phenomenal rate of 2.6 billion dollars, compared with 1.4 billion in 1931, so it contributed 1.2 billion dollars to the decline. No area of the economy advanced for the year as a whole, not even gold and silver mining.

Several rather trivial incidents together with the uncertainties outlined above started runs on banks, which spread like a prairie fire before the end of the presidential term. Although President Hoover could have resigned it must be remembered that he found himself so hamstrung that he could not, if he wished, institute any bold policy, and President-elect Roosevelt was waiting until he assumed office.

Late in 1932 and early in 1933, it was found necessary to declare banking holidays in Nevada and Louisiana. Currency hoarding increased greatly from the already high levels during the first two months of 1933. The governor of Michigan proclaimed a state-wide banking holiday on February 14. The Detroit banks were generally believed to be less sound than most of the large banks of the country. These banks had been considerably weakened by prolonged withdrawals.[9] No early solution was found for their difficulties, and the date of reopening was indefinitely postponed. The postponement resulted in what Leonard Ayres characterized as "one-way banking." The large corporations of Detroit, no longer having any banking facilities in Michigan, drew on their accounts in Cleveland, Chicago, Toledo, and northern Indiana for payrolls. With no banking facilities in Detroit, the cash drawn from banks in adjoining states was cached in Detroit. Such large withdrawals of funds from Ohio banks, in addition to the hoarding which had already taken place, so weakened the reserve position of Ohio banks that a banking holiday was shortly called in Ohio. By a similar process, it was but a matter of days until banking holidays were called in other states.

What was the chain of circumstances which led up to these banking holidays? The basic factor in the closing of the banks was the rapid increase in currency hoarding which took place in the early days of 1933. Hoarding is the result of panic fear, of economic uncertainty. Economic changes taking place in January and February of 1933 do not indicate any increase in uncertainty great enough to account for the large increase in hoarding then occurring.

The great increase in hoarding does not seem to have been caused

[9] On this question see R. G. Rodkey, "State Bank Failures in Michigan" *Michigan Business Studies*, Vol. I, No. 2 (1935). Cf. review of this book by W. G. Fritz in the *Journal of the American Statistical Association*, XXXI (December, 1936), 806–9.

by an increase in bank failures. Bank failures did increase in December and January, but they were much less than a year previous. The only reasonable explanation of this increase in bank failures, however, is the increase which was taking place in hoarding. There were no clear economic changes, other than hoarding, to which these bank failures could be related, such as was the case when bank failures showed large increases at earlier points in the depression. Stock prices were not declining to new low levels.

The most compelling explanation of the increased uncertainty which existed at the time is the fear created by the political outlook. National legislation to allay these abnormal fears was not, and perhaps could not have been, passed until the new administration took over in March. Roosevelt began to discuss payment of the war debt in silver. During the months of January and February, he called in and talked with many advocates of inflation, devaluation, and abandonment of the gold standard. Carter Glass was offered the portfolio of the Secretary of the Treasury. Glass held this position in the Wilson cabinet and was not desirous of taking it again, but nevertheless agreed to accept on certain conditions, one of which was that no inflationary policy would be attempted. On February 21, it was publicly announced that Glass had decided to reject the proffered portfolio.

Ayres calls attention to the fact that the banking difficulties created by increased hoarding were further accentuated by the conservative tactics followed by treasurers of large corporations.[10] Cities where these corporations kept accounts were watched for signs of increased hoarding. As soon as such signs appeared, the corporation's account was removed to New York, further weakening the local situation. As the situation became serious in February, Middle-Western states enacted laws giving preferential treatment to new accounts. These laws resulted in a large exodus of funds from New York to the West, since the treasurers of large corporations saw in this preferential treatment a new type of security for their funds.

Late in the evening of March 3, Governor Lehman of New York assured reporters that there had been no decision to close banks in New York, and he said further that no bank had even requested a banking holiday. At 4:15 A.M. on March 4, Lehman signed a proclamation ordering the closing of all banks. In spite of this order, many banks opened for business on March 4, but they were specifically ordered to close their doors. Perhaps we shall never know the working of Governor Lehman's mind which led him to this reversal, but at

[10] See L. P. Ayres, *The Economics of Recovery* (New York: Macmillan Co., 1933), pp. 46–48.

least it is reasonable to suspect that in the interim Lehman obtained instructions from the incoming administration at Washington.[11] With the New York banks closed, the incoming administration had but little alternative. A national banking holiday was foredoomed.

Except for March, when a national banking holiday paralyzed trade, production had not dropped back to the low levels of the preceding June. Even in March, production dropped only slightly below the level of this previous period. Stock prices remained measurably above the June lows. March can be truly characterized as the end of a phase of trough which began in June, 1932. With all of the banks closed, we had reached a culmination of our difficulties. All of the significant difficulties of the depression had centered around the banks and financial institutions.

3. THE UPSWING--MARCH, 1933, TO MARCH, 1937

The business decline is described above in considerable detail. The type of action taken in the Roosevelt administration was dependent upon the spirit of the people when he took the helm. As we have seen, Hoover took bold steps to halt the decline at the very outset, but they were unsuccessful. Lack of success led him to support government inactivity. This reversal of position was very unpopular. Continual and unrelenting decline month after month, year after year, to unbelievably low levels was unbearable.

The ingrained belief in a New Era and the ringing promise that the government would correct the difficulties in short order increased dependence on the government. McNair has described the situation as the virtual abdication of business leadership.[12] The spirit of the people was broken. The universal demand was for a leadership which would do something about business conditions. This was the mandate of the Roosevelt administration.

Monetary Reflation, March, 1933, to July, 1933. Franklin D. Roosevelt had a personality adapted to spectacular action. The breath-taking round of events immediately following March 4 is still hard to disentangle. The one central force which stood out in the early

[11] For the official correspondence see *Public Papers of Governor Herbert H. Lehman*, 1933 (Albany, N. Y., 1934). In answer to a personal letter written by the writer to Governor Lehman, he replied, "The banking holiday was proclaimed early on the morning of March 4, 1933, at the request of the Clearing House Committee of the New York Clearing House with the advice and recommendation of the Federal Reserve Bank of New York." Doubts have been expressed as to the necessity for a New York banking holiday. See H. Parker Willis, "The Crucial Question of the Bank Crisis: Why Were New York Banks Closed?" *The Annalist*, August 23, 1935, p. 260. See also Lawrence Sullivan, *Prelude to Panic* (Statesman Press, 1936), pp. 116-19.

[12] Malcolm P. McNair, "Business Cycle Theories: Some Comments for the Layman," *Business and Modern Society* (Cambridge, Mass.: Harvard University Press, 1938), p. 191.

months was monetary inflation. The reflation of prices was definitely promised, the monetary system was cut loose from the technicalities of the gold standard, and action was taken so swiftly and so decisively that no one long doubted that prices were going to be driven up. If prices certainly are going to rise, there is just one thing to do and that is to buy now. Inventory accumulation probably proceeded at a substantial rate until midsummer. If, after the first shock of violent action, anyone should have doubted the efficacy of monetary inflation his belief in the desirability of accumulating goods was amply fortified by the passage of the National Industrial Recovery Act on June 13. Wage rates were to be raised with an attendant rise in costs which almost certainly would result in a marking up of prices. For the time being the safe thing to do was to buy.

Industrial production rose with great rapidity, reaching by July a point about equal that of mid-1930 or early 1924, no allowance being made for growth. That no additional advance was made from this point for more than two years is another story. Hope was reawakened for the first time since the spring of 1930. Whatever feelings may have been in the previous winter, businessmen did not object to the New Deal in the spring and early summer of 1933.

In addition to the inflationary forces, certain less transcendant recovery influences should be mentioned. Beer and wine became legal on April 7. The Tennessee Valley Authority Bill was passed May 18, and a Public Works Bill became law in early June. These laws lent some assurance that activity would be generated in the durable-equipment industries. Plants had to be built to manufacture the legalized beverages, and public works activity was promised. The signing of Farm Relief and Unemployment Relief Bills on May 12 promised care for the needy and heartened those who felt that supplying fundamental needs was the chief requisite for recovery.

The World Economic Conference, which opened in London on June 12, seemed to promise the restoration of some order in international monetary relationships and possibly in the much abused barriers to international trade. The conference bogged down, however, on Roosevelt's unwillingness to tie the American dollar to any fixed exchange ratio with foreign currencies. Apparently, he felt that domestic inflation had proven itself pragmatically to be too powerful a recovery influence to take any chances on shackling it in favor of measures to restore order in world trade, which at best had less spectacular promise than inflation and of which he could not get any simple explanation to inspire confidence. Tying the dollar down would leave the administration unable to attempt inflation by varying its value. The World Economic Conference did not prove to be a

vital influence, but its results are so widely discussed that the student should see its relation to the major forces in 1933.[13]

Although we cannot say definitely that the universal closing of banks and the attendant economic crisis was essential in early March, the general result is clear. Economic activity was driven to an extreme low. When the banks were reopened activity necessarily increased because the closing of the banks had cut off some activity which would begin again when the banks opened. Not only is this true, but the reinforcing forces of the downswing had spent themselves. By June, 1932, the downward movement halted abruptly. If there had followed merely a level trough for a few months, the result would have been amply anticipated by earlier deep depressions. The excessive hoarding and bank failures of the winter of 1933 truly represent an inverted anticlimax. They typify the complete demoralization which pervaded the economy. Reassurance from the new administration was all that was required to start recovery. The cyclical forces were right, and the ending of a crisis forced an early upward movement. The inflationary measures which were adopted almost certainly forced a more rapid improvement than would otherwise have occurred up to July, but these measures were unnecessary for recovery.

The NRA Period, July, 1933, to May, 1935. Industrial production turned sharply downward in July, as the NRA codes began to take effect. High wage rates took effect as the codes provided for prices high enough to allow for them. At the same time, the codes did not permit runaway prices. There was no longer any need for haste in buying.

The supreme aim of the NRA was to raise wage rates and reduce hours of work. Reducing the hours of work had been tried since early 1930 to a greater extent than was consistent with efficiency and had come to be known as "staggering" employment. Prices were to be fixed at a reasonable level to absorb any necessary increases in costs. Industrial expansion was to be permitted generally only if the Code authorities approved of it, and excess capacity was to be kept down by this method. But the essential difference between prosperity and depression is the building of durable goods. The public works program of the government did not get an early start, and, in any case, it could not effectively absorb the major portion of the resources regularly used in expansion programs.

The NRA provided no basis for improving business conditions. The higher wage rates did not lead to higher total wages. Staggering em-

[13] See League of Nations, *Journal of the Monetary and Economic Conference*, (London, 1933). Raymond Moley has provided an interesting record from his point of view in *After Seven Years* (New York: Harper & Bros., 1939).

ployment spreads work, but it does not in any way tend to increase total activity. The fixing of prices removed the urge to buy. Regulation against expansion prevented the normal type of accentuated activity that gets under way in recovery. The whole plan was an artificial concoction and thus subject to whims and caprice. The forthcoming demand failed to inspire the confidence which arises under less disturbed market conditions.

The codes broke down from their own weight. By the time the NRA was declared unconstitutional in May, 1935, it had become little more than a shambles. The extent to which businessmen appeal to the principles on which it was founded is instructive. Businessmen have frequently called for its reinstatement. It is reckoned to solve by authoritarian decree the problems whose solutions are obtained so much more painfully in the competitive market.[14]

The price of gold was driven up rapidly from $20.57 an ounce and finally stabilized at $35 an ounce in January, 1934. Domestic price rises were not proportionate to the devaluation, and it appears to have had much less influence on domestic prices than the factors noted above. Import prices did rise about in proportion to the devaluation and imports were thereby greatly restricted.

Many measures, whatever their ultimate value to society, have tended to restrict activity which is already most restricted in a depression. The Fletcher-Rayburn Bill, setting up the Securities and Exchange Commission to regulate the selling of securities, seems to have had an influence in the direction of limiting capital expansions in the early part of its history. The Railway Pension Act which became law June 27, 1934, potentially imposed a large additional burden on the railroads at a time when the majority of them were already financially embarrassed. The fact that the Act was later declared unconstitutional by the Supreme Court does not change the effect it had when it became law.

The sidewise movement at the low level existent from mid-1933 to mid-1935 is the most novel characteristic of the depression.[15] It is the more striking because of a substantial rise in prices during the period. This long horizontal movement accounts for the exceptional length of the recovery, noted in the opening pages of this chapter. The NRA appears to be the chief explanation. Many measures were

[14] For a more complete analysis of the NRA and its economic effects, see L. S. Lyon and Others, *The National Recovery Administration: An Analysis and an Appraisal* (Washington: Brookings Institution, 1935); C. F. Roos, *NRA Economic Planning* (Bloomington, Ind.: Principia Press, 1937).

[15] This statement must not be taken to imply stable levels, for activity showed a marked decline late in 1933, came back in the spring of 1934, only to show an important relapse in the summer. No net recovery progress was made.

taken to prevent deflation, but these were acting with the general upward movement, not against the movement as were the cushioning and dilatory measures of the Hoover administration.

It is not unusual for the upward movement to be slow once supranormal levels are reached. Resources are in relatively full use at such a time, and increases in activity must draw into use less and less adequate resources. There is no such basis for a long, level movement at low levels. The essential nature of the business cycle is to move upward and downward. A sidewise movement (after initial recovery provides marked momentum as it did in 1933) does not fit the business-cycle pattern. There is thus a basis for saying that recovery forces were held in abeyance in the two-year period from July, 1933, to July, 1935.

Resumption of Recovery, May, 1935, to March, 1937. By the autumn of 1935 business was again showing a satisfactory rate of improvement. Government spending was an important influence. Public-works expenditures rose but did not reattain 1929 levels. Other government expenditures, including relief payments, were increasing. The theory that recovery depends upon the extent of purchasing power created by the government took form during this period.

The developments of 1936 and early 1937 are chiefly of interest in interpreting the downturn of 1937. The discussion of them is therefore deferred to Chapter XIII.

4. DECLINE OF SECONDARY TREND DURING GREAT DEPRESSION

The extended depression which followed the downswing of 1929 to 1932 was of major importance in producing a decline in the secondary trend. The disruption was so great in many areas of the economy that operation as near to capacity as existed in the late twenties became impossible.

The disillusionment and rude shock experienced when the unreality of the New Era was finally realized were demoralizing to enterprise. The result was similar to the shock of surprise experienced at times in shorter-period business movements. The market visualized by businessmen remained far under capacity levels until we were well into the World War II.

Major expansion in building became particularly difficult. Excessive mortgages and a high vacancy rate made the building market uncertain and discouraging. Residential building is most dependent upon population increases, the number entering adult life, and migration. The birth rate dropped to a very low level, marriages were generally deferred, and the migration occurring was principally to

leave the "dust bowl," not to go to expanding communities, for industry was stagnant.

By shrinking debts so violently, funds were not adequate to take advantage of new business opportunities which did become available. The Reconstruction Finance Corporation made only a minor contribution in this direction. Commercial loans of banks shrank from a level of 12 to 13 billion dollars in the twenties to approximately 6 billion dollars in 1933, which low level held until 1936. Total deposits shrank from 55 billion dollars in the middle twenties to less than 40 billion in 1933, and an important part of current savings was used to restore deposits. These aggregate changes do not tell the full story of the disruption. Because current replacements were not being made, the deposit accounts of large corporations were increasing during the period of violent shrinkage of total deposits; the decline in individual accounts was even larger than indicated by the total. Furthermore, individuals with relatively fixed incomes well maintained their deposits, but as a group these individuals tend to avoid risk.

The depression left foreign trade in a chaotic condition. Leading countries had raised tariffs and other barriers and had moved toward direct controls. Foreign countries experienced an increasing shortage of dollars. The physical volume of exports was cut in half and recovered very slowly. The disproportionate restriction of industries importantly dependent upon foreign trade, such as the machinery, automobile, and petroleum industries, left domestic trade unbalanced. The tendency to move resources out of exporting industries did not operate effectively because, with the depressed conditions, other industries did not readily absorb them. In some cases, like cotton, where artificial supports were employed to replace the market effect of exports, supplies overhanging the market grew to unprecedented levels.

Agricultural prices remained low relative to industrial products until World War II. Income from farm marketing was supplemented by government benefit payments to the extent of 7 per cent from 1935 to 1939 which were distributed so as to provide the greatest support to badly depressed areas. Agriculture scarcely supported its share of the market for industrial products, but the deficiency was not great. The important point for our purposes is that agriculture failed to provide an expansionary influence as it had in many earlier recoveries.

The low marriage rate slackened population growth and, resulting to an important extent from the depression itself, restricted not only residential building, but activity in all durable goods. A large proportion of consumer durable goods is sold to new households. In price deflated terms, the sales of consumer durable goods just reached the

1929 level in 1937, and fell far short of this level in earlier years. Capital expansion is required to add to the standard of living, but its need for added customers is much more obvious. Since enterprise was timid and pessimistic in the late thirties, the slow growth in new customers exerted a depressing influence on capital expansion.

Compared to approximate reattainment, on a price-deflated basis, of consumer durable and semidurable goods, and a substantial increase in expenditure for consumer perishable goods from 1929 to 1937, business expenditure for equipment and construction made a very poor showing. Deflated equipment expenditures failed by 10 per cent to reattain the previous peak, and business construction rose only to 50 per cent of 1929. In addition to the factors summarized above, special influences operated on business expenditure. The costs of business equipment and construction did not drop as much as the prices of consumer goods. By 1937 these costs were not markedly below 1929, whereas consumer prices were 25 per cent less. The tremendous shrinkage in business expenditure reduced the number of firms, thereby increasing monopolization and price rigidity in the equipment field. The NRA codes discouraged or prohibited expansion until 1935. The failure of producer goods to show full recovery is partially due to the uncertainty of governmental measures. These measures involved reforms calculated to produce stability, but many of them were contradictory in their effects. Also, they involved changes in the rules of the game, and businessmen were uncertain about the results. In addition, frequently they expected repeal, as did occur for instance in the cases of the Railway Pension Act in 1934 and the Undistributed Profits Tax in 1939. New legislation was constantly called for, and its uncertainty made for hesitation and timidity in laying out expansion plans.

5. SUMMARY

By the autumn of 1929 American prosperity had become far more vulnerable than was generally realized. A long rise in the stock market brought a parallel credit expansion and a rise in consumer expenditure. Decline in stock prices reversed the process. The seriousness of the Great Depression was closely related to the long period covered. Internally, the length was largely due to delay but not prevention of credit deflation; and to the inability of the banking system to absorb the contraction without extensive bank failures. Externally, it was due to a foreign credit structure even more unstable than ours; and to the severe repercussions of continued low prices on raw-material countries.

Maladjustments arose both in years of preceding prosperity and

in the depression period itself. Fundamentally, the prosperity maladjustments were largely those of speculation and monopolistic control, although if the student prefers, the same influences can be traced in terms of maladjustment between consumption and income. The very nature of structural change produced maladjustments, however, as in the cases of the growth of consumers durable goods and of population. The maladjustments arising in the depression principally grew out of temporary expedients by which attempts were made to prevent deflation and out of attempts to introduce far-reaching reforms.

Turning to the record of changes, the years of decline are the critical ones in understanding the outcome because, given the situation which existed in 1932, the spirit of the people made a considerable centralization of control inevitable. The focal change throughout the decline was the drop in stock prices and its effect on bank liquidity. The full effects of such a decline were prevented in the autumn of 1929 by the introduction of measures of artificial support. Stocks declined without much artificial support a year later, and banks which could not stand the strain failed. With this correction, recovery undoubtedly would have gotten under way in 1931 if the crisis in Europe could have been avoided. Even before the European financial condition reached the stage of spectacular developments, a break in the stock market was induced. The break which occurred in June, 1931, resulted partly from anticipation of the European developments and partly from shifts in short-term funds to Europe. At this point currency hoarding became an important factor, runs were started on the banks, and the depression reached a malignant stage. When England went off the gold standard in the autumn these difficulties were accentuated. In the early part of 1932 the decline reached the stage of complete rout. By June, 1932, conditions dropped so far as to produce an inverted climax. Sizable improvement followed for the first time since the decline began. Beliefs of New Era days had not been forgotten, however, and general dissatisfaction remained. Consequently, a new administration was elected in the autumn of 1932. The attendant uncertainties, together with a temporary reaction in the stock market in September after a violent rise in the summer, resulted in a leveling off of business conditions. Arrangements had reached the malignant stage where even a leveling in conditions could not prevent demoralization. Currency hoarding and bank failures, although at a rate below that of earlier periods in the depression, added enough weight to the disruption so that finally all of the banks were closed as the new administration took office.

The early months of Roosevelt's administration were marked by monetary inflation and an upward surge in business activity. There

followed a two-year lull during which the NRA experiment was tried. In 1935 business activity began to surge forward again. The developments to which this led are traced in the following chapter.

REVIEW QUESTIONS

1. Name the most significant limiting forces which were present in the latter part of the upswing from 1928 to 1929. To what extent do these correspond to prosperity maladjustments?
2. Compare the decline in business conditions from 1929 to 1932 in the United States with the decline in other important countries.
3. When did stock prices reach their peak during the prosperity of 1928 to 1929?
4. Make a table locating the times in the depression at which stock prices showed major declines and relate them to periods of bank failures and times at which hoarding showed the greatest increases.
5. Compare the movement of economic activity (*a*) in the early part of the years 1930, 1931, and 1932; (*b*) in June of these 3 years.
6. Classify various originating causes reacting on the Depression on the following bases: (*a*) according to whether or not the cause is the result of artificial interference; (*b*) according to whether or not, by forethought, the cause could have been prevented from producing significant effects on the Depression; (*c*) according to how unusual such a cause has been in past cycles; (*d*) according to whether or not we must expect such a cause to occur more frequently in the future than in the past.
7. In parallel columns, state the case for believing that World War I is chiefly responsible for the Great Depression, and the negative case.
8. Compare the reasons for believing and for not believing that the Great Depression is the worst depression of all time.
9. Discuss the use of savings in 1929.
10. Analyze the stability of capital formation from 1925 to 1929.
11. Weather conditions were unfavorable in 1930 and 1931, while the drought in the corn and cotton belts was wholly unprecedented in 1934. Trace the influence on business activity through agricultural surpluses, the "dust bowl," and agricultural relief. The following indexes of the volume of farm production (1935–39 = 100; see *Statistical Abstract*, 1943, p. 622) show the major changes in the flow of agricultural product:

Year	Total	Crops	Livestock and Products
1929	99	98	99
1930	98	96	99
1931	102	104	100
1932	96	92	99
1933	96	85	103
1934	93	72	106
1935	91	89	93
1936	94	82	101
1937	106	117	98

12. Show the changing areas of the economy accounting for the declines in activity in 1930, 1931, and 1932.

13. Trace the influence of the European financial crisis upon American activity.
14. Argue either that (*a*) the low level of the secondary trend was caused by the cyclical depression or (*b*) that there was substantial independence between the two movements.
15. Compare the relative declines in common stock prices, wholesale prices, and commercial paper rates from 1929 to 1932. (See Chart 21.)
16. Compare changes in world industrial production, United States Industrial production, and international trade. (See Chart 25.)
17. Compare German and English recovery to that in the United States. (See Chart 20.)

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CHAPTER XIII

THE 1937 RECESSION

THE PURPOSE of this chapter is to trace briefly changes in the first cyclical movement after the Great Depression. Our interest centers on the 1937 downturn in this period because of its recency, the violence of the decline, and the importance of self-generating influences, although true levels of prosperity had not been regained. To obtain perspective, it will be necessary to trace in more detail the recovery movement after the NRA was declared illegal.

1. THE PRECEDING RECOVERY

Business activity increased markedly from July, 1935, to May, 1937. The sustained rise in industrial production began at the level of two years earlier. The rise for the twenty-two months amounted to 44 per cent. Although this cyclical peak, without trend correction, was slightly above that for 1929, it was substantially short of prosperity relative to the secular trend; capacity to produce had grown much more. Unemployment was in the neighborhood of eight million persons, or 15 per cent of the labor force. It probably was no greater in most major depressions.

Originating causes of the period played an important role. On January 1, 1936, a 1 per cent unemployment tax on wages became operative under the terms of the Social Security Act. This tax represented but a minor increase in expenses and does not appear to have exerted any important inhibitory effect. On June 27, Congress passed over Roosevelt's veto the Adjusted Compensation Payment Act, which exerted an important influence on the upward movement. No provision was made for raising the huge "soldiers' bonus" for which the government became liable in terms of this act. Over three billion dollars were paid out in cashed certificates, and the government borrowed funds for the purpose. The funds were more than twice the amount loaned on compensation certificates as a result of the 1931 legislation, and they added to an improvement already proceeding at a satisfactory rate. The multiplier effect of these government payments is not easy to calculate. It is clear, however, that most of their stimulating influence came in the second half of 1936. After that, the absence of these funds automatically resulted in a slower rate of increase.

As 1936 passed, the government became more and more apprehensive about the rapid rate at which prices were increasing. Stock prices began to rise rapidly, and the violent decline in stocks after reaching inflated levels in 1929 was still fresh in memory. Margin requirements on stock purchases were raised to 55 per cent in March.

Excess reserves of banks were growing with great rapidity and had reached high levels for the country as a whole. If use had actually been made of them in a short period, a runaway inflation might have resulted. The administration appears to have decided to center attention on preventing such an inflation. On July 14 the Board of Governors of the Federal Reserve System announced a 50 per cent increase in the reserve requirements of all member banks, to take effect August 15.

One important reason for the growth of excess reserves was the rising hoard of "hot" money in the United States. Gold, which was being imported at a rapid rate, added to the excess reserves and at the same time was dangerous as a credit base because much of it might be recalled at any time. Accordingly, the Treasury, on advice of the Board of Governors, set up a scheme for sterilizing the inflowing gold. The Treasury paid for the gold by drawing upon its balances with the Federal Reserve banks, but set aside its current gold purchases in an inactive account and replenished its balance with the Federal Reserve banks by drawing funds from the market. This scheme was put into practice in December, 1936. Gold imports no longer increased bank reserves.

The problem was further dealt with by the Board of Governors of the Federal Reserve System on January 30, 1937. Member-bank reserve requirements were raised by one-third more to the maximum permitted, half of which was required by March 1 and the other half by May 1. This increase in reserve requirements amounted to 100 per cent in less than a year. Excess reserves were now drawn down to reasonable levels, but there is some evidence that the rapidity with which it was done may have produced deflationary influences. Information on what the increased reserve requirements did to individual banks is not available. The excess reserves in New York and Chicago were less adequate than for the country as a whole, and the banks in these centers appear to have been somewhat pinched by having to add to requirements so rapidly.

There were other repressive influences. The June, 1936, Revenue Act contained provisions on an undistributed profits tax. The rate of the tax varied from 7 to 27 per cent, depending on the proportion of income plowed in. This tax tended to force the prompt paying of dividends to the extent that profits were earned, thus adding to purchasing power. In this way, the effect was expansive. It exerted a

crippling effect on small expansion programs, however, for the corporations were heavily penalized if they kept funds for this purpose instead of paying them out in dividends. It is to be recalled that major laggards in this recovery were programs of expansion and development. Anything which repressed them was of critical importance. If the funds had been used for expansion, they would have added to purchasing power just as surely as when they were paid out in dividends. A peculiarity of the law was that, to avoid the tax, dividends had to be paid within the taxable year. The first influence was felt late in 1936. Dividends were paid out with an abandon never before realized.

The undistributed profits tax had an upsetting influence on the recovery in progress. The dividends paid late in 1936 added to the rapid improvement occurring in the second half of 1936, but they did not contribute to holding it in 1937. Similar disbursements could not be expected for another year, and even this was doubtful, for a powerful campaign to revise the law was under way. The undistributed profits tax was also psychologically repressive because many businessmen were fearful of it. The fact that many of these fears were illogical and unfounded has little to do with the fact that they dampened confidence in the long-term future.

On January 1, 1937, social security taxes increased 2 per cent. This increase represented the initial 1 per cent on the federal old-age annuity tax and the second 1 per cent on the federal unemployment fund tax. Before this date, the total tax was 1 per cent. The increase to 3 per cent is related to the ending of the recovery, inasmuch as it represented a substantial increase in federal revenue, practically wiping out deficit expenditures of the government. The taxes also appear to have been important in adding to industrial expenses. As we shall see, expenses were mounting rapidly at this time, while prices were leveling off.

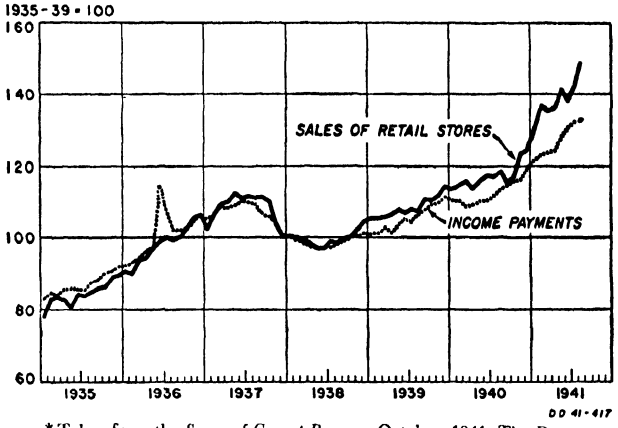
The strength of labor organizations in the period was phenomenal. Emphasis on the critical importance of purchasing power led to an early marking up of wage rates. In fact, wage rates generally led prices. Competitive forces would not lead to such a result, and we have had no comparable experience in any other recovery.[1] Between November, 1936, and May, 1937, wage rates rose with startling rapidity. According to the Bureau of Labor Statistics' Index of Hourly Earnings in Manufacturing Industries, the increase was from 58 to 65 cents, an average of a cent a month. This increase may be partially explained by the scarcity of skilled employees, even though some eight

[1] See Leo Wolman, "Long-Run Consequences of Governmental Sponsorship of the Labor Movement," *The Annalist*, October 22, 1937.

million persons remained unemployed. Apprenticeship programs had been discontinued and activity had been low for so long that they were not rapidly reintroduced with rising rates of activity in 1935 to 1937. A common complaint in industrial centers was that skilled employees were being bid away by competing employers. Thus, an artificial bottleneck arose, for the large body of unemployed and unskilled workers could not be readily absorbed without the necessary proportion of skilled. Expansion programs, which imply confidence

CHART 30

INCOME PAYMENTS AND SALES OF RETAIL STORES*



*Taken from the *Survey of Current Business*, October, 1941 The Department of Commerce has renamed the "income payment" series "personal income"

in the long-term future, remained at a low ebb throughout the period of recovery. The rapid increase in wage rates early in 1937, without any similar improvement in business, was somewhat climactic. The profit possibilities of increased plant and equipment appeared limited.

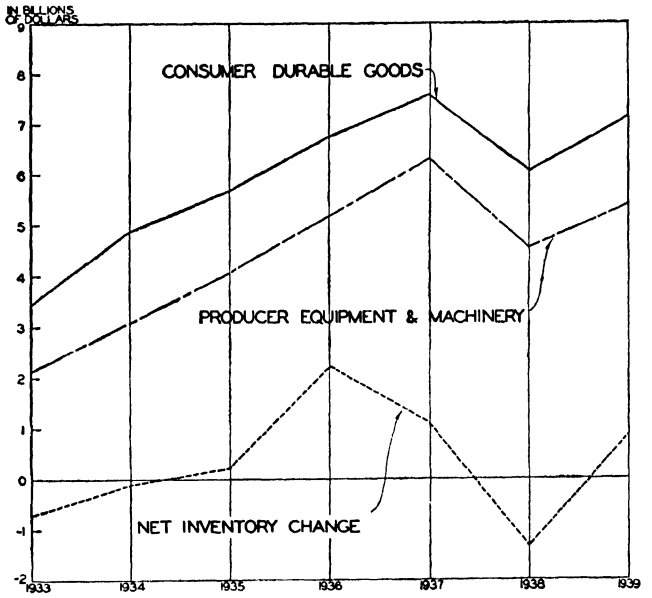
Legislative uncertainty remained late in the recovery even though the intensity was considerably less than in the early days of the New Deal. Some form of control of wages and hours was almost constantly before Congress, although no major law was passed until June, 1938. President Roosevelt's dogged insistence on changing the complexion of the Supreme Court, which began with a presidential message early in 1937, created a great deal of legislative confusion and exerted an important influence on sentiment generally.[2] Although the measure was defeated in July, uncertainty in the preceding months may have limited plans for business expenditure.

[2] See Joseph Alsop and Turner Catledge, *168 Days* (Garden City, N.Y.: Doubleday, Doran & Co., 1938), for a running record of the fight on this legislation. Also, Senator Vandenberg's article in the *Saturday Evening Post*, October 9, 1937, is helpful.

Other than deficit spending by the government, which tended most directly to increase consumer expenditure, the major rises in cyclically induced expenditure occurred in inventory accumulation, consumer durable goods, and producer equipment and machinery, as shown on Chart 31. In 1936 the rise in inventory accumulation, a very unstable type of expenditure, was as great as the combined increase in purchase

CHART 31

CYCLICAL EXPENDITURES IN THE 1933–37 UPSWING*



* Unrevised Department of Commerce data.

of consumer durable goods and producer equipment and machinery. Combined residential and business construction, normally of major expansionary potency in recovery, increased less than any of the expenditure series shown on the chart.

2. THE 1937 DOWNTURN

From March to August, industrial activity remained approximately on a horizontal level; then it fell at the most rapid rate on record. Most of the forces leveling business activity in the summer of 1937 are noted in the above paragraphs. The deficit spending of the government fell approximately to zero by the middle of 1937. With the cashing of compensation certificates, such spending climbed to over 500 million dollars a month in June, 1936, but fell rapidly from this level. Deficit spending had remained between 200 and 300 million

dollars a month from the beginning of 1934 until payment on the compensation certificates got under way. Collection of social security taxes and reduced government expenditures completely canceled the deficit spending by late summer 1937. Such spending was an important influence in a recovery largely dependent upon consumption, when expansion activity was extremely apathetic.[3]

The most urgent requirements to permit the maintenance of standards of living had been the replacement of durable goods. The financing of automobiles in mid-1936, for instance, was nearly twice as high as it had been in 1935. Automobile replacement had already made substantial gains by 1936 because the life of cars is short enough that replacement was absolutely necessary if relatively good continuance of their use was to be maintained. By mid-1937, not only were there no extra funds for making down payments, comparable to the bonus payments of 1936, but urgent replacements had already been made. The point was reached where additional expansion was dependent upon a general increase in standards of living, unless capital building increased markedly. Production was leveling off, however, at per-capita levels no higher than those in 1929.

In 1936 and early 1937, England was experiencing an armament boom leading to the stockpiling of raw materials, which was influential in driving up their prices. The speculation in London, resulting from this price rise came to a head in March, 1937, and raw material prices declined substantially after that date. Agricultural crops were far greater in 1937 than in 1936, and this led to a decline in the price of agricultural staples beginning in June, 1937. Roosevelt announced at a press conference on April 2, 1937, that some prices were too high. The administration policy had been to restore the 1926 price level; and, until this announcement was made, businessmen had not anticipated that a selective attempt might be made to depress some prices while the rise was still far short of the goal. It developed that the reference was to the price of durable goods, but the uneasiness regarding the government price policy was not lightened. As a result of these factors, the inclusive wholesale commodity price index rounded off in April, but no substantial decline occurred until September.

As we have seen, inventory accumulation was an important factor in the cyclical advance. As prices failed to rise, little inducement remained for further inventory accumulation. The accumulation which had occurred was partly attributable to the need for larger stocks with the rising level of business activity. But inventories were adequate by the spring of 1937, and business activity was no longer rising. Business-

[3] The problem of measuring deficit spending presents serious difficulties. See analysis of it in Chapter XVI, Section 10.

men were peculiarly sensitive to the size of inventories as business began to decline in the autumn of 1937 because the payments required under the terms of the undistributed profits tax required abnormal liquidity. As we shall see, the urge to deflate inventories largely accounts for the rapidity of the decline.

Frugality was forced on the railroads in 1937. They were overburdened with debt, and a social policy had prevented adequate reorganization. Together with rising material costs, the added unemployment and retirement taxes would reach a figure that would absorb practically all of the profits which might otherwise have been available in 1937. In addition, the railroad unions demanded a wage increase in February, 1937. In spite of much obsolete equipment, purchases showed marked declines in the spring, and maintenance expenditures were severely curtailed in the summer.

The price of government bonds began to decline in March, 1937. The banks held unprecedentedly large portfolios of government bonds, and therefore the decline in price threatened their earnings. Some selling of bonds occurred in the reserve city banks in the first half of 1937, but the holdings were so large that the banks could not expect to escape losses in this way. Undoubtedly, the banks became more conservative as a result of these losses. With such a large portfolio of government bonds, the banks were peculiarly sensitive to restrictive measures such as those pursued by the Board of Governors of the Federal Reserve System. In most recoveries, the significance of a decline in bond prices is represented by the increase in long-term interest rates. Even after the bond prices began to decline in 1937, long-term interest rates remained low. The influence was felt principally through a decline in bank-asset values which tended to depress psychological attitudes.

As the recovery movement came to show reduced vitality in the spring of 1937, businessmen looked forward to a summer lull. There was ample precedent for this feeling, since the summer seasonal usually is accentuated when orders are not pressing. When the summer came, however, activity declined little; and in August, several of the more sensitive industries reached new highs for the recovery movement. One reason was the expectation that some administered prices would go higher because marked increases had occurred in costs. An increase in the price of new automobile models, shortly to be released, was widely publicized in August. A widespread effort developed to get under the line of the old price schedule, especially since information leaked out that the model changes would not be significant. Automobile buying was concentrated in August at the expense of the later months in the year.

Since summer activity held up better than expected, businessmen were heartened, and they began to plan for a much better fall than they otherwise would have. The surprise met in the summer was failure of a summer decline to develop as expected. Consequently, the objective effect of the plan for better fall business was maintenance or increase of inventories and hardening of administered prices. These influences tended to maintain activity for the time being but did not produce any backlog tending to strengthen activity in the autumn.

In general, profit margins were increasing up to late summer in spite of rising costs. The chief factors responsible were the result of a lag in the prices at which orders were filled and the institution of methods to replace some of the high-priced labor. As new orders declined, an increased proportion of the current shipments was made at the current price quotations. Thus, even though quoted prices were not rising, the prices currently charged on orders filled were higher than in the preceding periods because prices had been rising. Expansion programs were limited, but they were especially pointed to the elimination of labor since labor costs were high.

The weakness of the prosperity reinforcement in 1937 was principally a result of the limitation of expansion programs. Capital expansion was probably geared more closely to increases in consumption demand than had ever occurred before. The acceleration principle is a better description of the behavior of this recovery than most, in the sense that capacity was added only to the extent that consumption demand made it necessary. Optimism added little to expansion programs.[4] When the government quickly withdrew the support of deficit financing from consumption, the necessary result was a tendency for consumption to level off. The fact that such a shift was involuntary and grew out of the payment of social security taxes has nothing to do with the effect on consumption. Working in the same direction was the quick exhaustion of special sources of income in 1936. The leveling of consumption was certain to be disastrous because all expansion programs depended on its increase.

Harrod's "breathing-space" concept[5] admirably fits the 1937 situation. All that was really needed was an increase in consumption to new high levels, which would have made expansion programs necessary. Such an increase was extremely plausible because the use of resources was far from reasonably complete. It is safe to say that if such an increase had occurred no major decline in business would have taken place in

[4] This has been most fully developed by Alvin H. Hansen. See *Full Recovery or Stagnation* (New York: W. W. Norton & Co., 1938), pp. 280 ff.

[5] See discussion of Harrod's theory in Chapter VIII, Section 5, pp. 193–97.

the autumn. Slichter holds that "it was a calamity that the soldiers' bonus was paid in 1936 rather than in 1937."[6] Consumption as a governor of activity broke down under the conditions described when an attempt was made to replace deficit spending with activity generated by private initiative.

In summary, government support through deficit spending ended at a time when the demand for consumer durables was less pressing, when various factors conspired to weaken prices, when the railroads were already reducing expenditures, and when bank managements were becoming pessimistic because of shrinking asset values. The decline shocked businessmen into quick retraction because they were not expecting it.

3. THE SEPTEMBER, 1937, TO JUNE, 1938, DOWNSWING

Beginning in mid-August, the stock market declined with unusual rapidity. The decline was related to the fact that reactions had been abnormally absent from the time the swift upward movement began early in 1935 until prices turned downward in April, 1937. Failure of the market to right itself with any thoroughness during this two-year period may have been related to a large capital-gains tax required on recent acquisitions. Undoubtedly, fear also played an important part once stock prices started to decline. The long, painful decline in the early part of the Great Depression had not been forgotten, and many were anxious not to repeat the mistake of holding stocks through a bear market. The lesson of selling quickly to cut losses short had been well learned.

There was no whistling in the dark to the refrain of "Prosperity is just around the corner," such as had occurred from 1929 to 1931. When increased activity failed to arrive, the shock produced a feeling of panic. The precedent of the 1929 decline and recurrent disappointment as improvement failed to arrive no doubt also played a part in this. Just as improvement was expected from 1929 to 1931 because it had come quickly in 1927 and 1924, improvement was *not expected* quickly in 1937 because it was so long delayed the last time. This situation led to prompt deflation of commodities as well as securities.

The part of the downswing in industrial production from early September to the end of the year was the most rapid on record. Inventory deflation and the restricted level of expansion programs were largely responsible. A fifth of the increased expenditure in 1936 resulted *directly* from inventory accumulation. The ending of accumulation was, therefore, in itself a powerful influence tending to level off

[6] Sumner H. Slichter, "The Downturn of 1937," *Review of Economic Statistics*, August, 1938.

activity. But it also weakened prices because the market had to absorb total output, once accumulation ended. We have seen that other factors also were tending to weaken prices. The commodity price decline was rapid, therefore, from September to December—more rapid than at any time in the Great Depression, although substantially less rapid than at the end of 1920. The price decline induced inventory shrinkage. This was large partly for the reasons noted in the preceding paragraph and partly because, with declining activity, cash was sought to pay the year-end dividends required by the undistributed profits tax. Profits had been good for a large part of the year. In some cases, such as in the textile industry, inventories were at first out of control because orders were declining so rapidly that commitments already made were great enough to fill them.

Expansion programs had been notably restricted, and therefore completion of them lent little support. The execution of such programs is time-consuming, and even though no additional building is begun after decline begins, completion of programs already under way ordinarily lends considerable support in the early part of most downswings. The meager expansion which had arisen in this recovery was principally of the type which required but a limited time to complete, representing the installation of machines rather than the erection of factory buildings and the development of new sites. Also, less public construction was begun in 1937 than in 1936.

Support was limited principally to making credit plentiful. As early as August 27 the New York Federal Reserve Bank had cut the rediscount rate to 1 per cent, an all-time low. Credit had remained plentiful and interest rates low, considering that activity did not reach high levels. On September 13 the Treasury released 300 millions from the inactive account set up to sterilize gold and announced indefinite purchase of short-term Treasury bonds in the open market. On October 27, the Board of Governors of the Federal Reserve System announced a reduction of margin requirements on stock purchases from 55 to 40 per cent and announced the institution of obligatory cover on short sales. The purpose was to lend some support to the declining stock market, but it did not supersede the initiative of the private buyer or relieve him of any risk. It lightened the load he must carry if he risked an improvement in the market.

In February, 1938, the sterilization policy was further modified so that newly acquired gold up to 100 million dollars a quarter would be added directly to reserves; in April the sterilization of gold was discontinued entirely. On April 16, 1938, the reserve requirements of member banks of the federal reserve system were reduced slightly. These, and other regulations of less importance, were extended to

keep credit plentiful and interest rates low. These purposes were accomplished.

Wage rates did not decline until the end of the year but, on the average, showed slight increases. Most other variable costs, however, declined drastically.

The rapid rate of decline ended at the turn of the year, but nothing tended to drive activity immediately upward. Since sales declined so rapidly, inventory deflation had not reached a stage where a rapid shift to increased production was generally necessary to fill current orders. An increase in social security taxes from 3 to 4 per cent, which became effective on January 1, 1938, was balanced by government relief expenditures. To meet the provisions of the undistributed profits tax, dividend disbursements were large in December, 1937, since in the year as a whole profits had been made.

Business activity continued to decline slightly until June, 1938. Prices became firmer but showed a slight decline in the first half of 1938. Even wage rates dropped slightly. A period of readjustment was in process. After the violent decline of the autumn, stock prices fell further to a low in March, from which point a steady rise began. Failures had increased somewhat but did not reach a high level and were receding after the early months of 1938. Utter collapse did not appear in any area, and infectious spreading of contraction from any center was no longer in evidence by the spring of 1938. This situation was to be expected in view of the limited character of the unbalance and the rapidity of the early phase of the decline.

On May 11, a drastic modification of the taxes on undistributed profits and capital gains became law and no doubt had an important effect on sentiment. On June 16, Congress passed a bill appropriating nearly 4 billion dollars for public works and unemployment relief. Deficit spending was again at the level in existence before the huge bonus payments in 1936. The downswing was at an end.

4. RESTRICTIVE INFLUENCE OF THE SECONDARY TREND

The low phase of the secondary trend in existence in 1937 can best be explained as resulting from a continuation of the factors set out in Section 4 of the preceding chapter. Activity was restricted by slackened population growth, disorganization in the residential building industry, shrunken credit, chaotic foreign trade, relatively low prices of agricultural products, and the restricted character of expansion plans. The secondary trend, restricted by these factors, did not rise rapidly enough to permit the attainment of truly prosperous conditions in 1937. The downturn in 1937 with unused resources so large (especially with unemployment so high), is fundamentally ex-

plained by the relatively low level of the secondary trend. This does not explain why the downturn occurred in 1937, but it does explain why it occurred before we had come as near to capacity to produce as in many prosperities of the past.

Since capacity to produce was so much above the actual level attained, failure to reach these levels may be accounted for by inadequacy of demand. Higher levels of effective demand would have largely overcome the difficulties noted in the preceding paragraph. Slackened population growth was important only because it restricted total demand. Housing standards were inadequate, housing mortgages had been readjusted by 1937, and restriction might be explained by the lack of urgency for housing. The limited use of credit could be said to be due to inadequate demand. Since foreign trade had fallen partially under the sway of direct controls, it might have been restricted even with a high level of demand, but its relative importance is not great enough that this alone would have made a material difference. The demand for agricultural products is highly dependent upon total demand. Industrial expansion would have been necessary if higher levels of demand had been achieved. The bottleneck created by inadequacy of the supply of skilled labor could not have been overcome immediately by increased demand levels, although the limitations imposed could have been dissolved in a period of time by wide institution of training programs.

These facts explain the basis for the frequently held position that the simple solution to the difficulties of this period would have been supplementation to income payments by adequately large government expenditure above taxes. Certainly, indefinitely large expenditures would have rapidly reversed the secondary trend. The government could, if the policy were consistently followed, spend any necessary amount to raise demand to a level consistent with productive capacity, although the distributional effects on the economy cannot be ignored.

Another over-all method advocated to correct the inadequacy of demand was to add sufficiently to the supply of credit funds. While demand deposits were substantially higher than before the Great Depression (because of continual government deficits), their rate of use had so decreased that total spending was less. Bank loans were far lower, and total private debt, long- and short-term, was 35 billion dollars less; declining from 160 to 125 billion. Only a slight recovery of 3 billion in total debt had been made from the low in 1935. The lower level of short-term credit accounts for 22 of the 35 billion shrinkage from 1929. While prices were lower in 1937 than in 1929, commodity prices were back to 90 per cent of the earlier level, and

the much smaller credit employed could not accommodate expanding business as effectively as the larger amount available before the depression. A higher level of business could have been forced by the use of more credit, although such forcing might have required more powerful inflationary measures than were employed. The point, however, is that direct addition to the purchasing power is not the only way that the restrictive influences of the secondary trend could have been counteracted. As outlined in Chapter XXII, a more effective method is to set up measures which keep a secondary-trend decline within reasonable bounds from the beginning of the depression.

The expansionary cyclical forces preceding the downturn of 1937 did not correct the restrictive influences superimposed by the secondary trend. The downturn in 1937 developed to a major extent from the internal shifting of the reinforcing cyclical forces, although net additions to income payments made by the government were a substantial originating force. The 1937 experience does not demonstrate the inability of powerful expansionary cyclical forces to overcome the restrictive influences of a low, secondary trend. But, the fact that they did not do so in this case reduces our confidence in depending on them.

REVIEW QUESTIONS

1. Trace the relation of the 1937 downturn to (*a*) extraordinary payments in 1936, (*b*) installment buying of consumer goods, (*c*) restrictive measures of the Board of Governors of the Federal Reserve System, (*d*) "hot" money flowing to the United States, (*e*) the undistributed profits tax, (*f*) the low level of profits from 1936 to 1937, (*g*) the governmental sponsorship of the labor movement, (*h*) President Roosevelt's attempt to change the Supreme Court, (*i*) the armaments boom, (*j*) the deflation of inventories, (*k*) the inadequacy of expansion programs, (*l*) agricultural drought from 1934 to 1936, (*m*) the decline in bond prices early in 1937, (*n*) the rise in durable goods prices, (*o*) the disappointment of businessmen's expectations, (*p*) failure to accept the "breathing-space" concept, (*q*) decline in the stock market.
2. Discuss the extent to which the reasons for the rapidity of the 1937 decline is likely to apply to future downswings.
3. Discuss the importance of intermediate movements in this period.
4. Write an essay on the recuperative power of business when low levels of activity exist but depression readjustments have been effected.
5. Using Appendix A, distribute the increase in total expenditure, year by year from 1933 to 1937, among the major types of expenditure responsible.
6. Point out the different effects of *ex ante* and *ex post* forces in the second half of 1937.
7. Compare the influence of leveling prices in the summer of 1937 with that of the horizontal price movement in the late twenties.
8. Why was the declining value of bank assets more influential just before the downturn in 1937 than in previous prosperities?

9. To what extent is the influence of the undistributed profits tax on stability in 1936 and 1937 unlikely to occur in the future if the law is in effect at that time?
10. Can you explain the low level of activity at the 1937 downturn as effectively without the secondary-trend concept?

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Chapter XIV

UPSWING FROM 1938 THROUGH WAR PROSPERITY

THE PURPOSE of this chapter is to carry the business-cycle history to the end of 1946 and, particularly, to point up the influence of World War II. The originating influences forced upon the business system have been even greater than after World War I.

1. JUNE, 1938, TO THE PEARL HARBOR INCIDENT

Improvement in industrial production was rapid from June to the end of 1938. Construction represented the most important source of the increased activity. Construction contracts awarded rose to a sharp peak at the end of 1938, almost 50 per cent higher than occurred before the 1937 downturn. Except for housing, construction activity fell back in 1939 to much lower levels until the end of 1940.

New capital financing rose immediately to levels as high as any which had been attained after 1930. The issues were almost wholly bonds whose prices were at new peak levels; stock prices, on the other hand, remained far under their 1937 highs. The seeking of funds so promptly was indicative of expansionary potentialities. The modest levels of new capital flotations in the second half of 1938 did not continue into 1939 and were not reattained until war demand assumed major significance in 1941. By autumn the threat of war and other originating factors had introduced major uncertainties into the picture.

Because of originating factors, short-period variation remained as important as it had been throughout the Great Depression. Industrial production advanced substantially in the second halves of 1938, 1939, and 1940; but slight declines were registered in the first part of all three years. With demand so far under capacity levels, prices other than for agricultural products dragged along a horizontal level until war broke out in Europe in September, 1939. The prices of agricultural products declined substantially until that date because of bumper crops.

Late in 1938 some uncertainty was generated by governmental actions. A widespread campaign against violation of the Sherman

antitrust law was ably instituted under the leadership of Thurman Arnold. Government policy, at worst, had encouraged combination, notably under the NRA, or, at best, generally overlooked it. The hearings of the Temporary National Economic Committee began in December, 1938, and at the time appeared ominous to some businessmen.

The rumble of European war thunder began in earnest before the end of 1938. The Munich Agreement to the dismemberment of Czechoslovakia was signed on September 29, and Chamberlain initiated his appeasement policy. The Sudetan area was annexed to Germany on October 1. A pogrom was set up in Germany on November 10. The American Ambassador was called home for consultation on November 14. On January 10, Ambassadors Kennedy and Bullitt warned of the imminence of European War. Schact was ousted as Reichsbank president on January 20, 1939, removing the last vestiges of sound economic policy. On January 30, Hitler served notice that demands would be made for the restoration of the German colonies taken away after World War I. Bohemia, Moravia, Slovakia, and Ruthenia were appropriated in mid-March, 1939. Danzig and Pomorze were demanded later that month.

In April, 1939, the worst coal strike in the United States since 1919 forced coal production to a third of its March level, but the strike was quickly settled. Stock prices dropped sharply in April but within the standard limits of a reaction.

Industrial production began to increase again in June, but advanced little until the outbreak of European war in September. Hitler signed a pact with Stalin on August 23 and invaded Poland on the first of September. England no longer could stand idly by. She declared war on September 3, and France did likewise on September 8. On the same day Roosevelt declared a limited national emergency. The American Selective Service Act became law a week later.

The markets were not disturbed as in 1914. Instead of the warring countries drawing funds from us as on the previous occasion, large amounts were sent to us for safekeeping. The stock market rose to new highs since early in the year; there was no need to close it this time.

Congress was called into special session and passed legislation on November 4 to modify the Neutrality Act to permit sale of war materials to belligerent nations under specified conditions, principally that the materials be collected at our ports.

We had already experienced the stimulus of defense expenditure. Supplementary appropriations for defense of well over a billion dollars, in addition to a half-billion-dollar defense appropriation in the

annual budget, had been made earlier in the year. Actual government expenditures for 1939 as a whole increased but moderately. The price increases in September encouraged inventory accumulation running to nearly a half billion dollars for the entire year.

The war appeared stalemated all during the winter of 1939 to 1940. Because of lack of activity, it came to be called a "phony" war or a "Setzkrieg." Under these circumstances, American munitions output increased only modestly, and exports were less than those of the previous year. The war uncertainties were disturbing to expansion plans for civilian output. Industrial production declined in the early months of 1940, and commodity prices sagged.

In the spring, however, the war began to take on totalitarian aspects perhaps never before attained in the world's history. On March 12, Finland capitulated to the Russian invasion. On April 19, Germany began the swift invasion of northwestern Europe. Italy declared war on June 10. Paris fell on June 14, and the conquest of Europe was virtually completed except for the English Islands themselves, and many persons felt that they could not hold out for long. In a swift succession of events, Churchill had become prime minister, the English government had been given dictatorial powers, and Dunkerque had been evacuated.

Billions of dollars were rapidly appropriated for defense by the American Congress; a two-ocean Navy and 18,000 planes were authorized; Senator Vandenberg renounced isolationism. The production of munitions expanded rapidly. For 1940 as a whole the government spent over 2 billion dollars on defense outlays, almost double the amount spent in 1939. The increase in government expenditure was paid for by taxes.[1]

Industrial production increased rapidly in 1941, with interruption only in April, when a bituminous coal strike reduced coal production more severely than did the strike two years earlier. Even in April, total industrial production dropped back only to the February level, remaining far above the levels of preceding years. By May, coal production was back to normal.

In March, the Lend-Lease Act, suggested by Roosevelt at the end of 1940, became law. The provisions made it unnecessary to give any consideration to current payments in furnishing goods to the democratic nations. Shortly, almost all of our exports were under Lend-Lease. On May 27, Roosevelt proclaimed an unlimited national emergency.

[1] If we consider taxes applicable to 1940 for which businesses became liable but did not pay in 1940, the increased taxes were greater than the increased expenditure. For analysis of method of handling net government expenditures, see Chapter XVI, Section 10.

Defense outlays amounted to roughly 14 billion dollars in 1941, an increase of 12 billion. This was far in excess of the increase in taxes, even if we consider tax liabilities rather than collections.[2]

Total expenditures (GNP) rose from 25 billion dollars to 125 billion in 1941; the government accounted for less than half of the increase. Controls prevented increased production of consumer durable goods in the second half of 1941 (automobile production dropped from 2.4 in the first half to 1.3 million in the second), but the expenditure for consumer nondurables was increasing substantially.

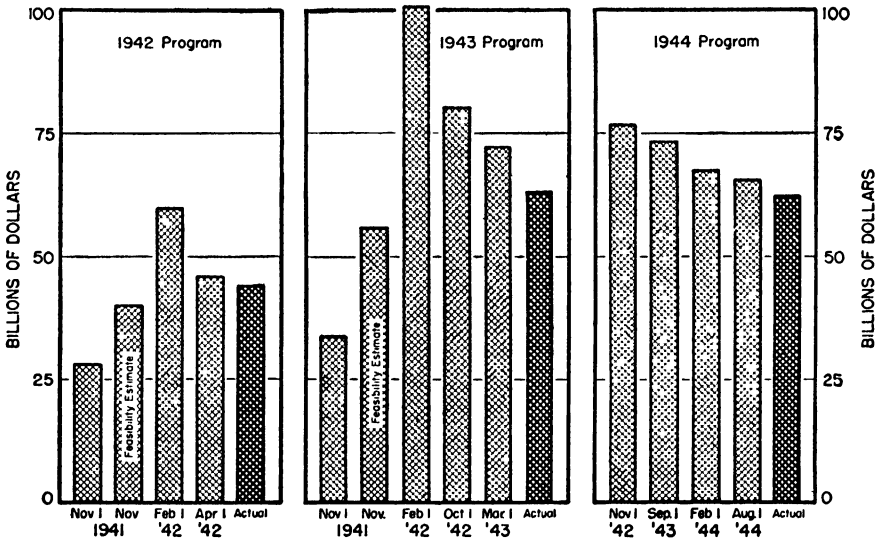
2. WAR PROSPERITY: JANUARY, 1942, TO AUGUST, 1945

With the Japanese attack on Pearl Harbor on December 7, war production was rapidly accelerated, and the levels of war output attained in two years were greater than most persons had thought

CHART 32

SCHEDULED AND ACTUAL WAR PRODUCTION, 1942-44*

Schedules Are Indicated by Light Bars; Actual Production by Dark Bars



* Taken from J. A. Krug, *Production Wartime Achievements and Reconversion Outlook* (Washington: War Production Board, October 9, 1945).

possible, as indicated by Chart 32. These gains were largely the result of absorbing most of the increase in production and the adaptation to munitions' manufacture of the line methods employed in civilian production. The First War Powers Act was passed in December, 1941.

[2] Tax liabilities exceeded collections by about 5 billion dollars in 1941.

The controls placed on the civilian economy were more onerous than ever before experienced in our country, but still they were relatively mild compared to those put in effect in most of the world.

In war prosperity, production is limited only by physical capacity, the amount of work laborers are willing to put forth, and organizing ability. As to capacity, the European war began when the secondary trend was at a relatively low level and there was a large unused capacity. Additions to war-plant capacity were made early, with the peak expansion occurring in 1942. Patriotism, drafting of men who would normally have been in college, training programs, and a reduced social life added to the total labor force. Probably of equal importance were the economic incentives of rising wage rates and overtime pay for long hours, especially in attracting workers to the munitions' industries. With the rapidly rising demand, labor instability was largely avoided by exacting of labor immediately after Pearl Harbor a no-strike pledge balanced by a maintenance of membership required of management.

The early expansion of plant capacity dates from the creation of the Defense Plant Corporation in August, 1940, and the passage of the Second Revenue Act of 1940 in October of that year. The Defense Plant Corporation provided a basis for financing plants through the Reconstruction Finance Corporation and leasing them to the manufacturer with the stipulation that he might acquire them at the end of the emergency. This was an effective basis for early expansion in aircraft facilities. The Second Revenue Act of 1940 permitted a private company to amortize approved facilities in five years. This provided a great stimulus to private capital expansion, concentrated principally in 1941. After Pearl Harbor, requirements were concentrated on highly specialized facilities which were generally government financed.

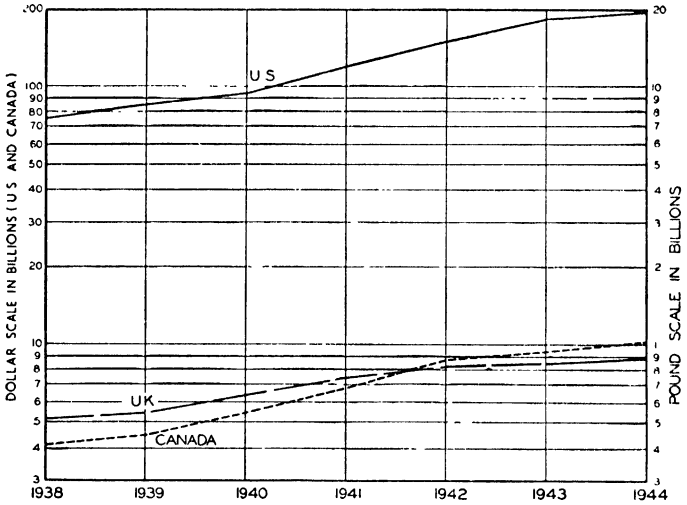
Public expenditure for facilities doubled in 1942, rising to 14 billion dollars, representing principally manufacturing plants and military installations. Munitions output more than tripled, rising to 32 billion dollars. The total government expenditure rose to 64 billion, an increase of 35 billion dollars. This was more than the total increase in expenditures, with private-business expenditure for facilities dropping materially and consumer expenditure rising only slightly.

With so much of the total output going for war goods, while civilians were paid for making them, the problem of inflation became serious. To the extent that prices failed to increase, an "inflationary gap" of unspent savings was created. Consumer prices increased nearly 10 per cent in the year. The price increase slowed somewhat after May. The Second War Powers Act was passed in March, 1942, giving the

President wide powers to seize property and enforce priorities and rationing. In April, the Office of Price Administration issued its famous General Maximum Price Regulation, establishing March, 1942, prices as the ceiling; also, it ordered wartime control on rents. The issue of ration books began in May. Equally as important were "limitation and material orders" promulgated by the War Production Board, limiting production and specifying reduced materials available for named items. A limitation order halted all private construction "not essential to public health and safety" in April. The War Man-

CHART 33

GNP IN THE UNITED STATES, THE UNITED KINGDOM, AND CANADA*



* Report of a Special Combined Committee Set Up by the Combined Production and Resources Board, *The Impact of the War on Civilian Consumption in the United Kingdom, the United States, and Canada* (Washington. Government Printing Office, 1945).

power Commission, limiting manpower for nonessential purposes, also was set up in April.

With official price ceilings as a guide, with new housing and most durable goods (such as new automobiles) denied, with many items such as gasoline very restricted, with reduced social functions, longer hours of work, more members of the family at work, and loved ones in battle, consumers did not try to spend all of their increased income. Consumer expenditures increased about in proportion to the increase in prices, leaving an unprecedented saving of 25 billion dollars by individuals and unincorporated businesses.

By 1943, the building of facilities had passed the peak. The expenditure for military installations was cut in half, and all other

construction categories declined. The production of munitions, however, almost doubled, reaching 56 billion dollars. As the size of the armed forces was rising rapidly, expenditure on war agency pay rolls and similar items rose to 25 billion dollars, twice the level of the preceding year. Total government expenditures increased from 64 to 93 billion dollars, or 29 billion. Total expenditure of the whole economy increased slightly more because of rising consumer expenditures. Price rises were not quite so great as in the preceding year. Consumers bought a slightly larger quantity of goods and services, although the number of civilians was reduced by men going to the armed services. Nevertheless, the increased government expenditure was great enough to raise slightly individual-type saving to 30 billion, even though personal taxes were tripled.[3]

The peak of war expenditure was reached in the fourth quarter of 1943. At this point the government expenditure had risen almost to pre-1941 peak levels for the entire economy. Partly by plan and partly by happenstance, this was the peak level to which the war effort had been scaled. War-production schedules continued to increase almost steadily for a year and a half more, but demand had become more selective and actual output slowly declined. On the scale of operations established, logistics and other problems would not permit major increases in the rate of production of standard items. An unlimited demand for new weapons constantly existed, but any great increase in their production had to await tooling up, diversion of labor, or possibly new construction and training programs. Once these steps were completed, the product quickly became a standard item, its production controlled by limitations of storage and transportation facilities and the size of the war effort. Sometimes it was made obsolete by newer technical developments. This process can be traced between 1943 and 1944 in the successive stages of the ship, aircraft, and tank programs. The tank program declined with increased requirements for noncombat motor vehicles in 1944. The aircraft program shifted to heavy bomber types. The escort-type ship program was materially reduced, and the landing-vessel program greatly increased. The size of bombs required successively increased, special types of artillery and ammunition for such weapons as the Bazooka was greatly sought, while many small arms ammunition plants were closed.

Peak levels of industrial production achieved in the late autumn of 1943 will not be reached again for many years to come. The war diversion to manufacturing was far greater than is required by civilian

[3] One reason for the difference in 1942 and 1943 results is the shrinkage in business-capital expenditure. In 1942 the drop was from 17.2 billion to 9.3 billion dollars, while the further drop in 1943 was to 4.6 billion, or much less than the decline in 1942.

demand. In peacetime prosperity about twice as many persons are employed in nonmanufacturing, nonagricultural pursuits as in manufacturing, while at the war peak there was less than one and one-half times as many so employed. Nonmanufacturing demands had to give way to war munitions. With a rounded civilian demand, capacity is not great enough to divert so much effort to manufacturing.

The only war expenditure to increase in 1944 was that for nonmunitions, particularly for armed personnel. Increase in this expenditure was modest, and a peak was reached by mid-year. On the other hand, government nonwar expenditures and consumer durable goods were passing their lows. Relaxation of the severe curtailment in consumer durables began in July, 1943, with approval of the resumption of production of ten forbidden metal household articles for the civilian economy; the program advanced unevenly because of the conflicting indications of war needs, but a slow advance was under way. There was almost no private capital building for another year.

The first war production cutbacks began late in 1943 with an ordered reduction in the rate of aluminum production. This cut did not represent any reduction in the rate of use of aluminum, but by then there was a sufficient stock on hand so that further inventory accumulation was unnecessary. The output of munitions was showing no material decline in 1944. The factor most responsible for easing the pinch of war demand was the rapid increase in the productivity of standard type munitions in 1944. Peak labor requirements of well over ten million employees in making munitions were reached late in 1943 simultaneously with the peak in output. By the end of 1944 this labor requirement had dropped to nine million with almost as large an output as a year earlier.

One of the most notable areas of increased civilian output in 1944 was farm machinery, which was permitted to expand to all-time highs. Agricultural income was at unprecedented peaks, making for a very high demand for such machinery, and the urgent need for food in spite of record crops provided a plausible basis for reconversion to civilian production in this area.

The global war remained critical in 1944, but ultimate victory looked more and more certain as the year end approached. The Battle of Stalingrad had been won, Tunisia had surrendered, and submarine sinking of Allied shipping had been greatly reduced in 1943. Early in 1944 the Allies gained air superiority in Europe. France was invaded in June; Paris was liberated in August. The Japanese Navy was decisively defeated in the Philippines in October. Perhaps we became over confident. In any case, short supplies and the cruel viciousness of the Battle of the Bulge took us by surprise in December. The output

of tanks and ammunition was rapidly stepped up for a few weeks. Employment in industries making munitions leveled off until February, 1945, after declining continuously for a year, only to drop still more rapidly after February.

Neither prices nor total production increased a great deal in 1944. War planning was much more difficult than in the early stages of the war, because then war requirements appeared unlimited all along the line. If output got ahead in some areas in the early stages of the war economy, resources could later be diverted to other areas to help them catch up. Now, however, production of standard lines could quickly exhaust storage facilities; yet the ultimate needs remained uncertain. At the same time, selective expansion of critical types of munitions was more urgent than ever, although rapid increase in output was not possible in most of these cases because they were little past the developmental stage.

War production continued at nearly peak levels in the first half of 1945. Output became increasingly selective, with the ship program showing the greatest contraction. The ammunition and bomb programs were rapidly stepped up. The aircraft program was contracting and shifting still more than in 1944 to heavy, long-range bombers.

With the German capitulation on May 8, war production began a precipitous decline, which became even more rapid after V-J Day in September. The production of munitions had declined from 5 billion dollars a month early in the year to only slightly more than 1 billion a month after the Japanese surrender. By the end of the year it was virtually reduced to a peacetime basis. Total war expenditures were cut in half between the second and fourth quarters.

The private economy quickly took up the slack with expenditures of the entire economy showing but a slight decline. Private capital expansion doubled, and consumer expenditures increased substantially, especially in the nondurable items where production could be rapidly stepped up. It had been generally believed that a rapid decline in government expenditure would cause a downswing. This, however, did not eventuate. War prosperity is sustained at such a high level because of the inexhaustible demand for war products. Because of the deferment of purchase of civilian goods during the war and the large volume of liquid savings accumulated as a result of the "inflationary gap," the demand of the civilian economy was almost inexhaustible after V-J Day.

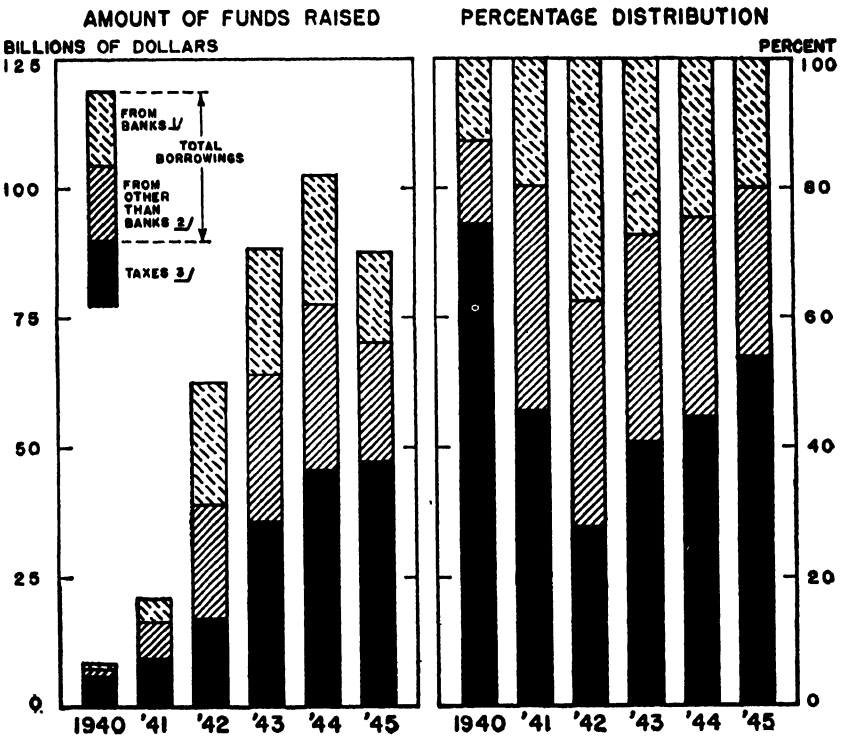
Savings rose to a high level of 3 billion dollars a month in 1944 and most of 1945. The holdings of liquid assets (bank deposits, currency, and government securities) had risen from approximately 75 billion before the war to about 250 billion dollars at the end of 1945. These funds resulted from the method of financing the war. As

shown by Chart 34, the relative dependence on taxes increased substantially after 1942, accounting for more than half of the federal government funds by 1945. Dependence was placed partially on private incentives, however, making the taxing-away of all income in

CHART 34

SOURCES OF GOVERNMENT EXPENDITURE DURING WAR PROSPERITY*

Calendar Years



* Taken from the *Survey of Current Business*, February, 1946.

excess of the civilian product at constant prices unachievable. Excess income served less purpose as the shift of sources became less necessary than at the early stages of the war. Reliance upon direct bank financing was successively reduced. Individual purchase of government bonds was partially encouraged by authorized deduction schemes put into effect by most organizations paying wage and salary income.

3. SHIFT TO PEACE PROSPERITY

Saving declined rapidly after V-J Day. Goods were more readily obtainable, the patriotic motives for saving were gone, and controls

were greatly reduced. In the fourth quarter of 1945, consumers were spending 88 per cent of their disposable income, far above the average of 76 per cent in 1944.

Not only were fears expressed that reduced demand might result from the withdrawal of war activity; it was also feared that "take-home" pay might decline disproportionately because overtime premiums would be lost with reduced hours per week; and that down-grading of jobs and shifts out of the war industries would mean reduced pay rates for the persons involved. Almost immediately after Japanese surrender, President Truman issued executive orders calling for wage-rate increases in cases of maladjustments and inequities, notably recommending increases in wage rates proportionate to the rise in the cost of living. Wage rates were freed of control so long as the rise did not require price advances. Increased wage rates were demanded by the unions to reduce the decline in take-home pay. The union demands were set off when Commerce Secretary Wallace made public on November 1, 1945, a hastily prepared interoffice report indicating that the automobile industry could pay substantially higher wage rates with rising volume of automobile sales and yet maintain prices and have high profits. An average increase of 15 per cent in manufacturing industries in 1946 was suggested. For the automobile industry "15 per cent can be granted without adverse results in the first postwar year of restricted operations, and a further increase of 10 per cent can be given for 1947 when production will have reached peak rates. A much higher wage income will have to be secured if demand is to be sufficient to produce full employment by 1948."[4]

General Motors automobile workers struck for higher wages on November 21. An industry-wide strike was called in the steel industry in January, 1946, reducing operations to an average of 20 per cent of capacity in February. Steel and many other industries were forced to operate at lower levels in April and May by a long coal strike which brought coal output close to the vanishing point. All told, many thousands of strikes occurred, at one point reaching a loss of 4 per cent of total working time—far above previous records. Many of these strikes were in industries whose products were critically needed for over-all expansion; and the crippling effect, especially in industries producing durable goods, was much greater than is indicated by time lost.

On February 14, President Truman outlined more fully the wage-price policy. The increase in cost of living since January 1, 1941, was

[4] The Commerce Report was published in the *United States News*, November 9, 1945, pp. 98–99. A reply by George Romney of the Automobile Manufacturers Association was published in the *United States News*, November 16, 1945, pp. 101–2.

defined as 33 per cent, and the wage stabilization agency was directed to approve automatically rate increases of this proportion. A price increase would be granted when found necessary to meet the higher wage costs.

Wholesale prices, which already had risen much more than during the war, advanced rapidly. They rose as much from February to June as they had in 3 years. Before the end of February, price increases averaging 5 per cent were granted to the whole range of basic steel products. The policy as enunciated by the government had made it clear that all industries would not be able to afford wage-rate advances uniformly, but labor leaders planned a campaign asking for uniform advances. Steel prices had not increased during the war; so price increases had to be granted in this case, opening the way for many similar cases. Neither had the low rates of operation resulting from crippling strikes been counted on in framing the wage-price policy. Price increases, in application to very low rates of operation, as later occurred in advancing automobile prices, were found necessary under the formula.

In these circumstances, continuance of price control beyond June 30, at which time the current act terminated, was under constant fire. A bill continuing price administration on a restricted basis was finally rushed through Congress at the last minute, but Truman considered it unacceptable and vetoed.

The price rise was rapid and immediate. The cost of living rose as much in a month as it had in 2 years, while wholesale prices rose as much as in 3 1/2 years. The advance in wholesale prices from February to July was as great as from Pearl Harbor to February, 1946. Both retail and wholesale prices rose further in August, but wholesale prices dropped back to the July level in September. The price rises were frightening, and mild price controls were re-enacted and signed by President Truman on July 25. Price "rollbacks," except on foods, were attempted in few areas. For the most part, the controls specified stable prices at the new levels. Much of the price advance had resulted from inventory accumulation. Reluctance to sell at the controlled prices was general, and price control was again having a hard time. On October 14, 1946, President Truman eliminated practically all price controls except rent. Supplies were now becoming more abundant, and in most areas little further advance occurred.

In a year beset by strikes, the climax was reached when John L. Lewis denounced the government contract in November (the government had taken over the mines in May to settle the strike). The strike continued until an appeal to the Supreme Court was made in early December, after a lower court had assessed a heavy fine. The strike

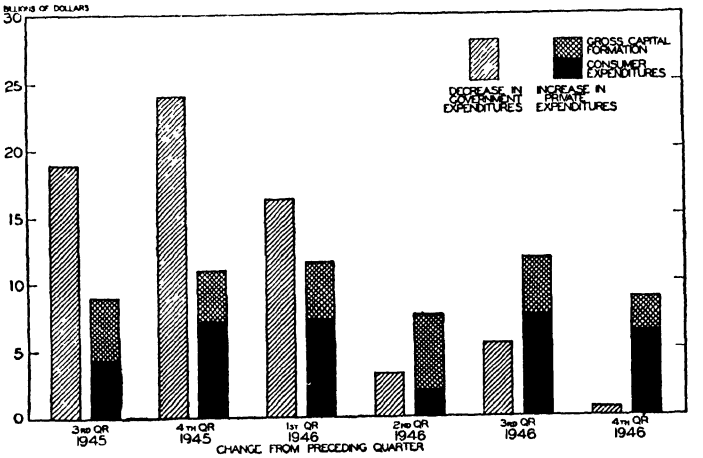
ended in time so that actual disruption did not approach that reached earlier in the year.

Weekly earnings or take-home pay in manufacturing by the year end had, on the average, nearly reattained the wartime peaks. Even this accomplishment was short of the 1945 objective because manufacturing employed a smaller proportion of the total workers than during the war. Wage rates in manufacturing rose an average of roughly 15 per cent from February to the end of the year; the cost of

CHART 35

OFFSETS TO DECLINING GOVERNMENT EXPENDITURES*

At Annual Rates



* Department of Commerce data.

living rose 18 per cent; and wholesale prices rose 30 per cent. The rise in wage rates of approximately 15 per cent therefore netted no increase in real income.

Although income payments had declined in manufacturing, they had risen in the rest of the economy enough to make up for part of this decline. By the end of 1946, consumer expenditure was back at the prewar rate of over 90 per cent of consumer disposable income, having risen from a rate of about 75 per cent during the war; that is, a larger part of income payments were being spent, so that consumer expenditures steadily increased.

Government expenditures to the end of the first quarter of 1946 declined substantially more than the rise in consumer expenditures, as shown by Chart 35. As a result, total income payments declined during this period, but disposable income rose after the beginning of

1946 because of lower income tax rates on individuals. In spite of a shrinkage in expenditure for the entire economy of over 10 per cent, the period is not properly to be considered a cyclical downswing. Consumer expenditure never rises during a downswing. The abnormal war activity was being rapidly eliminated. Government expenditure dropped from 25 billion in the second quarter of 1945 to 10 billion dollars in the second quarter of 1946, from which point the shrinkage was much slower. During this period, unemployment rose from less than a million to almost 3 million, and then declined. During the same period, the civilian labor force moved horizontally, with offsetting influences, such as women leaving commercial employment and demobilization of the armed forces. After the first quarter of 1946, the civilian labor force rose substantially, but employment rose still more rapidly.

A major expansionary force in 1946 was business capital formation. Inventory accumulation increased 4 billion dollars, partly because of the low stock levels of many types of civilian goods, and partly as a speculation on the price rise. Business construction and manufacture of durable equipment rose to 21 billion, an all-time peak, in spite of supply limitations.

Whether a downswing would have occurred after V-J Day without the encouragement lent to increasing wage rates, without the intensification of demand which resulted from shortages created by strikes, and without the rapid price spurts when quick shifts were made in price control policy is not to be answered dogmatically. Thinking on the question will aid in understanding the business cycle, however.

4. ELIMINATION OF WAR CONTROLS

Controls were imposed on the civilian economy each time the world situation reached a critical phase, although before Pearl Harbor the controls were stimulative as well as restrictive. The controls were thus laid layer on layer, and constant reorganizations and reshuffling of controlling agencies were being made. A detailed picture becomes very complicated, and a broad survey will provide a basis for examining the problems of decontrol and their influence on reconversion.

The major agencies of control at the peak of the war effort were: War Production Board (limitation and material orders, which partly accounted for the Board's restriction of material flow and amount of production and inventories permitted); Office of Price Administration (price ceilings and rationing); War Manpower Commission (flow and distribution of manpower); War Labor Board (control of wage rates). The OPA was guided by the General Maximum Price Regulation which established price ceilings as those in effect in March, 1942

although the ceilings set for most foods were established by the levels a year later. Rationing was at the direction of WPB. The benchmark for the WLB was the "Little Steel Case," established in July, 1942, to guide the Board in setting wage-rate ceilings. The cost of living was judged to have risen 14 per cent from January, 1941, to initiation of control, and wage rate increases were generally to be granted up to this level.

The program being built piecemeal, perspective is gained by noting the shifting shortages and urgency of programs. The following list includes only the items involving major civilian implications (the dates cover only the period of most critical shortages or necessitous decision in case of programs):

SHORTAGES

Machine tools	January, 1941—December, 1942
Aluminum	February, 1941—October, 1943
Copper	October, 1941—November, 1943
Rubber	May, 1941—January, 1944
Coal	October, 1941—March, 1944
Coffee	October, 1941—July, 1943
Lead	December, 1941—May, 1944
Zinc	December, 1941—May, 1944
Steel	April, 1942—April, 1944
Housing	May, 1942—End of war
Sugar	May, 1942—End of war
Gasoline	May, 1942—May, 1945
Domestic transportation	May, 1942—May, 1945
Shoes	February, 1943—End of war
Manpower	March, 1943—May, 1945
Clothing	July, 1943—End of war
Lumber and paper	August, 1943—July, 1945

URGENT PROGRAMS

Farm machinery program	September, 1941—September, 1944
Relaxation of antitrust regulations	April, 1941—End of war
Concentration of civilian production	April, 1942—April, 1943
Inflation	July, 1942—End of war
Resumption of production of consumer durables	April, 1943—End of war
Closed-down war plants	April, 1943—End of war
Renegotiation of war contracts	October, 1943—End of war
Surplus property	February, 1944—End of war
Contract termination	May, 1944—End of war
Preconversion to civilian products	July, 1944—End of war

Shortages and urgent programs noted are restricted to the war period in these lists because the nature of the programs shifted so materially after V-J Day. The use of rubber, for instance, was still under strict control at the end of 1946 because of the magnitude of civilian demand. The impact on the civilian economy of the war controls arose from attempts to speed reconversion.

Subsidies were effectively employed during the war to encourage production and prevent inflationary prices. The premium-price plan, notably employed to encourage the operation of high-cost lead and copper mines, was very effective. High prices were paid only for the high-cost product. These plans were continued into the postwar period, although modifications were introduced as time passed. A slow release from a government stock pile was helpful in 1946 after the subsidy was scrapped in the case of copper. Premium payment plans, authorizing payments for above-quota production, were expanded by special legislation passed in May, 1946, to encourage the production of building materials. Food subsidies were widely employed during the war to reduce the pressure for wage-rate increases; the large subsidy payments involved arose partly from the delay in instituting price ceilings on food. Many premium-payment plans remained in effect at the end of 1946. Support of agricultural prices to 90 per cent of parity, largely by granting loans, began in the autumn of 1946.

Some release of materials for the civilian economy was made before V-E Day if permission to use them would not restrict the flow of manpower and complementary materials to war programs, but no successful plan was developed to accomplish this. A "Spot Authorization Plan" was developed to grant special permission to produce civilian products in labor areas not classified as "tight," but change in the complexion of the war from day to day made for great vacillation in this policy. Not much reconversion resulted. Limited production of postwar experimental models was authorized, and permission to place unrated orders essential in retooling, especially in the automobile industry, was granted in July, 1944, but such preconversion authorization was withdrawn later in the year. After the Baruch-Hancock report on "War and Postwar Adjustment Policy" in February, 1944, plans were worked out for quick settlement of war contracts and rapid clearance of government property from contractors' plants.

Civilian reconversion did not get well under way until V-E Day in May, 1945. No attempt was made to schedule the resumption of civilian production after V-E Day; instead, manufacturers were given broad access to released materials to the extent permitted by reduction

in military requirements. Limitation orders on consumer durables requiring minor quantities of steel were immediately revoked. Pricing formulas for discontinued consumer durable goods were established either at 1942 levels or at 1941 levels plus cost increases. Wage rates for workers shifting out of their wartime wage bracket were opened to collective bargaining by the WLB. Construction controls were eased.

Controls were rapidly eliminated beginning in August, 1945, with acceptance of surrender terms by the Japanese government. WPB canceled most of its industry orders on use of materials and limitation of production schedules. Lend-Lease was immediately ended. All civilian manpower controls were dropped. Rationing was eliminated on gasoline, fuel oil, and canned goods. Automobile and shoe rationing ended in October. Wage-rate determination was restored to collective bargaining, with recommended increases up to the rise in cost of living. Price ceilings were generally maintained, however.

We have seen in the preceding section that the government wage-price policy promulgated in February, 1946, set up procedures for granting increases in ceiling prices where necessary to accommodate cost-of-living, wage-rate increases. The result was a rapid rise in wholesale prices which had remained relatively stable since 1942. While wholesale prices typically rise more than retail during periods of prosperity, price control had been successful in keeping wholesale price rises substantially less than retail. Relaxation of restrictions therefore drove wholesale prices up more and earlier than retail prices.

Rise in prices added to existing doubts as to the validity of price control under peacetime conditions. No one intended an abrupt removal of controls, but compromises were difficult to effect, and those finally made in Congress just before the lapse of legal authority on June 30 were unsatisfactory to President Truman, and his veto resulted in an abrupt termination of price ceilings. As noted earlier, the resulting price rises were so spectacular that a new bill not far different from the one vetoed in June was signed and became law on July 25. By this time, price control could have little immediate effectiveness because, for the most part, prices could not be rolled back; and speculation, when the price lid was off, had driven the levels about as high as they would go without control. As it happened, control broke down because of the rollback in the price of meat. Greatly reduced supplies of meat were forthcoming at the lowered prices, and the public rapidly lost confidence in price control. In desperation, President Truman removed practically all price controls except rent in October. It would appear that price controls worked reasonably well in the initial stages of peace, in spite of the supply situation and

general removal of rationing, because they were, by long familiarity, accepted. Possibly this could have continued until ceiling controls were no longer needed if readjustments had not been invited by attempts to drive up wage rates.

Controls were tightened on construction in favor of veterans' housing as the year proceeded. The demand for housing was very great, partly because of the rapid marriage rate, partly because the veterans did not move back to the farms in the same proportion that they left, partly because of the prosperity and high level of incomes, and partly because rent controls kept the cost of much of the housing absurdly low so that effective demand was not limited by high prices. In March, 1946, a veterans' housing priority regulation requiring that the major part of all housing materials be furnished for low-priced veteran housing was ordered by the Civilian Production Administration (successor to WPB). CPA approval was soon required for all non-housing construction; two-thirds of such applications were being denied by autumn. Although regulations were constantly being tightened up—premium payments were made for above-quota production of such items as brick and plywood, and roads were built to otherwise inaccessible lumber stands—the veteran housing program must be written off as a failure. Shortage of critical items was not overcome, and the costs of building were more than most veterans could afford. The program was largely scrapped in December.

Other orders were issued by CPA to assist in the production of critical products. In June, steel mills were instructed by CPA that preference must be given to certified orders from makers of fifteen types of farm machinery. The total steel allocated for this and similar purposes, however, was only 2 per cent.

At the end of 1946, the CPA itself was ended and with it most of the wartime controls affecting the civilian economy. On the last day of the year, President Truman declared the hostilities at an end, automatically terminating special war powers and paving the way for rapid termination of almost all others.

Rent ceiling was the only major control remaining. Available housing remained so much below effective demand that it was generally agreed that complete removal of these controls would be undesirable. The rent controls were, within limits, not difficult to enforce because of the contractual nature of payment. Nevertheless, it was undeniable that the low rents encouraged landlords to sell their real estate at uncontrolled prices and, furthermore, that the low rents were out of line with the prices veterans were having to pay to buy houses.

Surplus property had been disposed of haltingly. Of some 30 billion

dollars (cost price) of property in the country declared surplus or expected to be so declared, only a little over a third had been sold or leased by the end of 1946. UNRRA was terminated, and our participation in international relief was greatly reduced. This participation had taken principally the form of surplus property abroad, food, and some badly needed machinery products.

We were participating in an International Monetary Fund established to promote exchange stability. Also, we were a member of the International Bank to provide long-term foreign loans, although we were placing major reliance upon our own Export-Import Bank for this purpose. Early in 1947 reciprocal trade agreement discussions were held at Geneva by delegates from eighteen nations. Our position on international cartels was still undetermined. We were a party to the decartelization of German industry, but our representatives at the London Preparatory Committee of the International Conference on Trade and Employment in the fall of 1946 went on record only as favoring measures to produce full employment and took no forthright position against international cartels.

5. PARALLELS BETWEEN WORLD WAR I AND II

The most important differences between activity in the two war periods relates to unused capacity when the war began. Both unemployment and unused plants were greater in 1939 than in 1914. About 15 per cent of the labor force was unemployed in 1939, while only about half this percentage was unemployed in 1914. In addition to the greater rise in employment in the recent war, a greater increase was made in the production potential. The abnormal increase in the labor force reached approximately 7 million before the end of World War II, while it reached only about one million in World War I.[5] The greater expansion is due principally to greater mobilization and the longer period of the war.

Manufacturing employment increased by a third in World War I; by three-fourths in World War II. This and the number entering the armed forces were the major expansions both times. The rise in the armed forces was by about 4 million persons in World War I and by about 12 million in II. The labor force grew only 2 million the first time, compared to 10 million in the recent experience.

The increase in total output was by far greater in the forties' experience. The difference was due to the greater expansion in war production, since the quantity of civilian goods and services increased but little after our entry into both wars. Construction of war facilities

[5] The estimate for World War I is derived from measurements made by Clarence D. Long, "The Labor Force in Wartime America," *National Bureau of Economic Research, Occasional Paper 14* (March, 1944).

rose to a peak early in the second war, but amounted to little in the first. The first war took a quarter of total expenditures and the second a half.

It is notable that civilian purchases were not reduced in World War II when the war effort reached such heights, although the distribution was changed. High incomes and rationing this time made for a more even distribution of many products. Consumer durable goods production was practically eliminated, but other types were slightly expanded. The purchases of consumer durables declined by almost a quarter in 1918 but were still substantially greater than in 1914 because of their striking increase from 1914 to 1917. No doubt these industries would have suffered the recent fate of complete conversion if the first war had lasted longer.

Agricultural output rose much more this time than last, but the increases in price were very similar. Hence, the increase in farm incomes was greater this time. In World War I, increased output was due principally to expanded acreage, while acreage remained almost the same this time. Yield per acre rose to a very high level, partly because of improved methods and partly because of very favorable weather conditions. Agricultural employment decreased more this time. Farm real-estate values started from a lower level in 1939 and increased less than after 1914. The outstanding amount on farm mortgages decreased after 1939, compared to a rapid increase after 1914. Rises in new mortgages this time have been balanced by the paying off of old mortgages.

The rise in price of nonagricultural goods has been less since 1939 than after 1914. Wholesale prices of these goods rose less rapidly than retail during World War II, owing to price control, while in the first war the typically more rapid rise occurred in wholesale prices. In both cases, the situation was very inflationary, because of the relatively complete use of resources and the constant diversion of a part of the product to war. Prices did not rise much while we were actually at war either time, but the much longer second war period built up larger accumulated savings. Money in circulation tripled and bank deposits doubled, while the increases the first time were very modest. Government financing replaced the large increase in bank loans that occurred during World War I.

Interest rates, at very different levels, remained fairly stable until the end of both wars. Stock prices rose much more the second time. So also did exports, due to Lend-Lease, but imports rose in about the same proportion both times.

Some movements at the end of both wars were substantially similar. Prices rose rapidly, and inventories were quickly expanded. Labor productivity declined initially at the end of both wars, and labor

disputes reached high levels. Residential building rose under the pressure of high demand but was restricted by rapidly rising costs. Agricultural prices rose sharply to a peak and then declined.

Other major movements differed significantly. The prices of steel, copper, and other important raw materials declined sharply immediately at the end of World War I, in opposition to the rising movement of the all-commodity index, only to rise sharply a year later. In contrast, the prices of these commodities had been kept under stricter control in this war and showed no initial decline. Capital expansion rose to a peak at the end of the first war and thereafter steadily declined to the bottom of the 1921 depression. This activity was very restricted in 1945 but rose rapidly with the close of the war. Government expenditures rose to a new peak in 1919 but declined very rapidly in 1946. Manufacturing employment declined little in 1919 and soon reached new peaks, while a third of this activity was eliminated at the end of 1945. The proportion of consumers' disposable income spent increased in 1946 but soon declined in 1919 and 1920.

REVIEW QUESTIONS

1. In what way did strikes, increasing wage rates, and rapid price spurts prevent a downswing after V-J Day?
2. Show the relation between some of the urgent programs and shortages during World War II.
3. Discuss the development of "preconversion" during World War II.
4. Relate the findings of the "Commerce Report" on November 1, 1945, relative to needed wage-rate increases in the automobile industry, to the nature of shifting unit costs with a rising proportionate use of total capacity.
5. Explain the reasons for shifting price control policy in 1946.
6. If a downswing did not occur after V-J Day, how were the huge declines in government expenditure offset?
7. Review the reasons why take-home pay could be expected to decline at the end of the war.
8. Is it feasible to eliminate rationing and maintain price ceilings?
9. Present arguments for and against keeping rents out of line with real estate prices in peacetime.
10. List the different changes in important processes in World War I and World War II.
11. Explain the reasons for the downward movement in industrial production in the early parts of 1938, 1939, and 1940.
12. Compare the change in expenditure in 1938, 1939, and 1940.
13. Explain the way we arrived at the scale of war activity at its maximum.

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Chapter XV

BUSINESS BAROMETERS: INTEGRAL MEASURES OF GENERAL BUSINESS CONDITIONS

THE FUNDAMENTAL problem of the business analyst involves a knowledge of what data are needed and what data are available to throw light on business change. This problem is considered in the present and two following chapters.

1. NATURE OF BUSINESS BAROMETERS

In its most common scientific use, the word barometer signifies an instrument for indicating the weight of the atmosphere. Changes in such weight or pressure tend to precede changes in the weather in a fairly consistent fashion. The word barometer, therefore, has come to signify a mechanical device whose movements tend to precede those of some other thing in which we are interested.

Many have attempted to use the term business barometer in the pure barometric sense of a forecasting series, that is, a series whose movements lead, as distinguished from the metrical measurement of business conditions. As time has passed, however, business barometer has come to signify both the forecaster and the measure, in the vast majority of discussions. Carloadings and steel ingot production, for instance, measure rather than forecast general business conditions, but many businessmen speak of these series as barometers.

To avoid coining another word in this book, series which measure and series which tend to lead are indiscriminately called business barometers. Several factors make it unsatisfactory to limit ourselves to two expressions such as business barometers and business thermometers. First, in many cases the distinction, which is uncertain, is primarily a matter for investigation. Second, the business barometer may not have a barometrical characteristic with regard to the series which we wish to forecast, as for instance, the volume of stock sales compared to stock prices, both of which tend to lead general business conditions by about an equal period. Third, as is pointed out in Chapter XVIII, no one series is by itself an acceptable forecaster of business conditions. Not only should series which tend to lead business activity be used; so also should those which move with it and lag

behind it. Such series must be used in combination, although they cannot always be put into one index.

As will be pointed out later, for many purposes, determining the current position in the business cycle partakes of the nature of a forecast, and many times this is the most important forecast which can be attempted. In fact, major emphasis in forecasting is now directed to a comprehensive understanding of the current position and changes from the recent past rather than to lag and lead relationships.

2. CHARACTER OF AVAILABLE DATA

Completely satisfactory data for the purpose of tracing the course of economic change are not available. Extensive data have been collected since about 1920, but this collection has been a promiscuous affair. Some data are collected incidentally in the performance of other functions—for example, our data on the consumption of cigarettes come as a result of collecting excise taxes.

The data collected have not been assembled from the point of view of their utility in interpreting general business conditions. Even if they were perfectly adequate and intelligible, many of them would be useless in depicting general business conditions. It has been said, and with much truth, that what we need is not more data but better data, both as to quality and as to selection. Rapid progress has been made toward this goal in recent years.

Many data are not what they seem, not only because they have uncertain coverage, comprise a poor sample, and represent but a part of the total process, but also their names may be misleading. An excellent illustration is furnished by the bulk of the series entitled "consumption." The "consumption of cotton," for instance, is the amount of cotton purchased by textile manufacturers.

Statistical series are most significantly used in comparison with related series. For this purpose, difficulties commonly arise because of lack of uniformity in classification of industries. Notable progress has been made in this direction in recent years, and the basis is being laid for a great deal more, but several comparisons remain of uncertain value. Especially troublesome is the comparison of data collected on a product basis with those collected on a plant basis. Figures on employment in the automobile industry, for instance, represent all establishments whose major product is automobiles. Not only may such establishments produce other products, but they may produce varying proportions of automobile parts, both from establishment to establishment and from year to year.

The major portion of valuable current series is available in the

Survey of Current Business. This source carries over 2,000 series and is, in general, the best available data on each subject. Certain exceptions must be noted in connection with some of the measurements discussed in the following pages. Many of the series must be interpreted with great care. A supplement is promised for 1948, carrying the data for a longer period than the current monthly numbers and containing valuable footnotes discussing each series presented.[1] Before much reliance is placed on any series, the appropriate footnote should be read with care. The Office of Business Economics of the Department of Commerce, which publishes this periodical, cannot make the data any better than they are when they arrive from the agencies supplying them. The list of statistics included is recurrently reviewed, and the series thought to be inferior are dropped and new series are added. The best current data available on some subjects are inadequate in important respects, however, and it is difficult always to make the footnotes give adequate warning.

Attention also should be called to the *Federal Reserve Bulletin*, which carries the major banking series, international financial statistics, and a few well-chosen general business series;[2] Standard and Poor's *Current Statistics*, of the same order as the *Survey of Current Business* and supplementing it (but expensive); the U.S. Treasury Department's *Treasury Bulletin*, carrying data on federal government financing; and the Department of Labor's *Monthly Labor Review*, carrying commodity price data and labor data. All these publications are monthly, and all the barometers here discussed appear in one or more of them unless specifically excepted. The Department of Commerce's *Statistical Abstract of the United States* appears but once a year, but it is of major reference value and carries useful evaluations of some of the data. Also, the Department of Commerce publishes *Facts for Industry*, which are mimeographed releases carrying forward many series on particular industries.

Less knowledge is had of data which have been collected but not published. There are recorded instances of community studies being made at great expense when the desired data would have been available from the Census archives at the cost of transcription. There are many instances of different branches of the government collecting the same data. There are a great many cases of individual corporations collecting information which could have been taken from published records if the records were easily located.

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[1] Before the war the supplement was published biennially. The last previous issue appeared in 1942.

[2] Attention may be called to the fact that beginning in June, 1947, the Board of Governors of the Federal Reserve System began to publish monthly the *Federal Reserve Charts on Bank Credit, Money Rates, and Business*.

The shortcomings of available data are emphasized in this section because mistakes are so commonly made in interpreting currently reported figures. A series of figures appears so precise that one is given no inkling of the unreliability of the figures or of the appropriate use of them unless he goes behind the published figures and examines their derivation, which is often difficult. It is not to be assumed that figures mean nothing, but that they are dangerous unless some background of understanding is attained. Data which actually are technical and which have but a limited meaning appear to the uninitiated to mean many things they do not mean.

3. DATA NEEDED FOR UNDERSTANDING CURRENT ECONOMIC CHANGE

The fundamental problem which the business analyst must face is, not what data are available, but what data are needed to understand business change. It is true that a knowledge of needed data will be gleaned partly from an understanding of the nature of, and relationships between, available data. It is further true that, after we set down what seems, at present, to be the data needed for understanding economic change, we shall find that in many cases there are no completely adequate series but that we must be satisfied with the best available representation of them. Indeed, if we could be furnished with all of the series which we may reasonably state to be the minimum need, it is probable that we should find these series were not completely adequate. As our understanding becomes more complete because of more adequate data and more capable analysis, we can state this fundamental problem with more precision.

The failure to perceive the nature of the fundamental problem has led many to feel that what is needed is merely a description of the available series of data. This belief leads to a knowledge of a truly remarkable list of series—perhaps about 5 or 10 thousand if we omit some of the duplications and some of the minutest details. Many of the empirical relationships found in studying these series are contradictory. The result is a mass of detailed facts but no adequate generalizations, so that the facts are of little or no assistance in understanding business change; and they may actually be a detriment, leading to confusion and distrust of logical thought.

At the opposite extreme, there are those who feel that the data can contribute little to our understanding, since, in the end, changes will take place as a result of the fundamental principles regarding scarcity and utility. These principles are useful in their place, but they do not describe the current economic situation at any given time. To obtain such a description, it is necessary to know what is actually taking place.

A list of facts needed, together with a statement of the economic change reflected, can be stated tentatively as follows:

BUSINESS BAROMETERS

Series	Economic Change Reflected
1. Integral measures of general economic conditions	Locate the time when business turns occur; give the depth of depression or height of prosperity; measure the rate of improvement or decline
2. Regional measures of business conditions	Reflect the geographic variation in economic change
3. A comparison between durable and short-lived goods	Reflects a major type of disequilibrium
4. Measures of component processes of business activity	
a) Purchases or new orders	Reflect the strength of demand
b) Production	Traces actual activity
c) Shipments	Trace flow of goods
d) Inventories	Reflect the "sticking points," whose increases or decreases abnormally speed up or slow down activity
e) Unfilled orders	Reflect the backlog on which activity may depend without the spontaneous expression of further demand
5. Industry-consolidated accounting statements	Reflect the shifting accounting position
6. Measures of labor stability	
a) Union membership	Indicative of the strength of the labor movement
b) Labor turnover	Indicative of tension in the labor market
c) Industrial disputes	Indicative of labor dissatisfaction and disorder; take on the character of an originating cause
7. Measures of prices of various factors	
a) Wage rates	Measure the cost of labor; indicate the rate of labor income
b) Interest rates	Cost of borrowing money; have symptomatic importance because they are indicative of monetary stability, the use of credit, and discount of the future
c) Bond prices	Represent long-term interest rates; reflect tensions in the capital market
d) Stock prices	Are the residual valuation of capital; reflect sentiment and momentum of the expansion movement
e) Finished goods prices	Reflect the strength of final consumer demand
f) Raw material prices	Reflect the adequacy of currently available supplies of raw materials to support existing rates of activity

Series	Economic Change Reflected
g) Average of all prices	Most closely reflects the value of money; represents the extent to which price changes in general account for changes in market value of goods produced
8. Measures of prices at different points in distribution	
a) Wholesale prices	A comparison of changes shows elements of instability in distribution
b) Retail prices	Useful as a deflator to indicate changes in effectiveness of purchasing power
9. Measures of the flow of goods to the consumer	
a) Wholesale trade	Difference in rate indicates inventory accumulation or structural changes
b) Retail trade	Reflects changes in consumer buying
10. Measures of payments and income	
a) Total expenditure	Reflects flow of funds; support for further expenditure
b) Total national income and its parts	Reflects the flow of purchasing power
c) Income distribution	Measures market for mass distribution; most important in estimating propensity to consume
d) Net profits	Represent the incentive for expansion; their variation is a major factor in shifting the distribution of income over the cycle
e) Wage payments	Provide the basis for absorbing mass production
f) Interest payments	Charge on current output for past contribution
g) Dividend payments	Represent the receipt of profits by individuals; proportion to net profits may be of critical importance at extreme highs or lows
11. Savings and propensity to consume	Throws light on major forces affecting inflation and deflation
12. Government receipts and disbursements	
a) Tax payments	Represent a deflection of a part of private earnings; are of significance principally because of the variation in proportionate weight between depression and prosperity
b) Government borrowing	Reflects roughly deficit payments; fund often is so large as to outweigh all other money-market influences at funding periods
c) Net government contribution	Represents current additions to purchasing power by the government
d) Loans to private companies and individuals	Reflect an emergency condition if loans become important; direction of movement indicative of change in tension

Series	Economic Change Reflected
13. Measures of the growth of productive factors	
a) Growth of population and labor force	Reflects increase in labor power; automatic growth in demand
b) Changes in productivity	Reflect change in mechanical efficiency in using productive resources
14. Measures of unemployment of productive factors	
a) Unemployment of labor	Best indication of the inadequacy of activity in depression; measures the social impact of depression
b) Idle capital	Shift is indicative of needs for expansion
15. Measurable effects of originating causes	Show the disturbing influences superimposed on economic activity
16. Measures of credit conditions	
a) Secondary credit	Measures the basis for credit expansion
b) Ratio of bank liabilities to the money base	Measures the adequacy of standard money for credit expansion
c) Total loans	Measure the use of credit
(1) Speculative loans	Measure the strength of the speculative movement; rapid changes exert an abnormal influence on confidence and purchasing power
(2) Commercial loans	Accelerate or retard activity; often used for the accumulation of inventories
(3) Consumer loans	Accelerate or retard activity; reflect unstable purchase of durable goods
d) Turnover of bank deposits	Measures the rate of use of bank funds
e) Volume of long-term debt	Reflects the debt burden forcing a redistribution in current income
f) Capital investment—stock and bond flotations	Reflects the flow of savings to the capital market
17. Measures of business population	
a) New businesses	Represent expansion in entrepreneurial activity
b) Business failures	Reflect the major type of disruption arising in the business system; exert a major influence on confidence
c) Bank failures	Reflect a breakdown in the mechanism through which purchasing power flows; exert a material influence on hoarding.
18. Measures of business confidence	Reflect the psychological attitude of the community, determining the degree of emotional aberration

These measures must be considered from two points of view: (1) the logical regression relationship between them, and (2) comparative timing and amplitude of movement. In this and the two following chapters there are noted the best available measures and the relationships between them.

Many of the measures listed are less important as direct representations of business or economic factors than they are as symptoms of what is happening. What we need is an indicator of various forces, and it is of little importance whether the series used measures the forces directly or merely varies with them. Interest rates provide a noteworthy illustration. A study of the level of these rates is important chiefly because of the indication regarding the flow of credit, condition of the capital market, and monetary stringency. Many of the measures discussed in the following pages are principally symptomatic.

4. INCLUSIVE INTEGRAL MEASURES OF ECONOMIC CONDITIONS

An integral measure of economic conditions is represented by a weighted index of all types of economic activity. Gross national product (GNP) is such an index. GNP adds together the dollar output of all final products and services, including all goods for both capital and consumer.[3] A quarterly measure is currently computed by the Department of Commerce. GNP provides us with the only currently available measure of total activity. It therefore gives us our only indicator of total amplitude of fluctuation. It has the further advantage of dividing total product into important types of expenditure, although, on any considerable detail, such information is available only yearly and quite tardily.

The disadvantages of GNP measures are that they refer to a period several months prior to the date of publication and are quoted in current dollar terms. The current outlook cannot be seen very clearly with past information, so the analyst must make a rough current estimate by means of series which are available more promptly. The current-dollar quotation makes it necessary to deflate the GNP figures to put them in physical terms, although, as noted in the forecasting chapter, the value basis is the most useful one for some applications. For past periods the Department of Commerce makes available a deflation accomplished by applying the most appropriate price index to various sectors of GNP, but currently the analyst must deflate with the Consumers Price Index or some other general price series. The analyst must recognize that any measurement so global as GNP, involving estimates on many types of activity for which there are no adequate measurements, is only a rough approximation. The change shown from quarter to quarter or from year to year is probably representative of the general order of magnitude, but the precise differences must not be taken too seriously, especially over considerable periods of time.

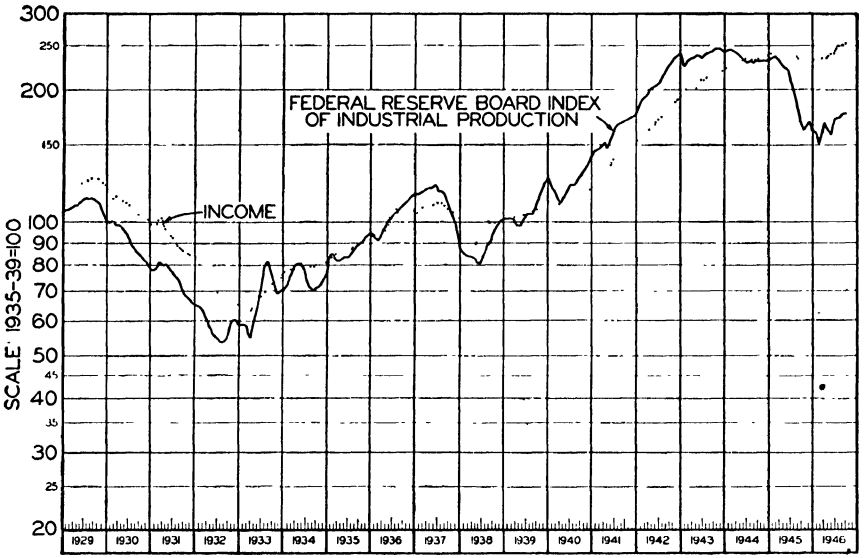
[3] For a statement of the derivation of gross national product figures from national income data, see Appendix B and Chapter XVI, Section 8. Detailed yearly measurements are presented in Appendix A.

Even under ideal conditions, no good measure of the amplitude of fluctuation would provide a sensitive measure that reflects promptly any turns in activity which may occur. Too many sluggish types of activity are included. GNP is inferior in this respect to the ideal situation because unavailability of data on many types of activity virtually forces the assumption of a horizontal change in making preliminary estimates of a considerable part of the economy.

CHART 36

INCOME PAYMENTS AND INDUSTRIAL PRODUCTION*

(Income Payments Are Not Deflated)



* Department of Commerce and Board of Governors of the Federal Reserve System. The 1947 revision of the income series shows a slightly greater upward trend than appears in the chart.

The Federal Reserve Index of Industrial Production, representing manufacturing and mining activity, is a far better sensitive measure. It includes the type of activity which most promptly reflects business-cycle changes and becomes available about a month after the activity occurs instead of being several months late. Since the Index of Industrial Production is comprised of physical quantity components, the statistical difficulties of price deflation are avoided.

The fact that industrial production represents the part of total production which is most sensitive to business-cycle changes is illustrated by Chart 36. Industrial production is seen to fluctuate more widely than the income measure, especially in periods of rapid decline, such as 1937. In this chart, comparison is made to personal income

because GNP is available on a quarterly basis only since 1939; the comparable fluctuation of income and GNP is quite similar at most times.

It is useful to compare the effectiveness of industrial production and total value of output with employment, wholesale prices, electric power production, carloadings, and bank debits as integral measures of economic conditions. Employment does not reflect changing productivity. Hence, over long periods of time the trend of employment does not reflect a major portion of industrial growth; and, since productivity varies somewhat over the cycle, employment traces a cyclical pattern varying somewhat from activity. Our employment measures do not reflect the hours of work, inasmuch as they are merely a count of the number at work and, therefore, fail to rise and fall as much as activity does. These differences are depicted on Chart 37, which compares factory employment with measures of industrial production. The best inclusive measure of employment, if comparison is to be made with broader activity than industrial production, is total nonagricultural, for agricultural employment does not well reflect cyclical movements.[4] However, employment is of great social importance and is a major criterion in economic control.

Wholesale prices best represent the strength of the market. Empirically, prices have been found to move generally with activity, although important exceptions occur when productivity is rising rapidly or when demand is weak at low levels of the secondary trend. Twenty years ago prices were frequently used to represent changes in activity, but the measure is not commonly applied for this purpose today. Because prices reflect the strength of demand, they are important in economic control. The best measure of prices to reflect the current strength of demand is the Bureau of Labor Statistics Index of Wholesale Prices.[5]

The consumption of electric power is a fairly general factor in production at the present time. It is expressed in physical units and thus avoids the problem of price deflation in a value index or explicit weighting problem in a quantity index. Implicitly, however, heavy users of electric power are overweighted. Also, major shifts in station-

[4] An intriguing suggestion on the analysis of shifting employment levels is made by A. F. Burns: "The character of the employment problem is not brought out adequately by existing statistics, and it will not be until statistical research agencies publish three figures instead of one for each industry and all industries combined; that is, the number in 'firms' experiencing a rise in employment, the number in 'firms' experiencing a decline in employment, as well as the total number employed."

Burns suggests the degree of cyclical diffusion can be measured in this way. See *Economic Research and the Keynesian Thinking of Our Times* (New York: National Bureau of Economic Research, 1946).

[5] See Chapter XVI, Section 6.

ary-power type to or from electric motors occasionally cause abrupt movements in the curve. The wide coverage of the measure, especially its automatic coverage of new industry, makes the measure useful, but it is not as dependable as industrial production.

Railroad carloadings represent another type of automatically weighted total like electric power production, and similarly contain implicit weights, being weighted especially by the movement of coal. Before the growth of other forms of transportation, especially trucking, carloadings were a more faithful measure of business activity than they are today. The shifting proportion of freight carried by trucks over the business cycle reduces the proportionate coverage of railway freight in depression. The carload is not so dependable a unit as the ton-mile, but railway ton-miles are reported much more tardily than carloadings.

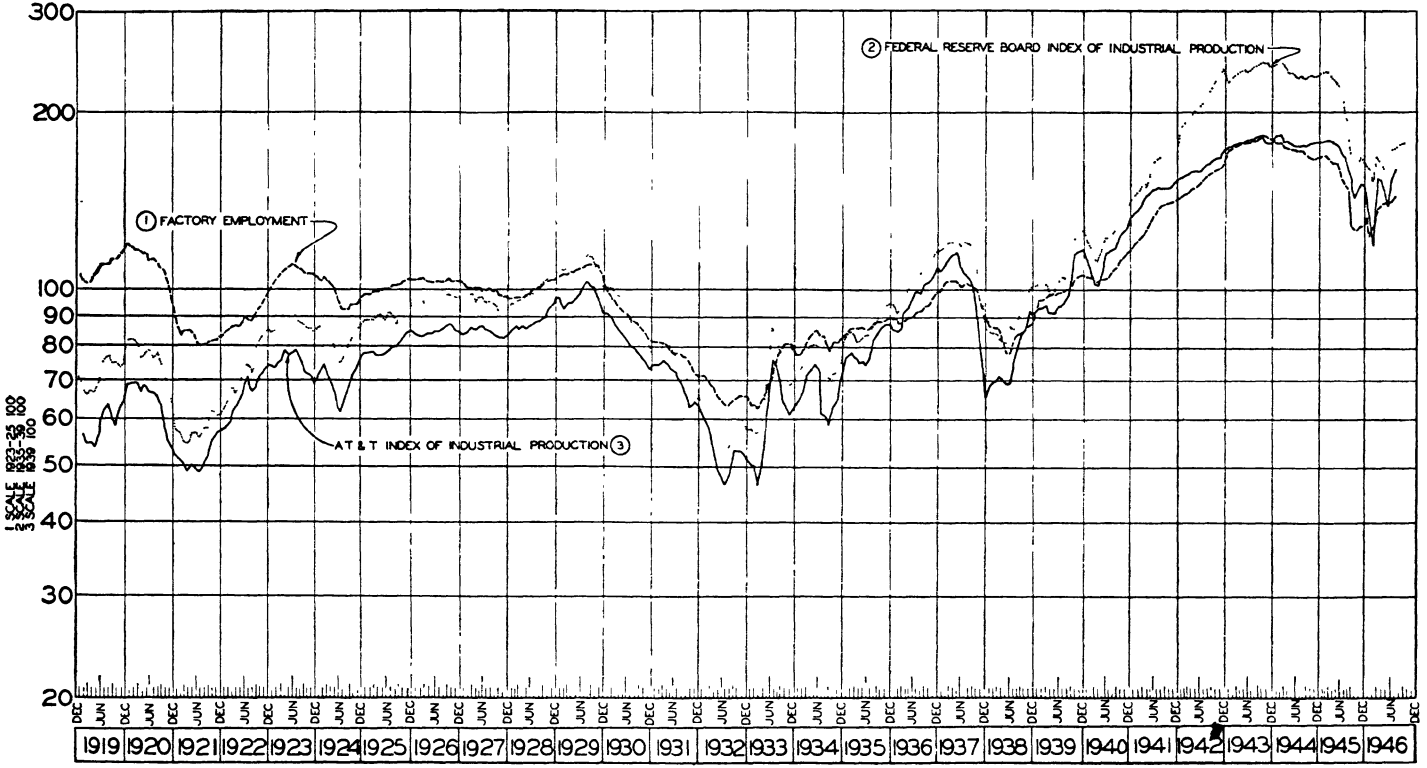
Bank debits, representing about 90 per cent of total payments, have frequently been used to reflect business activity. To avoid the over-influence of speculation in this series, New York City bank debits are commonly excluded from the measure. Payments are not precisely timed with activity, in that transactions taking time to complete, such as construction, result in delayed payments. Bank debits, being expressed in dollars, are partly influenced by price changes or must be subjected to inaccurate statistical deflation. Some shift in the proportionate representativeness occurs over the cycle, especially in payments made by consumers.

The conclusion is that GNP most faithfully represents the amplitude of change in total activity but, being a value index, involves price as well as activity changes. Industrial production provides the best sensitive measure, showing most faithfully and promptly the change in movement of activity.

Some criticisms have been made of the Federal Reserve Board Index of Industrial Production in recent years as a result of the introduction in the 1940 revision of man-hours worked adjusted for estimated changes in productivity to represent nonstandardized commodities for which output data are not available. The estimate of change in productivity involves a forecast and thus makes the index depart somewhat from the standard index-number practice of merely recording past changes. The device makes possible substantially greater coverage, however. From the comparison shown in Chart 37, it will be seen that the Federal Reserve Board index follows closely the movements of the independently computed American Telephone and Telegraph Index of Industrial Production, which is based on seventeen standard commodities. The A.T. and T. index is not at present available to the general public, but the Federal Reserve

CHART 37

COMPARATIVE MOVEMENT OF SERIES USED TO REPRESENT BUSINESS CONDITIONS*



* Board of Governors of the Federal Reserve System, Department of Labor, and American Telephone and Telegraph Company.

index can be currently checked by comparison with the Cleveland Trust Company Index of Industrial Production which adjusts the Federal Reserve index to eliminate the components represented by man-hours.

The Federal Reserve Index of Industrial Production can also be usefully checked for inclusive representation of cyclical changes by comparing it with Barron's Index of Production and Trade, a continuation of Persons' index.[6] This index represents the weighted average (with approximate weights shown in parenthesis) change of the Federal Reserve Index of Industrial Production (75), railroad freight traffic (11), building construction (10), and electric power production (4). If major changes in these other areas disagree with the changes in industrial production, Barron's index will provide useful information. Also, unlike the other measures we have been discussing, this and the Cleveland Trust Company index are adjusted for long-time trend.

5. WEEKLY INDEXES OF BUSINESS ACTIVITY

The index of business activity puts together series which purport to represent the change in activity and assigns them putative weights in accordance with the degree to which they are believed to represent total activity, usually without intending to measure any given process. The 1940 edition of this book pointed out that monthly indexes of business activity no longer served a very useful purpose in view of the effectiveness of the Index of Industrial Production as a sensitive measure. Since that date, many monthly measures of business activity have been discontinued.

Weekly indexes of business activity, however, serve a useful purpose in that they show the general direction of change at an early date. At about the twentieth of the month, for instance, faithful indications of what happened the previous month become available. The monthly indexes at such a date tell nothing of what happened in the first three weeks of the current month. The best of the weekly indexes give this information with reasonable accuracy.

A great many weekly indexes of business activity are computed at the present time. The best two available are reported by the *New York Times* and *Barron's*. Barron's Weekly Index of Industrial Production and Trade employs the same general weights as used in the monthly index computed by the same organization. The principal difference

[6] This index is employed in our study of business-cycle history. See Chapter X, Chart 15, for a comparison between the Cleveland Trust Company adjustment of the Federal Reserve index and Barron's index. Barron's index is currently published in *Barron's*. A pamphlet description can be obtained from Barron's Publishing Company, New York.

is that manufacturing and mining, receiving 75 per cent of the weight, are covered by fewer series. Steel ingot production, automobile production, bituminous coal production, and petroleum production are used for the purpose. The other components—electric power production, building construction, and railroad freight traffic—are represented nearly as satisfactorily as in the monthly index.

The New York Times Weekly Index of Business Activity is a weighted index of carloading (34), steel ingot production (10), electric power production (38), and paperboard and lumber production (18). (The numbers in parentheses give the present adjusted weights.) The effective weights, taken to represent relative importance, are divided by average amplitude (dispersion) of the series so that the index will not merely reflect the widely fluctuating series. Thus, although the effective weight of steel is greater than that of electric power, the adjusted weight of electric power is four times that of steel, because steel fluctuates much more widely than electric power. The New York Times index is published in the *Sunday Times* for activity one week earlier.

Weekly indexes are of quite limited importance in portraying the historical record. If used for this purpose, the relation between the make-up of the index being considered and the peculiar characteristics of the particular period must be given detailed consideration. Indexes of the type of Barron's and the New York Times will ordinarily portray the general movement of business conditions because of the general tendency for various processes to move more or less together. The components of these indexes are series which move violently and with reasonable promptitude.

For a weekly index of business conditions to be of much value, it must satisfy certain conditions. Adjustment should be made for strictly seasonal changes, but whether or not long-time trend corrections are made is a matter of little importance because growth cannot be an important factor over so short a period. The movement of the component series must not be primarily dependent upon price changes because price changes may not be closely timed with the movement of activity. The index must be made up of components which tend to move together and in the direction of movement of general business activity. The index must be an average of series which all relate to the same week in time regardless of differences in availability because the index must be designed to reflect the changes at a *stated* time. To satisfy these considerations, no substitute has been found for measures reflecting shipments and the level of production. The series available on production for such brief intervals of time indicate principally changes in durable-goods industries, although

the New York Times Index, by employing adjusted weights, greatly reduces the influence of these industries on the index.

Before the New York Times and Barron's indexes are available, two of the component series which appear early in the week are of particular value in indicating business conditions. The American Iron and Steel Institute estimates Monday afternoon the rate of operations in the steel industry for the current week. The Edison Electric Institute reports on Wednesday the weekly rate of electric power production for the preceding week. These figures are promptly available in most of the newspapers. Since prompt availability is the question at issue, such single series have much to offer. Weekly indexes are reported about a week after the week they represent. The power production figure is only three days late, and the steel production figure is actually a week early since it represents a forecast of the rate for the week beginning on the Monday the report is issued.

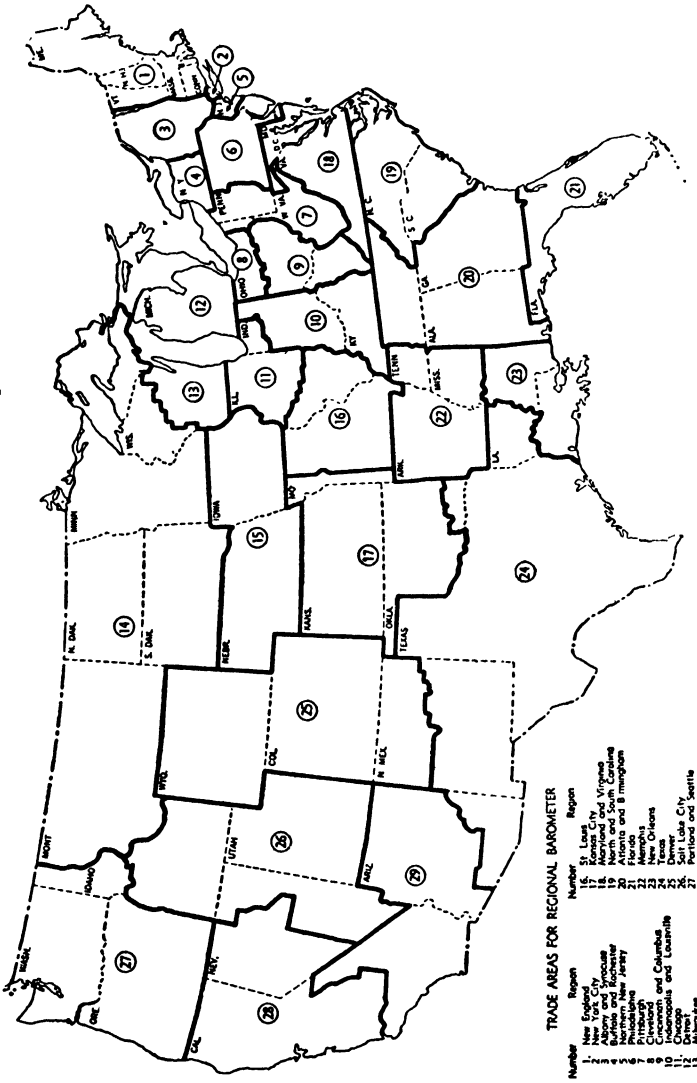
6. INDEXES OF REGIONAL BUSINESS CONDITIONS

The United States is a large country with important sectional differences in economic interest. These differences are founded principally upon the natural resources present in various parts of the country and upon the geographical concentration of important industries. Although most manufacturing industries move more or less together over the business cycle, there are important minor differences. For example, the textile industries in New England were less prosperous than most other manufacturing industries in 1925, with the result that business conditions were low in that section relative to the country as a whole. Furthermore, much of the area of our country is dependent upon agriculture, and prosperous conditions in agriculture are to a minor extent independent of conditions in manufacturing industries. It is clear that if one is interested in the changing economic situation in some one part of the United States rather than for the country as a whole, a regional index is desirable.

A great many university bureaus of business research now provide regional indexes. Each of the 12 Federal Reserve banks provides a range of measurements representative of conditions in its region, but they are not combined into regional indexes. Several individual companies make regional indexes for their own use, the most notable case being the subsidiary companies of the American Telephone and Telegraph Company. If timeliness is not required, perhaps the most useful measurement of regional differences is provided by the Department of Commerce yearly estimates of state income payments. These are published in the *Survey of Current Business* about the middle of the year.

CHART 38

DUN'S REVIEW REGIONAL DIVISION*
Regional Trade Barometer Map



* Taken from "Regional Trade Barometers," prepared by L. D. H. Weld, Director of Research, McCann-Erickson, Inc., p. 2, a pamphlet distributed by Dun and Bradstreet, Inc. Reproduced with permission.

Dun's Review publishes Monthly Regional Trade Barometers for 29 areas into which the United States is divided for the purpose. These indexes are computed from retail sales and bank debits. Sales of independent retail stores are used where available, including most of the regions. Department-store sales and bank debits are used in all of the regions; each region is represented by its major cities. Sales are

CHART 39

ECONOMIC REGIONS*

*Taken from National Resources Committee, *Regional Factors in National Planning and Development* (Washington: Government Printing Office, 1935), p. 166.

emphasized because they represent the flow of goods into consumptive channels, and this is the regional information desired by a manufacturer or distributor in intelligently marketing his products.

The regional division used for the *Dun's Review* barometers is shown in Chart 38. Four considerations are said to have determined the division: (1) knowledge of sales districts and trading areas in use by many large companies; (2) availability of data for the different factors in the index; (3) with few exceptions, the selection of a region lying completely within one federal-reserve district; and (4) the setting of the regional lines so that economic conditions would be approximately homogeneous within each region. It is easy to see that these considerations are somewhat inconsistent with each other.

The most appropriate regional division remains an unanswered question. Perhaps the best answer varies somewhat according to the purpose for which the regional measurement is desired. For many purposes, the twelve Federal Reserve districts may be a reasonably satisfactory division. The lack of economic homogeneity within the states make states rather unsatisfactory regional units. The National Resources Committee suggested several regional divisions. They derived the generalized picture shown in Chart 39, but data are not available according to these divisions.

The regional measurements display no consistent differences in timing and amplitude. Prior to 1914 the eastern part of the country generally led at the turning points, but this tendency has disappeared.[7] Convincing differences in amplitude can be found only in isolated cases. The regional differences are useful in pointing up special cases and are not likely to display uniform differences.

REVIEW QUESTIONS

1. Compare the various meanings of the term "business barometers."
2. What is the general difference between knowing what data are available and what data are needed?
3. Why is not an index of industrial production a completely adequate measure of integral economic conditions?
4. What influences tend to make labor-time fluctuate differently from production?
5. What are the weaknesses of prices as a measure of integral economic conditions?
6. What are the principal factors creating sectional differences in business conditions in the United States?
7. Do the states adequately represent economic regions?
8. Why do not bank debits, by states, provide an adequate statement of regional differences in business conditions in the United States?
9. What type of distinct series do you think should be given special consideration in specific regions in computing regional indexes?
10. Thirty years ago many businessmen felt that carloadings were an ideal indicator of changes in business conditions. Write the argument they might have given in support of this usage and write a criticism of the argument.
11. Write a statement of the uses of an indicator which will show the amplitude of change and the uses of an indicator which will show the general direction of change.

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CHAPTER XVI

BUSINESS BAROMETERS: PROCESSES OF CHANGE

1. DURABLE AND SHORT-LIVED GOODS

THE DIFFERENCE in fluctuation of durable and short-lived goods plays an important part in producing the cyclical movement. Durable goods, which include construction and a part of manufacturing production, represent about a third of the total output of all goods and services in prosperous years but only about 15 per cent in depression years like 1933. The difference can be shown roughly by grouping the components of the quarterly estimates of gross national product. The durable part of GNP includes consumer durable goods, producer equipment, and private and public construction. All except public construction can be taken directly from the GNP quarterly breakdown. Public construction can be obtained from the monthly estimates shown in the Departments of Commerce and Labor series on construction activity.

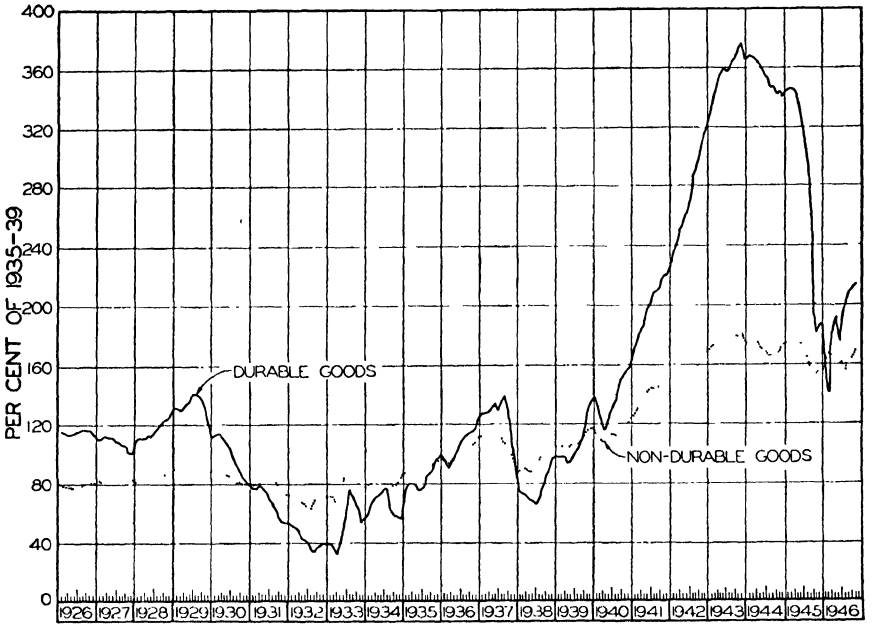
The manufacturing component of the Federal Reserve Index of Industrial Production is broken down into durable and nondurable groups. This is the best available representation of the difference in manufacturing fluctuation due to durability of product.[1] The Department of Commerce series on manufacturers' shipments is also broken down into durable and nondurable groups. The Bureau of Labor Statistics series on factory employment and payrolls are shown separately for durable and nondurable goods. Since shipments and employment are reported on a plant rather than on a product basis, the industrial production division is slightly superior.

Many separate measurements throw light on the fluctuation in durable goods. One of the simplest of all is steel production. Steel enters into most durable goods and is a much simpler total than can be obtained by an index. Its chief weakness lies in the fact that some steel is employed in nondurable manufacture, especially in making tin cans.

[1] The durable component includes iron and steel; machinery; transportation equipment; nonferrous metals and products; lumber and products; and stone, clay, and glass products. The nondurable component includes textiles and products; leather and products; food products; alcholic beverages; tobacco products; paper and paper products; printing and publishing; petroleum and coal products; and chemical products.

CHART 40

FEDERAL RESERVE INDEX OF MANUFACTURING PRODUCTION: DURABLES AND NONDURABLES*

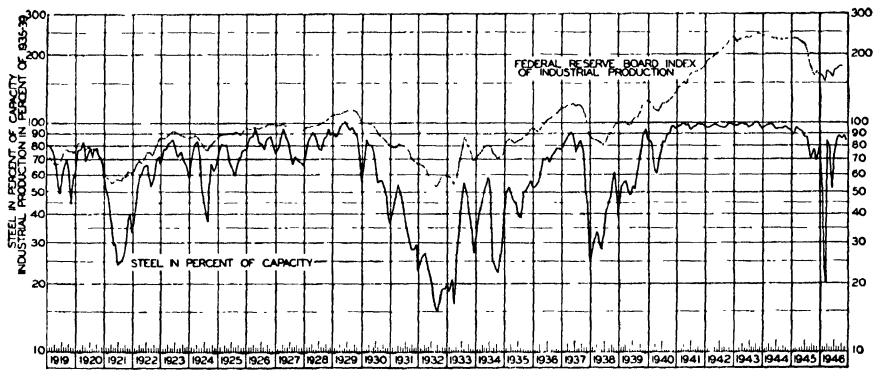


* Board of Governors of the Federal Reserve System.

Several series are available to show the fluctuation in construction. The F. W. Dodge estimates of construction contracts awarded are shown separately for public and private, residential and nonresidential, and for many subdivisions; each division is represented by num-

CHART 41

STEEL AND INDUSTRIAL PRODUCTION COMPARED*



* Board of Governors of the Federal Reserve System and American Iron and Steel Institute.

ber of projects, value of contracts, and floor space. The new series on dollars of construction activity, reported by the Departments of Commerce and Labor carries similar broad divisions.[2]

2. MEASURES OF COMPONENT PROCESSES OF MANUFACTURING ACTIVITY

For Total Industry. Much insight on the economic outlook can be gained by tracing the relationship between production and inventories. For this purpose the best available measurements are Department of Commerce estimates of GNP and business inventories. The shifting proportion of production going into inventory (negative when inventories are being depleted) is an important indication of instability.

Since manufacturing plays so vital a role in the business cycle, the processes of production, shipments, inventories, purchases or new orders, and unfilled orders should be traced for it. The Federal Reserve index best measures manufacturing production. The other processes are best measured by the Department of Commerce Industry Survey.[3] The Industrial Survey carries only durable goods in its unfilled orders index at the present time. This is the area where the backlog of orders is greatest under the immediate postwar conditions. Order duplication, with the prospect that assurance of delivery is thereby increased, makes the figures for early 1947 of questionable value.

Figures are available on the Industry Survey only since 1939, and the special influence of the war during this period makes it impossible to illustrate their use as effectively as should be possible later. Shipments lagged six months after the rise in new orders in September, 1945. This indicated a strength of demand somewhat inconsistent with the pessimistic expectations current before V-J Day.

The Industry Survey now carries figures on sales and inventories at the manufacturing, wholesale, and retail levels separately for durable and nondurable goods. When the war shortages have worked themselves out, it may be possible to establish a pattern of relationship between these successive stages of distribution and to point to positions which depart from alignment.

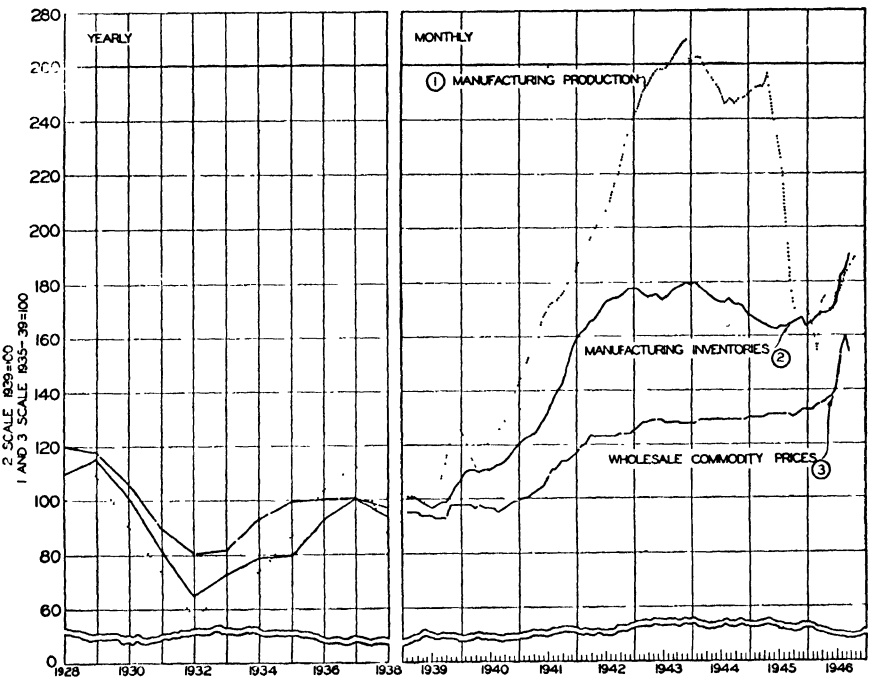
[2] The rise in construction values usually is partly due to rise in costs. Deflation to estimate quantity change is treacherous. The *Survey of Current Business* carries six construction cost indexes and component indexes and others are currently computed. For an analysis of the problems involved in deflating with construction cost indexes, see Lowell J. Chawner, "Construction Cost Indexes as Influenced by Technological Change and Other Factors," *Journal of the American Statistical Association*, XXX (September, 1935), 561–76; also A. D. Gayer, *Public Works in Prosperity and Depression* (New York: National Bureau of Economic Research, 1935), pp. 31 ff.

[3] This is published monthly by the Department of Commerce under the title "Industry Survey," and the major data are carried also in the *Survey of Current Business*.

For Individual Industries. The Federal Reserve Index of Industrial Production is reported for 75 subgroups. There are currently available adequate figures on the production of a large number of individual commodities. In some cases, where no figures on production are obtainable, series which well represent production may be used. The percentage of looms active is often used to represent the

CHART 42

CHANGES IN MANUFACTURING INVENTORIES COMPARED TO PRODUCTION AND PRICES*



* Manufacturing production taken from the Board of Governors of the Federal Reserve System, manufacturing inventories from the Department of Commerce, and wholesale commodity prices from the Department of Labor.

production of woolen goods. In some industries where production figures are not currently available, series on employment are used to represent production. Sometimes the consumption of a raw material represents production very well. For example, cotton consumption by cotton mills is used to represent the production of cotton goods.

Figures on shipments of individual commodities are not available currently for nearly so many commodities as for production. The Industry Survey shows shipments for 6 durable and 7 nondurable groups.[4] Carloadings are published for the following classification:

[4] Durable goods: iron and steel and products; nonferrous metals and products; machinery, including electrical; automobiles and equipment; transportation equipment,

coal, coke, forest products, grain and grain products, livestock, less-than-carload lots, ore, and miscellaneous. Very tardily, the Interstate Commerce Commission publishes figures on railroad shipments of many individual commodities.

The Industry Survey shows a breakdown for inventories for the same 13 subgroups as for shipments. World War II stimulated the collection of inventory data to a major extent. Because of the rigid inventory control exercised by the War Production Board, almost all companies were forced to keep inventory records. As a result, fairly adequate reports on inventories are being made available to the public. Unlike the broad indexes, these figures are generally available in quantity terms and thus avoid the special ambiguity introduced by variation in accounting methods of recording inventories in value terms.[5] As experience is gained in the use of these inventory data, much light will be thrown on the outlook in various industries. One refinement which is not now available for most individual products is quite important. This is the difference in rates of accumulation at different points in the distributive process. The now discontinued Dun and Bradstreet Indexes of Inventories indicated that small retailers added to inventories in the first half of 1938, a period of general retrenchment.[6]

Many raw-material inventories move inversely with the business cycle. This is usefully illustrated by zinc inventories, as shown in Chart 43. The tightness in raw materials in prosperity and excessive supply in depression aids in understanding the behavior of the market for these commodities.[7]

New orders are not separately available for many products at the present time and, where available, are usually expressed in dollar terms. The Industry Survey shows no new-order breakdown for non-

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excluding automobiles; other. Nondurable goods: food and products; textile mill products; paper and products; chemicals and products; products of petroleum and coal; rubber products; other.

[5] Some companies keep inventory records on a cost-or-market basis, while others keep them on some basis similar to last-in, first-out.

[6] See *Dun's Review*, October, 1938.

[7] The stocks of tin and lead, for instance, may be just as indicative as zinc, but the available information on the stocks of these metals is less adequate than the information on zinc. The stocks of copper are less indicative because copper production depends to so large an extent upon the production of silver, which, because of its monetary use, is subject to the foibles of legislation.

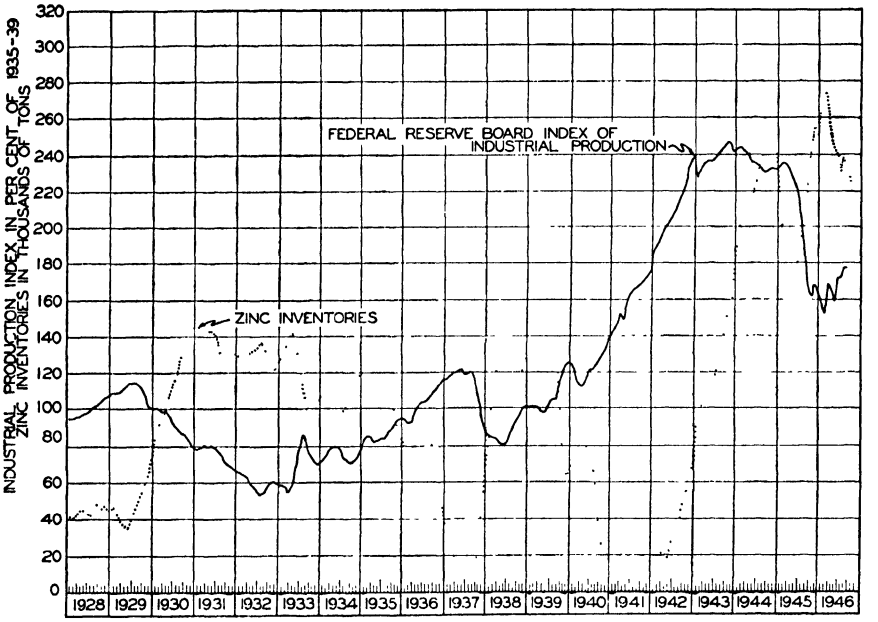
The stocks of steel and coal fluctuate directly with the business cycle, rather than inversely as the stocks of most raw materials.

On inventory changes, see further, R. H. Blodgett, *Cyclical Fluctuations in Commodity Stocks* (Philadelphia: University of Pennsylvania Press, 1935); C. L. Rogers, "The Conference Board Indexes of Manufacturing Inventories," *Conference Board Bulletin*, March 23, 1939.

durable goods and shows only steel and machinery separately in the durable group. The inventory data, however, are much more important in indicating the outlook.

CHART 43

STOCKS OF ZINC COMPARED TO INDUSTRIAL PRODUCTION*



* Board of Governors of the Federal Reserve System and American Zinc Institute

General Relationships. For total industry and for individual commodities, production, shipments, and new orders vary with some concomitance. It may be that total new orders lead total production, but available information is not adequate to verify this tenet.

It is true that new orders, production, and shipments represent three successive stages of business. In general, orders must precede production, and production must precede shipments. This relation, however, probably is not so significant as would at first appear. Although a good ordinarily is not produced before it is ordered, nor shipped before it is produced, production may decrease before orders decrease, and shipments may decrease before production decreases. This situation could arise because of a continuation of orders at a high rate, although specification against orders (statement by the buyer of the exact date of desired delivery and exact sizes wanted) might be delayed until the future. Production would tend to drop because the definite date of delivery is not in the near future, and

shipments would drop markedly since very few goods are to be shipped immediately. This illustration is quite artificial, but it serves to demonstrate that an order series does not necessarily lead a production series and that a production series does not necessarily lead a shipments series.

Information is available on unfilled orders for a few commodities. In most cases, unfilled orders probably show no consistent concomitance with production. The level of unfilled orders depends upon the following factors: (1) new orders which remain unfilled will increase the level of unfilled orders; (2) shipments out of old unfilled orders, or "backlog," will decrease the level of unfilled orders; (3) order cancellation, or the writing off of orders, will decrease the level of unfilled orders; (4) if, when new orders come in, they are arbitrarily allocated to other months, the level of unfilled orders will be similarly affected. If we disregard cancellation and allocation of orders, unfilled orders equal old orders plus new orders minus shipments.

Formerly, when unfilled orders were published by the United States Steel Corporation, this series was often used to represent changes in business conditions. An increase in unfilled orders does not necessarily represent an improvement in business conditions, however. Not only may the figures change because of cancellation or because of arbitrary allocation, but a temporary speeding-up of the delivery of goods may result in a decrease in unfilled orders. On the other hand, unfilled orders will show a temporary increase, even though conditions are growing steadily worse, if orders are filled less rapidly than new orders are coming in.

A close relationship exists between the various component processes of business activity. If it is assumed that there is no cancellation of orders or arbitrary allocation of orders, changes in unfilled orders plus shipments equal new orders. This relationship is useful in deriving data on shipments and new orders or in checking the data for internal consistency when all three series are given. The relationship, production minus shipments equals changes in inventories, may be put to similar uses.

3. INDUSTRY-CONSOLIDATED ACCOUNTING STATEMENTS

The analysis of total industries by use of the accounting figures that the individual businessman employs in running his own business appears to have major potentialities. Accounting figures portray both the financial results and the type of business decisions made. Protective measures against depression taken in prosperity, such as abnormal liquidity, will show up most clearly on a consolidated accounting

statement. As for the individual business, it shows where difficulties are arising. For example, such accounting would show up an increase in the length of the collection period. The data collected by the Securities and Exchange Commission (SEC) are the most important available for this purpose. A quarterly release provides a limited number of current asset and liability items. Supplemental semiannual reports show working-capital figures in greater detail. The Survey of American Listed Corporations, conducted by SEC, provides major cost and profit figures on an annual basis, but very tardily. *Dun's Review* also reports 14 major accounting ratios for many industry groups on an annual basis, but these appear so late as to be of little current value.

4. MEASURES OF LABOR STABILITY

The stability of labor is to some extent reflected by changes in labor-union membership. The relationship to the business situation is rather complex and quite interesting. Typically, if times are bad enough, labor demands fade and union membership declines. This reaction does not tend to be the first one, however. It is natural for laborers to blame the management for cuts in wage rates as business activity recedes, and the decline in union membership may show a considerable lag. The advantage of union membership is not likely to become immediately obvious as general improvement sets in. When labor becomes quite fully employed, bargaining advantages are greatly augmented, and unions may become quite active. Thus, there is not a close correspondence between union membership and cyclical movements. Labor agitation may break out as a result of social or cultural forces not closely timed with business conditions. For this reason, the series of labor-union membership becomes all the more important in sizing up the economic situation. The figures do not merely corroborate other evidence with regard to the cyclical situation; they also supply evidence regarding an obscure force we may call labor stability. Since this force is subject to movements which are somewhat whimsical, it adds to the information regarding factors in the business situation. Current figures on the change in union membership are not, however, available to the public.

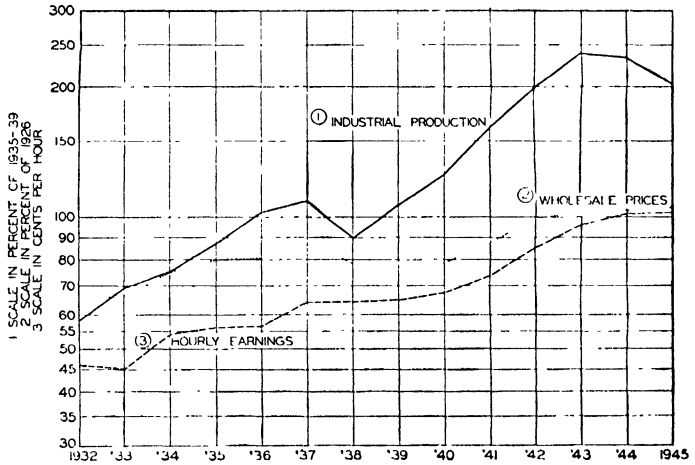
Less direct evidence on labor stability is supplied by labor turnover figures. The higher the turnover, the greater the tension in the labor market. Unsettled labor markets in prosperity provide the appropriate atmosphere for labor instability; unsettled markets in depression suggest that the employers have the bargaining advantage. Indicative figures for manufacturing industries are reported by the Department of Labor. These show the accession rate (the percentage of new

employees taken on), and the separation rate (the percentage of employees dropped from the payroll). The separation rate is shown separately for those discharged, laid off, and quitting. Aside from labor difficulties, the accession rate falls in depression and rises in recovery, whereas the separation rate rises in depression and falls in recovery.

Further evidence on labor instability is provided by figures on industrial disputes. Cessation of work resulting from disputes reduces activity and may act as a potent force in shifting the general direction

CHART 44

MANUFACTURING WAGE RATES, INDUSTRIAL PRODUCTION, AND WHOLESALE PRICES*



*Taken from Board of Governors of the Federal Reserve System and Department of Labor.

of change; that is, it may take on the character of an originating cause. Adequate strike and lockout data are now reported by the Bureau of Labor Statistics. These include figures on resulting man-days idle, number of workers involved, and the number of strikes and lockouts in progress.

5. MEASURES OF PRICES OF VARIOUS FACTORS

The price of labor is represented by wage rates. The Bureau of Labor Statistics estimates of wage rates in manufacturing represent the most reliable information on the price of labor. These figures are shown separately for major manufacturing industries. Estimates are made of straight-time hourly earnings for all manufacturing and separately for the durable and nondurable groups; these are helpful

in isolating the cost of overtime premium payments. The Bureau of Labor Statistics also reports separately on wage rates for major industries other than manufacturing, but no over-all average is currently available. Average weekly earnings are shown as well as average hourly earnings, but weekly earnings are representative of labor income rather than labor cost.

A measure of the change in average interest rates in all markets probably would mean but little, since interest rates differ greatly in level in different markets. For many of these markets, adequate measures are available. Open-market rates on call loans, on commercial paper, on bankers' acceptances, and on time money on security loans are currently available in most of the well-known sources, including the *Survey of Current Business*. Interest rates charged customers by banks in principal cities are compiled by the Federal Reserve Board. (See Chart 45.) The open-market rates synchronize, but there are important differences in amplitude of movement and level because of technical differences in the various markets. Rates charged customers by banks show a narrow fluctuation, and do not at all times move similarly with open-market rates.

The price of bonds represents, and in general moves reciprocally to, long-term interest rates. In fact, the yield on bonds is our only measure of long-term interest rates. Without refunding operations or a reorganization, the annual payment per bond does not change, but the changing price of the bond in the market fixes the level of long-term interest rates. Representative indexes of bonds, classified according to industrial, public utility, railroad, and federal government are obtainable in the *Survey of Current Business*.

Since the prices of all bonds tend to become equivalent in prosperity, while high-grade bonds move upward in depressions (not accompanied with panic) and low-grade bonds move downward in depressions, it is useful to obtain a measurement of the difference between the prices of high- and low-grade bonds. Some indication is obtained by comparing the prices of federal government and industrial bonds. A measurement of the price of bonds according to assigned ratings is also useful for this purpose. Average bond yields according to ratings as compiled by Standard and Poor's Corporation are currently reported in the *Survey of Current Business*. Moody's service prepares a similar compilation.

Available measurements of the current change in common stock prices are quite adequate. Most of the current stock-market indexes trace the course of the price of leading speculative stocks. All-inclusive indexes, however, as computed by the New York Stock Exchange, at times fail to move with the indexes of speculative leaders. This is

CHART 45

MONEY RATES*

*Board of Governors of the Federal Reserve System, *Federal Reserve Charts on Bank Credit, Money Rates, and Business* (Washington, 1946).

true even if comparison is made with Standard and Poor's excellent Index of 402 stocks. An adequate list of stock indexes is published in the *Survey of Current Business.*

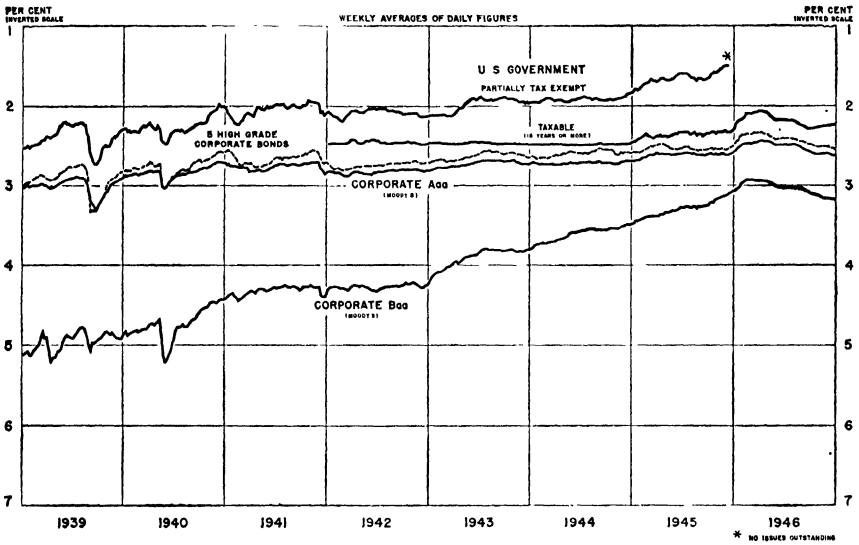
Standard and Poor's *Current Statistics* reports measurements of

the change in price of common stocks in each industry with a wide common stock ownership; also, they report the average price of preferred stocks.

The most adequate available measurement of current wholesale price changes is provided by the Bureau of Labor Statistics Index of Wholesale Commodity Prices, representing the average of nearly 900 price series. This index is available according to three types of goods: finished goods, semifinished goods, and raw materials. A comparison of average prices in these three groups is significant because of the

CHART 46

BOND YIELDS*



* Board of Governors of the Federal Reserve System, *Federal Reserve Charts on Bank Credit, Money Rates, and Business* (Washington, 1946).

difference in their average fluctuation over the cycle. The price of raw materials fluctuates the most violently; the price of semifinished products fluctuates less than the price of raw materials but more than the price of finished products. (See Chart 47.)

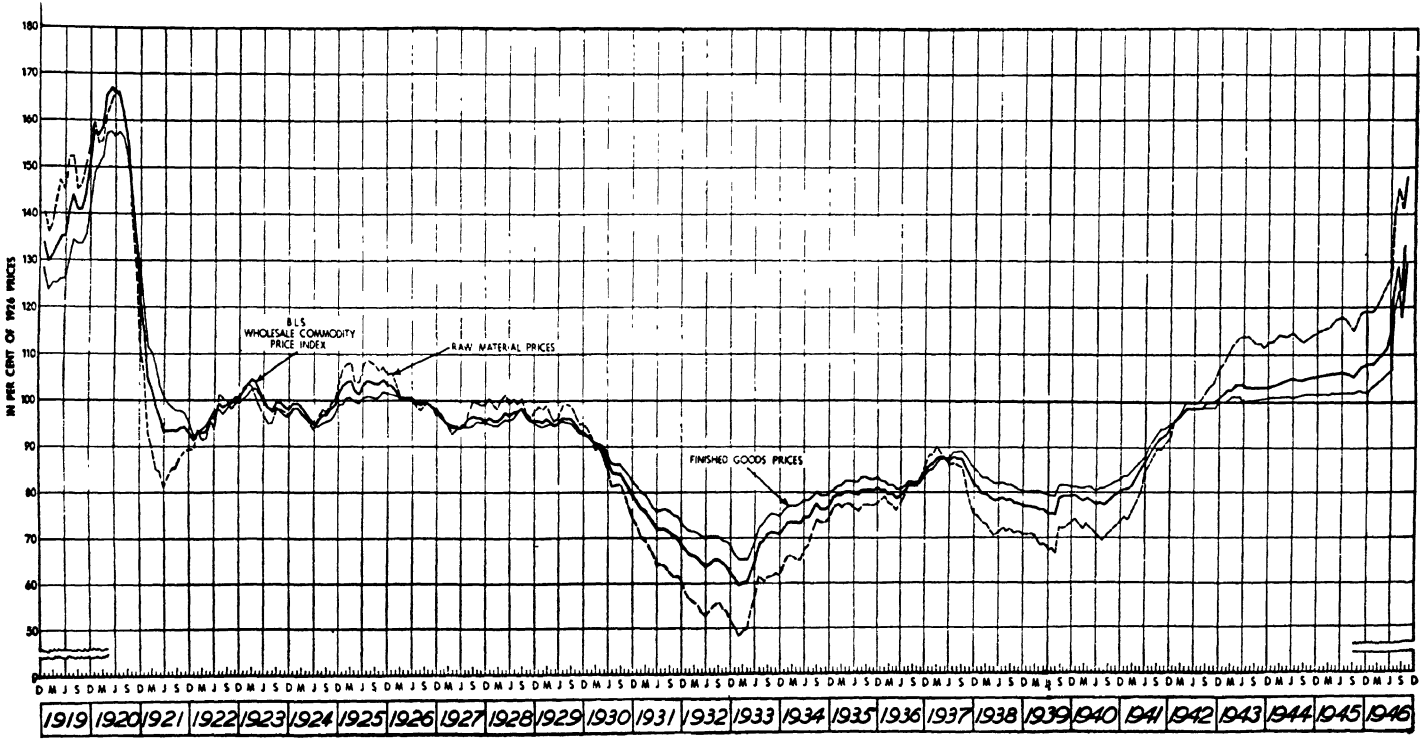
No index purporting to represent the average of all prices is reported at the present time. The Index of Consumers Goods Prices, discussed in the following section, is most frequently employed when an approach to relative change in all prices is required.

6. MEASURES OF PRICES AT DIFFERENT POINTS IN DISTRIBUTION

The price of products does not vary with the same amplitude and timing at various stages in distribution. The number of stages of

CHART 47

Raw-Material and Finished-Goods Prices*



* Department of Labor.

distribution varies for different commodities, but available price indexes relate only to prices at the farm, at wholesale, and at retail.

Commodities not coming from the farm obviously cannot form a component part of the farm-price index. For those commodities raised on the farm, however, prices at the farm represent a market at a distinctly separate point in distribution. The best index of this type is that currently computed by the Bureau of Agricultural Economics and published in the *Survey of Current Business.*

As noted in the preceding section, the best available current monthly measure of wholesale prices is the Bureau of Labor Statistics Index of Wholesale Commodity Prices. This price index, covering nearly 900 series for roughly 500 commodities, omits coverage on some commodities which fluctuate little over the business cycle and therefore slightly exaggerate the cyclical fluctuation. For some commodities, the prices averaged are for goods of varying standard. The price quotations do not represent any uniform standard as to time of delivery, terms of payment, or discount practice. The Bureau of Labor Statistics has been making a comprehensive analysis of the effect of noncomparable price quotations for some time. It is to be expected that the index will be greatly improved because of this study. The existing index is somewhat ambiguous, for several reasons: (1) there is no consistent policy as to the inclusion of freight costs, (2) good and bad grades are accepted as the same article in averaging to get some of the prices, (3) many of the prices represent the terms of sales for commodities which will be delivered at varying times in the future, and (4) prices are averaged together without regard as to whether or not allowable discounts are included. Although the index represents, at least to some extent, an illogical combination of noncomparable price quotations, the method of reporting does not change greatly from month to month, and the short-period changes are reasonably reliable. Even so, some important errors may result in the measurement of changes over the cycle because of a change in conditions. For example, goods are probably bought a longer period before delivery in prosperity than in depression, and the price index may more nearly represent the price of delivered goods in depression than in prosperity. On the other hand, the quoted price in prosperity probably more nearly represents the actual contract price than does the quoted price in depression, since there is a tendency for many producers to sell at less than quoted prices in depressions.

The Bureau of Labor Statistics computes currently a measure of the changing dispersion of the prices included in the Index of Wholesale Commodity Prices. While dispersion tends to rise and fall with the rate of change in the price index, a measure of the amount of

dispersion is significant because the greater it becomes the less faith we can put in the index.

A sensitive wholesale commodity price index adds information on current conditions. The Bureau of Labor Statistics Daily Index of 28 Basic Commodities is a satisfactory index of this sort. This index is much more sensitive to changes in market conditions than is the broader index, which includes fabricated commodities with narrow and infrequent fluctuations. The 28 commodities selected for inclusion in the sensitive index are freely traded on open markets. Most of them are raw materials; 18 are important in world trade. This emphasis on commodities exchanged internationally gives the index world significance. The markets represented can change rapidly in a day, and therefore the daily quotation is of substantial value, whereas changes over such short periods would have little meaning in the broader index. The Basic Commodity Index has produced some confusion since World War II among persons who failed to remember that it moves much more sharply than the average of all wholesale commodity prices.

Future prices paid on organized commodity exchanges probably reflect market changes more quickly than spot prices. The Dow-Jones Company reports an Index of Commodity Futures, based on the 5-month futures of 11 commodities: cotton, wheat, sugar, silk, corn, rubber, coffee, cocoa, oats, rye, and hides. Commodity values from 1927 to 1931 are employed as weights, and future prices are interpolated for each commodity to get the prices precisely on a 5-month basis. This index is reported hourly during the trading day, and a daily average is reported in the newspapers. While future prices reflect market conditions very quickly, their value in studying economic conditions is often greatly reduced by the fact that speculation plays a more important part in future than in spot prices. The comparable spot-price movement is relatively well shown by the Daily Index of 28 Basic Commodities because it includes nearly all of the commodities used in the Dow-Jones index.

The broadest measure of prices at the retail level is provided by the Bureau of Labor Statistics Consumers Price Index. Before the war this was called a cost-of-living index, but arguments growing out of war conditions made it desirable to make the title differentiate clearly between changes in price and changes in standard of living. For goods purchased at retail stores, the index is drawn from quotations in stores in major cities patronized by moderate-income workers. Some 8,600 food and 3,900 other stores are covered. It averages the change in price of food (35); clothing (11); rent (19); fuel, electricity, and ice (7); home furnishings (4); and miscellaneous (24). (Per-

centage weights in 1935 to 1939 are shown in parentheses; in 1946 the food weight—42 per cent—was abnormally high.) In addition to measuring the cost of living, the Consumers Price Index is the measurement most frequently employed to represent the change in general prices for such purposes as a crude deflation of income payments. The logic of this procedure depends upon the fact that cost-of-living prices represent the rate at which goods and services are ultimately purchased.

The retail prices of commodities move more widely than some items in the Consumers Price Index, notably rent. A comprehensive Index of Retail Commodity Prices is reported by the Department of Commerce. For the most part, the Retail Commodity Price Index is computed from the commodity series used in the Consumers Price Index but included also are nonconsumer commodities sold in retail stores, such as farm machinery and building materials. The Retail Commodity Price Index is built up of groups similar to those used in the Index of Retail Sales discussed in the following section, and a similar weighting process is employed so that the two measures are comparable. Because of uncertainty about the group indexes, only the comprehensive Retail Price Index is now reported.

The comparable movement of commodity prices at the farm, at wholesale, and at retail throws light on the cyclical movement. Farm prices are most significantly compared to retail food prices. The Bureau of Labor Statistics Food Division of the Consumers Price Index is reported currently according to four groups, fairly comparable to some of the groups of the Department of Agriculture Index of Prices Received by Farmers.[8] The Bureau of Labor Statistics wholesale and retail commodity price quotations are generally noncomparable, so that comparison cannot be made very effectively for individual commodities, but the over-all indexes probably represent the major difference in movement.

7. MEASURES OF THE FLOW OF GOODS TO THE CONSUMER

The Department of Commerce reports monthly estimates of retail sales, for all stores, broken down according to major types, and for twenty subgroups. This is the most important available information to represent the current flow of civilian goods to the final user. It is not all-inclusive, however, since some consumer goods do not pass through retail outlets; also, it includes small quantities of goods bought for business users.

[8] In this connection see particularly U.S. Department of Agriculture, *Price Spreads between Farmers and Consumers for Food Products, 1913–44*, Misc. Pub. 576, (Washington: Government Printing Office, 1945).

The Department of Commerce reports an all-inclusive series on consumer expenditures, both for goods and for services. This series is directly comparable to the measure of disposable income, noted in the following section and is highly important in deriving an estimate of proportionate consumer expenditure. The consumer expenditure series is available only quarterly and very tardily, however, and the estimate of retail sales must be principally relied on in making current estimates.

Before the retail sales and consumer expenditure series became available in recent years, the Federal Reserve Board Index of Department Store Sales was our most important indicator of the flow of goods to the consumer. Since department-store sales represent a rather narrow coverage and do not always move in conformity with all other retail outlets, they should not now be used to represent the over-all flow. Miscellaneous plus less-than-carload-lot railway carloadings also has been used for this purpose because the shipment of goods designed for retail sale conforms fairly closely with the actual sale. The railway shipments are not representative enough of total shipments to be useful when we have direct measurements of total retail sales and of total consumer expenditures.

The Department of Commerce reports monthly an estimate of wholesale sales of "service and limited function wholesalers," that is, the conventional types of wholesalers (not including such things as sales made directly by the producer). Since many retailers buy directly from the producer, instead of through wholesalers, this series runs at a substantially lower level than the series on retail sales. Nevertheless, it is useful to compare the relative change in the two series. A difference in their rate of movement is usually due to a divergence between wholesale and retail prices or to a change in retail inventories. For instance, with a parallel movement in wholesale and retail prices, an increase in retail inventories is indicated.

The movement in prices is shown by the Retail and Wholesale Price indexes. The Industry Survey estimates of retail inventories provide a partial independent check on their movement. None of these measurements are completely adequate, and a useful cross-checking is thus made possible. By employing also the Industry Survey estimates of wholesalers' inventories, additional light is thrown on the bargaining position of wholesalers. A fair picture of the flow of civilian goods and the market effects can be shown.

8. MEASURES OF PAYMENTS AND INCOME

No current measurement is available which shows adequately total gross payments in our economy. The closest approach to such a

measure is the Federal Reserve Board of Governors compilation of bank debits in leading cities. Covering check payments in major cities, while other check and currency payments are not represented, this series fluctuates more violently than total payments and is at best only roughly indicative of the change in the total. Thus, no data are available to show the crossflow of funds through the system. Without information on this crossflow, total payments, including many intermediate business transactions (such as the purchase of raw and semi-finished products and resale in the processes of production and distribution), throw less light on economic conditions than measures of net income payments. The major distinction to keep in mind is the much higher level of total gross payments, running typically about ten times net income payments.[9]

In the hierarchy of income measurements the most inclusive, and for our purposes one of the most important, is gross national product or expenditure. In a period of time it is approximately accurate to say that expenditure is made for the total product if all inventories are considered bought. This is a gross product in a very different sense from the payments discussed in the above paragraph. Gross payments include all payments made, whether for intermediate or for final products. GNP includes only net final products but is gross in the sense that final capital products which replace worn-out units are included, whereas a measure of net national product would exclude capital replacements. Such a measure of net national product is not much required in studying economic change but could be approximated by subtracting from GNP the Department of Commerce estimates of depreciation and capital outlays charged to current expense. Logically, there are various orders of grossness or netness.

Two major methods are available for measuring the value of national income and product, both of which are employed by the Department of Commerce. One is the aggregating of all of the incomes paid or accruing to factors of production during a given period, including wages, salaries, dividends, net rent and interest, entrepreneurial income, and retained corporate profits. The sum so obtained is called "national income." National income is also classified by industrial divisions, showing the amounts received from each of the major industries or types of employment. The national-income measurement is important from the point of view of welfare considerations, but is less useful in analyzing economic change than GNP, personal income, or disposable income.

[9] See Morris A. Copeland, "An Estimate of Total Volume of Debits to Individual Accounts in the United States," *Journal of the American Statistical Association*, XXIII (September, 1928), 301–3.

The national income measurement includes contributions to social security funds as part of the wage earners' income; therefore, these contributions must be subtracted from national income in estimating the flow of personal income. Retained corporate profits (corporate savings) must also be subtracted, for individuals do not receive such profits currently. With these two subtractions and the addition of transfer payments,[10] which are defined as those payments which do not add to total national income but merely transfer from created income to personal payments, a measure of personal income is obtained. This is of first-rate importance in analyzing economic change, for it represents the total current flow of income to consumers. It is available monthly, as contrasted with the quarterly publication of GNP and other income measurements. Very useful also is the measure of disposable income, obtained by subtracting personal taxes from personal income, for this represents the income consumers have left to spend.

A second method of measurement is the final-products approach, which involves the summation of the values of all finished goods and services produced or bought during the period. Amounts spent by the government are added to the amounts spent in other sectors of the economy. The government purchase of goods and services is thus compared with the purchase of final products by business and by consumers. This division provides the basis for indicating the extent to which a change in total expenditure arises from government, business, or consumer spheres. The breakdown of total expenditure in each of these three spheres is shown in Appendix A. The breakdown of consumer expenditures is especially useful for business planning, but in indicating the current outlook we have to be content with the major division into durable and nondurable goods and services shown with the quarterly estimates of GNP.

Gross national product can be derived from national income figures by adding indirect business taxes and depreciation charges, plus a few minor adjustments.[11] In deriving national income, indirect busi-

[10] These are derived principally from social security funds, veterans' payments, food stamps, interest currently paid by the government, and business transfer payments. With the 1947 revision, interest currently paid by the government is not included as part of national income because it does not add to current product. Business transfer payments include corporate gifts to nonprofit institutions and consumer bad debts. The gifts to nonprofit institutions are transfer payments because, using limited classifications, nonprofit institutions and trust funds are included as "persons."

[11] Business transfer payments are not counted as net income and therefore must be subtracted. Minor adjustments are made for current subsidy payments and surplus of government enterprises to conform to the accounting procedure used. Finally, since gross national product and national income are derived independently, adjustment must be made for a statistical discrepancy. See Appendix B, Table 1.

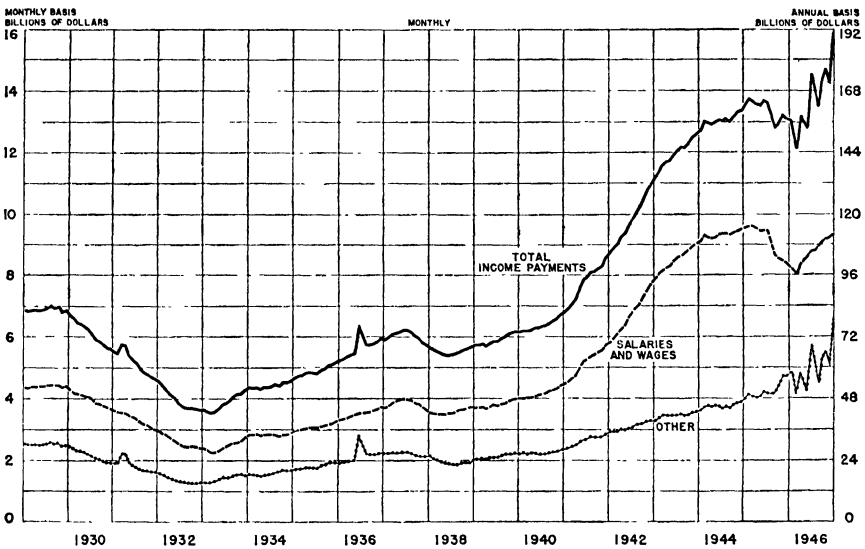
ness taxes and depreciation charges are subtracted as costs to get net income figures. Therefore, to get the value of total product, these costs must be added back in.

The divisional parts of the personal-income series provide about as current measurements as are available on the flow of income. They show estimated total salaries and wages in government, commodity-producing, distributive, and service industries; other labor income

CHART 48

INCOME PAYMENTS*

Department of Commerce Estimates, Adjusted for Seasonal Variation



*Board of Governors of the Federal Reserve System, *Federal Reserve Charts on Bank Credit, Money Rates, and Business* (Washington, 1946)

Beginning with July, 1947, the Department of Commerce series on income payments has been renamed "personal income," as identified in the text.

and transfer payments; dividends and interest; and proprietors' and rental income. These estimates appear on a monthly basis, but about two months late. Other series are valuable in showing more detailed changes. The Bureau of Labor Statistics Payroll Indexes for many branches of economic activity are particularly useful, especially the one for manufacturing industries, which is broken down into 90 separate industry groups. The Federal Reserve Board of Governors' quarterly compilation of net profits of 629 corporations is shown separately for 11 industrial divisions. An estimate of dividend payments is made available monthly by Moody's.

Current estimates of the shifting income distribution according to

the number of workers falling in each income group would be of inestimable value in judging mass markets and the shifting propensity to consume, but no such figures are available currently. There is not even enough information to make rough, indirect estimates. The most nearly current information comes from the blown-up sample studies of the Department of Labor, appearing several years late.[12]

A final word regarding the reliability of national income and GNP aggregates is desirable because of their major importance in analyzing economic change. Kuznets has estimated the "margin of error" or the maximum percentage of error which may be assumed for many income measurements[13] since a measurement of probable error was found to be impractible, and it seemed to be more important to estimate how large the error could be than how small. A large proportion of the error margins is found to be under 20 per cent. The margin is found to be much greater for the estimates employed in developing consumer expenditures than for income payments. Thus, consumer expenditure figures, valuable as they are for our purposes, must be employed with caution. Owing to serial correlation, the error is likely to be in the same direction between two successive points of time. Therefore, great as the errors in the total may be, the movement from one point to the next is usually roughly indicated.

9. SAVINGS AND PROPENSITY TO CONSUME

The GNP quarterly components make possible the estimate of savings currently set aside. Disposable income minus consumer expenditure equals personal saving. Representing amounts individuals receive and do not spend, they must be spent elsewhere in the economy. They represent *ex post* figures and must balance with business borrowing or deficit spending of the government.

The Securities and Exchange Commission (SEC) also makes quarterly estimates of individual savings. These are currently available from SEC in release form. These figures differ somewhat in concept from the Department of Commerce estimates, principally in including expenditures for consumer durable goods. (It will be remembered that the accepted concepts of capital formation or investment do not include such goods.) The SEC estimates are derived from data on fund accumulation instead of from the differences between estimated and

[12] See U.S. Department of Labor, *Family Spending and Saving in Wartime*, Bulletin No. 822 (Washington: Government Printing Office, 1945). To estimate prospective propensity to consume, figures on expenditures or savings by income classes must be had, and these are obtained from the sample in this study. From current data on income, past expenditure patterns provide a crude approximation.

[13] Simon Kuznets, *National Income and Its Composition, 1919–1938* (New York: National Bureau of Economic Research, 1941), pp. 498–537.

disposable income and expenditure, the procedure employed by the Department of Commerce. Because of the inadequacies of the data available, the figures differ more than might be expected because of difference in concept. Both estimates include not only savings of consumers but also those of unincorporated businesses; all corporate savings are excluded in both cases. The data do not make it possible to separate expenditures of small unincorporated businesses, such as farmers; and a good case could be made that their savings are treated by the businessman in much the same way as those of an average consumer.

The SEC report is broken down into the following types of saving (showing funds added to): (1) currency and bank deposits, (2) saving and loan associations, (3) insurance and pension reserves, (4) securities, (5) residential dwellings, (6) automobiles and other consumer durable goods, and (7) liquidation of debt. The SEC reports the total of individual savings, less all consumer durable goods (including residential building in consumer durables), as liquid savings. The statistical difference between this figure and the estimate of personal saving made by the Department of Commerce is shown in detail in Appendix C, Table 2. A common meaning attached to liquid savings includes only net additions to currency, bank deposits, and U.S. government bonds. The SEC report provides the information for deriving this total. Liquid savings represent the amount that individuals might feel free to spend from past rather than current earnings. There is some uncertainty as to what amount should be included; increases in demand deposits and currency appear to be in this category, but rising prices or living standards might make individuals feel the necessity for increased liquid funds. Katona holds, on the basis of survey analysis, that individual purchase of government bonds is not thought by purchasers to be a temporary employment of funds.[14]

The above measurements exclude corporate savings, or the amount withheld by corporations. The quarterly GNP statement provides an estimate of corporate savings equal to the remainder when dividends are subtracted from net corporate profits. This is a much less useful figure for our purposes than the total amount that corporations set aside for investment. For this purpose, we must add to corporate savings the amount set aside for depreciation and depletion because the purpose of such reserves is to provide investment replacement. If, in depression, investment replacement is largely deferred, the result of accumulating these reserves will be to add to corporate liquid

[14] George Katona and Rensis Likert, "Relationship between Consumer Expenditure and Saving," *Review of Economic Statistics*, November, 1946; and "Psychological Analysis of Business Decision," *American Economic Review*, XXXVI (March, 1946), 44–62.

funds. Businessmen frequently are sensitive to the use of the term "gross corporate saving" as the sum of net corporate saving plus depreciation and depletion reserves. It is this sum, nevertheless, which is to be balanced against investment to see whether or not activity is being reduced by hoarding.

The average propensity to consume (spend) is measured by the percentage which individual expenditure is of disposable income. Obversely, the average propensity to save is measured by the percentage which individual savings are of disposable income. This is important in relation to the amount of saving and in comparison with the amount which is currently demanded on the investment market. Marginal propensity to consume is most closely approximated by the percentage which the *increase* or *decrease* in individual expenditure is of the increase or decrease in disposable income (assuming both move in the same direction). This is the more important relationship because it indicates the shifting condition, whereas the average propensity is measured from a balanced income statement.[15]

10. GOVERNMENT EXPENDITURES AND RECEIPTS

Since World War II, government operations have become so large that they are of major consequence in estimating economic change. The high percentage government expenditures of GNP in the thirties could be explained by the generally depressed conditions. The 50 per cent rate reached during the war was due to the extraordinary requirements of war, but it now appears that all government expenditures will not fall far short of 20 per cent of GNP even under prosperous conditions during the next few years. Such a proportion of total expenditures freed from economic incentives can exercise a critical marginal influence, and hence is likely to be a limiting or reinforcing force of major importance.

Under these circumstances, a measure of government expenditures is a significant barometer. A quarterly measure presented as a component part of the Department of Commerce GNP statement is the only inclusive estimate made currently. Not only expenditures, but also government receipts, are of major importance, because any important change in their level may produce fundamental shifts in private expenditure patterns. By combining the estimates shown on personal and business taxes[16] in the quarterly GNP estimate, a government receipt series can be derived.

[15] See further the theoretical analysis of the propensity to consume measurement in Chapter VIII, Section 3, pp. 197–99.

[16] Since a minor part of these payments is not ordinarily called taxes, terminology of the GNP statement is "business tax and nontax liabilities" and "personal taxes and nontax payments."

The difference between government expenditures and receipts is even more important in evaluating prospective changes in economic conditions than these series considered separately. The extent to which the government pays out more than it takes in may be said to provide a net addition to total expenditure (GNP) and may be called the net contribution of the government. Warning should immediately be given that any such estimate is an oversimplification because a tax levied in one way has a different influence from the same amount of tax levied in another way; different types of government expenditures have different effects. However, over short periods, the types of taxes and expenditures change significantly only if emergencies arise or disappear. When such major changes occur, the shifting influence must be estimated and then taken into account in using the net contribution figure.

Estimates of government expenditures and receipts by the Department of Commerce represent a component part of the current GNP estimate. The purpose is to measure current net product output; hence, all net expenditures and receipts of the government which do not reflect current production are excluded. The adjustment of the Commerce estimates of government expenditures and receipts as part of the current GNP statement, suggested in the following paragraph, turn on this fact. We consider any government *payment or receipt* (but not loan) as adding to or subtracting from the government's net contribution.[17]

In developing government expenditure and receipt series for inclusion in the GNP statement, the Department of Commerce adjusts the figures reported on budgetary expenditures and receipts to count business taxes as receipts in the time period when the tax liability is incurred instead of when the tax is paid. It appears that entrepreneurial decisions are affected most at the date of liability, but many small businessmen may show the greatest reaction when the tax is paid. Amounts paid to the government in the purchase of surplus property of inventory-type goods and depreciable assets are deducted from the Treasury expenditure figures on the theory that they reduce total expenditure for new goods by this amount. The result is a distortion of the government expenditure series. To make an appropriate adjustment for our purposes, the government receipts from the sale of these assets should be added both to the government re-

[17] H. H. Villard uses the scheme of counting half of the capital transfers in his estimate of federal net income-increasing expenditure, on the assumption that only half will add to current expenditure of individuals. This is a position midway between the direct use of the government expenditure and receipts components of the GNP statement and the method suggested here. See H. H. Villard, *Deficit Spending and the National Income* (New York: Farrar & Rinehart, Inc., 1941), p. 388.

ceipts and expenditure components of GNP. Payment for these goods add to government receipts, and this will be the result shown by this procedure. The refunds of taxes are subtracted from taxes by the Department of Commerce in the GNP component to put both receipts and expenditures on a net basis. This has greater inherent meaning than the method employed in developing the Treasury figures.

Employment taxes and relief and other transfer payments are eliminated from the Treasury accounts in the Department of Commerce GNP component series on government receipts and expenditures, but a deficiency between employment taxes and payments out of them is as truly a net contribution of the government as an excess of payments for regular government services over taxes collected to pay for them. Interest on the public debt, whether paid out currently or not (for example, interest accruals on Series E and F bonds) is not included as current expenditure. Interest paid currently adds to the government net contribution.

In summary, the best estimate of the government net contribution beginning with the GNP components requires that government interest currently paid and all transfer accounts be added back on the expenditure side; government receipts from the sale of inventory-type surplus property and depreciable assets as well as employment taxes be added back on the receipts side.

The GNP components are available only after several months' delay, and it is necessary to employ the current series provided by the Treasury Department, although these data are less satisfactory for our purposes. The Treasury prepares budgetary expenditures and receipts, compared conceptually above to the GNP components, and also a series on cash income and outgo. The Treasury figures are currently available on a monthly basis. It must be remembered that they exclude state and local government activities, and when they are used to project the GNP components, it is necessary to add in estimates for state and local governments. These can be projected on a relatively horizontal basis because they remain relatively stable.

Since the Treasury Department figures are undergoing rapid revisions, it is not worth while to describe in detail the difference between the series. Net budgetary deficit or surplus (difference between expenditure and receipt series) includes appropriations to the trust or social-security accounts as expenditure, while excess of cash outgo or excess of cash income includes actual cash payments; the former counts interest chargeable in a given period as expenditure; the latter counts only that actually paid. Otherwise, the major differences between both series and GNP components are, as noted above, (1)

business taxes paid instead of liability accrued; (2) inclusion of transactions in capital accounts (including surplus property); (3) tax refunds as government expenditures rather than as reduction in gross receipts; (4) employment taxes as receipts and transfer payments as expenditures. Both the Treasury net deficit and excess cash outgo series are improved by a smoothing moving average because many government accounts are recorded irregularly.

If government expenditure and receipts series had no separate importance, and if net cash flow was the most appropriate measure of the net government contribution, a financial series showing the net change in government deposits and securities would provide a simpler measure. While such a series may at times provide a useful check, the foregoing discussion indicates that neither of the conditions noted applies. No such single series is available, but the federal government part could be estimated from monthly reports on government deposits, change in the gross debt, and net expenditures of government corporations.

11. MEASURES OF THE GROWTH OF PRODUCTIVE FACTORS

Relatively good measures of the current change in the population of the United States are now available, in spite of the fact that a Census of Population is taken only once every ten years. These measures may be obtained by an analysis of the yearly changes in birth rates, death rates, and net immigration. Estimates on the level of population oftener than once a year are unnecessary because, in modern countries, the size of the population never makes any rapid change in direction of movement, except possibly during a major war. Even more important in studying the economic outlook are estimates of the labor force. These figures are obtained from a carefully drawn sample of 25,000 households taken monthly by the Census Bureau. Included are blown-up estimates of all persons 14 years of age and over at work (1) for pay or profit or on public projects, (2) with a job but not at work, and (3) those without a job and actively seeking work.[18] Estimates of the yearly level of the population are published in the *Statistical Abstract* and monthly estimates of the labor force in *Monthly Report on the Labor Force*, or in less detail in the standard sources.

Output per unit of labor time, or what is commonly called "productivity" (productive efficiency), is an important indicator of capacity. However, except for the most standard products, only *changes* in productivity can be estimated. The output per man-hour for most single industries or for total industry must be expressed as an index

[18] On the problem of adjusting this figure to represent total work performed, see discussion of unemployment measures in Section 12.

number. The only current measures of productivity are yearly estimates by the Department of Labor for major manufacturing and mining industries, for electric light and power, and for agriculture. No over-all index for manufacturing or mining is currently made available, but estimates for the past have been made by the National Bureau of Economic Research and the industry sampling shown in the yearly estimates is wide enough to enable the general movement to be roughly projected. The estimates are not useful in analyzing the current outlook, however, for they are computed on a yearly basis and are available tardily.

For current estimates of changes in productivity, resort is usually had to GNP and estimates of total employment—a very hazardous procedure. GNP divided by number employed gives estimated dollar product per worker, which differs from productivity in that the changes may be due to price or shifting proportionate production of different industries as well as changing productivity. The dollar product per employed person is greater in durable than in nondurable goods industries. Thus, when durable goods industries rise more rapidly than nondurable in prosperity, GNP per employed person increases, even though no advance in productivity occurs. Also, the employment figures count employed persons rather than man-hours, and a further adjustment may have to be made for the changing length of the work week. None of these adjustments can be made very effectively.

A relatively stable trend projection in productivity for broad industry groups or for total industry has been reasonably effective at most times as an aid in bringing past measures up to date. However, productivity varies cyclically as well as secularly because of a shift in average resources employed,[19] necessitating some rough correction of projected trends for cyclical effects. Such a procedure is particularly troublesome at the present time because of the war influence. Just as after World War I, at first productivity slackened abnormally, after which unusually rapid increases may be expected.

The only other indicator of productive capacity for which there is a major need in following current changes is plant capacity. Seldom has any attempt been made to measure shifts in this capacity, but efforts to project the influence of the war on manufacturing capacity represent an exception. Depreciated book value of plant and equipment before the war was added to war additions thought to have peacetime uses. The slightest reflection will convince one that the dollar value obtained does not well represent the amount of product which can be produced because of changes in dollar costs of plant;

[19] See Chapter V, Section 3, pp. 122–23.

a plant almost worn out may currently produce as much as a new one. The dollar investment currently made does not well reflect changes in plant capacity because of changes in the price level, and it cannot be effectively compared with past investment to represent relative change in product capacity. The best procedure to employ in measuring plant capacity would be to aggregate the physical output reasonably efficient plants could produce. The accepted level of inefficient plants varies from prosperity to depression. Measures of the physical output of individual plants are inadequate.

12. MEASURES OF THE UNEMPLOYMENT OF PRODUCTIVE FORCES

Since no adequate measure of plant capacity can be obtained at the present time, no significant measure of unused capacity is available. In many industries, this depends, in addition to the factors noted in the above paragraph, on the length of the plant day. In most industries, plants could be worked more hours a day with reasonable efficiency if manpower and material were available. The significance of a measure of unused plant capacity can be easily overestimated. Such a measure would perhaps be most important as an indicator of critical levels in crucial areas when capacity is so fully employed that additional production is very costly or must await the construction of additional plants. A margin of unused plant capacity is wholesome in that maneuverability is greater in adjusting to shifting demand.

A reasonably adequate measure of labor unemployment is now provided by the Census Bureau's Monthly Report on the Labor Force. "Drifts" from benchmark figures on labor force at a given time are avoided because a well-developed sampling procedure is employed. The sampling procedure itself, however, must assume reasonable stability of economic groupings; and when industrial shifts are rapid, such as those which occurred in 1945, revisions must be made. The unemployment measure is obtained by subtracting the estimate of employment from the estimate of the labor force. Since employment includes those with a job but not at work, as well as those who work one or more hours a week, the unemployment figure must be used with great care. For instance, the number of persons with a job but not at work late in 1946 was as great as the number of persons unemployed. In a depression, large numbers may work an abnormally short work week. Since the Monthly Report on the Labor Force provides a broad classification of employment by hours worked per week, an estimate of the below normal man-hours per week can be obtained. When studying economic change, a better indication of

the deficiency in the total work performed is obtained by including below normal man-hours with the number unemployed. The number unemployed is more important from the points of view of unemployment benefits, relief, and similar social considerations.

Hoarding as the representation of unemployed savings has sometimes been considered an unemployed productive force, but it is better considered as a retarding factor in the flow of funds. Funds are not a resource like plant and labor but a guiding mechanism controlling the flow of activity. A continued full spending of income will support activity; a deficiency will reduce it; and an excess will raise it.

13. MEASURABLE EFFECTS OF ORIGINATING CAUSES

For the purpose of interpreting economic change, it would be helpful, indeed, to have available the measurable effects of all of the originating causes of the business cycle. For most originating causes, however, current effects cannot be measured by the quantitative changes in any single or few series of data. Such is especially true of the effect of wars, cultivation of new wants by the consumer, commercial utilization of new inventions and discoveries, and changes in the legal rules. In none of these cases is it possible to recommend a single series which will give any inkling as to the influence of the originating cause. For three originating causes there are available series which give valuable information regarding effects on the business cycle. These are the economic conditions in agriculture, in foreign countries, and government spending. The problem of measuring the influence of government spending is discussed in Section 10, above.

The effect of the weather on the business cycle probably is principally transmitted through agricultural conditions. The changes in agriculture take place largely as a result of weather changes, government subsidies, and business-cycle changes in the industrial economy. The weather makes the yield per acre vary, which, in turn, affects total agricultural output. Its influence therefore is best traced by the Bureau of Agricultural Economics Index of the Volume of Farm Marketings. Its relative influence can be determined by comparing the movements of the volume of farm marketings to the Bureau of Agricultural Economics Index of Cash Farm Income, which best traces the amount of funds available for purchase of manufactured products. In general, the influence is inverse, with high output reducing farm income because of the high inelasticity of demand for farm products. The index of farm prices will aid in checking the relationship. Farm subsidies may not be recurrent enough to be thought of as a part of the self-generating cyclical influences along with the direct effect of the business cycle on farm income.

As reported in the League of Nations' *Monthly Bulletin of Statistics*, there were available before the war several measures of business conditions in leading foreign countries, including measures of industrial production. These measurements were interrupted by the war. Even if we had an adequate measure of business activity in each foreign country, the effect of conditions in these countries upon conditions in our country would not be automatically provided. The best indication of the effect of the business cycle in foreign countries upon business conditions in our country is provided by figures on our exports to foreign countries. When exports are increasing, conditions in foreign countries are tending to improve business in our country; with decreasing exports, conditions in foreign countries are tending to make business worse in our country. Figures on exports must be interpreted in the light of tariff changes and extratrade international shipments and payments, however, since it may be a tariff change rather than foreign business conditions which is shifting the level of exports.[20]

With world conditions as upset as they are now, figures on exports should be checked with the balance of international payments. Unusual payments flowing internationally may influence the local situation. Large foreign investments and large foreign-debt service affect the stability of demand. The Bureau of Foreign and Domestic Commerce publishes a yearly pamphlet giving detailed figures on the balance of international payments. While some of the figures which must be used in making such an estimate are quite inaccurate, general changes are roughly indicated.[21]

The shift in the level of exports may not be caused by the business-cycle position in foreign countries but perhaps by agricultural conditions, if it is agricultural exports which are increasing or decreasing. In several cases in our past history, as noted in Chapter XI, a strong impetus toward recovery in our country was provided by crop failures in foreign countries. The effect of rapid industrial or agricultural development in foreign countries can be analyzed only by more complicated methods. Such effects, however, are not rapidly vacillating as are business-cycle conditions in foreign countries, and therefore their understanding does not require current barometers.

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[20] A useful statistical analysis of the relation of exports and imports to cyclical conditions will be found in C. J. Bullock and H. C. Micoleau, "Foreign Trade and the Business Cycle," *Review of Economic Statistics*, November, 1931; see also Charles A. Bliss, "Is the United States Losing Its Foreign Markets?" *Harvard Business Review*, XVII (Summer Number, 1939), 477–91.

[21] See Amos E. Taylor, "Statistical Methods in Balance-of-Payments Estimates," *Journal of the American Statistical Association*, XXXII (March, 1937), 65–74.

REVIEW QUESTIONS

1. How can the cyclical difference in fluctuation between durable and nondurable goods be watched currently?
2. Discuss the use of inventory data in obtaining an estimate of economic conditions.
3. Can shipments decrease before production decreases?
4. Will an increase in unfilled orders represent an improvement in business conditions?
5. With unfilled orders and shipments data, how can new orders data be derived?
6. Why are the price quotations used in the Bureau of Labor Statistics' "Index of Wholesale Commodity Prices" not entirely comparable?
7. What type of commodities are included in a sensitive price index?
8. Compare various measurements which have been employed to measure the flow of goods to the consumer.
9. What is the difference between personal income payments and GNP?
10. Discuss the use of the Department of Commerce measure of GNP.
11. Compare the Department of Commerce measure of savings with that of the SEC.
12. What are liquid savings?
13. What is the objective in attempting to measure the government net contribution?
14. What is the best procedure to employ in representing changes in productivity?
15. Of what value is the Census Bureau's "Monthly Report on the Labor Force"?

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Chapter XVII

BUSINESS BAROMETERS: CREDIT AND FINANCIAL CONDITIONS

1. SECONDARY CREDIT

IN OUR modern economic system, exchange takes place largely by means of credit rather than directly by means of money. Credit is created either by the banks in the process of fostering exchange or by the government in financing deficit expenditure. On the basis of the deposits of the individual members of a community, a bank makes loans to individuals or corporations needing funds to perform profitable exchanges. Governments create credit to support production either for war or to bolster peacetime activity. Such credit, even in theory, is less clearly self-liquidating than private credit.

The general purpose of the central bank, stated in its most elementary form, is to provide a needed reservoir of *secondary credit.* When the individual bank wishes to make total loans and investments which are larger than its deposits (less legal reserves), the bank must turn to the central bank for the additional funds. In the United States the member banks of the Federal Reserve System borrow from the Federal Reserve banks either by rediscounting notes from their portfolios or by selling Treasury bills to the Reserve bank. In the Federal Reserve bank statements the first type of borrowing is recorded as *discounts and advances*, the second as *U.S. Government securities.*

The Reserve banks can and do vary the reserves of member banks by *open-market operations* in U.S. Government securities. By buying they add to the reserves of the commercial banks; by selling they reduce the reserves of these banks.

Member banks of the Federal Reserve System are required by law to maintain with the Federal Reserve banks prescribed legal reserves against deposits. Reserve bank credit provides funds for these reserves. This use of Reserve bank credit is recorded as *member bank reserve balances.*

Another major use of Reserve bank credit is to provide for *money in circulation.* At the present time, money in circulation is principally made up of: (1) Federal Reserve notes, which may be created with funds provided by Federal Reserve credit, and (2) subsidiary coins

and silver certificates, which are provided by the government without regard to Federal Reserve bank credit. It should be borne in mind that "money in circulation" is not defined precisely as the uninitiated would expect it to be. It includes not only money in the pockets of individuals and in the cash registers of stores and business houses; it also includes all money held in tills by commercial banks and all money hoarded by individuals. In other words, money in circulation includes all kinds of United States money outside of the Federal Reserve banks and the Treasury. The *Federal Reserve Bulletin* reports on the amount of *currency outside banks*, which is more in keeping with the popular conception. Currency increases with increasing prices and with improving business conditions in order to expedite larger dollar amounts of exchange. Currency also increases with hoarding, which sometimes occurs in secondary depression.

The Board of Governors of the Federal Reserve System estimates *excess reserves* of member banks, an important figure in understanding the supply of secondary credit. *Excess reserves* equal total reserves minus required reserves. In a period of prosperity, excess reserves are likely to be small, since credit funds are in urgent demand; in depressions, especially if the Federal Reserve banks engage in "easy money policies," excess reserves are likely to be large. Excess reserves compared with government securities held by the Federal Reserve banks are a good measure of the extent to which easy money policies fail at such a time.

Excess reserves, however, are greatly affected by the amount of gold and by the amount of fiat Treasury money. If gold flows out of the country, excess reserves are decreased and the money market is tightened; when gold flows into the country, the money market is eased. Devaluing the dollar early in 1934 automatically greatly increased the supply of gold dollars and greatly increased the ability of the government to create excess reserves. However, the government did not immediately take its "profit," and the devaluation merely increased the *Treasury cash and deposits with Federal Reserve banks*. This figure has never been under 2 billion dollars since early 1934, although it was relatively small before that date.

The Board of Governors of the Federal Reserve System has the power to vary reserve requirements over a range of 100 per cent. For example, Central Reserve city bank requirements may be fixed at any point from 13 to 26 per cent. Excess reserves were rapidly drawn down by this device from late 1936 to early 1937. Currently, the reserve requirements are fixed at the upper statutory limit for most banks, and excess reserves are being kept at relatively low levels.[1]

[1] The only exception is requirements for demand deposits of Central Reserve city banks which are being kept at less than the relatively high percentage permitted because of low

2. RATIO OF BANK LIABILITIES TO THE MONEY BASE

Our money and credit system is based upon the maintenance of a prescribed reserve of standard money against outstanding credit and currency. The best measure of the adequacy of the standard money reserve is provided by the *Federal Reserve ratio.* The Federal Reserve ratio is the ratio between the gold certificate reserve and Reserve bank note and deposit liabilities. As long as this reserve ratio is high, the Federal Reserve banks are in a position to extend additional secondary credit as required. When and if the reserve ratio becomes low, the ability to extend additional credit is limited, and expansion of credit cannot extend much farther. During World War II the ratio required was reduced to 25 per cent because the rapid rise in deposits and currency brought the actual ratio precariously close to a higher legal requirement.

It was common for the banking system to reach the limits of expansion in prosperities prior to 1914.[2] The failure of the Reserve ratio to drop anywhere near to the minimum in the twenties must be attributed to the large flow of gold to the United States and to restrictive policies of the Federal Reserve banks. When the minimum ratio was recurrently reached in each prosperity, it could be concluded by a simple process of reasoning that cycles were entirely caused by the inelasticity of the banking system. Such a theory was very popular in the first and second decades of this century.

The Reserve ratio is now far above the 25 per cent required, and, in practice, the actual ratio has not been anywhere near the legal minumum since 1921, except briefly during the war. Under these circumstances, its gyrations have no practical significance in interpreting economic conditions.

3. THE EXTENSION OF BANK CREDIT

The Board of Governors of the Federal Reserve System reports currently on the *total loans of all banks in the United States.* These figures represent the extension of primary bank credit, that is, credit extended to producers and consumers in contradistinction to secondary credit which is extended to bankers. The use of credit is large in prosperities and small in depressions. The reported figure at the end of 1929 was 42 billion dollars, as compared to a low for the Great Depression of 20 billion in 1935. Bank loans have been experiencing a secular decline

excess reserves in these banks. The Board now advocates closer uniformity in reserve requirements with little regard to the size of the community.

[2] See Alvin H. Hansen, *Cycles of Prosperity and Depression in the United States, Great Britain, and Germany: A Study of Monthly Data 1902–8* (Madison: University of Wisconsin, 1921); W. C. Schluter, *The Prewar Business Cycle, 1907–14* (New York: Columbia University Press, 1923).

because hand-to-mouth buying has reduced the need for inventory credit, and major companies now carry adequate funds for seasonal needs.

Figures on total loans are available not oftener than quarterly, and very tardily. Current weekly figures available on *loans of reporting member banks in leading cities* give a reasonable representation of the direction of movement of bank loans.

It has often been pointed out that a classification of loans on several bases would be of great value in understanding current economic change. First, it would be valuable to have loans classified as to the industry into which the funds flow. This classification would improve our understanding of the changes taking place in various industries. Such information is not available. Second, it would be valuable to have loans classified as to quality of the loan or, what is the same thing, the degree of risk. Not only do we have currently available no such figures, but no practicable plan of classifying loans as to degree of risk has been suggested.

One of the most important loan classifications available is the one which covers commercial, industrial, and agricultural loans. The amount of loans in each of these fields is an important factor in sizing up the business situation. It is the best series available for indicating the amount of loans made to small companies for business purposes. Such loans vary with inventory accumulation and depletion, but probably they will be less affected than they formerly were at times of small inventory variation because of present abnormally large deposit balances. The Securities and Exchange Commission release, "Working Capital of U.S. Corporations," provides some indication of the extent to which business, on the average, may be able to finance itself; but since loans are usually extended for emergency needs, the averages do not tell the whole story.

The commercial, industrial, or agricultural classification may not always be completely accurate. The borrower is likely to be reluctant to reveal the *purpose* of the loan in critical circumstances when he might believe that the facts would stand against his getting it. Hence, loans classified as commercial, industrial, and agricultural may be used to some extent to tide the consumer over critical times or carry securities when the market is declining rapidly.[3]

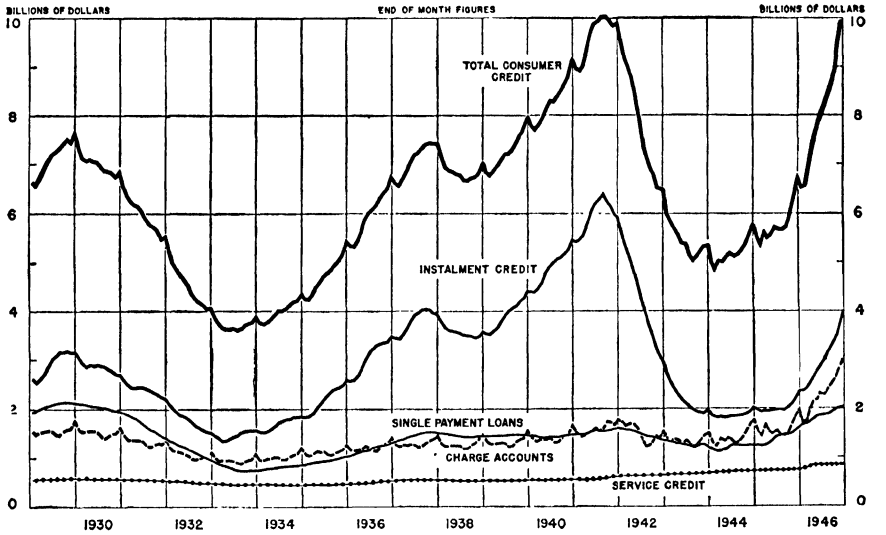
Loans for purchasing or carrying securities are classified according to (1) whether they are backed by U.S. Government obligations or

[3] Data on the commercial, industrial, and agricultural loan classification are available only since the beginning of 1939. Before this date "other" loans roughly indicate business loans. The new classification was adopted to avoid the type of difficulty noted in the text. No doubt something has been accomplished on this line, but the fact remains that many times people will not give a frank statement of their purposes.

other securities, and (2) whether they are to brokers and dealers or to others. Government obligations presumably are more liquid than other securities, and therefore the other security series is of critical importance. Loans to brokers and dealers are likely to be employed to purchase additional securities and are, under ordinary circumstances, more speculative than loans to others. The New York Stock Exchange publishes series on brokers' balances of member firms carrying margin accounts, showing the part borrowed and the part covered

CHART 49

CONSUMER CREDIT*



* Board of Governors of the Federal Reserve System, *Federal Reserve Charts on Bank Credit, Money Rates, and Business* (Washington, 1946).

by customers' free balances; the extent to which these funds are utilized in speculation is thus indicated. When brokers' loans are being rapidly liquidated, as in October and November of 1929, margins may be temporarily covered by additions to nonbroker loans.

Real-estate loans are shown separately and throw light on conditions in this market. If, for instance, such loans reach a high level in a real-estate boom and remain high with a decline in real-estate activity a danger area is indicated.

Consumer loans represent a type of increasing importance. To a major extent, these loans directly originate outside the banking system. In contrast to bank loans which have shown a secular decline, consumer loans are trending upward.

The dollar amount of *consumer credit* is reported monthly by the

Federal Reserve Board of Governors. This is shown separately for installment debt, charge-account sale, single-payment loans, and service credit. Installment debt, in turn, is shown by major products where the debt is contracted in connection with the sale of the product, and by credit institution where cash loans are obtained. These series are of major importance because changes in them show the extent to which consumer expenditures are made on credit rather than from disposable income, or the extent to which disposable income is used to pay off short-term debt.[4] The movement of the main types of consumer credit since 1929 is shown in Chart 49.

4. INVESTMENTS OF COMMERCIAL BANKS

Historically, bank investments have declined in prosperity when bank funds were employed to finance increases in loans and risen in depression when loans were run off. Since the early twenties, however, bank investments have tended to increase at all times because of the secular decline in loans. With bank investments now three times as great as loans, no semblance of the old relationship is to be expected. The changed picture is depicted on Chart 50, which shows the major position of U.S. Government security investments in bank assets. The tremendous increase in deposits was closely related to the adding of government securities to bank portfolios in financing the war.

As a result, the present relation between loans and deposits is very different from the prewar relation. The loan-deposit ratio was then useful in showing the extent to which loans were being extended by the banks on the basis of deposit liabilities; a ratio of 130 was generally thought to represent an unsound condition. Deposits are now based largely on investments in government securities, so that cyclical changes in short-term financing cannot be readily appraised with figures showing the relation between bank loans and deposits. The Board of Governors of the Federal Reserve System reports on bank investments and deposits for the same bank groups as loans.

5. RATE OF USE OF BANK CREDIT

The rate of use of bank credit is measured by the turnover of bank deposits—the ratio of bank debits to demand deposits. Bank debits represent the dollar amount of checks written and a series is reported currently covering principal cities. Because of the abnormally high

[4] These series were developed by the National Bureau of Economic Research. For a description of their derivation, see Duncan Holthausen, "Monthly Estimates of Short-Term Consumer Debt, 1929–42," *Survey of Current Business*, November, 1942. The series were revised in 1947; see "Revised Consumer Credit Series," *Federal Reserve Bulletin*, XXXIII (July, 1947), 830–35.

level of deposits, the turnover figure is very low compared to past standards; this lies at the basis of many forecasts that prices can be expected to reach much higher levels.

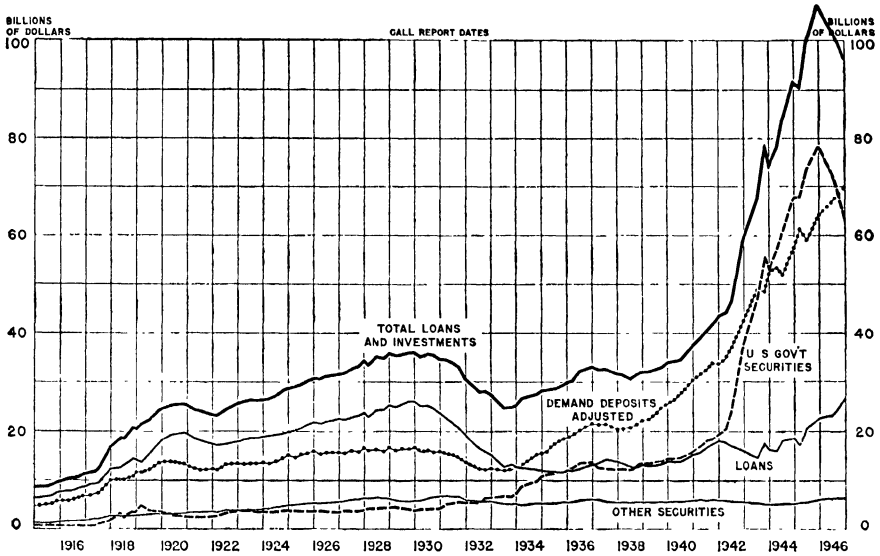
Turnover of bank deposits represent the V' in Fisher's "equation of exchange":

$$MV + M'V' = PT,$$

where M represents the money in circulation, V represents the rate of use of this money, M' represents the volume of bank deposits, P

CHART 50

LOANS AND INVESTMENTS OF MEMBER BANKS OF THE FEDERAL RESERVE SYSTEM*



* Board of Governors of the Federal Reserve System, *Federal Reserve Charts on Bank Credit, Money Rates, and Business* (Washington, 1946).

represents the price level, and T represents the level of business activity. $M'V'$ is measured by bank debits; PT should move with GNP, although at a higher level. Since about 90 per cent of total payments are made by check, we can largely disregard MV in tracing the current changes of factors in the equation of exchange.

Many of the schemes of artificial control are postulated upon relations existing in the equation of exchange, and, in like manner, the success of such schemes can be largely tested by the changes of the various factors in the equation once any such scheme is put into operation. Indirect control has frequently been attempted by increasing the volume of credit money. This method results in an in-

crease in the M' in the equation. Now, if the result of increasing M' is to *decrease* V', nothing has been accomplished. Neither prices have been increased nor business activity improved. In such a case, more credit becomes available in the form of larger bank deposits, but businessmen check against these deposits more slowly.[5]

Without the intervention of artificial control, prices tend to move with business activity and bank deposits with the turnover of bank deposits; all four elements tend to move in the same direction. We have noted in Chapter XV that price indexes, as well as measures of business activity, have been employed as a representation of business conditions.[6] The turnover of bank deposits may be used as a measure of business confidence, as is noted in Section 9 of this chapter.

Large claims for the forecasting significance of bank debits, the $M'V'$ term, have been made at different times. A position of R. D. Skinner is worth quoting:

> Conspicuously in the first half of 1937, a more than seasonal decline of 15 per cent in bank debits in contrast with a rise of some 6.2 per cent in commercial loans indicated that the American public was curtailing its buying activity at the very time when manufacturers were piling up inventories in anticipation of improving sales. This obviously indicated an approaching condition of log jam in the economic system. Yet how few people were interested enough in banking statistics to follow this simple comparison or ratio of spending to borrowing! It was the earliest indication of the depression trend and preceded by nearly eight months the more convincing expression of this new trend in the equity markets and in industrial production figures. Proper correlation of various banking figures can thus show us with surprising frequency beginnings of new trends which sooner or later have their unavoidable impact on short- and long-term interest rates, on the state of trade and earnings, and eventually upon the values of securities based on those earnings.[7]

It is best to look behind changes indicated by such banking figures, however. The decline in spending in the spring of 1937 resulted chiefly from a tapering-off of the 1936 spending created by payments on veterans' compensation certificates and excessive year-end dividends. The increase in loans was a normal recovery influence and probably was not of critical importance in producing recession, since loan extension was relatively low in the spring of 1937.

6. VOLUME OF DEBT

The Department of Commerce makes yearly estimates of the total volume of debt, including long-term debt.[8] Private debt is substantially

[5] This is the best method of testing the success of "easy money policies."

[6] See Carl Snyder, *Business Cycles and Business Measurements* (New York: Macmillan Co., 1927), chap. vii.

[7] *Econometrica*, VI (April, 1938), 182–83. See also service of Townsend-Skinner and Company, New York, notably a current publication entitled "Trend Reports."

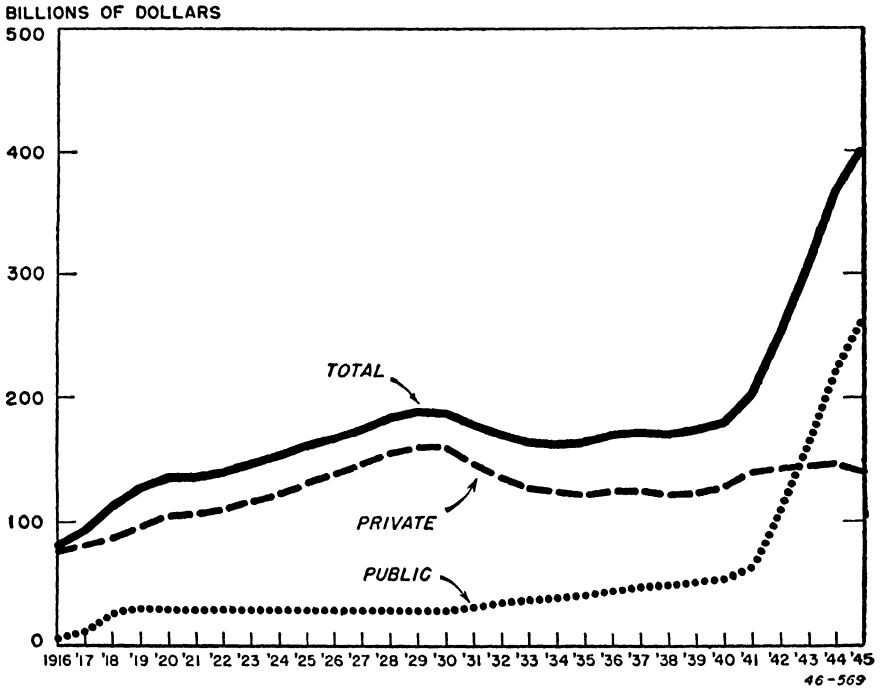
[8] A yearly article in the *Survey of Current Business* gives these figures. The figures shown here are "net" debt in the sense that each corporate entity, public or private, is taken on a consolidated basis.

lower than it was fifteen years ago, while public debt is far higher, as can be seen on Chart 51. Long-term private debt declined from 94 billion dollars in 1930 to 72 billion in 1945.

Carl Snyder has shown that the growth in long-term debt paralleled national income from 1880 to 1930.[9] In fact, national income, or

CHART 51

NET PUBLIC AND PRIVATE DEBT*
End of Calendar Year



* Taken from *Survey of Current Business*, September, 1946.

GNP, has moved reasonably parallel to the total of all debt in recent years. From 1929 to 1945, all debt rose from 188 to 401 billion dollars, or by over 110 per cent; GNP rose from 104 to 213 billion dollars, or by over 100 per cent. So far the growth of income has been rapid enough to keep up with the growth of accumulated debt. However, public debt increased much more rapidly than *capacity to produce* during the war.

In prosperity, the long-term private debt measure provided by the Department of Commerce indicates the extent to which expansion is

[9] Carl Snyder, "The Increase in Long-Term Debt in the United States (from 1880)," *Journal of the American Statistical Association*, XXIX, 166–74.

financed by relatively intractable debt securities instead of equities. In depression, the extent of contraction of long-term debt represents failure or drastic reorganization.

7. INCREASE IN CAPITAL INVESTMENT

The amount of investment currently made is shown by the private gross capital formation component of GNP. In the quarterly estimate, this appears separately for residential and other construction, producers' durable equipment, and net change in business inventories. Because of the critical position investment occupies in an analysis of economic change, these estimates are invaluable. They are available only after a substantial lag.

A survey of planned capital outlays, conducted jointly by the Department of Commerce and the Securities and Exchange Commission, now provides a quarterly estimate of expenditures for plant and equipment for all private nonagricultural businesses. Reporting companies submit three estimates: one about the middle of the preceding quarter, another, early in the quarter to which it applies, and finally an actual report after the close of the quarter. The planned capital outlay figures are extremely important in providing prompt estimates of investment flow (available in a release issued by the Securities and Exchange Commission).

Figures issued on securities are of particular value in showing publicly subscribed funds obtained by governments and private corporations. Although funds are also obtained from retained earnings, from short-term loans, and from personal subscription, public security issues are sensitive to current economic change because they are employed to obtain *additional* funds. The best series are those reported monthly by the Securities and Exchange Commission and by the Commercial and Financial Chronicle. The SEC series runs at a far higher level because it includes the gross sale of government securities; the Commercial and Financial Chronicle series includes a net figure for government securities, with redemptions subtracted. Both series are relatively complete. The SEC series covers offerings rather than sales, but the difference is not great at most times; it omits all offerings in amounts under $100,000. Both series are classified into new money and refunding issues, a very important distinction since only new money issues absorb savings.

Security issues represent the flow of capital funds instead of actual investment. In periods of rapid cyclical change, funds obtained from security issues frequently are not used for the purpose originally intended. Security issues are frequently used to obtain working capital or to finance reorganizations as well as for capital building. The

published series on securities issued may not tend to represent the same proportion of total funds employed for capital building. For these reasons, comparison with capital formation series is of uncertain value.

Residential building is classified as part of capital investment, but other consumer durable goods are not so considered. Series available to measure residential building activity are noted in Chapter XVI. The major proportion of funds put into residential building are not publicly subscribed.

Measures of investment are critically important because, like all durable goods, they show a wide cyclical fluctuation and because they provide the outlet for savings.

8. MEASURES OF BUSINESS POPULATION

The Department of Commerce provides quarterly estimates of the number of operating businesses, showing a level of approximately 3.5 million businesses at the present time, with almost half of the total accounted for by retail trade. The number of service industries, manufacturing, construction, and wholesale trade are also shown separately. Estimates are given for the number of new businesses or "births," discontinuances or "deaths," and transfers or simultaneous withdrawal from one line of business and entry into another. These are extremely valuable figures, representing the entry of new enterprisers and the withdrawal of others. When the business transfer series is used, it is best added to both new and discontinued businesses because it involves both processes. As indicated in the following section, the number of new businesses and discontinuances are valuable series in indicating the state of confidence. Substantial changes in business discontinuances are the best available evidence of strong cumulative upswing or downswing.

A surprising showing obtained from the figures on business births and deaths is the comparatively high turnover of business in almost all lines. For instance, in 1944 and 1945 turnover was as great in manufacturing as in retailing.[10]

A much longer series on industrial and commercial failures is reported by Dun and Bradstreet, but it is substantially less comprehensive. Major advantages of the Dun and Bradstreet report are that it appears monthly and provides figures on dollar liabilities of failed companies as well as on the number. Much more confidence can be placed in the Department of Commerce series, however.

[10] See D. W. Paden and A. Nielson, "Recent Trends in the Business Population." *Survey of Current Business*, May, 1946, showing the industrial breakdown on a much finer classification than the current quarterly reported figures.

The Interstate Commerce Commission provides annual reports on railway receiverships. The Board of Governors of the Federal Reserve System reports monthly on the number of bank suspensions and the dollar amount of deposits involved. No bank suspensions whatever occurred in 1945 and 1946.

9. MEASURES OF BUSINESS CONFIDENCE

Several discontinuous attempts have been made to measure business confidence directly. The most notable of these attempts is represented by the "Executive Forecast," begun by *Fortune* magazine in 1947. Questionnaires are mailed to roughly 28,000 persons in the executive group asking their opinion of the prospects for gross national product, industrial production, unemployment, and cost of living, as well as the outlook for the executive's own business.[11] But little can be concluded regarding the results. The series cover far too short a time, and at best, it is not possible to check measures of business confidence in any simple manner, since we have no objective measure of business confidence.

There is room for doubt as to whether people can tell us what the state of their confidence is as well as we can measure it indirectly. A valid generalization seems to be that the more freely a man spends his money, the higher the state of his confidence. If this conclusion is valid, a good measure of business confidence is provided by the turnover of bank deposits. In case artificial control is exercised to pump credit into or out of banks, however, we must remember that a natural consequence will be respectively a decline or an increase in the turnover of bank deposits, and that this change probably has but little to do with the state of business confidence. Measurement of the turnover of bank deposits was discussed earlier in this chapter.

As noted in the preceding section, business births and deaths represent fair measures of the state of business confidence. Certainly, when failures are numerous and increasing, confidence will be at a low ebb; but when failures are few and decreasing, businessmen will tend to be optimistic. If businessmen see that others conduct ventures which are not sound and seem to be getting away with it, they will feel rather confident that they are operating on a sound basis. But when sound, old-line companies are failing, they may be critical of any extension whatsoever. It must be remembered that if vested interests are artificially protected, the fewness of failures will not indicate so high a state of confidence as if failures are scarce under competitive conditions.

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[11] See "The Executive Forecast," Supplement to *Fortune*, August, 1947.

When confidence prevails in a growing economy, new companies are formed. People are most confident when needs are expanding, and expanding needs provide good reasons for the forming of new companies. Also, as Schumpeter has so vividly pointed out, imitation of the successful is a characteristic feature of recovery periods. It is not at all certain, however, that confidence actually is lessened any if the formation of new companies becomes less after efficient resources are quite fully employed in prosperity. Another possible limitation of the use of new companies as an indication of confidence is that the government may set up requirements which discourage the formation of small companies.

The price of common stock indicates the state of confidence to some extent. Common stocks represent the ownership value placed upon fixed capital in the hands of going businesses. If a high value is placed on such capital, it indicates confidence that the capital will produce good returns in future years. However, as pointed out in Chapter XIX, the short-term technical conditions of the stock market change in such a way that people may attain increasing confidence while the price of stocks is declining over a few weeks or months; pessimism of those in control of important businesses may grow for a few weeks or months, while the price of stocks continues to increase. It is doubtful, nevertheless, whether the price of common stocks and the state of confidence could move in opposite directions for an extended period.

Leonard Ayres recommended the use of the spread between high- and low-grade bonds as a measure of confidence. The risk involved in the purchase of high-grade bonds is slight, while the risk is great in buying low-grade bonds. The spread in price varies with economic conditions. The price of high-grade bonds varies little over the business cycle when severe crisis or secondary depression does not develop; in fact, it drops late in prosperity because the possibilities of common stocks appear so great. The risks involved in the purchase of low-grade bonds come to be discounted in prosperity. The bond interest is often well covered, and the improvement comes to be interpreted as a structural change. As a general indication of the shift in confidence back and forth between depressed and good conditions, the difference in price of high-grade and low-grade bonds is of great value. Also, as an indication of the reattainment of confidence after a crisis has been passed, it may be efficient. Low-grade bond prices often rise more rapidly than common stock prices at such a time. At many times the efficiency of this measure in displaying a sensitive indication of changes in the state of confidence may be reduced because of capital flotation. The price of bonds of a given grade will reflect to some extent the attempt to obtain funds in the market. For periods of large

bond flotation, some other measure may indicate shifting confidence more clearly. Ayres used the price spread between "Aaa" bonds and "Baa" bonds as compiled by Moody's.

There are many ways of indicating the state of confidence by measures which reflect it indirectly, and the exclusive use of any one measure for this purpose is inadvisable. General change in the state of confidence between depression and prosperity is fairly well reflected by all of the measures mentioned. In all cases, technical factors may reduce the value at certain times, and these should be kept in mind when use is made of the series.

REVIEW QUESTIONS

1. How can we determine whether the secondary credit supply has largely arisen from a demand for credit by the business community or is an artificial creation?
2. How can we obtain a statistical test of the success of "easy money" policies?
3. How can we obtain some information on inventories by use of loan data?
4. What cyclical significance may be attached to a change in the number of business failures?
5. Some people have claimed that conditions now are much more unstable than they used to be because of the growth of debt. Discuss the statistical evidence regarding this claim.
6. Write an essay on the measurement of business confidence.
7. What is the significance of the loan-deposit ratio today compared to twenty years ago?
8. What is the significance of a measurement of turnover of bank deposits?
9. What is the relative importance over the business cycle of a rise in short-term, as compared to long-term, debt?
10. Explain what the major bank-loan classification tells us about short-term debt.

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CHAPTER XVIII

THE FORECASTING OF BUSINESS CYCLES

THE PROBLEM of business-cycle forecasting under present conditions involves the twofold economic analysis of what will happen if stabilization controls are superimposed by the government on the economy and also what will happen if no such intentional interference is assumed. The effect of various proposed controls in stabilizing the economy is analyzed in Chapters XX to XXII. The present chapter considers the problem of forecasting the future cyclical implication of the economic condition existing at any time during the business cycle. The forecast of seasonal and long-period movements in economic conditions involves different procedures and is considered in Chapters II and III.

Business-cycle forecasts are important in the future planning of business decision-makers, even though no explicit forecasts may be formulated. They are also basic to analyses of what most stabilization plans are intended to achieve and what they will accomplish, for few such plans propose changes far-reaching enough to eliminate completely the cumulative self-generating cyclical changes and processes.

1. THE LOGICAL BASIS FOR BUSINESS-CYCLE FORECASTING

Any satisfactory method of forecasting business cycles must rest upon our understanding of the way business cycles take place. Business cycles occur as the result of originating causes which disturb balanced conditions so that responses to these originating causes carry unbalance through cyclical gyrations; these facts are set out in detail in Chapters V and VI.

Forecasters usually recognize the possibility of originating causes, although the terminology varies; some speak of "unusual events" or "external factors," others of "acts of God," and still others of "initiating impulses." It is clear that we have practically no basis whatsoever for forecasting originating causes. The one important originating cause which is entirely independent of the capricious human element is the weather; we are unable to forecast the weather far enough ahead to assist in business-cycle forecasting.[1] No expatiation is nec-

[1] See, however, Woodrow C. Jacobs, "Weather Analysis: Aid to Business Planning," *Dun's Review*, March, 1947.

essary to convince us that we are unable to forecast wars, the commercial utilization of inventions and discoveries, the discovery of gold mines, or changes in the legal rules.

The forecasting of business-cycle changes must rest upon our information about business responses. Business responses are composed of cumulative self-generating cyclical changes. Two distinct types of forces are involved: the reinforcing, which tend to make the cyclical movement maintain its present direction; and the limiting, which tend to make the cyclical movement turn in the opposite direction.[2] The most logical forecast of the business cycle would be the result of a quantitative determination of the relative strength of these two sets of forces. It is well to recognize at the outset some of the difficult questions which must be faced in attempting such a quantitative determination. What is the amount of the influence of a given increase in production toward a further increase in production? To what extent does a price increase make people think prices will increase still further?[3] To what extent will price increases lead to a piling of inventories? How much of an increase in profit margins and increase in production will be required to create enough confidence so that the production of capital goods will begin on a wide front? What is the physical storage space available for storing various goods? To what extent will it be used in the upswing? When are variable costs rising faster than prices? How are we to judge the ending of the period of gestation in the production of capital goods when we have so little information about the quantity of capital goods in the various stages of production? At what point in the upswing have investments exhausted planned savings?[4] At what point, if any, may we say that a disproportionate amount of purchasing power is used to purchase capital instead of short-lived goods? When does the inefficiency of workers attain significance in prosperity?

The questions are similar regarding the downswing. What is the amount of influence of a given decrease in production toward a further decrease in production? To what extent does a price decrease make people think prices will decrease still further? How rapidly are inventories depleted during the decline? How much of a decrease in production and in profit margins is necessary to result in a given

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[2] These forces are analyzed in detail in Chapter VI.

[3] Some attempts have been made to give consideration to expected price changes in the analysis of demand. See e.g., C. F. Roos, *Dynamic Economics* (Bloomington, Ind.: Principia Press, 1934), pp. 239–45.

[4] E. C. Harwood has attempted to supply an answer to this question. See his *Cause and Control of the Business Cycle* (Cambridge: American Institute of Economic Research, 1939), especially chap. iv. More direct methods involving saving and investment outlets are considered in the following section.

further decrease in the production of capital goods? How urgent is the increasing need for capital equipment when its production dwindles to a low level? What quantity of savings is being made during the depression? How soon can we expect savings to drive high-grade bonds to high prices? When has the efficiency of workers shown marked improvement? When have variable costs dropped enough to exert a favorable influence on the profit margin? How can we measure the decline in overhead costs?

These questions were asked in the previous edition of this book, and the conclusion was then reached that available data were completely inadequate to provide direct quantitative answers. At that time the measurements described in the barometer chapters represented business-cycle processes much less directly than those noted in the present edition. Fortunately, it is now possible to measure some of the critical business-cycle processes directly, and their employment in business-cycle forecasting is analyzed in the following section. It should be borne in mind, however, that the available pioneering measurements are still crude and involve indeterminate statistical errors; it is a mistake to accept them uncritically.

Even crude measurements are not available to represent directly many cyclical processes. Resort must still be had to measurements *symptomatic* of many of the cyclical processes. Symptomatic measures are merely indicative of cyclical change; they do not measure it directly. The best results in the use of such symptomatic evidence will be achieved through the light shed on the central framework of cyclical forces. Too often in the past symptomatic evidence has been employed mechanically in the belief that it would provide incontrovertible information with no need for logical checking.

2. FORECASTING BY CROSSCUT ANALYSIS

Historical comparison and *crosscut analysis* are the two principal forecasting methods. Historical comparison is based on "the theory of regularity in the succession of economic events."[5] It represents a primitive type of symptomatic measurement in that it depends upon a regularity of recurrence which seldom, if ever, is logically integrated with cyclical processes. Major historical comparison methods are described in the following section.

The popularity of historical-comparison methods is waning, and the method of crosscut analysis is becoming the predominant one for the first time since quantitative methods have been extensively employed in business-cycle forecasting. One reason for the long distrust of crosscut analysis is that the method was early held to be based on

[5] C. O. Hardy, and G. V. Cox, *Forecasting Business Conditions* (New York: Macmillan Co., 1928), chap. iii.

"the belief that each situation is different from the preceding ones and that the forces making for change may be identified, interpreted, and measured."[6] The method of crosscut analysis, as distinguished from historical comparison, involves a separate analysis of each current situation in lieu of depending on a recurrence of economic events assumed from symptomatic evidence. It is not reasonable, therefore, to identify crosscut analysis simply with the belief that each situation is different from the preceding one. Much similarity can be accepted; and yet it may be held that there is enough difference from previous situations to require that identification, measurement, and interpretation of the forces present be made specifically, instead of reaching a conclusion from the mechanical recurrence of symptomatic series.

Favorable and Unfavorable Factors. The most elementary form of crosscut analysis involves a separate listing for favorable and unfavorable factors in the outlook. As Haney says, this method "will help to break the problem down into its constituent elements, and at the same time to insure a complete coverage of the numerous and complicated factors."[7] Such a procedure is so useful that it has been employed for many years by all experienced analysts, with the possible exception of a few who have strictly adhered to the historical-comparison method. The crosscut method provides no more than an initial step, however. The listed factors are qualitative, and it is impossible to sum qualitative factors.

Aside from the difficulty of measurement, a classification based on favorableness is not well pointed at the cyclical process. In the first place, what one considers to be favorable is likely to depend partly upon his social outlook and personal interests. For instance, note the fact that rising wage rates always appear as unfavorable in the lists of some analysts and favorable in others. In the second place, it is a major mistake to evaluate the outlook in terms of logical relations to be expected under balanced conditions. For instance, price cuts in a decline do not always increase the amount purchased. It is frequently difficult to translate favorable and unfavorable factors in terms of the degree of unbalance in the business cycle. Because of the unbalance in the cyclical movement, favorable factors may not produce expansionary effects.

What is desired is a balance between limiting and reinforcing forces rather than between favorable and unfavorable ones. These forces can no more be added than factors of favorableness, but they pointedly call attention to the business-cycle process. A shift in the proportion of income spent on consumer durable goods, as an illustration, may

[6] *Ibid.*

[7] L. H. Haney, *Business Forecasting* (Boston: Ginn & Co., 1931), pp. 221–22.

be neither favorable nor unfavorable, but it is a potent cyclical force. Consumption out of inventory in the downswing is unfavorable, but it soon becomes limiting.

Pattern-of-Relationship. The most outstanding method of forecasting employed at the present time may be called the "pattern-of-relationship method." This method establishes for the major economic measures in a comprehensive framework of the economy a system of standard relationships against which actual performance can be checked. The discrepancy between standard and actual relationships provides the basis for forecast. Such a procedure has major promise in that, for the first time, it makes possible identification, measurement, and interpretation of major cyclical processes.

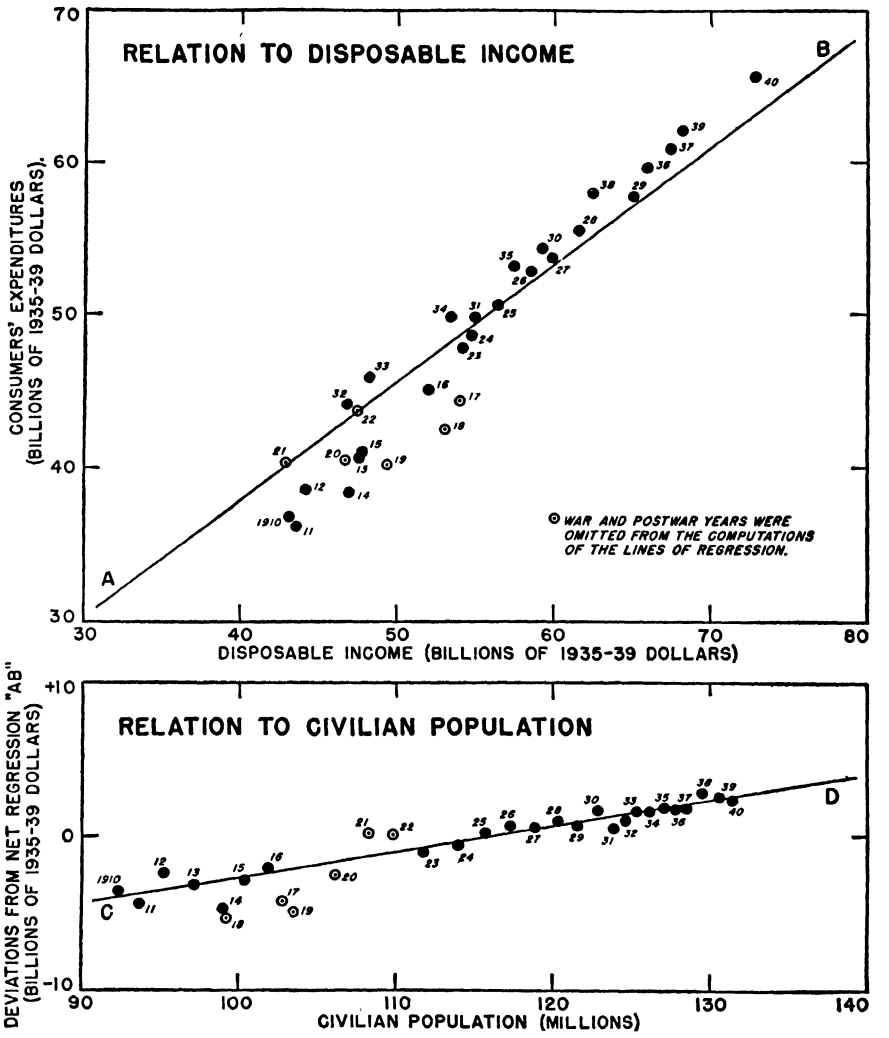
The best-developed pattern-of-relationship method applies to the components of GNP. The reader is cautioned initially that the standard relationships set up must be considered in preliminary form and that the measurements involve an indeterminate statistical error. While it is a mistake to accept such forecasts uncritically, notable achievement has been made in identifying salient relationships. The most widely employed one is the relationship between consumer expenditures and disposable income, as illustrated in Chart 52. It will be seen that the points below the line of relationship are predominantly in the early years, while the points above the line are predominantly in more recent years, indicating that the tendency has been to spend an increasing part of disposable income. The relationship can be somewhat improved, therefore, by including time as a second independent variable. The relationship is also slightly improved by employing per-capita data, as indicated by the lower part of the chart. Various other statistical refinements, such as the elimination of abnormal years and deflation of the data, have been suggested.

Careful use of these relationships between disposable income and consumer expenditure makes it possible to quantify the consumption function and thereby to aid in predicting the approximate amount of investment offsets required to prevent the nation's savings from becoming deflationary. At the present time, the relationship developed assumes that approximately 90 per cent of disposable income is spent by consumers and about 10 per cent saved, although slightly variable over the business cycle. An equation may be developed to act as a guide, but the best procedure is to make an empirical estimate on each occasion.[8]

[8] The most widely employed equation used is one developed by Louis Paradiso: $Y = 5.50 + 0.828X_1 + 0.04$ (for year 1935); unit = 1 billion dollars. See *National Budgets for Full Employment* (Washington: National Planning Association, 1945), pp. 79 ff. See further the analysis of this problem in Chapter VIII, Section 3.

CHART 52

RELATION OF CONSUMER EXPENDITURES TO DISPOSABLE INCOME*



* Reproduced by permission from V. Lewis Bassie, "Consumers' Expenditures in War and Transition," *Review of Economic Statistics*, XXVIII (August, 1946), 117-30.

Conclusions are also frequently derived from the difference between the current relationship of expenditure and disposable income and the standard indicated by the line of relationship. Such a procedure is hazardous unless related to other current forces which corroborate the lack of balance indicated, because new factors added to the picture are always modifying past relationships. A major unknown

in this respect at the present time is the influence of large accumulated savings.

It should be stressed that conclusions derived from the difference between the current relation of consumer expenditures and disposable income and the standard indicated by the line of relationship must be interpreted in the light of other GNP components. Of major significance are the relations between income and expenditure considered separately for individuals, business, and the government. For example, savings of individuals and corporations plus reserves for depreciation and depletion must be equal to gross capital formation plus the net contribution (plus or minus) of government. This balance holds for any accounting period. Hence, indications of adjustment or maladjustment in the economy may be inferred from changes in any of these magnitudes from period to period.

Since the GNP statement provides the major breakdowns of total income and expenditure, many other relationships are possible, and some of them have been frequently employed. The percentage which salary and wage payments are of total personal income is such a relationship; frequently it has been approximately 60 per cent. This relationship cannot be readily fitted into an equational balance, however, and any shift has little predictive significance unless the change in other income payments is examined.

A more promising procedure, which has been used by the "model builders" in projecting postwar levels of activity, involves making a comprehensive forecast by estimating each component of GNP separately on logical grounds and modifying where necessary to satisfy logical relationships when the parts are added up. Relatively simple procedures are employed. In some cases, it seems most logical to project recent changes into the future; in others, it seems better to project a horizontal change or an abrupt change because of known new factors about to enter the situation. By this method, the total is derived from the sum of the parts, and it can be checked for consistency by parallel procedures. For instance, income, expenditures, and savings are separately built up from what are assumed to be relatively stable minor groups. When put together, they may not balance. The step employed here is to examine the change in relationship which has been occurring between income and various expenditures and saving. If expenditures have been growing more rapidly than income, as in 1946, the preliminary estimate of savings may have to be revised downward.

This method of putting together estimated parts of GNP truly involves comprehensive identification, measurement, and interpretation of the current situation. It is very adaptable in that changes

anticipated at any point in the economy can be directly allowed for and added in as a part of total change. Each forecast can be checked against the actual change as it occurs, and points where errors were made will stand out. Greater care, or more information, will be required at these points. The detailed group assumed to be stable in its pattern of short-term behavior may have to be broken into more detailed parts. Since the pattern of change is always varying with shifting institutions and motives, need for adjustment will constantly occur.

The method of analysis by components requires the establishment of many detailed patterns of relationship because of the difficulty of independent estimation of the various parts of GNP. The very nature of cyclical change turns around the interrelationship between the various processes in the economy. However, with adequately developed measures of interrelationship, appropriate adjustments can be made to allow for the correlated movements. With an adequate development of these relationships, advantage can be taken of the flexibility of estimating separately each of the parts in accordance with known detail. This method has been employed by the Department of Commerce, although the detailed tables used are not available.[9] It has been frequently used in crude form and appears to have great promise if carefully developed.

Another method of pattern-of-relationship which has been suggested, but perhaps not actually employed in business-cycle forecasting, is the Leontief input-output relationship tables that show the crossflow of sales and purchases between industries, distribution of raw materials by final products, distribution of manpower requirements, etc.[10] These tables describe substantially normal rather than cyclical relations, and there is reasonable doubt as to whether they would reflect short-period changes even if the enormous detail required could be measured currently and made available promptly. The amount spent by the motor vehicle industry for rubber, for instance, involves the normal consumption of rubber per car and the level of automobile sales. The first does not vary with the cycle, while the second must be predicted independently.

A method involving a system showing the interrelated flow of funds through the economy resembles in part the Leontief analysis, in that it shows the flow of payments between industries as well as all other spending units in the economy. This system represents a comprehen-

[9] See Louis J. Paradiso and Lawrence Bridge, "National Economic Activity in 1945," *Survey of Current Business*, July, 1945.

[10] Wassily Leontief, "A New Approach to the Problem of Market Analysis," *American Management Association Marketing Series*, No. 59 (1945). See further discussion of the secular application of the Leontief methods in Chapter IV.

sive statement of source and use of funds. Whether this statement should show every company or only industries is still a matter of debate. Adequately worked out, this system would spot where the fund flow is retarded or speeded up, and therefore would provide a locator to show precisely where changes are taking place. To be of value for analyzing the current outlook, the figures would have to be reported for short units of time and be promptly available. No working model has yet been perfected.[11] Even if this is successfully accomplished, it will be many years before practical application can be made on any extensive scale because of the immense statistical requirements for prompt reporting. Both this and the Leontief scheme follow through payments made in intermediate business processes, including the various stages of fabrication and distribution, as well as payments for final products; therefore, they are much more comprehensive than the distribution of GNP.

The comparative movements of the component processes of economic activity (production, shipments, inventories, and new orders) for total industry and for individual industries and at successive stages of distribution provide another comprehensive scheme. If these data were provided uniformly throughout the economy, they would furnish a basis for examining the points of inventory accumulation or "sticking points," the differences in urgency of demand, and differential changes in the rates of activity. Patterns of relationship could be developed, but there is no simple unifying principle as in the methods described above. The elements do not sum to a total, as in the GNP distribution method; no comprehensive system emerges such as that of the Leontief crossflows or the interrelated flow of funds. If danger areas arise in the processes of distribution, this method is nevertheless very effective; the processes involved are particularly pointed at the uniformity of the flow of goods to the ultimate consumer. However, except for a crude and elementary application, this scheme is not in use. Scattered, individual industry series and the Department of Commerce Industry Survey do not provide adequate information for a comprehensive application.

Another forecasting method, somewhat similar in outline to the GNP method, involves the compilation of consolidated accounting statements for an industry or for total industry. The terms used are somewhat changed from those employed in individual accounting statements. The method has been used by several economic advisory

[11] The most searching analysis of the theoretical problems involved in setting up a mechanism representing the interrelated flow of funds will be found in A. W. Marget, *The Theory of Prices* (New York: Prentice-Hall, Inc., 1942), II, pp. 319 ff. A short statement of the National Bureau of Economic Research program is contained in its *Twenty-sixth Annual Report* (1946), pp. 58–59.

services. Systems developed on this basis are not comprehensive like the distribution of GNP, unless a complete source and use of funds statement is developed, but they have the advantage of summarizing the type of thinking the enterpriser employs in examining his own business. These accounting statements permit the derivation of comprehensive accounting ratios which will show the individual-industry prospects and the need for shift in management policy more effectively than the GNP distribution. Unfortunately, adequate data are not available to employ this method effectively. The *Dun's Review* accounting ratios represent the best data of this type available. Banking data are usually employed by advisory services using this method, but such data are of uncertain significance for these purposes.

No one of these pattern-of-relationship methods can be expected by itself to provide effective forecasts in the near future. The most promising at the moment is the GNP distribution, but we have seen from the brief survey of alternate schemes that there are types of information which may have critical importance which the GNP method does not readily provide. The most promising technique of combining the GNP distribution scheme with other methods is considered in Section 4. Although the other pattern-of-relationship methods possess significant advantages, no further consideration need be given to them here; they are unlikely to be reduced to effective working models in the near future.

3. FORECASTING BY HISTORICAL COMPARISON

The Harvard Index Chart. The most famous historical-comparison method depended upon successive leads in series representing the three markets: stock, commodity, and money, as illustrated in Charts 53 and 54. This method was employed by the Brookmire Economic Service as early as 1911. After a careful study of the timing of various economic series, the Harvard Committee on Economic Research from 1918 to 1919, under the leadership of Warren M. Persons, concluded that this timing relationship could most effectively be employed in forecasting business activity.[12] Before World War I, and from 1919 to 1921, the curve of speculation uniformly led, and the money curve usually lagged behind, the commodity curve. By studying Chart 53; it will be seen that this interrelation of lags and leads provided an effective forecasting method. Unfortunately, the timing relationships have been very misleading since 1921. This has been partly due to (1) the speculative excesses in the stock market in the twenties, so that it did not vary in the previous manner; (2) the abnormal influence

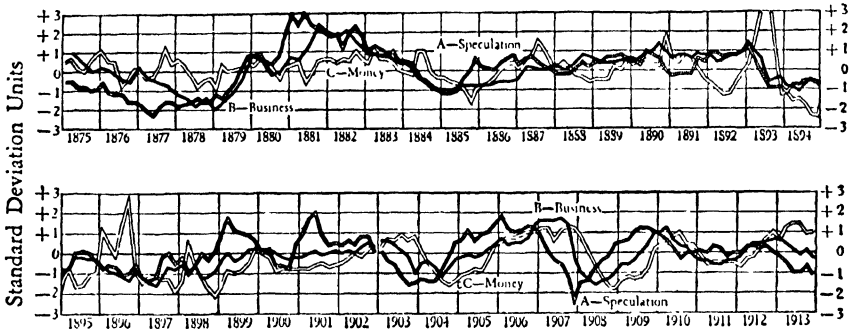
[12] See early issues of *Review of Economic Statistics* and a pamphlet by the Harvard Committee entitled *The Harvard Index of General Business Conditions: Its Interpretation*, 1923.

of large gold imports on the short-term money market in the twenties; (3) the absence of significant demand for short-term funds in the depressed thirties; and (4) the fact that the characteristic flow of funds between business and the stock market under the inelastic credit conditions existing under the National Banking System did not occur when credit supplies were not restricted by any such inelastic

CHART 53

THE PREWAR HARVARD INDEX CHART*

Adjusted indexes of (A) average stock prices and New York bank clearings, (B) wholesale commodity prices and outside bank clearings, and (C) rates on 60–90 day commercial paper: bimonthly, 1875–1902; adjusted indexes of (A) speculation, (B) business, and (C) money: bimonthly, 1903–13.



*Taken from J. L. Snider, *Business Statistics* (2d ed.; McGraw-Hill Book Co., 1932), facing page 422. Reproduced with permission.

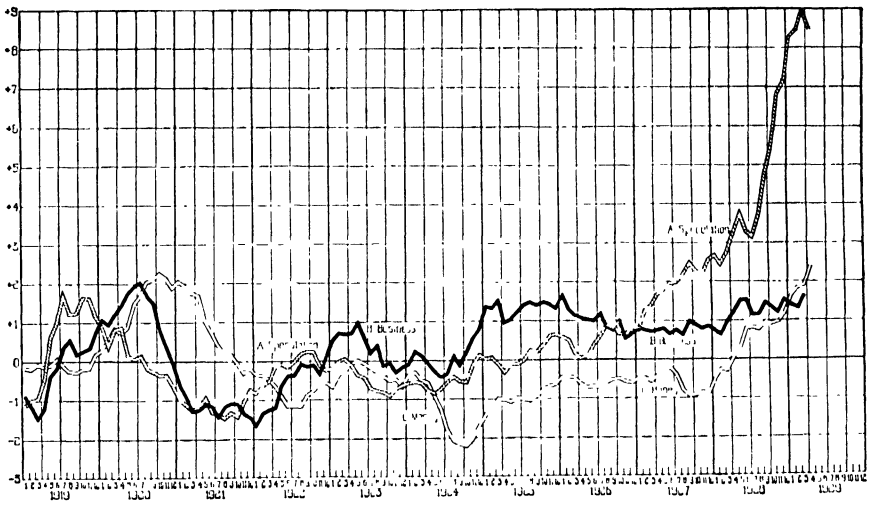
limits after the establishment of the Federal Reserve System. However, the Harvard Index Chart has not been published since 1941, and the method has fallen almost completely into disuse. It still remains true that the most characteristic timing is for the stock market to lead business activity and for money rates to lag.

The tendency for stock prices to lead has never been completely understood, but there are two major explanations. One is that business changes are foreseen by those who own or deal in stocks, and that their market operations reflect later movements in general business. This theory appears to contain at least one vital truth. Whether those dealing in stocks forecast general business or not, they have all of the vital information about the individual companies in which they typically make large investments. This information may indicate a change in profit prospects before change actually takes place in the rate of production of the individual company. A second reason sometimes given is the characteristic cyclical use of funds for commercial operations. When business drops to a low level, there is little com-

CHART 54

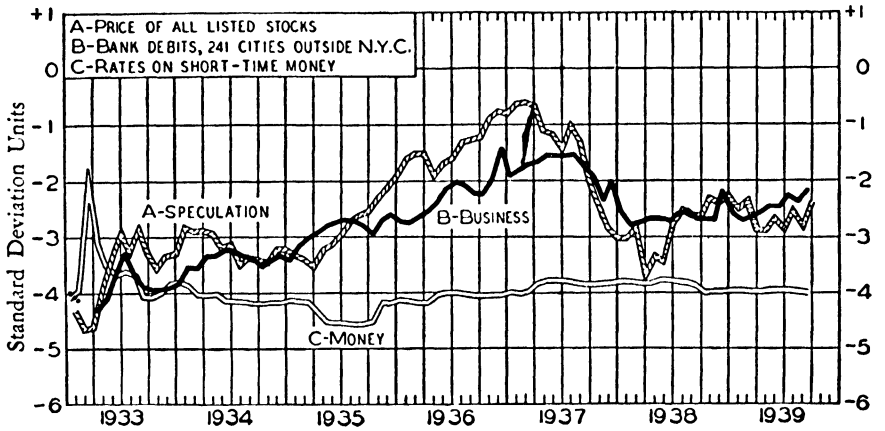
THE POSTWAR HARVARD INDEX CHART

Harvard Index Chart as Revised at the End of 1928*



* Taken from J. L. Snider, *Business Statistics* (2d ed., McGraw-Hill Book Co., 1932), p. 422. Reproduced with permission.

Harvard Index of General Economic Conditions, Monthly, January, 1933—September, 1939†



† Reproduced with permission from *Review of Economic Statistics*, XXI (November, 1939), 149.

mercial use for funds, and the funds flow to the stock market to be invested. When business rises to a high level, commercial loans increase, funds must be obtained by selling stocks, and thus stock prices are driven down. Stock prices depend fundamentally upon profit

prospects, however, and usually the amount of funds available is of secondary importance. This is much more true today than before World War I because the Federal Reserve System does not permit credit to be cut off at an inelastic limit, and commercial and speculative loans are of very minor importance relative to total bank funds.

The lag in money rates behind business is due (1) to the continued demand for credit during the period of liquidation in the commodity and stock markets following the cyclical downturn, and (2) to the sufficiency of available funds without expansion of credit at the time of the cyclical upturn.

Bond Prices. Haney has shown that the movements in bond prices have led the movements in stock prices with some consistency during the twentieth century.[13] With the possible exception of the war peak from 1916 to 1917, bond prices have invariably led general business during this period in the United States.[14] Although the characteristic lead of the bond market has been enough to be unmistakable, its length has varied so greatly that the time of the turn in business activity was not clearly indicated. Furthermore, in case of panics in the middle of depression, the bond market can be expected to make a cycle independent of business conditions. Such a situation occurred when the bond market reached a peak in September, 1931. It may be noted also that the lead of the bond market when it made a low in September, 1925, is of no real significance since business did not turn *downward* until over a year later. Bond prices reached a peak in December, 1936, prior to the 1937 downturn.

Bank Deposits. Advocates of the use of banking figures as a basis for business-cycle forecasting can always be found. The series on demand deposits is often used.[15] This series has sometimes led general business activity and is useful in that symptoms may be inferred, but mechanical use of the series is of doubtful value. A change in the level of deposits may indicate a varied range of economic developments, and it can be interpreted most intelligently if the responsible develop-

[13] See L. H. Haney, *Business Forecasting* (Boston: Ginn & Co., 1931), p. 305 for a table showing the lags at peaks and troughs of the cycles of stock prices.

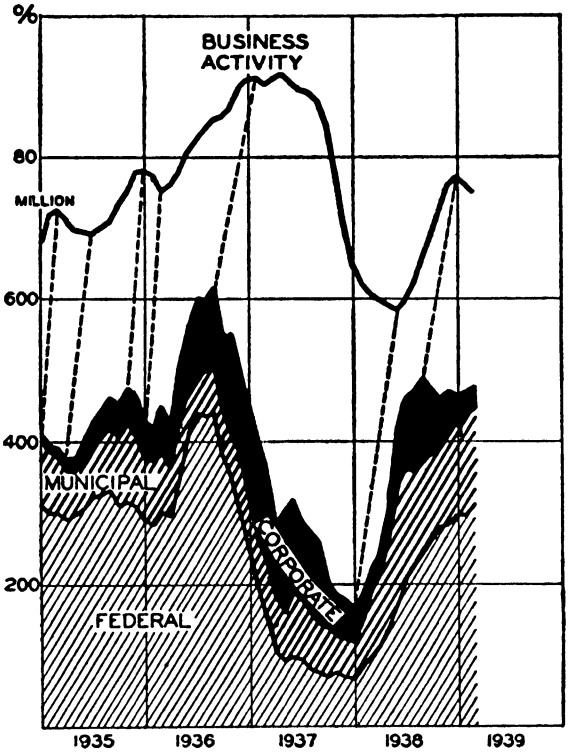
[14] The bond market reached a peak in late 1916 or in January, 1917, depending on the index used, while there is some question whether the peak of general business was in late 1916 or in the spring of 1917. It is clear that war activity might be expected to disrupt the characteristic timing of the bond market.

[15] Attention is called to the claims made by R. D. Skinner of the Skinner-Townsend Service, reproduced in Chapter XVII. For an earlier claim, see Holbrook Working, "Prices and the Quantity of Circulating Medium, 1890–1921," *Quarterly Journal of Economics*, XXXVII, 228–56. E. von Mickwitz presents the case against believing that demand deposits have forecasting significance in *Nationalokon*, III (1932), 427–34, in an article entitled "Die Bedeutung der Bankdepositen als Konjunktursymptom." Theoretically, some question arises about the lead in deposits since it is a summation series relative to bank debits.

ments are cited. If the drop of demand deposits in the spring of 1937 had been related to a preceding expansion in loans, instead of to discontinuance of special sources of purchasing power, the rational interpretation would have differed somewhat. Increases in demand deposits as a result of government spending in the thirties give the

CHART 55

AYRES'S INFLOW OF NEW FUNDS CHART*



* Reproduced with permission from the *Cleveland Trust Company Business Bulletin*, April 15, 1939.

series a different significance from that which should be attached to it when the increases result from market demand.

Inflow of New Funds. The lead in the flow of new funds in the economy was used to some extent after the 1937 downturn to forecast business conditions. Chart 55 shows a form of this measurement, developed by Ayres, which would have forecast the 1937 downturn. The effectiveness of the presentation is dependent upon the relationship between federal government excess of cash outgo and business activity during this period. Although Ayres's series does clearly lead

at the 1937 downturn, new funds provided by the federal government are not always relatively so important as they were then.

In utilizing the concept of the inflow of new funds, it is necessary that the total amount of such funds be stated precisely and developed carefully. The net contribution (plus or minus) made to such a flow by all sectors of the economy must be analyzed. The government net contribution (plus or minus), based on the relationship between expenditures on the one hand and taxes and other government receipts on the other, should include all governmental units—federal, state, county, and municipal. The analysis in Section 10 of Chapter XVI shows that the best measurement of government net contribution is not the Treasury excess of cash outgo series, partly because it covers only the federal government and partly because it is not adjusted to reflect the economic outlook; notably, business taxes are counted at the date of payment instead of at the date of liability. Rather, the best series obtainable is an adjustment of GNP government expenditures minus taxes. The net new funds (plus or minus) from the nongovernment sector in the economy are represented by the difference between consumer and business saving on the one hand and new-money corporate securities, additions to consumer credit, to bank loans, and to capital funds obtained by unincorporated businesses on the other hand.[16] The best representation of the private sector would appear to be private net capital formation, as shown by the GNP statement. The sum of the private and government inflow of new funds, measured in this way, might provide a historical-comparison forecast. However, the GNP quarterly statement has not been available long enough to cover a cyclical turn, and no empirical test is available. New funds, so conceived, by definition, equal savings. The idea of new funds has validity but would appear to be most promising as a part of a study of the GNP distribution.

Other Series Which Lead. Other major series known to lead business activity in the typical cyclical turn are residential building, automobile production, the basic commodity price index, and inverted bank failures. The first two of these are durable goods and lead because they represent derived demand as characterized in the analysis of the acceleration principle. Unlike producer durable goods which show no similar lead, they are built quickly and financed in a short period. The lead in the basic commodity price index is due to the rapid market reaction to changes in demand or supply for these goods.[17]

[16] Stated in this simplified fashion, funds invested by business out of current saving are not included in business saving.

[17] This type of index was termed a sensitive price index up to recent years, and the inferences drawn here are principally from the older indexes so termed. The most noted is

Inverted business failures show a mechanical lead at the upturn because a rise in the index, reflecting fewer failures, tends to occur whenever economic conditions begin to level off to such an extent that business failures become less important. A similar situation develops at the cyclical downturn.

In none of these series is the lead consistent, and it is shorter than in bond prices. It is useful to know that these series tend to lead, but their bellwether significance is quite limited.

In 1938 the National Bureau of Economic Research suggested a list of series for use in indicating the cyclical upturn.[18] This is the most elaborate sifting ever made of statistical series to find those which lead. Over 1,000 were studied to find those having the longest and most consistent lead for a reasonably long test period. The data were first adjusted by the National Bureau method described in Chapter IV. Since the leads in each cycle are compared with technical reference dates which are influenced by sluggishly moving series, the Federal Reserve Index of Industrial Production is found to show an average lead of three months. Since industrial production must be viewed as moving with the cyclical turns, from the point of view of analyzing the current outlook, a series must lead more than three months in the National Bureau classification to have historical-comparison significance. Only 6 of the 20 best series show an average lead of longer than one month ahead of industrial production. Of these 6, there are 4 which are duplications of the series considered above; the other 2—railroad operating income and paper production—turned, on the average, only two months ahead of industrial production. No similar study was made of cyclical downturns.

The National Bureau study illustrates most effectively the serious difficulties presented by variable-length leads and by irregularity in movement of series. The Dow-Jones Index of Industrial Stock Prices, for instance, was found to have an average lead of four months ahead of industrial production, but this varied for the 9 cycles available from a lead of fifteen months to a lag of three months. Furthermore, the cyclical turn could not be confirmed until many months afterward because of uncertainty as to whether the experience was a cyclical reversal or an irregular variation.

Amplitude Differences. The difference in amplitude between series is an essential characteristic of the business cycle, whereas timing differences are of secondary importance. As developed in earlier

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the Harvard sensitive price index, no longer currently computed. See S. J. Dennis, "The Sensitive Price Index," *Review of Economic Statistics*, XIV (February 15, 1932), 42–44.

[18] W. C. Mitchell and A. F. Burns, "Statistical Indicators of Cyclical Revivals," *National Bureau of Economic Research Bulletin*, No. 69 (May 28, 1938). Plans to extend the study have been announced.

chapters, the difference in fluctuation of durable and short-lived goods, of various prices, and of different income streams lies at the source or cause of the cyclical disturbance. The timing differences considered in this section are best described as the result or effect of the cyclical movement itself. For instance, bonds are sold in prosperity, depressing their price, because they are less desirable as investments when commodity prices rise. The rise of bond prices in depression results from their purchase to hedge against commodity price declines. The commodity price variation is part of the cycle itself. The bond price variation is indicative of what is taking place, but largely results from it.

Nevertheless, differences in amplitude appear to be even less satisfactory as a mechanical, historical-comparison device than timing differences. The area on the chart between the series showing a difference in amplitude tends to widen until the turning points are reached. Since this area represents the difference between two shifting lines, a more effective presentation to employ in mechanical forecasting is a single series showing the net differences, such as the lines relating to the net contribution of the government shown on Chart 55. The inflow of new funds series is derived from differences in amplitude, but no other important application of amplitude differences in mechanical forecasting has been made.

Critical Levels. Another historical-comparison method draws inferences on prospective cyclical reversals from the attainment of critical levels or magnitudes which cannot be greatly surpassed or long maintained. As noted in Chapter XVII, 130 in the loan-deposit percentage was once thought to represent a critical level, but this percentage is not applicable to the current banking situation. Critical levels represented an effective tool in describing the influence of banking controls on business activity when banking credit facilities approached an inelastic limit, but this is not a faithful representation of our present banking institutions.

Capacity limits can be advantageously characterized by critical levels. A relatively inelastic limit has been reached for the time being when the steel industry reaches an operating rate of 100 per cent of capacity. The supply of steel in such a situation can be increased only by diverting part of the present supply for a substantial period to the construction of new steel plants. A relatively complete employment of the labor force represents a somewhat less inelastic limit but indicates that increases cannot continue to occur much more rapidly than at a secular rate.

No similarly effective critical levels can be located at the upturn. *Support levels*, however, representing a somewhat similar concept, are

likely to become increasingly important in depression. A current illustration is provided by the government support of agricultural prices at 90 per cent of parity. Such support levels limit the range of possibilities of further decline, much as critical levels limit further increase. Neither level will forecast the cyclical movement, but both are helpful if used in conjunction with other methods.

Specific Historical Analogy. This method rests upon the finding of a cycle in past history which is sufficiently like the present one so that a forecast can be made according to the timing of events in the past cycle. Ordinarily, of course, careful comparison of any differences between the two situations will be made, but it will be difficult to give these differences weight in making the quantitative estimates. A primary difficulty with this method results from the impossibility of setting up an objective basis for deciding on the likeness to any previous cycle. Probably the same general set of originating causes is never exactly repeated, and only qualitative statements can be made regarding the extent of the similarity or dissimilarity.[19] If this method is used, emphasis should be placed on similarity or dissimilarity in the amplitude differences of the two cycles. Differences in amplitude which will throw light on the type of cyclical discrepancies are (1) overdevelopment of durable goods, (2) certain income streams showing disproportionate increase, or (3) price movements indicating abnormal dispersion.

Cycle Hypothesis. This method draws an analogy to the average cycle in the past rather than to one specific cycle.[20] An analysis is made to determine the current stage of the business cycle. The forecast is based on the assumption that the length of the current cycle phase will be comparable to that of the average cycle in the past. Because full cycles and single phases vary so widely in length, such a method cannot be expected to come close to the mark. Ordinarily, it is a useful procedure, however, in that it may raise the question why the cyclical movement is expected to be exceptionally long or short.

4. AN EFFECTIVE PROGRAM FOR BUSINESS-CYCLE FORECASTING

A program is outlined in this section which promises to produce moderately effective business-cycle forecasts. If this is true, it will

[19] The difficulty becomes clear when we examine forecasts attempted by use of specific historical analogy. A good case is the attempt to forecast the Great Depression by this method. See, for instance, W. M. Persons' forecast by use of the 1884–85 depression, *Forecasting Business Cycles* (New York: John Wiley & Sons, Inc., 1931), pp. 42–43.

[20] For a fuller discussion of this method, see C. O. Hardy and G. V. Cox, *Forecasting Business Conditions*, (New York: Macmillan Co., 1928), chap. xi.

indeed mark a distinct shift from the mediocrity of past results. A study made by G. V. Cox indicates that published business-cycle forecasts achieved a somewhat better than chance result in the twenties. In grading six well-known forecasting organizations, for the period from 1919 to 1929, he found that the monthly forecasts were right substantially more often than wrong.[21] Counting each organization forecasting a major turn as one forecast, Cox developed 46 forecasts for this period, classified as follows:

Classification	Number of cases
Helpful	14
Slightly helpful	22
Neutral	6
Slightly misleading	2
Misleading	2
Total	46

Only in the 1923 downturn did Cox find more forecasting agencies wrong than right at turning points.

No similarly careful study of the effectiveness of forecasts in the thirties is available, but the results are known to have been substantially less adequate than in the twenties. In the summer and fall of 1945, rather pessimistic forecasts, involving a cyclical downturn which did not arrive, were general.[22] Furthermore, these forecasts were made from the GNP approach, the general approach suggested in the present section. As pointed out later, however, the schemes employed were substantially less comprehensive than the one suggested below.

The belief that business-cycle forecasts can now be reasonably adequate, in the face of such an unsatisfactory showing in the past, is founded on the following considerations: (1) employment of a pattern-of-relationship framework which makes possible the tracing of the influence on total activity of any particular factor and the cross-

[21] See G. V. Cox, *An Appraisal of American Business Forecasts* (rev. ed.; Chicago: University of Chicago Press, 1930). The organizations whose forecasts were studied are (1) Babson Statistical Organization, (2) Brookmire Economic Service, (3) Harvard Economic Society, (4) Moody's Investors Service, (5) Standard Statistics Company, and (6) National City Bank of New York.

On a scale from −1 to +1, the average grade for the six organizations was +.34. S. L. Andrew and H. M. Flinn, "Appraisal of Economic Forecasts," *Journal of the American Statistical Association*, March, 1930, Supplement, pp. 36–41, grading the forecasts of 11 forecasters made during November and December from 1923 to 1928, for the ensuing year came out with an average grade of +.39.

[22] See Eric Schiff, "Employment during the Transition Period, in Prospect and Retrospect," *Review of Economic Statistics*, November, 1946; L. R. Klein, "A Post-mortem on Transition Predictions of National Product," *Journal of Political Economy*, August, 1946; "Monthly Report on Civilian Production," Civilian Production Administration, April, 1946.

checking of various assumed relationships; (2) substantially improved data which purport to measure some of the most important cyclical processes; and (3) public interest in developing any other measurements necessary to make adequate cyclical forecasts.

Step One. (Listing of Limiting and Reinforcing Forces in Parallel Columns.) This has the advantage of forcing the analyst not only to think precisely about the influence of all cyclical processes but also to realize what the cyclical changes are for which no measures exist. At this point, improvisation is necessary to fill gaps with available series in the best way possible and to devise the best procedures for obtaining direct measurements in the future. Also, some of the danger areas are made to stand out because of the shifting of processes from the reinforcing to the limiting columns, or *vice versa*, from forecast to forecast.

Step Two. (Establishing Preliminary Models of the Formation and Distribution of GNP for the Forecasted Period.) The procedure involved in this step represents the pattern-of-relationship method of forecasting. Each of the GNP components is analyzed in terms of (1) a projection of the changes that occurred from the preceding to the present quarter, and (2) its relationship to other income and expenditure components. In most cases, barring special evidence to the contrary, it is most likely that the past movement will continue to occur. Part of the problem here is to compare the net-income streams which increased or decreased GNP up to the present with the projected changes in income streams. Major relationships requiring checking involve (1) the comparison of disposable income with consumer expenditures for the total and by major groups; (2) the comparison of savings and an adjusted series on inflow of funds as outlined above; (3) numerous critical comparisons, such as net profits and total income payments to individuals, government, and private expenditures; and (4) comparison of wage and salary payments with several major economic measures. The *change* relationships are as important as the static proportions. In other words, the regression relationship between the *increase* in such a series as expenditure for consumer durable goods to the *increase* in total disposable income is as important as the regression relationship between expenditure for consumer durable goods and total disposable income. The two are not the same because a slight change in the particular type of expenditure may bring it close to the standard line of relationship with disposable income; but nearness to the standard line of relationship will shed no light on the part of increased disposable income which will be used to buy durable goods.

Each part of GNP is estimated on the basis of interrelationships between it and major GNP magnitudes—total GNP, total income

payments, disposable income, total consumer expenditures, or whatever is most appropriate in the individual case. The most appropriate relationship is to be determined logically and empirically, since conclusive evidence on all of these relationships is not yet available. In fact, the best relationships to employ may vary somewhat from time to time. With an estimate of the parts, a first preliminary model of the projected GNP and its distributed parts is obtained. This must then be checked against (1) an independent projection of major GNP magnitudes, and (2) the resulting relationships between the various GNP components. The first of these checks is necessary because various different forms of reasoning may be employed to project the parts, and they will not necessarily add up to the totals for GNP which would have been projected independently. The second check is necessary because the interrelationships employed may not all tell the same story, and compromises have to be made. Finally, the figures arrived at must be checked back to see that they do not unreasonably violate any of the past relationships. The reconciliations will result in a second projected preliminary model of GNP.

Step Three. (Checking for Comformity with Other Patterns of Relationship.) Particularly important is a study of the comparative movements of shipments, inventories, and new orders. The Department of Commerce has shown that, for a sample of stores, new orders as a percentage of sales remained almost constant from 1944 to 1946; but shipments to these stores as a percentage of new orders, and inventory accumulation as a percentage of sales, rose sharply in 1946.[23] These figures indicate that the stores were not disposing of goods as rapidly as they were accumulating them. Later, when no further accumulation is being made, the effect is certain to be felt on net expenditure for the goods involved. Such evidence does not, for the most part, flow from an analysis of the GNP distribution. Independently derived, it must now be employed to revise the preliminary GNP model. Perhaps it might be found to indicate a weakening of retail prices. If so, the preliminary projections of the value of consumer expenditures imply a greater flow of goods than will in all likelihood occur. The estimates must be re-examined to determine what this new evidence indicates regarding consumer saving. Available information may not be convincing in this respect, and, if so, resort must be had to surveys or additional current reports. No assurance can be given that without these additional steps the influence can be properly traced to the related categories of net income and expenditure. This, however, is essential for a satisfactory forecast. It is to be expected that such relationships can be learned by experience. As the reasons

[23] See *Survey of Current Business*, January, 1947, p. 4.

for error in the forecast of various detailed categories of expenditure become evident, the kind of additional information necessary to make a satisfactory forecast will become evident also.

Changing cost-price-profit relationships must be examined. If prices and profits are rising in a given area, an increase in capital expenditure should normally be expected. Increasing capital expenditure which has been related to rapidly rising profits should be watched carefully, for an unstable condition is likely to materialize.

Any disproportionate rise in processes which tend to fluctuate widely should be watched with care because it indicates an unstable condition. This does not mean that any slackening would appear likely immediately without other evidence. An upswing which has fed largely on capital expansion, however, may come to an abrupt halt when the supplies of raw materials, such as steel, are flowing at a full capacity rate. Further increases in the income streams involved can occur only with price increases.

Use of the cycle hypothesis will be helpful in forcing an explanation of the reasons for extreme variation in length of cycle phases. Such variation indicates that unusual forces are at work, and, if this is true, the reliability of past relationships may be reduced.

These paragraphs should not be taken to represent a complete list of useful checking procedures; they are merely illustrative. Further development will no doubt bring to light other procedures, and a comprehensive classification will be more appropriate at such a time.

To be useful, all evidence must be reduced to an estimated influence on some portion of net income or expenditure. By applying new evidence to the second GNP model, a third model is developed. This model represents the forecast.

Step Four. (Tracing the Effects of the Limiting and Reinforcing forces Implied in the Forecast.) It is now time to determine what the projected expenditure series mean with respect to the forces making for continued or reduced strength of the cyclical movement in progress. The most important evidence here is total GNP itself; under most circumstances GNP movement indicates whether an upswing or downswing is in progress, and its rate of change indicates the relative strength of the movement. But this broad statement is subject to many qualifications. In the process of shifting from wartime to peacetime prosperity, from September, 1945, to February, 1946, for example, GNP declined substantially without the momentum of prosperity being lost. This was due to a very special set of circumstances, however, and the continued expansion in total purchases of the private economy (consumer expenditures plus gross capital formation) clearly indicated the character of the movement.

A derivation of industrial production from the implied forecast will help in evaluating the strength of the cyclical movement. At most times there is a very close relationship between industrial production and GNP. Since the cyclical movement centers in the processes traced by industrial production, expected change in this part of the economy is very helpful in tracing the strength of the movement. If the analyst can go beyond the mechanical relationship for the period in question, can account for the expected change in industrial production in terms of the shifting expenditures for various types of consumer and capital goods, and can also account for the inventory accumulation projected in the GNP model, an effective analysis of the implication of the movement will be provided.

Step Five. (Confronting Forecasts with Actual Developments, Conducting Surveys, and Developing New Data.) The advantage of the program for forecasting which is now in the process of development is that everything which occurs can be fitted into the pattern of expected income or expenditure. Since a great many relationships will be involved, experience will help us understand which are most reliable. It is very important, therefore, that a *post mortem* be conducted on every forecast.

If existing information is not producing effective results for certain types of income and expenditure, it may be necessary to develop new series which may be expected to give better answers. For instance, in the study of consumer expenditure and saving, more detail on income distribution may be found necessary.

Where there is some promise that saving and spending plans are fairly concrete for most consumer and business units, but knowledge is lacking on the total situation, surveys may prove to be very useful. The Securities and Exchange Commission—Department of Commerce Survey on expenditures for new plant and equipment has already proved its worth in providing information on the composite plans for capital expansion in the following quarter. Such a survey is no longer in the exploratory stage but has become a part of the data employed in Step Three. At times, quick surveys may be made by public-opinion poll methods to provide special information needed in the current forecast, but principally the survey contributes information for improving later forecasts.

Forecasts must be subjected to continual revision. Such a procedure is in line with the approach of the businessman. Until he is definitely committed, he keeps his plans open to any change indicated by new developments. A most important reason for continual *reforecasting* is the constant occurrence of originating causes. The arising of such an event as a major strike must be evaluated in terms of its influence on

net-expenditure streams, and the GNP model must be adjusted accordingly. In most cases, the adjustment required will be much less than is popularly anticipated at the time, because of the tendency to overemphasize current happenings.

The most publicized, although by no means the major, use of the GNP method of forecasting is the one that was widely made in the summer and fall of 1945 in evaluating the shift expected with the end of World War II. A downswing was almost universally forecast, with unemployment expected to reach the general magnitude of 8 million. Instead, the prosperity momentum was not lost, and unemployment did not exceed 3 million. The error made in the forecast was essentially that of failing to project a sufficient rise from the abnormally low war levels in the proportion of disposable income spent. The high level of liquid savings might have been expected to indicate such a rise, but the major changes in production required to move to peacetime goods were expected to produce much greater disruption than occurred. The mistake made in this forecast must not be considered to illustrate the ineffectiveness of forecasting with the GNP pattern-of-relationship. None of the GNP models developed at the time was refined beyond a first preliminary model. In most cases, the projection depended almost entirely on the relationship between the major types of consumer expenditure and disposable income, largely ignoring other relationships such as could have been developed, for instance, from the survey on expenditure for new plant and equipment (which became available for the first time in the summer of 1945). Since consumer nondurable expenditure was at the standard line of relationship, it was incorrectly assumed that increases would not occur in that area. Such failure should add to our distrust of any one type of empirical relationship, no matter how good the cluster for a limited period. It should not, however, keep us from expecting effective results when all aspects of the outlook are evaluated in terms of their influence on net income and expenditure streams. Except for originating causes, the cyclical level of the next following period is almost entirely determined by the cumulative cyclical changes now occurring. A reasonably adequate evaluation of these cumulative cyclical changes can be made by analyzing the influence of measurable changes on income and expenditure streams, adding these up to obtain GNP, and breaking the projected GNP down in accordance with the influence the total change will have on changes in the parts.

5. FORECASTING INDIVIDUAL INDUSTRIES

The first and foremost question in forecasting the cyclical movement in any individual industry turns on the relation that the movements

in this industry bear to total industry. If a manufacturing industry is in question, and if the industry is represented by a quantity series, the index of industrial production or its component series are probably the measures with which comparison should be made. If total dollar sales represent the industry, the series should be deflated by an appropriate price index before comparison is made. GNP may provide the proper comparison if the company finds its own sales correlate more closely with total industry than they do with any individual industry.

Ordinarily, it will be better to compare the sales of a given company with activity in its particular industry and then compare the particular industry with total industry. Comparison can be made most effectively if these series are put in dispersion units (for example, standard deviation units), so that differences in violence of movement will not interfere with a visualization of the extent to which they move together. The major problems become those of accounting for the differences in movement of the three series and anticipating the extent to which such differences can be expected in the projection. It is not easy to generalize regarding methods of working out these differences; they depend on the particular industry. Fundamentally, the business cycle is a characteristic of total industry, and the differences found will show the typical reaction of the business-cycle influence on the individual industry, plus any other recurring cycle pattern in the industry, such as the two-year cycle in the textile industries.

Cases occur where there is not a close relationship between the cyclical fluctuation in total industry and in the individual industry. For instance, some branches of the agricultural equipment industry bear no close relation to total industry. The proper procedure in such cases is to regard available forecasts of total industry as of minimum importance for the particular industry and seek other analytical procedures.

The major statistical data now employed by many industry analysts to anticipate directly the cyclical movements in an industry are new-orders series and requirements of customers. New orders have frequently been applied by the historical-comparison method but with no marked success. Because of the technical meaning of new orders, they will not necessarily turn upward or downward before production, even in industries where production is in anticipation of orders. The date at which shipment is specified against the order backlog is much more important in this respect than new orders themselves.

Used in combination with production, shipments, inventory, and price, new-orders series are more promising. Used in combination, these series have major potentialities for forecasting. The market

position can be seen fairly clearly by their interrelated movements, indicating the probable movement in price for the product and throwing light on the probable movement in production. For instance, if all of these series have been increasing, but a point is reached where prices and production are advancing less rapidly, and all of the increased production is going to inventory, price weakness is to be looked for. The interrelationships between these series provide the best individual-industry information on the economic outlook.

A study of customers' requirements is useful principally in checking projections made by other methods. If shipments are to increase, it is useful to set up a reasonable pattern showing the outlets expected to take the increased quantities. Since the cyclical movement in outlets usually is no easier to forecast than in the industry in question, the method is of little independent value in forecasting. The steel industry has frequently been forecast by the indicated requirements in the outlet industries. It is easy to see that the automobile industry will take an increased quantity of steel in periods of seasonal expansion, but seasonal movements in outlet industries do not forecast the cyclical movement in the steel industry. It is as difficult to forecast the cyclical movement in the automobile industry as it is to forecast it for the steel industry.

In summary, the most promising methods of forecasting individual industries involve deriving the implied movement in the individual industry from the projection for total industry and from the relationship existing between production, shipments, inventories, price, and new orders. The projection thus obtained should be resolved into a reasonable pattern of customer requirements.

6. FORECASTING INTERMEDIATE MOVEMENTS

The short-period variation in business activity was unusually marked in the thirties. The decline in industrial production in the latter part of 1933, in the middle of 1934, and in the first half of 1940 was very impressive to businessmen. A decline for a month or two, which is widely accepted as temporary, is taken as a matter of course. But, when this type of decline stretches out over several months, and uncertainty arises as to whether or not we have entered a major downswing, the intermediate movement attains critical importance. Currently, there is less interest in whether such a decline is only intermediate or a major downswing than in anticipating when an intermediate decline will start. The businessman tends to follow about the same policy in the two cases, so differentiation is likely to appear academic to him.

The most promising basis for intermediate-movement forecasting

is a study of indicators of the forces which produce the intermediate movement. As developed earlier in the book,[24] the principal reasons for the occurrence of these movements are price variation, unusual seasonal influences, and minor originating causes. The best basis is to study current conditions to determine whether these situations are unusually influential.

The price factor may best be studied in terms of a daily index of basic commodity prices. Most of the minor variations occurring in the twenties decade were anticipated by such an index, as developed in the reference cited in the footnote.[25] Prices sensitive to market changes quickly reflect market influences. Prices did not so clearly anticipate the intermediate declines in the thirties because of anticipated government support for prices in general.

Unusual seasonal influence is not likely to become important enough to produce a significant, intermediate movement in total industry, but it is of major importance in individual industries which experience a wide seasonal variation. An unusually warm winter, for instance, substantially reduces fuel consumption. At the same time, other industries dependent upon outdoor activity may be stimulated. With the development of longer period weather forecasts, it may be possible to forecast such variations.

Originating causes have appeared to be the most important influence in the recent intermediate turns. Principally, these have been new governmental regulations and increases and decreases in government spending, either actual or planned. The importance of these forces has been discussed more fully in the history chapters. Originating causes arising from natural forces cannot be forecast, but careful analysis of public opinion and political attitudes should make it possible to anticipate, at least to some extent, the major governmental influence.

The processes affected in intermediate movements are necessarily more or less localized. Should the movement spread to all processes, the general momentum of movement will shift, and a cyclical turn will occur. The localization suggests a scheme for forecasting. If one or two processes on which the change is centering can be discovered, symptomatic series related to them should forecast the movement. The discovery of such processes may be difficult, and no general procedure can be outlined. Perhaps long experience with the problems of business change is a necessary background for making a study of the critical processes. Yet these processes stand out fairly well in

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[24] See Chapter VI, pp. 152-54.

[25] S. J. Dennis, "The Sensitive Price Index," *Review of Economic Statistics*, XIV (February 15, 1932), 42–44.

recent history. The 1933 and 1934 declines are closely related to the working of the NRA. The decline in the first half of 1940 was due to the temporary slowing-down of war activity in Europe. If short-period variations are to remain as important a factor in our economy in the future as in the period preceding the war, the most effective method of forecasting them may be the singling out of critical processes. If they are to fade to a position of minor significance, such as they have occupied in the greater part of our history, their forecast usually may be made most expeditiously by a study of sensitive price indexes and unusual seasonal movements.

Intermediate movements are much more closely related to industrial production than to GNP because many of the slow-moving processes represented in the latter will not well reflect the intermediate movements. The anticipated intermediate movements are best introduced in the GNP forecast when the changes in industrial production are related to the GNP forecast. The GNP models used in forecasting the cyclical movement do not exclude the intermediate movement, and an effort should be made to see that this movement is properly reflected in the projection.

7. EXTENT TO WHICH FORECASTING THE BUSINESS CYCLE WOULD ELIMINATE IT

Since the business cycle is the representation of an unbalanced condition and is of a relatively temporary nature, it is often taken for granted that forecasting would eliminate it. A universally accepted forecast that a stock would rise fifty dollars over a period of two years and then fall fifty dollars in two more years would, for the most part, prevent the movement.

Forecasts by private enterprisers of the type suggested as possible in this chapter would directly contribute little, if any, to a reduction of the violence of the business cycle. Except at the turning points, a forecast three to six months in advance leaves the length and extent of upswings and downswings as much in doubt as ever. When higher and higher levels of GNP are forecast on the upswing, just as many persons as ever might doubt whether a downturn ever would occur. Knowledge that a downswing will continue a few months certainly would not prevent it and might even make it more intense. The use of the forecast in setting up control measures is another matter and is considered in detail in the final chapters of this book.

An accepted forecast of a turning point might itself conceivably be responsible for a reversal in the direction of movement, as pointed out by the Council of Economic Advisers:

If the various predictors and those who look to them for guidance, progressively comparing notes, come to substantial agreement in picking the third quarter as the time, 20 per cent the magnitude, and 1 year the probable duration of the decline, and if the majority of businessmen accept this counsel as their guide to action, it can be expected that they will make about the appropriate curtailment in operations and will emerge from the storm cellar at about the appropriate moment so that the prediction will in fact prove true. It will, indeed, become the engine of its own verification. The journey into the area of restricted production, unemployment, and low purchasing power will have been completed according to schedule or even accelerated. The question, however, might be asked: "was this trip necessary?"[26]

While action induced by the prediction of accepted forecasters might produce a turn which might not otherwise occur, turns produced by such causation do not appear too important as a practical matter. In the past, most turning points were not clearly foreseen, and seldom have forecasters been in universal agreement regarding them. If enough persons are convinced a turn will occur six months hence, they may take immediate action and either produce an immediate turn or effect enough adjustments to delay it.

The influence of forecasting on the business cycle will differ according to the type of expansion or contraction under way. In a period of inventory expansion, an accepted forecast of continued expansion might make the expansion even greater; certainly, if inventory depletion is under way, an accepted forecast of a continuation of the downswing would tend to make for more rapid depletion.[27] Such influences would be much less marked in case of capital expansion because the whole transaction takes a substantially longer time than the period forecast.

A perfectly adequate forecast of the complete business cycle might eliminate it *if at the same time there was a perfect forecast of the growth in demand for various products.* As the rise and fall of the stock market might be eliminated by perfect knowledge, an adequate understanding of the shape and length of the complete business cycle about to occur might eliminate all but over- and underestimates of long-time trend

[26] Council of Economic Advisers, *First Annual Report to the President*, (Washington: Government Printing Office, December, 1946), p. 10.

[27] In this connection, a quotation from F. R. Macaulay's *Bond Yields, Interest Rates, and Stock Prices in the United States since 1856* (New York: National Bureau of Economic Research, 1938), pp. 22–23, may be of interest. If the individual "is to be personally successful in the speculative aspects of his business life, he must strive to forecast not only those occurrences of the external world that will influence his competitors but also how those competitors will react to such influences—and to their forecasts of how he and others will act. Inevitably he tends to forecast their future actions by means of their immediately preceding actions. In all his speculations he tends to 'follow the trend.' He hesitates to buy on a falling market or sell on a rising one. There is little more limit to his optimism than to his pessimism. When sugar, some years ago, went to twenty-five cents a pound at retail, housewives who had never speculated and never owned more than ten or twenty pounds of sugar began to buy it by the barrel."

movements. If the growth of a given industry is overestimated, a slackening in the rate of expansion must occur sooner or later, and this will tend to produce a cyclical downswing. Perfection in forecasting the complete cycle is, however, even farther in the future than perfection in long-time trend forecasting.

REVIEW QUESTIONS

1. Compare forecasting by the method of crosscut analysis and by the method of historical comparison with inductive and deductive methods of deriving knowledge.
2. To what uses can a forecast of business conditions a few months hence be put?
3. Will forecasting eliminate the business cycle?
4. Compare "new money" or "inflow of funds" methods of forecasting when most of the new funds come from government deficit spending with the same method when most of the new funds are generated in private savings and invested in capital expansion under the aegis of private expansion.
5. Place in parallel columns favorable and unfavorable influences in the current business situation, and star limiting influences.
6. Discuss the "critical-process" method of forecasting intermediate movements.
7. Everyday forecasting based on the implication of a cycle is interesting. Let the student reflect on the following illustrations: (1) The golfer says he has been in a slump but that his game is getting better for the time being. (2) In tossing pennies, the person says 5 tails have come up in a row, and the next toss is more than likely to result in a head. (3) In playing bridge, a person says that his cards have been bad all evening but that shortly the distribution should begin to shift to his favor. (4) After several days of intense heat, a person says that the weather is likely to become more temperate soon. (5) A favorable or unfavorable incident is often met with the comment "it never rains but it pours." Classify these cases according to the extent to which cyclical forecasting is justified, and discuss the extent to which the classification depends on independence of successive events or on some other principle.
8. Compare the "GNP pattern-of-relationship" method of forecasting with the "source-and-use-of-funds" method.
9. Why is the "Harvard-index-chart" method of forecasting no longer used?
10. Can the steel industry be forecast by building up forecasts of the outlet industries?

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CHAPTER XIX

FORECASTING STOCK AND COMMODITY PRICES

IN THIS book we have considered the strategy of forecasting the three fundamental types of economic change: seasonal variation, long-time trend, and business-cycle fluctuation.[1] There are two subsidiary economic processes for which forecasts are frequently attempted, namely, agricultural-commodity prices and common-stock prices. A brief statement of the current status of the forecasting of these price series is presented in the two following sections.

1. THE FORECASTING OF AGRICULTURAL-COMMODITY PRICES

In so far as the short-time changes of the prices of industrial products are predictable, the forecast can be derived most expeditiously from a forecast of the quantity of production in the industry. Business-cycle changes in the price of manufactured goods are positively correlated with business-cycle changes in the quantity of production.[2]

The forecasting of agricultural-commodity prices is, to an important degree, unrelated to the forecasting of business-cycle changes. There are two general types of agricultural-commodity price forecasts. One type is a forecast of prices of agricultural commodities *before* the crop is harvested. The other is a forecast of prices of agricultural commodities *after* the crop is harvested. The second, and simpler, is the only one which will be considered here. The forecasting of agricultural prices before the crop is harvested involves the same problems as the forecasting after harvest; in addition, however, it is necessary to forecast the amount of the commodity which will be harvested. Forecasting the amount of the harvest depends principally upon a forecast of the weather.[3]

After the crop is harvested, the principal factors determining the

[1] See Chapters II, III, and XVIII, respectively.

[2] With regard to the forecasting of the prices of manufactured goods, see particularly E. W. Pettee, "Short-Term Price Forecasting, 1920–29," *Journal of Business of the University of Chicago*, IX (July, 1936), 280–300; and "The Three Approaches to the Problem of Price Prediction," *ibid.*, (October, 1936), 347–67.

[3] For some consideration of the elaborate methods used for this purpose by the Department of Agriculture, see "Crop and Livestock Reporting," by W. F. Callander, printed in J. L. Snider, *Business Statistics* (2d ed.; New York: McGraw-Hill Book Co., 1932), pp. 214–19.

change in the price of agricultural commodities during the following few months are usually known. The change in price for this limited period is principally the result of the interaction of demand for the product which has existed in the recent past and the relatively fixed supply. To determine the probable price, therefore, the general technique necessary is to plot price-supply relationships. Chart 56 illustrates the method using price on the Y-axis and supply on the X-axis. The paired price and supply figures for past years are then plotted. By some mathematical technique, or by freehand methods, a line is fitted to the resulting points. To determine the probable average price for the next succeeding period, it is necessary to estimate the total supply of the commodity available (it should be noted that the total supply is the current production plus carry-over from the preceding year) and to find the point on the price axis which such a supply will locate when the line of relationship is used.

In actual practice, many refinements on this technique are required. Quantity must be adjusted for the trend of consumption (resulting, in the case of most agricultural products, principally from changes in the population and from changes in consumption habits). Quantity should also be adjusted for any variation in quality of the product.[4] For many commodities, there is a seasonal variation in price while the commodities are drawn from inventory, so that the average price determined must be adjusted for expected seasonal changes.[5]

Although the principal factors determining price are known at harvest, one that is not known is business-cycle changes. For most products, the changes in business conditions are adequately shown, for this purpose, by the changes in the general average of wholesale prices. The agricultural-commodity prices used in the charts showing price-supply relationships ordinarily are deflated by general wholesale prices. At most times, the change in general wholesale prices will be relatively slight in the period of a few months. Forecasting the price of agricultural commodities is more or less independent of business-cycle forecasting.

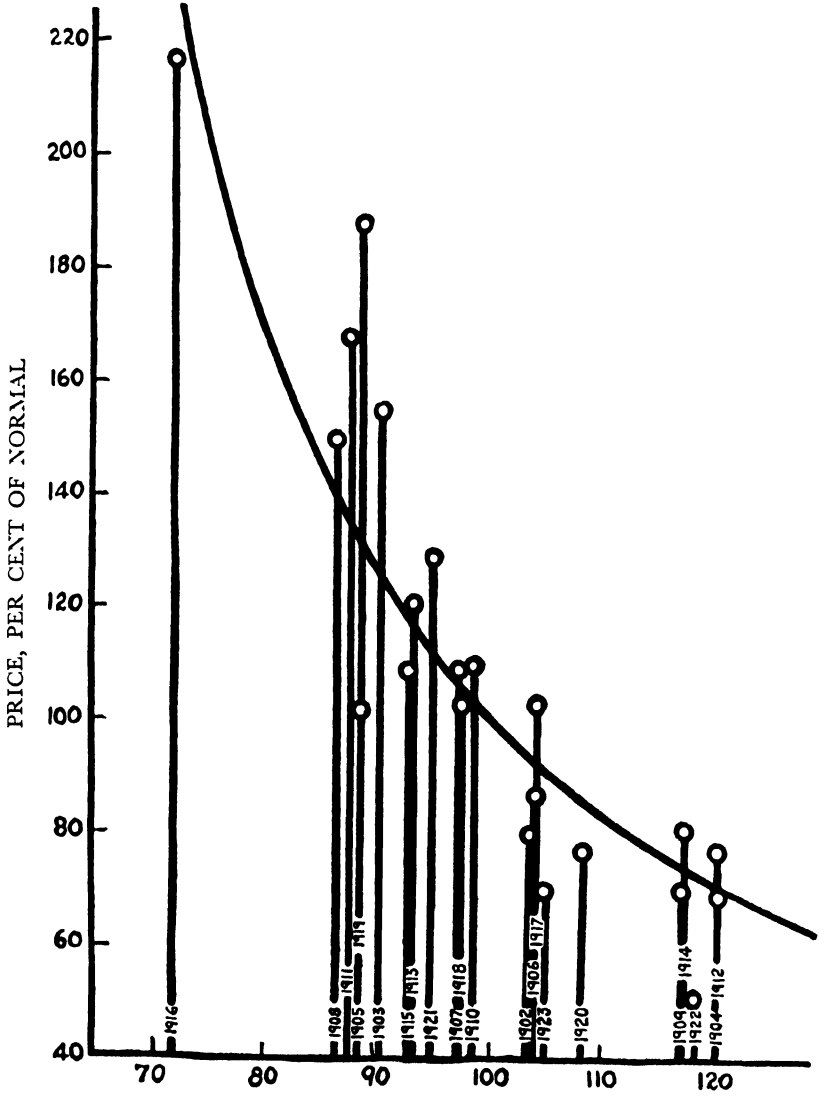
The price forecast, based upon the supply available when the har-

[4] The adjustment for trend of consumption is simple, once normal consumption is determined, involving merely the computation of the per cent of normal. Allowance for a change in quality is much more difficult. It is difficult to measure in the case of some products, as e.g., in potatoes. The change may be the result of a variation in crop conditions in different parts of the country, as e.g., in 1931 there was a large crop of winter wheat, but a small crop of spring wheat. Since a certain quantity of Durum wheat is required in milling, the price of Durum wheat did not drop, while the price of winter wheat dropped markedly.

[5] An excellent illustration of analysis of such seasonal changes is given in Holbrook Working's "Factors Affecting the Price of Minnesota Potatoes," *University of Minnesota Agricultural Experiment Station Technical Bulletin*, No. 29 (October, 1925).

CHART 56

RELATION OF PRODUCTION AND PRICE OF POTATOES*



* Holbrook Working, "Factors Affecting the Price of Potatoes," *University of Minnesota Agricultural Experiment Station Technical Bulletin*, No. 29. Reproduced with permission.

vest has been completed, is useful only until something is definitely known about the following year's crop. Ordinarily, this information is not available for several months after harvest, but there are cases when something is known earlier than usual about the probable size

of the following year's crop. Unusual weather conditions, for instance, will forecast a good or poor crop.

Several individuals have shown that the price forecasts of most agricultural commodities (after harvest) are quite accurate.[6] The price forecasts of wheat are probably less accurate than those of most agricultural commodities, however, because important additional supply becomes available through most of the year.[7] The raising of wheat is well distributed through the various latitudes. As long as the wheat raised in a country is all consumed locally, the effect on the world price of a variation in the crop is much less than when the country normally has a sizable export surplus.[8]

Because of annual harvesting of crops, some forecasts of the purchases of the farmer during the following year are made possible after the amount of the harvest is known and after some estimate has been made of the price at which the crop will sell. An illustration is provided by the forecasting of the purchase of fertilizer by southern farmers with data on estimated gross money income from cotton crops.[9] Similarly, the size of the sales of farm machinery seems to be related largely to the gross income from crops harvested the preceding year.[10]

The social usefulness of forecasting the price of agricultural commodities is quite obvious. Such forecasts tend to prevent the wide variation in the price of agricultural commodities which might take place if buyers and sellers were less well informed. The extent to which the better information leads to a more stable price depends, of course, upon the extent to which the improved information is well disseminated among all buyers and sellers of agricultural commodities.

2. THE FORECASTING OF COMMON-STOCK PRICES

There are three general types of movement in stock prices. These are long-time trend, business-cycle, and technical movements.

[6] See R. M. Green, "Batting Averages in Agricultural Forecasting," *Journal of Farm Economics*, VIII, 174–93; O. C. Stine, "Progress in Price Analysis and an Appraisal of Success in Price Forecasting," *Journal of Farm Economics*, XI, 128–40.

[7] Some analysis of past exportable surpluses of wheat in various countries will be found in *Wheat Studies*, Food Research Institute, Stanford University. On the forecasting of wheat prices see further, Holbrook Working, "Forecasting the Price of Wheat," *Journal of Farm Economics*, IX, 273–87.

[8] See Food Research Institute, *Wheat Studies*, Vol. VI, No. 10.

[9] A chart demonstrating the high relationship between gross income from cotton and cottonseed and farm expenditures for fertilizer by farmers in cotton states will be found in J. L. Snider's *Business Statistics* (1st ed.; New York: McGraw-Hill Book Co.), p. 110.

[10] For a study of forecasting the sales of farm machinery, see O. S. Powell, "Forecasting Farm Tractor Sales in North Dakota," *Journal of the American Statistical Association*, Vol. XXIV (March, 1929), Supplement.

The long-time trend of stock prices is essentially a fortuitous movement, and thus it differs fundamentally from the secular trend growth of the physical product of industries discussed in Chapter III. A long-time trend movement in stock prices results to some extent from secondary trends and long-price swings, which are largely unpredictable. Shifts in capitalization also play a part. The larger the part of the capitalization accounted for by stocks, the less rapid is the long-time trend increase in stock prices likely to be. The structural level of stock prices is shifted adventitiously by such factors as split-ups or stock dividends.[11]

The forecasting of the business-cycle movement in the stock market is closely related to the forecasting of the business cycle in economic activity and is, therefore, subject to some of the same limitations. Stock prices move with the business cycle because the price of stocks rests essentially upon the profits made, and, obviously, profits customarily are positively correlated with the business-cycle movement. For a given phase of a business cycle, stock prices might move differently from the business cycle. An unwonted proportion of profits may be paid out in dividends, unusual financial strength may be exhibited by major corporations, or there may be an unusual supply of funds (with unusual interest rates). Commodity prices exert a major influence on stock values. If commodity prices and business activity show some divergence, as they may do for short periods after major wars, stock prices may move with commodity prices rather than business activity. For instance, in 1945 and 1946, stock prices moved more closely with commodity prices than they did with GNP or industrial production.

As pointed out in Chapter XVIII, typically the stock market slightly leads the business cycle in economic activity. A forecast of industrial activity may, therefore, be too late to forecast the stock market. Haney has set up indicators for use in determining whether the market is reaching a peak or trough in the cyclical movement.[12] (1) The price of stocks moves oppositely to the price of bonds. (2) Time money rates are far out of line with bond yields. (3) Business activity is cyclically high or low, and sometimes the stock market is discounting an improbable further upward or downward movement in business activity. Controls likely to be placed on money rates and bond prices in near-future years make these indicators of doubtful significance at the present time.

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[11] The most comprehensive analysis of the long-time trend of stock prices available will be found in Alfred Cowles 3d, and Associates, *Common-Stock Indexes 1871–1937* (Bloomington, Ind.: Principia Press, 1938).

[12] L. H. Haney, *Business Forecasting* (New York: Ginn & Co., 1931), pp. 301 ff.

Since stock prices tend to move most rapidly in the early part of the upswing or downswing, a trailing[13] moving average is useful in studying the cyclical movements. A slowing-down of trailing moving averages, therefore, is of some help in indicating the approach of peaks or bottoms. Obviously, the length of the moving average used is of significance in determining the point of slowing-down, but the writer knows of no adequate determination of the length of the moving average which should be employed. It appears, however, that a moving average of almost any plausible length will usually give some rough indication, which is about all that one can hope to attain by this method.

The technical fluctuations in the stock market are of shorter duration than the business-cycle movement. These short movements are roughly of a cyclical character, but they are not periodic. They are correctly called a "speculators' fluctuation." They arise from the speculative nature of stock-market trading and from the nature of the pricing process in this market. Because of the speculative characteristics of the market, there arises a large amount of trading which is based not upon the long-term economic value of the stock but upon the expected action of other buyers and sellers of stock.

The longest of the technical fluctuations in the stock market usually lasts from 3 to 9 months. These are of far more general interest than any shorter technical fluctuation. They are typically called secondary or intermediate movements. Their essential characteristic is that of a spontaneous rally in a declining or "bear" market, or of a spontaneous reaction in a rising or "bull" market. It should be kept in mind that, except for differences in timing, declining markets occur during the downswing in general business activity, and rising markets during the upswing in general business activity.

Stated in the simplest language, in a declining market, sellers sell until selling is overdone (until it becomes clear that stock prices have overdiscounted the prospective decline in economic conditions, and/or short sellers are in a weak financial position); in a rising market, buyers buy until buying is overdone (until it becomes clear that stock prices have overdiscounted the prospective improvement in economic conditions and/or buyers on margin are in a weak financial position). This type of movement appears to be characteristic of human nature operating in such a market. In a declining market, traders are relatively sure prices are going to continue to decline for some time. This belief is well founded on the cyclical nature of business. The self-generating forces operating in the business cycle produce a downward

[13] By "trailing" is meant that the moving average is not centered in time but placed at the date of the most recent figure available.

movement in business activity in the phase of decline which takes several months to work itself out. The fact that declining markets usually last for some time is not based on any logical conclusion regarding the cyclical movement but on past experience. But, if the market is going to continue to decline, why hold stocks at present prices? It would be better to sell and buy back when prices are lower. A general tendency to sell continues for this reason until it becomes obvious that stocks have gone too low. How else, one may ask, will the anticipation of lower prices disappear?

An oversold condition will ordinarily appear long before the end of a bear market. A market rally results. If there are no clear signs that the declining market is over, the rally feeds purely on spontaneous forces of the oversold market—those forces arising when prices become obviously too low as described in the preceding paragraph. Often short selling has played an important role. Once the spontaneous forces are spent, the market decline is restored. As a matter of experience, during a rally the market has typically regained from one-third to two-thirds of the price decline from the peak of the preceding rally, although it is not possible to give a logical explanation for these limits with currently available information.

The explanation of the reaction during a bull market is analogous to the explanation of the rally during a declining market. Traders can be sure that the general upward movement of stock prices will continue for some time. Under such conditions, a rational basis for selling stocks at anything but increasing prices exists only after it is obvious that prospective improvement has been overdiscounted and/or buyers on margin are in a weak financial position. When this situation arises, stock prices must decline, producing a reaction in the rising market. As is similarly true of rallies, in most reactions the market has lost from one-third to two-thirds of the price rise from the nadir of the preceding reaction. Since, at most times, we are either in a rising or in a declining market, the intermediate market movement is a commonly present characteristic.

It has often been noted that the stock market frequently is currently moving in a direction opposite to the movement in general business conditions. The chief reason for this difference in movement is the intermediate movement in the stock market. In an upswing, business conditions may be improving at an unprecedented rate, but the price of stocks may be declining because the market may have become technically overbought. A similar statement can be made regarding a downswing. Great wonder seems to be excited when business conditions temporarily turn downward in an upswing, or upward in a downswing, and stock prices fail to follow. Whether stock prices will

make a similar intermediate movement depends largely upon the technical condition of the market. Intermediate market movements are not independent of business conditions and prospects; on the contrary, a reaction or a rally is frequently initiated by some exceptional news, if the technical condition of the market is appropriate for a reaction or a rally. When a spontaneous reaction or rally begins, however, it would take unusual news indeed to change the direction of the market until the corrective movement has fairly well run its course. After a reaction or a rally has run its course, the market is virtually certain to resume the general direction of movement, unless it appears probable that a change in the cyclical direction of general business is about to occur.

The intermediate stock-market movement thus explains many of the divergences between the movement of stock prices and general business conditions. The intermediate movement exhibits certain regularities, especially in the proportionate extent of a rally or a reaction. Nevertheless, no facile scheme for forecasting the stock market is thus provided. Intermediate movements do not last any stated length of time, so we never know just when a rally or a reaction will take place. What has been called "trading with the trend"[14] appears to be the only important forecasting principle which can be derived. When the market starts moving in one direction, it is likely to continue in this direction for a limited time.

The most important scheme which has been developed for forecasting the stock market is embodied in the "Dow theory."[15] The essential proposition involved is that if the market prices reach levels measurably above or below those which have been attained for a considerable time, the market will continue on upward or on downward for an indefinite time. Although this rule has been by no means invariable, it has been correct in a majority of the cases. It is not difficult to understand the fundamental truth involved. A rising market is founded on a phase of cyclical upswing. Stock prices move upward until they are obviously too high, and then a reaction sets in. If a reaction is looked for, buyers are likely to be cautious. Cautious buyers are not likely to pay higher prices than any which have been paid recently. The market attains new high levels, therefore, only

[14] This terminology is taken from William Dunnigan, "Trading with the Trend," a mimeographed publication, copyrighted in 1934.

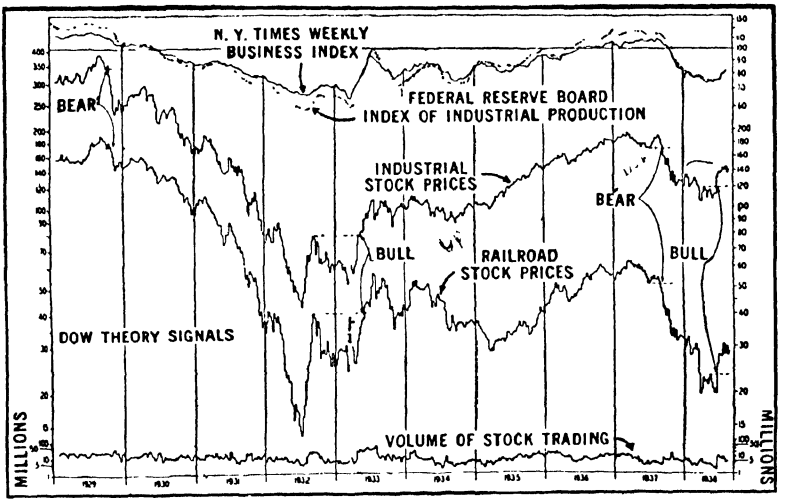
[15] For a more complete exposition of this theory, see Robert Rhea, *The Dow Theory* (New York: Simon & Schuster, 1938). In addition to the proposition made in the text, the Dow theory is sometimes thought to involve "confirmation" of one average by another, in the sense that both must move into a new high or new low ground. Industrial stocks and railroad stocks were formerly used for this purpose, but some persons now replace the railroad average with an index of public utility stocks.

when it is clear that the market is technically strong. But the very nature of a rising market is to move upward except during periods of reaction. Hence, once prices move above previous high levels there is a good chance that they will continue to move upward. Similarly, new low prices indicate still lower prices. It must be borne in mind,

CHART 57

Dow Theory Signals*

As Interpreted by H. M. Gartley, Inc.



* Taken, with permission, from "Forecasting Business," *Fortune*, Vol. XVIII (October, 1938).

however, that the Dow theory applies to new high or low prices which are attained only after considerable hesitancy. Once the movement into new high or low ground gets under way, a reaction or rally can be expected in due time.

A large number of maxims have been used for forecasting the stock market. A selected list of situations often accepted as indicating higher stock prices is as follows:

1. Lows to which average stock prices drop become successively higher
2. Stock prices move above trailing moving averages
3. Stock prices move up with increasing volume of trading
4. Volume of trading increases when stock prices are moving up but decreases when stock prices are moving down
5. With heavy volume of trading in a declining stock market, the relative additional decline in stock prices is slight

The situations taken to indicate a decline in prices are analogous.

Similar maxims used for forecasting the price of average, or indi-

vidual, stocks have been dramatized by "chart readers." A few may be mentioned. Upper "resistance levels" which will tend to be broken through are indicated when the price of a stock just reaches a horizontal in its upward movement, but the lows to which it drops become successively higher. "Narrow triangles" are defined as a price fluctuation which steadily converges from above and below to a horizontal line, although the relative width of the fluctuation was not great to begin with. They are usually taken as indicating a continuation of the general movement under way. In the case of "wide triangles," the fluctuation is relatively great at the start, and it converges to a horizontal line from above and below. The wide triangle ordinarily is accepted to indicate a reversal of the movement.

A few stock-market maxims appear to state characteristic market behavior, but undoubtedly the large majority of them are pure balderdash. By far the most careful testing which has been made of them to date is that by William Dunnigan.[16] Dunnigan has made careful comparisons between the maxims and empirical evidence. Borrowing from his evidence, the writer believes that the five maxims listed above as indicating higher stock prices have given correct indications in the majority of the market situations of the past.

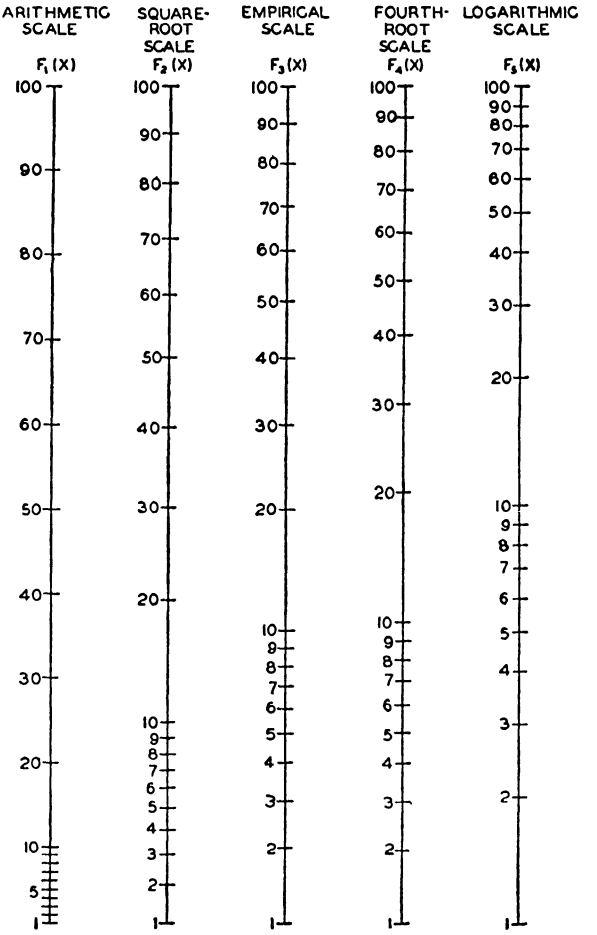
Before we can make anything but tentative conclusions, however, much more far-reaching research must be made of stock-market maxims. Their testing would be facilitated if a better basis were had for making comparisons between changes in prices and volume of trading at markedly different levels. For instance, how much of a change in price in a low-priced stock is comparable to a point change in a high-priced stock; or how much of a change in price in the stock-market averages in 1932 is comparable to a point change in 1929? It has long been known that a point change does not have the same significance at different levels. The earliest alternative suggestion seems to have been that a proportionate change is comparable, but this suggestion has been discovered to be incorrect. (It is well known that a stock will rise from 1 to 2 much more readily than from 100 to 200.) It has been suggested that a square-root scale (which implies a fluctuation in between that of the absolute scale and the ratio scale) would produce fluctuations readily comparable at different levels.[17] A square-root scale would, for example, assume a change in price from 4 to 9 to be comparable to a change in price from 144 to

[16] See his *101 Forecasting Rules for the Trader and Investor* (privately published, 1933); and *Summary of Today's Forecasts* (Chicago: The Institute of Forecasting, 1936). A summary statement of a larger number of stock-market maxims will be found in these references.

[17] For a valuable statement of the meaning and common use of the square-root scale with references, see D. W. Ellsworth, "The Use and Abuse of the Square-Root Scale for Charting Stock Prices," *The Annalist*, December 23, 1932.

CHART 58

SCALES FOR EQUALIZING AMPLITUDES AT DIFFERENT LEVELS*



* Reproduced by permission from John H. Smith, "Constant-Amplitude Scales for Plotting Stock Prices," *Econometrica*, XIV (October, 1946), 316–19.

169 (because the square root of 9 minus the square root of 4 equals the square root of 169 minus the square root of 144). It will be seen that the proportionate change from 144 to 169 is far less than the proportionate change from 4 to 9. Von Szeliski has shown that the scale which will make comparable fluctuations at different levels is probably somewhere between a square-root scale and a ratio scale.[18]

[18] Victor S. von Szeliski, "The Statistical Analysis of Stock Prices," *Econometrica*, III (October, 1935), 435–55.

The empirical scale shown on Chart 58 was developed by Theodore Yntema in comparing stock prices in four weeks of the early thirties.[19] The statistical problem is the determination of the proper nth-root scale; the ratio scale is approached as n is made indefinitely large. Such schemes for making comparable the fluctuations of the market at different levels do not directly provide a stock-market forecast, but they do provide tools whereby we can test stock-market maxims much more adequately. Adequate use of such tools awaits the future, however.

According to the best-informed opinion, there exist in the stock market technical fluctuations of various lengths, shorter than the intermediate movement, which have the characteristic nature of the intermediate movement. However, not enough painstaking analysis of such shorter fluctuations has been made in a scientific fashion to provide even tentative conclusions.

From checks of stock-market forecasts which have been made, it can be tentatively concluded that, in general, published stock-market forecasts have been wrong as often as right.[20]

REVIEW QUESTIONS

1. For what type of prices is the demand curve, studied in theoretical economics, useful for forecasting the changes in the near future? Can the demand curve be applied directly for such forecasting?
2. How adequately have forecasts of agricultural prices been made after the size of the crop was known?
3. What is a promising method of forecasting the following year's purchase of farm machinery?
4. In setting up the statistical basis for forecasting any agricultural commodity price after harvest, state the adjustments which should be made to the figures on the quantity of the product and to the figures on the price of the product.
5. Explain why stock prices may move up for a month or two while business conditions are steadily growing worse.
6. What relation is there between resistance levels and the Dow theory?
7. Explain the use of trailing moving averages in forecasting stock prices.
8. Do you see any logical reason why stock prices should rise if they drop to lows which are successively higher?
9. Why do not stock prices decline continuously in a bear market?
10. Compare amplitudes of movement when the second- and fourth-root scales move through different price levels.

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[19] See John H. Smith, "Constant-Amplitude Scales for Plotting Stock Prices," *Econometrica*, XIV (October, 1946), 316–19.

[20] See Alfred Cowles, 3d, "Can Stock Market Forecasters Forecast?" *Econometrica*, I (July, 1933), 309–24; S. L. Andrew and H. M. Flinn, "Appraisal of Economic Forecasts," *Journal of the American Statistical Association*, Vol. XXV (March, 1930), Supplement.

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CHAPTER XX

STABILIZATION PROPOSALS

THIS and the following chapter evaluate the major proposals for ironing out the business cycle and the secondary trend. So many proposals have been made that all cannot be covered; only the most widely advocated and the most promising measures are chosen for consideration. The final chapter outlines what the author believes to be the most promising stabilization program, including some of the proposals considered in this and the succeeding chapters. This proposed program is believed to be in line with the best thought on the subject; few, if any, authorities hold that a panacea can be found. As stated by the Council of Economic Advisers "why limit ourselves to a single remedy . . . when we can muster a set of remedies fitted to the whole range of particular situations?"[1]

The stabilization proposals with which we deal in these chapters involve the use of forecasts and analyses of secular trends, because stabilization at or near the secular trend level is the same as ironing out the business cycle and secondary trend. Seasonal stabilization is for the most part a separate problem, and it is analyzed in Chapter II rather than here.

Control measures proposed to stabilize the business cycle and the secondary trend may be divided into the following classification, proceeding from measures involving less to those involving more government regulation and control of the private economy:

1. Measures designed to adjust for cosmic forces
2. Nonmonetary measures proposed to adjust and improve business practices
3. Monetary-policy measures
4. Fiscal-policy measures
5. Direct government intervention, control, and operation of the economy

1. CRITERIA FOR JUDGING STABILIZATION PROPOSALS

One criterion for judging the effectiveness of a control measure is the direct effect which can be conservatively expected. The direct effect is always appraised, but at times a satisfactory judgment of its

[1] Council of Economic Advisers, *First Annual Report to the President* (Washington: Government Printing Office, December, 1946).

significance may be difficult. There are two other significant criteria for judging proposals: (1) the derived effects, and (2) the timing required.

The derived effects ordinarily are of more importance than the direct effect, but it is more difficult to appraise their importance. The highly interrelated character of all economic activity is responsible for the fact that a force introduced at one point in the system sets up repercussions even at very remote points. The extent to which derived effects are customarily overlooked is surprising. Very often with an elaborate analysis of the direct effect there will appear no consideration whatever of the derived effects. Probable derived effects must be watched with great care.

The aggregate sum of the derived effects of any control measure will always form what the mathematician calls a converging series rather than a diverging series; that is, the sum of these derived effects will be finite. A physical world analogy to the derived effects is the successive series of ripples set up in a pond by dropping a stone into the water. Derived effects of control measures seem, however, to defy the rigidity and oversimplification required to force a statement of them into a practicable mathematical function. An extremely large ripple, to carry out our analogy, may be created at some distant point because of a particularly obscure relationship.

Timing is the essence of many control measures. If the measure is instituted at a time when reinforcing forces are so strong as to overpower its influence, carrying it out may merely prolong the phase. For instance, the control measure might have the effect of slowing down the rate of inventory depletion but not be strong enough to prevent a slow reduction of inventories. In the downswing, the effect may be merely to freeze, for the time being, situations which require correction before recovery can proceed. In the upswing, a control measure introduced at the right point may prevent overexpansion, which otherwise might take place, and thereby prolong prosperity. If the measure is introduced at a time when the reinforcing forces just about balance the limiting forces, it may easily control the direction of the movement. In this way, either the upswing or the downswing may be cut short a few months by the introduction at the right time of a factor of small proportionate influence. Similarly, it might seem theoretically possible to prolong either phase almost indefinitely. It must be remembered, however, that time itself calls into play powerful limiting forces which may ultimately defeat such a prolongation.

Since no single control measure is likely to be of much consequence by itself, the most important of all bases of judgment is how the measure fits into an integrated control plan. The way various pro-

posals may be fitted into a comprehensive control plan is considered in Chapter XXII.

2. MEASURES DESIGNED TO ADJUST FOR COSMIC FORCES

There have been times in our country's history when the business cycle was attributed to forces arising in the physical universe. Weather was advanced to explain the business cycle at various times in the period from the 1870's to World War I. Since the weather was something about which it was believed nothing could be done, the advocates of this explanation also thought of the business cycle as intractable.

Many of the early weather theories traced the ultimate cause to sunspots. These theories now appear to be wrong in that the weather apparently is not closely related to sunspot variation; on the other hand, it has been found that close functional relationships between sunspots and economic activity in the United States do hold for a considerable period.[2] Sunspots have therefore come to attract some attention as the cause of the business cycle. However, attention has been given almost entirely to establishing the relationship; serious proposals for control have not been made. If sunspots are the cause, and if it is possible to isolate the mechanism through which they exert their influence, it is conceivable that offsetting measures might be employed. If the sunspots vary the ultraviolet ray absorption, and this variation in some way causes the business cycle, all that is needed is a judicious use of ultraviolet ray lamps. If forces in the physical universe are to be considered seriously as the basic causes of the business cycle, such a proposal may be of some importance. However, no further attention will be given to this line of thought here because no mechanisms have been worked out, and the predominant opinion at the present time does not favor causation from the physical universe.

Brief note, however, may be made of the problem of agricultural planning. The weather is involved in this problem because per-acre yields, which vary with the weather, are the principal determinant of agricultural output. The farmers' economic position is also significantly influenced by the level of industrial output because farm prices vary directly with it. The control measures for agricultural stabilization usually are directed at the stabilization of agricultural prices. The crudest and least effective proposal is a price floor. A similar proposal calls for "parity prices" which would keep the prices of farm products at the same level relative to prices paid by farmers as they were in the period from 1910 to 1914. The keeping of prices at any

[2] See Chapter VII, Section 1, and the references there cited.

such relative level must involve subsidies, acreage control, or stock-piling of farm commodities. These measures would probably produce a more effective measure of stabilization if not tied to parity prices at all. The problems involved in subsidy payments and stock-piling are later considered at length. Acreage reduction is either tied to them or to measures which relate to the conservation of resources and secular growth, such as irrigation, flood control, and relocation of agricultural populations, rather than to business stabilization.

The most promising method of keeping weather variation in its influence on agricultural output from greatly disrupting the market for industrial products in agricultural areas is crop insurance. If well developed, crop insurance could bring the farmer a more even flow of income; but, as yet, such insurance has not been put on a very workable basis.[3]

3. NONMONETARY MEASURES PROPOSED TO ADJUST AND IMPROVE BUSINESS PRACTICES

We will consider in this section measures proposed to stabilize the business cycle by adjusting and improving business practices. Until World War I, it was assumed that the efforts of the government should be devoted solely to steps which would permit the business community to stabilize the level of economic activity. Such a position is less common today and part of the control measures considered in this section, as well as in subsequent sections, involve stabilizing measures introduced by the government.

Price Cutting. Price cutting as a control measure refers to the use of price reductions on the part of the business community during the downswing of the business cycle to induce customers to purchase goods and services which are relatively unattractive at higher-price levels. It is an effort to lower prices in order to prevent substantial cyclical declines in output and employment. Price cutting is not usually practiced by the business community and, when practiced, seldom appears to have a stabilizing effect.

This experience contrasts strikingly with the theory that the business community should pattern its behavior after that of the farmer, who does not vary his output from prosperity to depression, whereas the market for farm products is cleared by price variation. There is a fundamental difference between agriculture and industry in this respect, however, for the business cycle originates in industry and is superimposed on agriculture. Agricultural prices are described by

[3] For a short survey of the problems of stabilizing the interrelations between agriculture and industry, see T. W. Schultz, *Agriculture in an Unstable Economy* (New York: McGraw-Hill Book Co., 1945).

the static demand curve relationship, while industrial prices represent positions on successive demand curves.[4] The theory that price variation will substitute for output variation in industrial products is founded, explicitly or implicitly, on the static demand curve of price varying with the quantity put up for sale. This curve is descriptive of the demand situation in industrial as well as agricultural commodities at any *moment of time* but not, in the case of industrial products, *over time*. The clearest demonstration of this truth can be deduced from the fact that there is a positive, not a negative, correlation of price with quantity sold in the case of industrial products. The prices of industrial products experience their most important variation over the business cycle, and in this movement they correlate positively with output. The positive variation of prices with quantity output is one of the most distinctive characteristics of the business cycle. In the theory chapters we found that it is not reasonable to believe that the price variation is a sufficient explanation. This being the case, intolerable difficulties would necessarily be faced in attempting to vary prices to avoid the cyclical movement. If this is true, it should be possible to show what some of these difficulties are.

In the first place, the structure of prices is substantially distorted at the upper turning point of the business cycle. Raw-material prices, for instance, are disproportionately high. These prices cannot be lowered without eliminating activity in high-cost mines; to cut prices so that such activity is eliminated will reduce output.

Cutting the price of consumer products at the peak would necessarily reduce profit prospects, which would, in turn, limit capital building. This would be one of the most certain ways of creating a downswing because total activity is abnormally dependent upon capital building at the peak.

An unavoidable psychological reaction which arises especially in purchase by businessmen is the lead of declining prices to further declines. A first reaction to a cut in price, therefore, may be *reduced* purchases.

If there is no price decline which would immediately restore prosperity levels once a downswing begins, the industries making capital goods would not be able to maintain output by cutting prices, short of giving capital goods away, for no need for additional capacity can be visualized at such a time. Yet the variation in the building of capital is very violent and is agreed to be the most difficult variation to control.

To hold that price cutting could not stabilize the business cycle, however, is not equivalent to saying that no price readjustment is

[4] See Chapter IX, Section 1, pp. 212–15.

required. If the prosperity has reached a position such that the demand for some products has become much more inelastic than for others, competitive forces may tend to bring the price of such products down more than others. Prices which have risen disproportionately, like those for raw materials, must decline disproportionately if a downswing gets under way.

Dynamic-Price Policy. This section deals with proposals for continuous price adjustment by business and does not involve the employment of monetary controls designed to lower the general price level. The most notable proposal for dynamic-price policy is that of E. G. Nourse and other Brookings Institution economists.[5] Fundamentally, the idea is to encourage businessmen to engage in a type of pricing which would maintain "capacity to produce."

Dynamic-price policy is a reaction against the popular practice of basing prices on current or historical costs plus a suitable profit margin, which fails to recognize explicitly in the accounting statement basic cyclical and structural change. For example, such a policy ignores the general level of business activity, activity of competitors and potential competitors, change in technology, and most importantly the change which would occur in demand for the product if prices were lowered and the demands of lower-income groups were tapped.[6]

Dynamic-price policy is a major contribution businessmen can make toward increasing activity by making anticipatory price declines, when justified. It is more effective as a long-run readjustment to keep maladjustments from developing than as a measure to be implemented during a sharp cyclical reaction.

Prices that will tend to maximize output over a period of time can be just as rational as those established on a narrow interpretation of historical cost figures. Businessmen, on the whole, have given insufficient attention to the increase in demand which would occur with a dynamic-price policy. These arguments cannot be countered with a classical demonstration of the way prices are established in the market, because, for the most part, the prices of industrial products are the result of business policy-decisions rather than the interaction of demand and supply schedules in the competitive market as traditionally conceived. The establishment of prices has become a primary managerial function.

[5] Notably, see E. G. Nourse and H. B. Drury, *Industrial Price Policies and Economic Progress*, 1938; H. G. Moulton, *The Formation of Capital*, 1935; and E. G. Nourse, *Price Making in a Democracy*, 1944. (All are published by Brookings Institution, Washington.)

[6] See particularly a simple discussion of alternatives to cost-plus methods of pricing by Joel Dean, "Planning the Price Structure," *American Management Association Marketing Series*, No. 67 (January, 1947).

The major difficulty in the way of adoption of dynamic-price policies by a particular enterpriser in the past has been the uncertainty of the effect if there were no relatively universal acceptance. There are now two reasons for believing that more rapid acceptance may be possible. One is the effort of business groups, such as the Committee for Economic Development,[7] to encourage businessmen to adopt such a dynamic-price policy. A second, and very important reason, is the threat of labor groups to drive up wage rates to the extent of industry's ability to pay. Rapid price adjustments curb that threat. The widespread organization of labor may lead to a rapid spreading of dynamic-price policies if key companies adopt such policies to avert the pressure labor organizations might apply.

While such a dynamic-price policy could make a tremendous contribution if effectively developed, it could not compensate for the failure of enterprisers to shift rapidly to areas of new demand. A few years hence it is fairly certain that the demand for many consumer durables, such as automobiles, will be virtually saturated. Pricing may not be able to avoid a fall in demand.

It should not be inferred that dynamic-price policy always results in lower prices. As costs rise in the upswing, prices must rise in many cases. The potential demand the enterpriser sees is largely the result of an upward shifting of the demand curve rather than a reaching into lower-income strata. In practice, no clear-cut distinction between the two is possible. The businessman sometimes tries to average out in prosperity by making up for depression losses, but this will defeat the aims of dynamic pricing. Because of these difficulties, dynamic pricing used by itself has only limited promise in the near future. It is, however, useful as part of an integrated program.

Advancing Wage Rates in Proportion to Increased Productivity. An alternate proposal to dynamic pricing, now widely advocated, is to advance wage rates sufficiently to insure that enough income is paid out to buy a "capacity output." Like dynamic-price policy, this proposal assumes that attention should be directed to the relationship between pricing and effective demand. Dynamic-price policy is predicated on the theory that the businessman can formulate effective price policy through an analysis of demand, while this proposal would increase wage rates up to business ability to pay.

There are limitations to the effectiveness of the wage-rate proposal. If wage rates are to be advanced in proportion to increased productivity on a unit as small as a company, the increased payments are not likely to go to wage recipients who would buy the additional

[7] Relative material is contained in many of the CED reports. See especially *Jobs and Markets* (New York: McGraw-Hill Book Co., 1946).

product. Paying automobile workers higher wage rates, for instance, will not sell additional automobiles to the extent that lowering prices will. Further, if wage rates are advanced by each industry in proportion to the increased productivity in the most efficient units, operation in the less efficient units will be made unprofitable. If, on the other hand, wage rates are advanced in proportion to productivity increases in each *company*, a large part of the incentive to reduce costs will be destroyed. To be effective, wage-rate increases must not be driven up to the full extent of the productivity increase in the most efficient unit; in addition, they must be widely adopted.

The chief argument for the wage-rate method, as opposed to dynamic-price policy, is based on the fear that businessmen cannot be expected to follow the latter plan. Although wage-rate increases are forced on the businessman, his co-operation would nonetheless be essential. He should be assuming that widespread advances in wage rates will add sufficiently to the effective demand to offset the increased manufacturing cost resulting; otherwise, he would reduce his output, and the higher wage rate would not increase total wage income. Because the theory is to *force* higher wage rates in proportion to increased productivity, co-operation will be more readily attained in implementing dynamic-price policy. Furthermore, dynamic pricing may be of some aid in keeping abreast of shifting demand, while rising wage-rate policy does not assume price adjustment and therefore does not aid in following demand.

Traditionally, rising standards of living have been accompanied by declining prices in the areas where consumption has increased most rapidly. Advancing wage rates, if effective, would retard declines in prices. On the other hand, rising prices tend to produce more optimistic expectations. If wage rates should remain stable, dynamic-price policy would promote a price decline with increasing productivity. Some balance between price and wage-rate changes is therefore essential in a progressive economy. Advancing wage rates should be a part of the wage policy in our integrated program but not to the extent of increase in productivity.

Development of New and Improved Products. Prosperities are partially supported by the deferred demand accumulated in depression; this is notably true of durable goods. Saturated demand is a likely eventuality in many durable industries in prosperity. To prevent a downswing, all companies facing saturated markets should have available substitute products ready to take up the slack when demand for established products tapers off. While no nice adjustment is possible in most companies making durable goods, the constant adaptation of new and improved products would represent a major

contribution. Major reliance must be placed on *company*, rather than industry, adaptation. For instance, if the output of General Motors should decline substantially, smaller companies developing new products could not be expected to take up the slack at the proper time.

Antitrust Action. Some persons put their faith in legal action intended to break up monopoly price arrangements as a method of keeping prices in adjustment with demand.[8] "Big-stick" methods have been significantly unsuccessful in enforcing competition in the past, but advocates of this method of control can point to inadequate support and a vacillating policy. The antitrust division has never had staff enough to do more than establish token control. In the twenties, major attention was placed on the prevention of unfair competition, and in the years of downswing after 1929, government policy did not generally assume prices to be too high. The NRA, with its pattern of trade-association agreements, set the standard in the early days of the New Deal. It was not until after the 1937 decline that public confidence was shaken in the soundness of competitive conditions and Arnold began a vigorous, if small-scale, program of antitrust action. This was interrupted by World War II because of the need for co-operative effort in the war program.

The aim of antitrust action has never been very clearly defined in realistic terms. If it is to enforce small-scale competition, Nourse's point that the prices of industrial products are administered deserves serious consideration. Probably the size of industrial units which have arisen under the aegis of monopolistic competition are not the most efficient, but in most cases they are far more efficient than very small units would be. If the formula is to force dynamic pricing on industry, as advocated by Nourse, antitrust action is too belated to provide a business-cycle control. The downswing will be well under way, or over, before court action can effect a change in prices. Some attempt to make decisions more timely has been made under the consent decree, by which procedure cases can be negotiated and consent developed without trying the case. This, however, is no substitute for court action and in practice has often been abused.

The threat of antitrust action is not too important as long as the Department of Justice is so overworked that only the most flagrant cases can be considered. In any case, a standard of price-making policy must be set to make the procedures effective; if this standard is Nourse's dynamic-price policy, the courts can never become expert

[8] See particularly the cases presented by Arnold and Berge, both former directors of the Antitrust Division of the Department of Justice. Thurman W. Arnold, *The Bottlenecks of Business* (New York: Reynal & Hitchcock, 1940); Wendell Berge, *Cartels: Challenge to a Free World* (Washington: Public Affairs Press, 1944); also TNEC Monographs, Nos. 16 and 21 (Washington: Government Printing Office, 1941-1940).

enough in market potentialities to do an effective job unless the major part of the business community co-operates by attempting to set prices in this way. Antitrust action might be important as a supplemental device in developing a dynamic-price policy, but it could have no major independent value.

Encouraging Small Business. Until recently, less attention has been given to encouraging new business than to enforcing competition among existing business units. If, however, competition is ineffective among existing business units, the addition of new units is theoretically superior to enforcing competition among existing companies. A direct method of doing this is to set up "yardstick" government companies to develop what costs and prices should be in noncompetitive industries. This has been done in electric utilities, but some questions remain as to whether government corporations can duplicate competitive conditions in most industries and how overhead costs should be allocated to effect comparability with private operation.

Measures to assure new companies reasonable equality with old companies in access to markets have some promise. Particularly, financing and tax burdens can be put on a more equal basis. With the broad development of national financial markets, small companies experience difficulty in raising funds. Local savings gravitate to the more diversified national markets or are channelized into institutions disinclined to invest in small business. Investment bankers have not been able to develop efficient techniques for floating small-capital issues. It is possible that some adaptation of the loan practices developed during World War II, which were carried out through the Federal Reserve System and the Smaller War Plant Corporation, could be applied. This would involve government or Federal Reserve System guarantee of a substantial proportion of long-term capital loans to small business which would be made by commercial banks. The idea, however, is still in the blueprint stage, and, if it is to become effective, will require careful development.

Companies of a size requiring the type of financing suggested in the above paragraph will help little in adding immediately to the competition in semimonopolistic markets, for these are industries in which only large companies operate. Over the longer period, however, such financing might help "incubate" companies until they could develop into large ones. A most important consideration is the assurance that medium-sized companies get an even break in moving into the big-business field. Something might be done in the way of permitting incorporation when a size is reached that financing requires it without being penalized by added corporate taxes.[9] Another important con-

[9] See C. C. Abbott, "Small Business: A Community Problem," *Harvard Business Review*, XXIV (Winter Number, 1946), 183–96.

sideration is antitrust action to prevent unfair competition. It is important that antitrust action be implemented to keep big companies from freezing potential competitors out of markets. The evidence required for such action is easy enough to obtain to make antitrust action promising in this area.

The Annual Wage.[10] Much attention has been given recently to plans which call for the guarantee of wages for a year or some other period. The most famous are the Procter and Gamble plan, which has been in use since 1923; the George A. Hormel plan, where the formal contract dates from 1931; and the Nunn-Bush Shoe Company plan, which was put into effect in 1935.[11] These plans vary substantially, and it is now generally believed that no standard plan for guaranteeing wages would be satisfactory. The general features of the Procter and Gamble plan are extremely simple and may be used for illustration. For an ensuing calendar year, forty-eight weeks of work at a standard work week are guaranteed for a major proportion of the hourly-rate employees. The guarantee usually has covered about 80 per cent of such employees, but the proportion set at the beginning of the year depends upon various factors which reduce the stability of employment.

The guaranteed wage plans recognize explicitly the disproportionate part of the burden of instability borne by industrial wage earners. In most cases, however, these plans can do little more. As a contract, they give notice that the management is convinced it can maintain stable employment to the extent agreed. A plan of guaranteed wages then rests upon other methods developed for stabilizing sales. A plan based on nothing more than hope may do more harm than good because it is likely to lead either to bankruptcy or to repudiation of the plan. Repudiation smacks of bad faith and may create labor difficulties. So far, effective plans have been developed only in relatively stable consumer industries.

It is useful to speculate on the potentialities of the annual-wage plan applied to residential building. As developed in Chapter II, it is now generally believed that residential building could, as far as technical conditions are concerned, continue at a fairly regular rate throughout the year. The high seasonal irregularity in the industry is largely responsible for the high level of wage rates in the building

[10] See particularly J. L. Snider, *The Guarantee of Work and Wages* (Boston: Harvard University Graduate School of Business Administration, 1947); "Will the Guaranteed Annual Wage Work?" *National Industrial Conference Board Studies in Business Economics*, No. 5 (1946); M. W. Latimer, *Guaranteed Wages* (Washington: Government Printing Office, 1947); A. D. H. Kaplan, *The Guarantee of Annual Wages* (Washington: The Brookings Institution, 1947).

[11] See J. L. Snider, *op. cit.*, pp. 7 ff.

trades, while the high level of wage rates is partially responsible for the high cost of building. Therefore, a more regular rate of building construction would be profitable all around. It would reduce the cost to consumers and increase the potential market, thereby increasing the annual wages received in the industry. It will not be possible to go far in reducing the instability in the industry until the potential market for new houses is substantially widened. A major difficulty here, however, is that most of the building industry is directed by small contractors. They can scarcely afford to initiate annual-wage plans but might be expected to follow if larger operations came to be conducted in this way.

The Undistributed-Profits Tax. The Revenue Act of 1936 included an undistributed-profits tax. Although this tax was modified in May, 1938, and finally was wholly eliminated in June, 1939, the control procedures implied by such a tax are worthy of brief consideration.[12] The idea is to penalize the retention of profits. As far as attempts to produce business stability are concerned, two essentially different ideas are involved. One is to increase the flow of purchasing power; the other is to foster sounder capital extensions.

If all profits are paid out in dividends, the funds become purchasing power and cannot be kept idle by the company, awaiting profitable use. To what degree individuals receiving the dividends will spend them more fully than the corporation is an unanswered question. If paid in dividends, however, some part may be spent on consumption, whereas the only way corporations can use the funds is in the investment markets. If corporations fail to invest all of the savings withheld from the stockholder, they are tending to reduce activity by removing from circulation a part of the flow of funds. Such action tends to reduce activity in prosperity, just as paying out dividends tends to increase activity in depression.[13]

The second main argument advanced for undistributed-profits taxes as a stabilizing influence is the provision of a sounder basis for

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[12] See especially A. G. Buehler, *The Undistributed Profits Tax* (New York: McGraw-Hill Book Co., 1937); Norman S. Buchanan, "Theory and Practice in Dividend Distribution," *Quarterly Journal of Economics*, LIII (November, 1938), 64-85; J. E. Amos, *The Economics of Corporate Saving* (Urbana: University of Illinois Press, 1937); Martin Taitel, *Profits, Productive Activities, and New Investment*, TNEC Monograph No. 12 (Washington: Government Printing Office, 1940).

In 1938, Section 102 of the Revenue Code was revised to require that corporations show reasonable business needs if more than 30 per cent of net earnings were retained, or suffer penalty on the charge of using the corporate form to conceal profits. This is a mild form of the undistributed profits tax.

[13] See O. J. Curry, *Utilization of Corporate Profits in Prosperity and Depression* (Ann Arbor: University of Michigan Press, 1941), who holds that there is no apparent relation between plowed-in profits in the twenties and dividends paid in the thirties.

capital extensions.[14] The officers of all corporations tend to be ambitious for the company and to desire its expansion. Their own positions would be more important in a larger corporation, and the basis would be provided for larger profits. Hence, there is a strong tendency for them to expand whether or not any sound justification exists for expansion. Industrial overdevelopment is one of the most difficult maladjustments to correct in depression. The individual investor is less likely to be affected by this type of bias, and he would tend to place his funds where the profit possibilities are the greatest. In other words, use of the capital market provides a test which would not be available in the case of reinvested earnings. Such an argument is hard to evaluate. Unquestionably, the corporate officer has a personal interest in expansion, but he does not have such an interest for any extended time if the expansions are unsound. There is no more effective way to invite bankruptcy. The individual investor, on the other hand, is notoriously a poor judge of sound expansion. The argument appears to be nearly a tossup.

All agree that small companies should be exempted from an undistributed-profits tax. It is difficult for small companies to obtain capital in the security market, especially in newer industries which are not well understood. If there is any truth in the argument that we are facing the danger of a shortage of investment opportunities, growth of small companies in new lines should be encouraged. When the undistributed-profits tax forces small companies to pay dividends, the investor may try to place the funds in well-known companies where only limited capital extension is desirable.

In 1937, the undistributed-profits tax was unstabilizing rather than stabilizing. The tax was based on the year as a unit; and this worked badly in 1937, a year which started with relatively high levels and ended with a violent decline. Large dividends had to be paid at the end of the year, while the low levels of activity existing at the time completely failed to justify them. This is what many objectors to the undistributed-profits tax contend is possible without it—the paying-out in depression of profits retained in prosperity. Large dividends were paid from the profits of good times after the decline came. Instead of leading to an early cushioning of the decline, they actually appear to have accentuated it in the early months! With the knowledge that the taxes would have to be paid, enterprisers tried frantically to deflate their inventories in September and October in order to protect their cash positions.

[14] The argument sometimes turns on the possibility of control instead of on the soundness of expansion. Some control measures depend upon regulating the interest rate, but the interest rate loses its regulating force if corporations invest their own surpluses. The investment process loses much of its market aspect. For an analysis of interest-rate control measures, see pp. 504–5.

Method of Handling Depreciation Charges. Some have proposed that an accounting system should be put into operation whereby the cost of fixed assets is charged to the output when the plant and equipment are used.[15] A simple method of achieving this would be to employ universally the "production method" of charging for depreciation.[16] Under this system, the life of the asset is reckoned in terms of expected quantity of output during its life. Depreciation would be charged according to the proportion that current output is to the total expected output. When output is low, very little depreciation would be charged, and profits would appear much higher than under the straight-line method of depreciation. When output is high, the depreciation charge would be greater than under the straight-line method, and profits would appear lower than shown by the straight-line method. The result would be a tendency to dampen optimism in prosperity and to reduce pessimism in depression. Since only the record of changes, rather than changes themselves, is involved, unless a different outlook results, some persons might fail to be impressed by a different accounting figure representing the same facts. Actually, it appears that adjustments are made under present methods of accounting so that depreciation charges vary to some extent with gross income.[17]

It has been frequently proposed in recent years that an accelerated rate of depreciation be permitted for income-tax purposes. This might not have a stabilizing influence on the business cycle, but it would appear to encourage investment during prosperity. The argument is that substantial immediate profit may be visualized for added investment, but that the more distant future is much less clearly anticipated. By immediately charging off a large proportion of the investment, the immediate profit seen would not be greatly reduced by income taxes. Assuming that the capital investment would continue to be used during its service life, the accelerated depreciation proposal would not decrease the total government receipts from income taxes because more would have to be paid in taxes in later years. In September, 1946, the Internal Revenue Department ruled in favor of

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[15] Although the idea is not developed precisely as it is here, particular reference is made to C. M. Armstrong, "Cost Accounting Fallacies That Tend to Accentuate Fluctuations in Business," *The Annalist*, August 10, 1938.

This proposal is precisely opposite to that of J. M. Clark, who calls for a system of social accounting whereby not only overhead costs of the given concern, but the costs of overhead in raw-material industries and the cost of idle labor are considered as true overhead. See Clark's *Studies in the Economics of Overhead Costs* (Chicago: University of Chicago Press, 1923). The practical embodiment of Clark's proposal would involve procedures for assigning social responsibility which have not been developed.

[16] See, for example, R. B. Kester, *Advanced Accounting* (New York: Ronald Press, 1946).

[17] See W. J. Vatter, "Depreciation Methods of American Industrial Corporations, 1927–35," *Journal of Business of the University of Chicago*, X (April, 1937), 126–46.

the "declining-balance method" of accounting for depreciation for rental housing, but the charge is not to exceed 150 per cent of the normal straight line-rate; in other words, the depreciation can be overcharged up to 50 per cent in any year. When introduced, permission to charge accelerated depreciation rates would reduce income taxes, thereby leave more funds in industry, and tend to be inflationary, but at some later date a matching increase in taxes might occur and produce a deflationary influence. A similar method, considered in the following chapter, is to vary the business-income tax rate over the business cycle.[18] This method permits the government to control variation in the inflationary or deflationary influence over the cycle and would be less likely to encourage overexpansion in prosperity.

Method of Handling Inventory Profits. H. B. Arthur, among others, holds that inventory profits are a highly unstabilizing factor. It is a well-known fact that companies handling large quantities of raw materials, such as those producing rubber products, find inventory depreciation one of the chief reasons for losses in a period of decline and inventory appreciation one of the chief reasons for profits in a period of upswing. Isolation of such an influence from the interacting forces of the self-generating cyclical movement is a laudable objective. Arthur summarizes the case as follows:

> The greatest portion of industrial inventories is analogous to water in the pipes of the economic production system. They cannot be drawn off and consumed without stopping the operations of the system. An increase in the prices at which these inventories are valued produces an apparent profit, but this gain is fictitious and unexpendable; it could not be converted into cash without liquidating the inventories. Such a profit is in effect an unrealized (and in practice largely unrealizable) capital gain, yet it has been treated by most accountants, statisticians, and economists as current income—even as a part of our national income. . . . Businessmen make their decisions as though fictitious inventory gains (amounting in some years to several billions of dollars) were expendable, and the effect of this misunderstanding is to aggravate the cyclical fluctuations of business.[19]

Inventory valuation is most commonly made by the cost-or-market method, that is, inventories are valued at cost or market price, depending on which is the lower. Suggestions have often been made that the last-in, first-out method of inventory valuation should replace this.[20] The essential idea of this method is that the stock of inventories which is not withdrawn remains permanently on the books at the valuation originally fixed on it, and hence a change in its value is not

[18] See Chapter XXI, pp. 503–4.

[19] H. B. Arthur, "Inventory Profits in the Business Cycle," *American Economic Review*, XXVIII (March, 1938), 27–40. He gives a good list of references on the subject on p. 27.

[20] See particularly American Petroleum Institute, *Uniform System of Accounts for the Oil Industry*, published by the Institute.

reflected in the profit statement. The material currently used is charged at the most recent price paid.

By use of the last-in, first-out method, the accounting statements will not show profits that are dependent upon variation in the value of inventories. The income tax law permits the use of the last-in, first-out method for the purpose of making income tax returns. Another method, called the inventory-reserve method, has been suggested to give recognition to the difference between inventory and operating profits without maintaining two sets of books.[21] The essential idea is to segregate inventory profits by statistical procedures and set up a reserve account to which such profits are posted. This procedure gives notice that they are not payable in dividends.

Since inventory appreciation and depreciation are of considerable significance in generating business-cycle variation, these methods at first appear to contain startling possibilities. Variation in inventory valuations is not merely a matter of accounting fictions, however. It actually changes the size of the income streams. A corporation *does* acquire increased funds when it is able to use low-priced materials to manufacture goods to be sold at increasing prices.

If an accounting system could prevent the variation in inventory values, it would indeed perform a notable service. However, we are not likely to be limited in our actions by the form in which profits appear on the accounting statement. If speculative profits appear possible, it seems reasonable that corporations will try for them much as they do now, even if we change the accounting fictions. The clear differentiation between inventory and operating profits, however, might make people evaluate the situation more sanely and reduce the wide swings in emotional response. If the very high profits were known to be the result of a temporary price increase in prosperity, and of a temporary price decline in depression, emotional aberration would be decreased. The segregation of inventory profits, however, is no guarantee that the business community generally would become convinced that the high profits are temporary. The inventory-reserve method is to be highly recommended because it gets the facts clearly before us without attempting to ignore the shifts in income flow which occur as a result of shifting inventory valuations.

To the extent that the last-in, first-out inventory method is employed to redirect the flow of corporate income, it is interesting to compare the effect with that of the undistributed-profits tax. They

[21] This idea has been worked out most carefully by the National Bureau of Economic Research Conference on Research in National Income and Wealth. See Parts 3 and 4 of the first volume of the reports on this conference, published by the National Bureau of Economic Research in 1937. Note that this method is not to be confused with the setting-up of reserves for inventory valuation.

are exact opposites. Recognition of the transitoriness of inventory profits would tend to cut down dividend payments in prosperity and increase them in depression because the accounting statement would disclose a smaller variation in profits, given the same facts. On the other hand, an undistributed-profits tax forces larger dividend payments in prosperity. If both the undistributed-profits tax and one of these inventory accounting methods were adopted, conditions might be changed little, if at all. The two devices might largely offset each other, in so far as any shift in purchasing power is concerned.

Recovery by Exhortation. The proposal to aid recovery by the hortatory method includes such plans as a "buy-now campaign," or a plea to the banks to hasten recovery by making renewed loans to industry. Both of these hortatory methods were rather widely used during the Great Depression.

A buy-now campaign, if conducted in a perfectly frank and sincere fashion and if timed correctly, might prove a useful supplementary method of shortening by a few months a phase of decline. However, unless the campaign is conducted near the bottom, when the limiting forces very nearly equal the reinforcing forces, little may be accomplished. Support may be lent to price levels needing readjustment. If the prices of durable goods drop substantially at a later date, the public is likely to feel deceived and additional buy-now campaigns may not meet with public favor.

Much attention was given during the Great Depression to the need for encouraging banks to increase their loans to industry.[22] The continuation of excess reserves during the period indicates that suasion was ineffective in accomplishing this purpose.

Establishment of an Adequate System of National Employment Exchanges. The United States Employment Service has established a relatively adequate system of intrastate employment exchanges but lacks a satisfactory interstate system. If employment interchange between the states could be developed, it should contribute somewhat to a reduction in the violence of depressions because it provides knowledge of the supply of laborers available to fill positions. In the past, an indeterminate part of the unemployment was due to the inability of employers to find the laborers needed. This service also makes possible a more intelligent relief system.

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[22] The most adequate of the government studies made as a result of this attention is *Report on the Availability of Bank Credit in the Seventh Federal Reserve District*, submitted to the Secretary of the Treasury, by C. O. Hardy and Jacob Viner (Washington: Government Printing Office, 1935). The authors found they could recommend working capital loans up to six months maturity and recommended a modification of rules of eligibility for rediscount to include six months paper or paper renewed any number of times. See also Lewis H. Kimmel, *The Availability of Bank Credit* (New York: National Industrial Conference Board, 1939).

Systems of "Staggering" Employment.[23] Early in the Great Depression, employment was artificially distributed among a large group of workers. This scheme is expensive in that it keeps more men on the pay roll of each concern and does not permit picking workers purely on the basis of efficiency. By reducing the incomes of all workers, it produces a disproportionate decrease in the purchases of consumer durable goods. The purchases of consumer durable goods are, in any case, greatly restricted in depression. Thus, by increasing the costs of doing business and by decreasing the purchases of consumer durable goods, a system of spreading employment tends to retard recovery. If socially justified, it must be as a relief rather than as a recovery measure.

Measures proposing to limit the total number of hours of any one worker have the same purpose in view. The most popular of these is the 30-hour week proposal. This is ordinarily proposed on the basis of the misconception that we live in an economy of plenty, and that the difficulty is entirely a result of maldistribution of income.

Abolishing or Penalizing Debt as a Form of Contract.[24] It is sometimes proposed to abolish the right to contract debt in order (*a*) to prevent disruptive changes in ownership which result from credit contraction, reorganizations, and bankruptcy, or (*b*) to eliminate stable-income streams which do not bear their fair share of adjustment unless, or until, a complete breakdown occurs. The difficulty the railroads faced in readjusting their relatively heavy debt structure through long drawn-out receiverships in the thirties illustrates the problem. It is certainly true that greater equity ownership and less debt makes the capital structure of an economy more flexible.

Abolishing debt is tantamount to eliminating all credit, both long- and short-term. Such proposals as the hundred per cent reserve plan, considered later, involve elimination of some forms of short-term credit by the use of a monetary control. Outlawing all forms of debt involves a far more drastic change. Credit has been one of the major characteristics of our economy. As we have noted, credit possesses inherent elements of instability, but so does the use of money. So sharp a break as proposed by the total elimination of debt would not seem justified on the basis of the slight evidence available on the increased stability provided. Much can be said, however, for contracts which call for amortization of debt at least as rapidly as the asset purchased depreciates; otherwise, minor disturbances may lead

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[23] If the student thinks of such a proposal as of no more than historical interest, he should read Benjamin Graham, "The Hours of Work and Full Employment," *American Economic Review*, XXXV (June, 1945), 432–35.

[24] See particularly TNEC Monograph No. 25, "Recovery Plans," (Washington: Government Printing Office, 1940), pp. 92–99.

to a cumulative spiral of debt deflation.[25] In the following section on credit control, consideration is given to various measures suggested to moderate the cyclical disturbance which credit tends to produce.

4. MONETARY CONTROL MEASURES

Banking Control of the Cost and Amount of Secondary Credit. The Federal Reserve banks vary bank reserves by open-market operations and vary reserve requirements by moving up or down the percentage of reserves required against deposits held. They vary the cost of adding to reserves by raising or lowering the buying rate on Treasury bills. By these procedures, the degree to which banks can expand their loans is controlled. Commercial loans, however, are not likely to be a major problem in the near future because of the large volume of liquid funds held by most companies and the widespread tendency to buy on a hand-to-mouth basis, which decreases working-capital requirements. Consumer loans are much more likely to become overexpanded, but the commercial banks are not the only source of credit in this area. The controls might be of some importance in case of stock or real-estate speculation, but even here the large bank deposits in existence and the low rate of turnover would make possible large-scale speculation before the banking controls could become effective. Selective credit control, or the direction of credit into desired channels, even if it could be effective, might begin to operate too late to be of much value at the present time. Cash and deposit holdings are so large that an increased turnover could be inflationary without further credit extension. The fact that credit extension may assume significant proportions even under these circumstances, however, is illustrated by the rapid increase in consumer credit that is now occurring.

To strengthen banking controls so that we may be assured that credit expansion generated by the banks will not become an important factor in inflation, the Board of Governors of the Federal Reserve System proposes that additional power be granted: (1) to vary the amounts of long-term marketable securities any bank can hold; (2) to set a specified percentage of Treasury bills and certificates which must be held as reserve against demand deposits; (3) to permit further increases in reserve requirements above the present limits.[26]

The primary reason for requesting these additional powers is to limit the practice which has been followed by the banks of monetizing

[25] See Norman J. Silberling, *The Dynamics of Business* (New York: McGraw-Hill Book Co., 1943).

[26] See *Thirty-Second Annual Report of the Board of Governors of the Federal Reserve System* (1945), pp. 5–8.

the federal debt by sale of short-term securities to the Federal Reserve banks, and to limit the excess reserves which may become available to commercial banks. The orthodox procedure would be to raise rediscount rates and the buying rate on Treasury bills, but the United States Treasury and the Federal Reserve System have adopted policies intended to prevent significant increase in the short-term rates on government securities. The freezing of interest rates is intended to prevent an increase in the interest charge on the government debt and to avoid depreciation in the value of government securities held in bank portfolios. The contrasting traditional policy of credit control assumes that interest rates will be driven up in a period of prosperity to discourage the use of credit. We are not likely to see major emphasis placed on traditional credit-control procedures in the near future.

Banking-control procedures are more effective in the upswing than in the downswing. Credit use can be encouraged in the upswing by making it plentiful and cheap or discouraged by reducing its availability and raising interest rates. Credit availability, however, is not frequently a critical factor in the downswing and making it easy does not force its use, although easy credit may encourage credit expansion. The best which could be expected under any circumstance is that credit control could be used to encourage or discourage industrial expansion, or to discourage speculation.

Direct Control of Credit Terms. As a war measure, the Federal Reserve Board of Governors was given extensive powers to set the terms on which consumer credit could be extended. Still in effect in 1947 are regulations regarding the amount of the down payment and length of the installment contract permitted in the purchase of a limited number of consumer durable goods. That this control has not proved to be very effective is shown by the rapid increase now occurring in installment credit. This condition may be partly due to the urgency of demand for consumer durables, and such credit might be more amenable to control under ordinary circumstances. It seems desirable that these direct controls be available to discourage installment credit at prosperity levels.

The Board of Governors of the Federal Reserve System also establishes the margin requirements for the purchase of securities, both for direct bank loans on stocks and for credit extension to brokers. This is a selective credit control of major importance because it limits the credit which can flow through accepted channels to the stock market. If it had been in effect in the late twenties, stock speculation would have been substantially limited.

One Hundred Per Cent Reserves. This is a proposal to eliminate the extension of credit on demand deposits. Two major purposes

would be achieved. Bank liquidity would be almost assured in that demand deposits could be fully paid at all times. Thus, runs on banks, such as those which occurred in the early thirties, could not produce bank suspensions. The increase in bank loans in prosperity might be restricted in that they could be extended only on time and savings deposits and on paid-in capital and surplus.

The 100 per cent reserve plan was a major issue before the war,[27] but, for various reasons, is of less significance at the present time. Time deposits have so grown in size that they could readily support any probable extension of bank loans. The potential rate of expansion possible in the rate of use of the present huge demand deposits is so great as to reduce the emphasis placed on bank-credit expansion. One hundred per cent reserves at the present time would neither greatly restrict credit extension nor materially reduce the probability of bank failures. Also, most of the hazards of bank failure visualized by some of the advocates of this scheme have been eliminated by the guarantee of bank deposits.

If the 100 per cent reserve plan were to be extended to time deposits to prevent any substantial increase in bank loans in prosperity, the prospects for substantial accomplishment would not be bright. Consumer loans may experience the most dangerous expansion, but the major part of these are not made by commercial banks. If bank accommodation were not available, many companies would seek and obtain trade credit. Payment on demand could not be reasonably denied to time depositors if fully backed by money.

Demand deposits are in practice almost fully backed by government bonds at the present time. Monetizing these bonds by exchanging them for money certificates would produce 100 percent reserves. This would save a substantial interest charge now paid by the government. The result also would be that demand deposits no longer paid for themselves, and the banks would have to charge depositors for keeping their money and handling their checks. Another method of accomplishing the same result is the taxing of deposits.

Taxing Demand Deposits. A tax on demand deposits is an advanced form of "scrip taxes" which were used to some extent in the Great Depression to encourage rapid spending.[28] The affixing of

[27] See particularly H. C. Simons, "A Positive Program for Laissez Faire," *Public Policy Pamphlet*, No. 15 (Chicago: University of Chicago Press, 1934); J. W. Angell, "The 100 Per Cent Reserve Plan," *Quarterly Journal of Economics*, L (November, 1935) 1–35; Irving Fisher, *100% Money* (New York: Adelphi Co., 1935); W. E. Spahr, *Fallacies of Professor Fisher's 100% Money* (New York: Farrar & Rinehart, 1938); Benjamin Higgins, "Comments on 100 Percent Money," *American Economic Review*, March, 1941.

[28] See particularly Silvio Gesell, *The Natural Economic Order* (San Antonio: Free-Economy Publishing Co., 1934); Irving Fisher, *Stamp Scrip* (New York: Adelphi Co., 1933).

stamps monthly or at other regular intervals to specially prepared scrip currency is required by the latter scheme. Scrip taxes represent a direct and naive proposal to prevent hoarding; or represent an effort to supplement measures tending to increase the supply of money so that the momentum of credit expansion will not be lost by a reduced velocity of circulation. A stamp-scrip tax would tend to drive purchasers into using checks, which already account for the major part of total payments.

A more inclusive proposal is a tax on bank deposits, either supplemented by a scrip-currency tax as described above, or by forcing people to exchange their money for a smaller amount if the supply of money has exceeded certain established limits.[29] If the tax on deposits were national and monthly, evasion probably could be made difficult. Plans differ on such features as the exclusion of small deposits, but for the purpose involved, no difficult exceptions are necessary. In order to avoid the tax, the individual would look for places to put his money which would, in many cases, involve expenditure. If the tax makes him spend his money more quickly, its purpose is achieved. Actually, the tax will not be avoided in this way for society as a whole, even if the funds are put into new investment, because at each successive step the funds merely move to someone else's bank account.

If great enough uncertainty is felt about the future, a very high tax might be required to force spending. If confidence runs high, a very slight tax might do it. Hence, the method does not have great promise in a downswing or at low levels of depression. In such periods, time is required to find areas where increased amounts should be spent; if forced, buying would likely move to those commodities which could be hoarded and which might have better than average chances of not declining in price if left undisturbed. Recovery might result, but uncertainty is thrown on the question because of the kind of speculative activity forced on everyone.

The deposits' tax could be expected to speed up recovery and to tend toward the maintenance of prosperous levels. More effort would go to finding additional uses for funds. The method will be practical, however, only if business activity is below prosperous levels or if the underlying situation is deflationary (planned saving exceeds planned investment). It is not a two-way or compensatory method: it will tend to drive activity upward only, not downward. A business-cycle forecast becomes particularly important at prosperous levels, so that

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[29] See Arthur Dahlberg, *When Capital Goes on Strike* (New York: Harper & Bros., 1938); *Recovery Plans*, TNEC Monograph No. 25 (Washington: Government Printing Office, 1940), pp. 64–77. Dahlberg suggests calling currency, if it exceeds a predetermined amount only at a tax date for deposits.

overencouragement will not be given for spending. Without very nimble adjustment of the tax rate to the requirements of a good forecast, an inflationary situation could readily be created.

One of the advantages claimed for a tax on deposits is a reduction in interest rates. If the tax were two per cent, an individual would accept a lower interest return on the use of his money rather than hold money on deposit. Such an argument appears acceptable. An individual would pay a slightly higher price for a commodity rather than hold deposits subject to tax; he might, further, loan money for a very low return or no return at all to avoid the penalty tax. A most likely tendency of the deposits' tax would be to drive depositors to buy securities. This would not have much influence in the downswing or deep depression, because risk is viewed as indeterminately great, but it would be a major factor in the upswing. Low interest rates increase investment potentialities.

Some idea of the way a tax on deposits might work could be obtained by monetizing bank holdings of government bonds. The initial effect would be to reduce a considerable part of the present bank income, which might be made up in part by a service charge on deposits. The result would show something of the power of a penalty levied against holding deposits. If everyone became anxious to spend his money, the present low-deposit turnover rates would be speeded up, and an inflation would develop.

Unused Savings Tax. A more direct attack on lack of adjustment between planned saving and planned investment is a tax on saving intended to encourage spending.[30] Although this proposal assumes that planned saving will always be too large and therefore proposes only a tax, a bonus could also be paid on unused saving. It might appear that an unused savings tax could do no good because, by the time the results could be reported, the effect on the level of business activity would have been accomplished. As a matter of record, total real saving equals total real investment. Some individuals, however, do accumulate unused saving, with the result that expenditure is reduced. The purpose of the proposal is to dissuade individuals from taking such action. As long as planned saving is precisely equal to planned investment, relatively stable levels can be maintained; however, if consumers add to their saving, because, for example, automobile prices are too high, a tax on saving may make them buy

[30] See Ruth P. Mack, "The Fullest Measure of Employment after Victory," *The Winning Plans in the Pabst Postwar Employment Awards* (Milwaukee: Pabst Brewing Co., 1944), pp. 61–65; *Recovery Plans*, TNEC Monograph 25 (Washington: Government Printing Office, 1940), pp. 78–79.

automobiles, but the required expenditure would become successively harder to maintain. Such a difficulty is shared by many plans, including the tax on deposits just considered.

The only feasible method of instituting an unused savings tax would be in connection with the payment of income taxes. In such a case, the individual would be required to report not only on income, but also on expenditure. The difficulties of recognizing what should be considered expenditure for this purpose are so great that no practicable plan has been proposed. If an individual buys listed securities out of his income which were held by another investor, he is not hoarding his money, but he has not put it into new investment. It would seem necessary not to accept this as expenditure, and therefore to levy a savings tax against the amount of the purchase. If an individual buys a new house out of his income, he has added to new investment; if an old house he has not. The first would be classified as expenditure, the second as saving. If we try to trace the transaction to the person who keeps the funds idle—the first seller of the asset—the method will not differ greatly from a tax on deposits. The proposal might be modified to become a tax on *increases* in deposits after allowance is made for structural and other changes in a business or shifts in the size of an individual's income. If a rough measurement of unused saving could be estimated in this way, a bonus could be applied for abnormal deposit increases if there were danger of inflation. Paying an indiscriminate bonus on total deposits would not work well, because it would provide a windfall gain to those regularly holding large deposits. A tax might be defended on the argument that the size of the deposit gives some indication of ability to pay, although some businesses with a low turnover must maintain disproportionately large deposits.

Incentive Taxation. Hazelett has suggested a method of broadening incentive taxation to cover all phases of economic action and not merely unused saving.[31] By this procedure, adjustments can, at least theoretically, be forced at the points where they are needed. To use the oversimplified illustration given above, one would not be forced on the penalty of paying a tax to buy an automobile when automobile prices are too high. Rather, the automobile companies would be forced, on the penalty of paying a tax, to produce at "capacity" and sell the total product for the best price obtainable on the market.

Fundamentally, Hazelett's proposal amounts to a broad and sys-

[31] C. W. Hazelett, *Incentive Taxation* (New York: E. P. Dutton & Co., 1936); *A Dynamic Capitalism* (New York: Harper & Bros., 1943).

tematic use of the taxing power as a weapon to force economic decisions which will produce full employment. He would penalize each factor of production which failed to provide its appropriate contribution to production. "Incentive taxation would require labor and capital to do what the farmer already does, that is, to accept the best price obtainable for their services which permits of full employment."[32] A company's tax rate would depend on (*a*) the rate at which funds were spent; and (*b*) the level of its activity in relation to full employment. The aim is to tax funds and resources into use.

The tax on the rate of use of funds is similar in intent to the deposits' tax or unused savings' tax. It would be computed on the basis of the ratio of "real disbursements" (outlays for goods and services currently produced, dividends, and new investment sold by original issuers) to the average deposit balance. The determination of "real disbursements" suffers from the same difficulty as noted above for "expenditure" in setting an unused savings' tax. The purpose is the same as for the tax on deposits and unused savings. The difficulties involved in getting the appropriate turnover rate are so great that a tax on deposits or changes in deposits is probably more plausible.

The income tax is proposed to penalize less than full-employment rates. The income tax would be lowered progressively with higher rates of operation, becoming negligible at full-employment capacity. The taxpayer himself would be required to estimate the "maximum man-hour potential employment of his property." A heavy penalty tax for underestimating such capacity would be provided to insure an honest appraisal. The applicable income-tax rate would be determined by the ratio of man-hours actually worked to the estimate of maximum man-hour potential employment.

This procedure assumes that the businessman knows or can figure out what products he should produce and how much he should produce. The tax is to force him to price his product so as to reach his potential market. What is required, therefore, is dynamic pricing of the type advocated by Nourse. We have seen above that there are forces now operating which induce the businessman to move in the direction of dynamic pricing. Incentive taxation, if effective, would add another inducement. On the downswing, it would accelerate price cutting, but it could not be very effective because no one has a good idea in depression of the potential employment of each company. Being forced to pay a large tax at such a time might prove disastrous for many companies. Under prosperous conditions, there is some point in forcing enterprisers to readjust their prices and products to

[32] *Incentive Taxation*, p. 54.

maintain their market. But it should be remembered that adding a tax burden to companies which find themselves poorly adjusted to their market might make them fail.

REVIEW QUESTIONS

See end of Chapter XXI.

SELECTED REFERENCES

See end of Chapter XXI.

CHAPTER XXI

STABILIZATION PROPOSALS—*Continued*

MEASURES proposed to make the business system adjust itself are considered in the preceding chapter. Attention is now turned to measures designed to employ government action to force stability on the system.

1. FISCAL POLICY DESIGNED TO SUPPORT THE ECONOMY

Most of the monetary control proposals made to date would not provide effective control in the downswing or depression phases. They are designed to maintain prosperity, or, in the rarer case, to cut down on expansion which might lead to depression. Fiscal control measures overcome these weaknesses by direct *compensatory action.* Expenditure is added by the government to compensate for lack of it by the private economy, or, if the occasion warrants, some of the funds arising in the private sector are withdrawn to prevent inflation. Entirely aside from the promise such proposals have to compensate for instability in the private sectors of the economy, they assume importance because of the level to which government expenditures have risen. At such levels, government expenditures can themselves become a major source of instability if they reinforce rather than compensate for excesses in the private economy.

Making the Treasury a Supersavings Bank. Dickinson and others have proposed that unused savings be absorbed by the Treasury and spent by the government in order to maintain total expenditures.[1] Dickinson would have the Treasury pay a flexible interest rate, using whatever rate is necessary to induce consumers to part with all funds they do not spend or invest. This is a straightforward attack on the problem: absorb directly into the public sector whatever funds do not continue to be spent in the private sector. It would satisfy the criticism that, since the deficit spending needed to maintain full employment is precisely equal to the leakages out of income, fiscal policy should not rest on bank borrowing.[2]

[1] See Hobart C. Dickinson, *The Mechanics of Prosperity* (Baltimore: Williams & Wilkins, 1937). See also TNEC Monograph No. 25, *Recovery Plans* (Washington: Government Printing Office, 1940), pp. 35 ff.

[2] See John H. Williams, "The Implications of Fiscal Policy for Monetary Policy and the Banking System," *American Economic Review,* 1942, Supplement, pp. 234–49.

Perhaps such a proposal would not be practical unless combined with an unused savings tax. A very high interest rate might be necessary to attract part of the savings, and this could scarcely be condoned under conditions requiring deficit spending.

Perhaps the government securities now available, including savings bonds for individuals, would be satisfactory. Under these circumstances, the only new machinery required would be an unused savings tax, or perhaps better, considering the difficulties of measurement, a tax on change in deposits. If an unused savings tax were employed, the purchase of government bonds would have to be accepted as expenditure. To avoid the tax it would only be necessary to buy government bonds. It would appear possible to devise a scheme along these lines for channelizing savings into government bonds.

Planning Public Works and Social Services.[3] The scheme developed in the preceding paragraphs refers principally to a method of financing government deficits. Deficit financing is one of the most important problems no matter how or on what the government proposes to spend the funds. Public works represent one of the forms of expenditure most acceptable for compensatory spending. A certain portion of public works—perhaps a third—is not postponable; such projects must be provided at a relatively steady rate of expenditure. The other two-thirds theoretically can be postponed in prosperity and built in depression. This requires setting aside a "shelf of public works" when times are good.

With our present institutions, however, major postponement does not appear to be politically feasible. Usually a congressman can ill-afford to vote for the shelving of a public improvement of interest to his constituents. Most voters are not likely to look favorably on postponement of public works in the optimistic atmosphere of a prosperity. They may become convinced that a depression can be avoided and feel that postponement is unnecessary. They may argue that the prosperity will last so long that the public improvements in question will be necessary before it is ended.

Under these circumstances, the shelf of public works has to consist of items of secondary importance—projects possibly felt to be desirable by many, but not things about which the average voter gets excited. The proportion of public works postponable as a practical matter is substantially less than the theoretical figure. This is unfortunate, for, even if planned saving runs higher than planned in-

[3] See especially A. H. Hansen, *Fiscal Policy and Business Cycles* (New York: Norton, 1941); A. H. Hansen and H. Perloff, *State and Local Finance in the National Economy* (New York: W. W. Norton, 1944); A. D. Gayer, *Public Works in Prosperity and Depression* (New York: National Bureau of Economic Research, 1935).

vestment throughout prosperity, it would be better to rely in prosperity on a type of spending which is not readily postponable. Satisfactory compensatory action is not possible unless expenditure can be stepped up substantially when depression is threatened. No such stepping up is readily possible if the expenditure is running near peak levels in the prosperity.

Theoretical justification of compensatory spending as applied to public works was supported by the dual budgets prepared for the federal government under the New Deal Administration; during several years a division was made between ordinary and extraordinary items.[4] As in private business, charging only for the yearly service of capital items makes sense. Private business could not so readily "bunch" its capital expenditures in prosperity if total expenditures, including capital items, were to be balanced by current operating receipts each year. If the government is to compensate for the bunching of expenditure by the private economy, it must similarly plan to pay over the years for items of lasting value, the actual expenditure for which may be made irregularly.

If public expenditure must be extended at all times to offset unused savings, an alternative channel is represented by expanded social services: programs for medical care and education, care of the underprivileged (except cyclical unemployment), school lunches, etc. Old-age annuities might be increased. These are programs which cannot be readily varied over the business cycle. Any given program must be justified on its own merits, but the most desirable socially could be expanded if otherwise planned saving would be excessive at all times. Public works lend themselves to compensatory action; the social services and old-age insurance do not.

A problem of first-rate importance in developing a compensatory program of public works is timing. It takes several months after the go-ahead signal is given to get most public projects going full tilt. Even if an adequate shelf of public works is at hand, unless the decline is seen well in advance, the program cannot be put into operation quickly enough to offset declining activity in private investment. This is particularly important if public works are counted on to provide enough activity at the downturn to prevent the occurrence of a downswing.

It means also, that any compensatory action by this method is dependent upon a good business-cycle forecast. Since compensatory action should result in a leveling activity of total investment, timing is of crucial importance. If forecasts are in error, and public works

[4] Cf. Alvin H. Hansen, *Economic Policy and Full Employment* (New York: McGraw-Hill Book Co., 1947), pp. 111 ff.

are greatly extended when prosperity reaches final peaks and then withdrawn as the downswing begins, the cyclical movement will have been accentuated rather than moderated.

The method of financing is also of major importance. To produce the maximum effect, not only should public-works activity be greatly reduced in prosperity and greatly increased in depression, but taxes should be used to prevent excessive private investment in prosperity. Whether so drastic a course is required depends upon the relative size of planned saving in prosperity. If satisfactorily high levels of investment have not been reached, taxes should not be permitted to withdraw and sterilize funds; for the withdrawal of funds tends to reduce activity.

If the business-cycle movement were nearly symmetrical—with prosperity expansions balancing depression contractions—the appropriate method of financing would be sterilization of funds collected from taxes in prosperity and the use of such funds to finance expanded public works in depression. A deflationary effect is thereby provided in prosperity and an inflationary effect in depression. Alternatively, the expanded public works can be financed by borrowing in depression instead of building up funds in the preceding prosperity. In that case the funds would be provided, if at all, in the *following* instead of in the *preceding* prosperity. If the bonds paid off in a following prosperity represent bank holdings, monetary-control measures should be employed to avoid expanding bank credit. If the debt repayment is to individuals, the search for new outlets for the funds may be almost as stimulative as the taxes withdrawn for repayment are repressive. Possibly even better than the orthodox procedure would be a Treasury-savings-bank plan for absorbing unused savings of individuals in prosperity, if such there be, for expenditure in the *following* depression.

Public works financed through taxation will be stimulative *only* if the funds taken by taxes to finance the program would otherwise have been hoarded. The effect will depend upon the type of taxes employed, but the hoarding thus prevented is not likely to be a major item. Too little is known about the relationship between private expenditure and various types of taxes to predict the extent to which hoarding could be prevented by public spending of funds obtained by taxes in a depression.

A serious problem posed in using public works as a compensatory device is geographical location of the projects. The most needed public works are geographically distributed very differently from the cyclical unemployment. Unemployment is most severe in the industrial centers making durable goods. Although some public works will be justified in such areas, a sound development program would necessitate

migrating workers to other areas. Any program of large-scale migration to compensate for cyclical unemployment is certain to face extremely serious difficulties.

In spite of the difficulties a program of public works is seen to present, it will remain a method of substantial importance in business-cycle control. An essential requirement in depression is work for those who are unemployed; the alternative is the threatening demoralization of enforced idleness. If no shelf of public works or other compensatory measures are available when depression strikes, some type of public expenditure must be quickly instituted, even if much less desirable than we should like.

Federal Subsidies to New Construction. The principal reliance upon public works as a compensatory cyclical measure depends upon the character of construction in general, that is, upon the fact that public works, being durable, do not have to be produced in a regularly recurring stream; they can be timed somewhat in accordance with our cyclical needs. Such durable goods are particularly appropriate as a compensatory device because they are such a major factor in the fluctuation over the business cycle. It is logical to plan an anti-cyclical fluctuation in public durable goods to offset the cyclical fluctuation in private durable goods.

Some analysts have thought it just as logical to encourage enterprisers to maintain a regular flow of private durable goods. A famous proposal is to have companies submit proposed projects and bid for subsidies.[5] The government could accept these bids in accordance with the subsidy required. Presumably, the aim would be to seek the lowest subsidy cost required to approve a satisfactory quantity of construction work. Since the normal requirement for private non-residential construction is in the order of 7 billion dollars, and for producers equipment in the order of 15 billion, a few billion in subsidy might induce satisfactory output. Rorty proposed that the program of subsidies be financed by a sales tax.

In essence, this program reduces the cost of capital in depression. It is to be doubted, however, if cost is the major deterrent at such a time because costs are lower than at other phases of the cycle. Major companies ordinarily could raise funds to finance investment at these costs as indicated by the low yield on high-grade bonds. The enterpriser has difficulty in judging a need for additional capital investment during a period of low operating rates. In fact, a common opinion at such a time is that there is no major need for additional capital. Some small enterprisers with vision but insufficient financial backing may

[5] See M. C. Rorty, "How Can Business Revival Be Forced?" *Harvard Business Review*, X (April, 1932), 385–98.

see needs which merit support. They should not require subsidy, however, if they have discovered promising projects. Rather, they will require a source for capital funds, such as has been provided by the Reconstruction Finance Corporation.

A mild form of this program is the tax exemption of new construction in depression, discussed later in the chapter. Subsidies are provided to the extent of tax remission.

Foreign Investment. As pointed out in the business-cycle history chapters, the downswings in 1924 and 1927 were partially offset by an increased flow of foreign investment. This result, however, was made possible by the payment of war debts. Such large extratrade payments are now thought to be undesirable, and therefore the conditions of the twenties could not readily be duplicated.

Domestic prices decline in depression; and if foreign countries are not also in the depression phase, they will buy an increased quantity of our goods and automatically provide some support. No significant proposal has been made, however, with respect to providing only depression support for foreign trade.

A major proposal now made is to step up our foreign investment substantially to offset any excess of planned saving over planned investment in prosperity.[6] Our exports should not be made contingent upon such a program if measures can be applied to induce ready absorption of goods and services at home. The author believes that better measures are available to accomplish this purpose. There is little need to give our products away to stabilize our economy if we can do just as well in absorbing the products ourselves. In the long run, foreign countries would disapprove of such a policy, just as countries have always disapproved of dumping in international trade.

The stimulation of foreign trade does not, of course, always or necessarily imply giving products away. If the policy comes to be no more than that of stimulating foreign trade, however, it no longer is of much importance as a stabilizer. The actual increase in foreign demand might well come at a time when domestic conditions were inflationary; and when our markets need support, the foreign countries might also be depressed.

Note should be made of the fact that analysts in foreign countries are very fearful of the instability of American business activity. The soundest international policy is to establish foreign trade and investment on the basis of the mutual interests of the countries involved.

[6] See Henry Wallace, *Sixty Million Jobs* (New York: Simon & Schuster, 1945); Hal Lary and Associates, *The United States in World Economy* (Washington: Government Printing Office, 1943); A. H. Hansen, *America's Role in the World Economy* (New York: W. W. Norton, 1945). For a more theoretical analysis see Fritz Machlup, *International Trade and the National Income Multiplier* (Philadelphia: Blakiston Co., 1943).

Our own domestic stability is the major contribution we can offer to the stability of international economic conditions.

Unemployment Insurance. Public payments in fiscal policy can either be made in support of investment or in support of consumption. Just as public works represent the most direct method of supporting investment, unemployment insurance represents the most direct method of supporting consumption, since payments go directly to unemployed persons. If carried to the extreme limit, these payments could be equivalent to those the workers would have received if employed, and a decline in the flow of income payments would be avoided. Few, if any, propose unemployment-insurance payments at so high a level, but substantial disagreement exists as to how high the level should be. In the early days of the Social Security Program, unemployment insurance was too small to be of major importance in cyclical stabilization. The size of the payments and maximum period of payment have been increased to the point where unemployment insurance must now be given serious consideration as a stabilizer and must not be considered as a mere palliative.[7]

No problem of postponement, so perplexing in public-work programs, is involved in unemployment insurance. Unemployment insurance is paid only when workers are unemployed. While the amounts paid in unemployment insurance under prosperous conditions are more than many persons realize, these sums are paid only where needed. Prosperity unemployment is produced by many factors, but they are generally unrelated to the forces producing depression unemployment.

Unemployment insurance differs from public works in presenting no problem of migrating workers. The most desirable public-works projects may be in geographical locations other than the place of residence of the workers. Also, unemployment insurance involves no administrative decision as to the nature of activity needed. Unemployment insurance is not paid for current service performed. If the public-work project is of any value, a social gain results as compared to paying workers kept in idleness. The public-work projects stimulate the basic industries which are depressed by the decline in demand for durable goods. Unemployment-insurance payments lend no special support to these industries.

Unemployment insurance should be useful in keeping workers ready at all times for absorption in private industry. If large enough unemployment-insurance benefits are paid, on the other hand, work-

[7] See National Resources Planning Board, *Security, Work, and Relief Policies* (Washington: Government Printing Office, 1942); L. H. Feder, *Unemployment Relief in Periods of Depression* (New York: Russell Sage Foundation, 1936).

ers may be reluctant to return to work. The present prevailing opinion is that wage rates on public-work projects introduced to support investment in depression should be as high as on private work. Even if wage rates are somewhat lower, it is possible that some difficulty would be experienced in shifting workers to private industry when they are needed. Migration may have been necessary for the public-work project; the key personnel required on the project, if it is to continue at all, are likely to be those first needed in private industry.

Public-work projects are limited by the types of investment socially acceptable at the time. Unemployment insurance is theoretically limited by the built-up reserve, but the amount of the reserve will probably be no deterrent to the amounts of unemployment insurance paid in a future depression.

Fiscal control should involve both public works and unemployment insurance, and it is not possible to state that either one or the other is the superior form under all circumstances. Enough cases will occur when a choice must be made between them that their relative merits are important. Unemployment insurance will be available immediately, while it will take some time to get under way a public-work program of substantial size. Therefore, unemployment insurance provides an earlier support. Governments are less likely to become panicky if unemployment insurance is widely available, and in this way it may help to develop a more thoughtful program. Under conditions of long periods of idleness, on the other hand, the argument must generally be resolved in favor of the public-work program because of the humiliating and demoralizing effect of forced idleness.

Since no activity is involved, unemployment insurance is purely inflationary, just as the unemployment taxes collected in prosperity minus the unemployment benefits paid at that time are purely deflationary. Unless the pay-roll taxes involved are absorbed into the general fund and come to be looked on as a method of financing other activities of the government, which appears unlikely, they must be looked on as deflationary in prosperity.

In depression, there is no problem of the financial effect, as long as benefits are paid out of reserves. The payment will be purely inflationary. After the reserve balances are gone, financing may be by bank borrowing, with the same effect as before; or it may be by taxing, in which case disposable income might not be increased by the benefit payments.

After a time, during prosperity, the rate of reserve accumulation slows down materially because in most states the unemployment tax rate varies with experience ratings, which were set up on the theory that employers could be induced to give steadier employment if a

financial incentive were provided. Employers may be so induced to provide steadier seasonal, but not cyclical, employment. The loss of profits in depression is a strong enough financial inducement.

The funds paid out in depression probably will not be limited by accumulated reserves because the problem is likely to be viewed in terms of general fiscal policy. Such a policy would necessitate continued payment of benefits in depression, regardless of the size of reserves.

Underwriting Consumer Spending.[8] Unemployment insurance under present conditions cannot be expected to provide benefits large enough to maintain consumption. The obvious objection to large enough benefits is that they would entirely remove the economic incentive for work. Consumer income can be augmented by various other means, however, to an extent great enough to maintain total consumer spending. This, Pierson proposes to do. His method involves the direct projection of the GNP statement to the following period. Pierson would offset by the payment of consumer subsidies whatever shrinkage is indicated. He recognizes that an estimate would have to be made of the extent to which the consumer subsidies would be saved instead of spent; thus, the larger the leakage, the greater the subsidy would have to be. This measure represents a logical method of fiscal control. The particular methods of paying the subsidy are not an essential part of the plan. It is reasonable to think in terms of the best combination of total subsidy payments which we can devise, involving unemployment insurance, sales subsidies, reduced income taxes, and the direct mailing of checks to consumers by the government.

It is idle to attempt a detailed analysis of the workability of this plan. The issues it raises need merely be mentioned. Would there be constant danger of inflation? Would not undue attention of everyone be focused on ways of channeling the consumer bonus for his own benefits? Would not subsidies tend to be extended to industries which have outlived their usefulness? Would not successive declines in the elasticity of demand which occur in prosperity make the problem of monopoly increasingly grave? Might not unemployment become so large that the consumer subsidies would become tantamount to continuing unemployment benefits?

There are also issues which put the plan in a more favorable light.

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[8] See J. H. G. Pierson, *Full Employment* (New Haven: Yale University Press, 1941); J. H. G. Pierson, "Underwriting of Aggregate Consumer Spending as a Pillar of Full-Employment Policy," *American Economic Review*, XXXIV (March, 1944) 21–55; D. M. Wright, *The Creation of Purchasing Power* (Cambridge, Mass.: Harvard University Press, 1942).

Is it not better to support consumer income by bonuses than to force up costs by wage-rate increases which may impede production? Are not economic readjustments better effected when all consumers have a full demand complement with which to vote? Cannot producers plan better for consumer needs if they are always assured of the level of total demand?

One's evaluation of the plan depends upon (*a*) his faith in the effectiveness of administrative control, and (*b*) his estimate of the prodding necessary to make everyone contribute his maximum productive effort. The necessity of leaving so sweeping an issue up in the air is due much less to uncertainty regarding the type of reaction which occurs over the business cycle than to uncertainty regarding the type of reaction which would occur under drastically changed conditions.

Sales Subsidy. Most plans refer to one particular method rather than to an all-inclusive procedure like that of underwriting consumer spending. The payment of a subsidy to retailers or manufacturers is one method of utilizing consumer subsidies. Assuming sales taxes were in use, the first step would be a remission of these taxes, and, if consumer expenditures were still found to be unsatisfactory, the government would mail subsidy checks to distributors instead of collecting taxes. Carried to the limit of underwriting sufficient consumer spending to maintain "full employment," this method would become a painless substitute for price cutting. With a subsidy, prices could drop to any necessary level to move the required volume of goods.

Subsidies might be paid on the prices established by the market. To do otherwise would involve many detailed administrative decisions such as were required by OPA. This would involve, however, some mechanical rule such as the amount of subsidy relative to the percentage decline in price. If no limit were set on the percentage decline in price permitted, enterprisers would be encouraged to produce everything up to the limits of complete satiety—so long as the consumer would pay anything for the product. The resulting distribution of product would parallel available capacity rather than the market demand, which would of course be the demand if there were no subsidy. As a practical matter, broad limits almost certainly would be set to the price declines permitted, but these limits would largely determine demand distribution. If, say, a fixed percentage decline were established for all commodities, the tendency would be to perpetuate the prosperity structure of prices. The instability of price interrelations in prosperity, with high raw-material prices, for instance, is well known. Therefore, if activity declined, industries where very high-cost units were withdrawn from production would make

very high profits; if activity remained stable, disproportionate cost reductions from improved methods would overstimulate certain industries. Detailed administrative control might be hard to avoid.

Varying Tax Rates. A form of consumer subsidy widely favored at the present time is a reduction in the income-tax rate. This method would have been less promising before the war because of the relatively small group of persons paying income taxes and the relatively small amounts involved. Both of these conditions are now reversed; in addition, the withholding feature of our present income tax system provides the basis for appropriate timing. To make this timing feature effective, however, would require administrative control which the Congress is unlikely to favor. Theoretically, at least, the tax rate could be moved below zero by adding credits to workers' income accounts instead of subtracting withholding debits.

Compared to the sales subsidy, graduation in favor of the lower-income groups would be more difficult. The high-income tax rates are at the high-income levels, and remission of income taxes paid by the lower income groups would not greatly increase expenditures. The granting of an income credit would be politically less acceptable than sales subsidies. Administrative control is more likely to be given in the case of sales subsidies because the effect on expenditure is more direct. The tax-remission method applies to income rather than to expenditure, and estimated savings must be subtracted to get the expenditure effect.

On the other hand, the tax-remission method would involve less uncertainty as to the extent of administrative control which might eventually materialize. Unlike price interrelationships, rate and graduation of taxes are now completely controlled by the government.

A feature of the tax-rate method is that it does not involve any increase in government expenditure and provides for reduced taxes when support is given. But the sales-subsidy method of increasing expenditures without reducing taxes should produce about the same deficit and the same effect; in fact, since no savings are directly involved, the deficit provided by sales subsidy might be even more effective.

Unless the theory is accepted that the only purpose of taxation is to provide an instrument for stabilizing the economy, the tax-rate method can be criticized for its erratic influence on the tax system. The part of the total tax load borne by income taxes would vary greatly from year to year. This is a disadvantage which accrues when any established process is changed to provide a method of stabilization by compensation. If an established process is not taken over, new machinery must be set up.

Townsend and Ham-and-Eggs Plans. During the Great Depression frantic search for spending methods to support activity frequently directed attention to early retirement and old-age pensions. The Townsend Plan would provide $200 per month to retired citizens over fifty-nine years of age on condition that they immediately spend it for goods and services. The Ham-and-Eggs Plan would pay all citizens over fifty years of age $30 in stamp scrip every Thursday. Both plans rely on sales taxes for financing. Varying the tax rate is not proposed, but that would be the only way of introducing compensatory features into these plans. The claim is sometimes made, on the basis of the proposed tax rates, that these plans would be deflationary.[9] The first effect, however, might be higher prices to absorb the sales tax. Ultimately, of course, the influence would be deflationary if the amount of the tax remained larger than the payments.

2. FISCAL POLICY DESIGNED TO FORCE ENTERPRISE

Consideration is given in this section to proposals to employ greater or less force through fiscal policy to induce enterprise to provide stability. For so complicated a problem as control proposals, it is impossible to adopt a completely logical classification scheme; the proposal for incentive taxation, analyzed in the preceding chapter, and the proposal for federal subsidies to new construction, analyzed in the preceding section, properly belong here. They are discussed at these earlier points so that they may be better contrasted with substitute proposals.

Exemption of Business from Taxes. Proposals to lighten business tax burdens when business incentives should be encouraged differ substantially from those made to vary individual income-tax rates. There is a direct, and at most times reasonably close, relation between consumer disposable income and expenditure; reduced taxes increase disposable income. The businessman, on the other hand, will spend for capital investment when he sees consumer markets. Most plans for reducing business taxes operate by reducing the cost of capital investment. When such an inducement is necessary, the enterpriser usually fails to see the need in terms of consumer markets and may have extensive unused capacity. Most enterprisers at such a time are not likely to be interested in acquiring capital goods at any cost.

These criticisms are particularly applicable to property tax exemption on new construction in depression. Other than for residential building, little interest is likely to be shown in business construction just because property taxes are lifted; empty stores, office buildings,

[9] See Dahlberg's short description of these plans in TNEC Monograph No. 25, *Recovery Plans* (Washington: Government Printing Office, 1940), pp. 44–47.

and factories are generally available at below current costs of construction in depression. The most common exemption of property taxes applies to residential building, however; and in this area it has more promise because housing facilities are generally more fully used in depression. Several municipalities have granted tax exemptions ranging from 5 to 15 years. The method introduces some irregularity into the residential property tax and is frequently disapproved of for this reason.

Kalecki has recently proposed changing business income taxes to permit charging gross current investment, instead of depreciation, as a cost for income tax purposes.[10] To avoid paying income taxes, enterprisers could spend the whole of their net profit on capital building. Kalecki thinks this would help to keep planned investment adequate in prosperity. Costs are a factor at this level, and the plan might encourage prosperity investment. With uncertainty as to the adequacy of planned investment, the author suggests that the plan needs more flexibility. Permission to deduct the full amount of gross investment might prove inflationary in peak prosperity. The method would be of little value in depression. The income tax would represent a penalty paid for not expanding, but most companies make little if any net profit in depression. For a company making a net profit in depression, and whose capacity was thought to be excessive, the penalty tax probably would be paid. The plan might turn out to be stimulating in prosperity and repressive in depression.

Variation of business income-tax rates, although infrequently suggested, is a logical extension of the variation of individual income-tax rates. Such a plan affects income from current operations and does not provide incentives to increase capital investment. Business costs would be increased in prosperity and decreased in depression. In depression, the method would be somewhat comparable to a sales subsidy, except that prices would not have to be decreased to get the benefit. In prosperity, costs added by the increased tax rates might be passed on in higher prices.

Government Loans to Industry. In depression, inability to obtain capital, rather than high cost, is more likely to act as a deterrent to investment. Risk is apt to be assigned an exaggerated importance, making it difficult for most enterprisers to obtain loans. The Reconstruction Finance Corporation has provided an important service in this respect. Reasonable assurance of funds for promising capital expansion is needed in depression. If the government extended loans in great enough volume, expenditure could be underwritten as fully

[10] M. Kalecki, *The Economics of Full Employment* (Oxford, Eng.: Blackwell, 1944).

as with public works or sales subsidies. However, since it would be difficult to find requirements for any such volume of loans in depression, the other policies are to be preferred if a thoroughgoing compensatory measure is desired.

Government loans for residential building have assumed considerable importance because of their tendency to force interest rates to lower levels. Current payments required to finance a house were reduced in the late thirties, and this factor was stimulating because capital costs are an important factor in the demand for housing.

Multiple-Commodity-Reserve Plan. Benjamin Graham has devised a stabilization plan dependent upon the storage of specified commodities without limit as long as deflationary forces persist.[11] The commodities involved would be only those dealt with on the organized exchanges, and these commodities would have to be sufficiently nonperishable to be subject to reasonable lengths of storage. Graham suggested the following list: barley, cocoa, coffee, copper, corn, cotton, cottonseed, cottonseed meal, flaxseed, gold, hides, lead, oats, petroleum, rubber, rye, tallow, tobacco, silk, sugar, tin, wheat, wool, and zinc. The mechanics of the plan is to permit free exchange between one composite unit of commodities and a thousand dollar certificate. The amount of each commodity included in the composite unit would be fixed by its consumption in the previous decade.

The weighted-average price of the depositable commodities could show no decline, for the weighted combination would be exchangeable for a fixed sum of money. It is most important (1) that each individual price would not be stabilized, nor (2) would it be as much influenced by the stable commodity unit as by general market factors. In Graham's suggested unit, wheat is listed at $1.24 per bushel, and 824 bushels are required to obtain a thousand dollar certificate. Thus, in the thousand dollar unit, wheat accounts for $104.90, or slightly more than a tenth of its total value. Let us assume that wheat supplies rose a great deal and that the demand for wheat did not increase; wheat prices might be assumed to drop to 25 cents a bushel. Now the value of wheat would account for little more than $20 in the commodity unit. If no market change occurred in the other commodities in the unit, the price of each other commodity would rise proportionately to make up for the decline in the price of wheat. No change would take place in the quantity of each commodity required in the "market

[11] Benjamin Graham, *Storage and Stability: A Modern Ever-Normal Granary* and *World Commodities and World Currency* (New York: McGraw-Hill Book Co., 1937 and 1944, respectively); League of Nations, *Economic Stability in the Postwar World*, Part 2 (Geneva, 1945); H. Feis, *The Sinews of Peace* (New York: Harper Bros., 1944); W. W. Riefler, "A Proposal for an International Buffer Stock Agency," *Journal of Political Economy*, December, 1946.

basket" originally established to sell for a thousand dollars. The individual prices would shift, the only condition limiting their fluctuation being that their average price must always remain the same.

The plan amounts to stimulating activity in depression by storing specified commodities. It differs from the collection of agricultural surpluses under the various stabilization plans for agriculture in including a broader list of commodities. Maintained production of all products would sustain prosperity. Under these circumstances, the ideal of fiscal control policy would be achieved: merely by standing ready to buy at a maintained price level, the government would sustain prosperity. Production otherwise purchased by the government actually might be bought by the private economy because the requisite purchasing power would be created. While Graham's plan does not offer to purchase all commodities, it covers several of the raw materials whose prices decline most in depression, and it probably could be extended to cover others of similar nature.

The production cost of most products is dependent principally upon two major items: labor and raw material. Short of a major depression, it is not likely that wage rates will be allowed to decline significantly in the future. Therefore, if raw-material prices are supported, product prices could vary only because of shifts of demand in their own markets. The most violent variation in prices in the past has been in the raw-materials markets. The markets for final products have been greatly disturbed by this variation.

It is far better to stabilize the average price of a group of raw materials than to stabilize each raw material at a fixed price. The average and not the individual prices are fixed in the commodity reserve plan, because the thousand dollar certificate would be exchanged only for a composite group of commodities in established proportions. If the market price of one of the commodities declined, its proportionate value in the thousand dollar certificate would shrink. If individual prices were supported, substantial storage would be almost certain to develop. It could be avoided, in fact, only if the price were no higher than would have occurred on the competitive market.

The price of raw materials in depression has always declined relative to other commodities. To the extent that the raw materials represented in the composite unit are consumed in durable-goods industries, their consumption is certain to decline unless a downswing is avoided entirely. For many of these commodities, the production does not tend to decline with an initial shrinkage in industrial production, because they are agricultural commodities or produced under similarly competitive conditions. The quantities available will tend to outrun the market demand in a downswing. For these reasons, the

plan could be expected to lead to storage problems. Since the setting of price floors in the past has led to embarrassing surpluses, the piling-up of government-supported commodities is viewed with disfavor. For this reason, the plan would probably not be successful without general conviction that a drawn-out depression would be avoided. With this conviction, such a plan comes as near to automatic support of high-employment markets as we can hope to attain.

Support would be given to the markets which become most demoralized in depression. Such support for construction is the most important reason why many persons favor public-work programs rather than consumer subsidies. Many of the difficulties of the public-work program, such as those listed below, would be avoided: migration of workers, the building up of a shelf of public works, the improvising of make-work projects, the inevitable lag in getting public-work activity started, the bidding of workers away from public employment when recovery gets under way. Even the difficult forecast of the amount of support needed would not be of crucial importance. Commodities would move into storage when private demand became insufficient to support their average price.

International support of raw-material prices now appears to be assured, but it is developing in terms of floors for each commodity.[12] It is difficult to deny that raw-material countries need to provide themselves with some degree of market stability. In the event of a major depression, the shrunken demand and extremely low prices for their products leave them in a pathetic condition. At such a time they must await recovery in industrial countries, for with raw-material prices absurdly low, they, themselves, can make little further contribution toward recovery. The commodity-reserve plan is therefore of interest in contributing to international stability. Maintenance of the gold standard to foster international trade is not now an issue.

Difficult problems of judgment would be faced whenever revision of the composite unit came up for consideration. If the conditions that the commodities must be traded on organized exchanges and shall be represented by the preceding ten-year average consumption are strictly followed, arbitrary decisions could be reduced to a minimum.

Other Purchase-Agreement Plans. Frank Graham would extend the multiple-commodity-reserve plan to all standard storable goods (including automobiles, for instance):

> Let business enterprisers making *standard storable goods* (whether producers' or consumers' goods) be encouraged to produce as much as they can, with all the labor at their disposal, on the understanding that on the appearance of sagging markets the

[12] See International Labour Office, *Intergovernmental Control Agreements* (Montreal, 1943).

Federal Reserve Banks, acting on behalf of the public through an affiliate Federal Reserve Corporation, will purchase liens on any unsold present or accruing inventory at a price sufficient to cover the enterpriser's out-of-pocket expenses in the production of the goods in question. Payment for the lien will be made in ordinary Federal Reserve deposit credits which the enterpriser will, of course, immediately transfer to his own commercial bank in exchange for deposits in those banks. Liquidity, in any amount, will thus be given to producers of goods, and total national expenditures will be automatically kept at the level necessary to take off the market all the goods that can be produced in full employment.[13]

For raw materials he would stick to the multiple-commodity-reserve plan, buying composite units rather than setting prices for each commodity to cover "out-of-pocket" expenditure. As a result, raw materials would get better treatment on the average than other standard storable goods.

What are the advantages and disadvantages of extending the commodity-reserve plan to cover other than raw materials at so-called out-of-pocket prices? A cumbersome machinery would be necessary to set out-of-pocket prices. How would the plan work as a downswing begins? Presumably the producer would sell at maintained prices on the private market and fill out his output with products sold to the government just covering his out-of-pocket costs. In industries with "price leadership," prices might even be raised in the private market. Large groups of potential buyers might thereby be deprived of an opportunity to buy. Graham thinks his plan would eliminate monopoly because production would be unrestricted, but his is a very special type of unrestricted production. If prices were kept high in the private market, the government obligations might become larger and larger.

Graham holds that guaranteeing out-of-pocket costs would assure high-investment levels. The producer would be assured of a market, but not of a profitable one. Could he expect the government to continue to buy capacity-output of his product if his expansion proves to be unreasonably excessive?

The Ezekiel purchase-agreement plan is one of the most famous. It can be summarized as follows:

Industrial expansion will provide for expanding employment by having an appropriate government agency arrange with business concerns to increase their volume of operation. Before the national program is put into operation each major industry will be called upon to prepare programs of expansion. Both workers and employers in each industry will help in developing these industry programs. The expansion programs from the several major industries will then be checked against one another and revised where necessary to make sure they fit together. After that is done the

[13] See Frank D. Graham's essay in A. P. Lerner and F. D. Graham, *Planning and Paying for Full Employment* (Princeton: Princeton University Press, 1946), pp. 44–45.

designated government agency will give the concerns in each industry advance orders for the planned increase in production, by underwriting the expansion program and agreeing to buy any unsold surplus. Each concern will then know it can count on the increased output being sold. It will be safe in increasing its activity, putting more men to work, raising pay, as called for in the programs, and in starting to repair and expand its productive equipment. The increases in pay rolls and in the purchase of plant and equipment by industry generally will provide the market for the increased production.[14]

Two major steps are involved. Plans for investment would be initiated by industry and approved or disapproved by an administrative agency of the government. If approved, the government would underwrite the expansion program to the extent of agreeing to purchase any unsold surplus. The administrative agency passing on expansion plans would possess great power, opening the door for arbitrary decisions.

In evolving this procedure, Ezekiel was thinking of the NRA, which was "largely captured by business groups and diverted to their own special interests rather than used for the general welfare";[15] and of the agricultural AAA programs which had taught the farmers to solve their problems through collective action. "Collective action through government might similarly help business and labor to work together to solve some of the economic problems of industry."[16] But the problem of industrial expansion is quite dissimilar to that of agriculture, and the few large business units might co-operate in quite a different way. Judgments on the plan will turn largely on evaluation of the desirability of an administrative agency of the government making key decisions on industrial expansion and of permitting businessmen in each industry to make a joint and binding decision on expansion plans. Such decisions and co-operation would be a necessary part of industrial planning under government control.

The government would have to write off large losses if it had to make good on its guarantee to buy unsold surpluses. Our experience with the sale of war surpluses by the War Assets Administration illustrates the point.

The Industrial Expansion Plan proposes to maintain the level of activity so that depression-induced surpluses would not occur. All analysts agree that depressions do not occur when there is an adequate amount of investment activity. Ezekiel's plan proposes to effect this directly by government action. Needless to say some mistakes would be made, resulting in useless production. Mistakes of this sort occur

[14] Mordecai Ezekiel, *Jobs for All* (New York: Alfred A. Knopf, 1939), p. 19; see also Ezekiel's *$2500 a Year* (New York: Harcourt, Brace & Co., 1936).

[15] *Jobs for All*, p. x.

[16] *Ibid.*, p. xi.

in any system. If the plan would guarantee high-employment activity at all times, we could afford to take much larger losses than in the past on the production of unwanted goods. Landauer suggests that the Ezekiel plan would be improved if the government paid claims for compensation of losses rather than stood ready to purchase unsold surpluses of co-operating firms.[17] Losses so incurred would be comparable to the subsidies required in Rorty's plan of federal subsidies to new construction, which was outlined above.

Forward Agreements. Morris Copeland proposes "forward agreements" between enterprisers and the government, intended principally to maintain stable inventories in recessions and to have construction projects ready for activation on short notice.[18] The government would offer bonuses and tax credits for compliance, and no compulsion would be applied. Subsidies paid on forward agreements to have construction projects ready for activation on short notice is quite similar to the proposal for federal subsidies to new construction discussed above. Bonuses to prevent inventory depletion in depression would encourage accumulation with abandon in prosperity unless handled with great care by an administrative agency, both in prosperity and depression. The provision represents a mild form of Landauer's proposal for loss guarantees, but, in this case, the guarantee covers past and not present production. Thus, the aim of the stable inventory agreement is to prevent a deflationary force rather than to provide an inflationary one.

3. DIRECT GOVERNMENT INTERVENTION, CONTROL, AND OPERATION OF THE ECONOMY

Instead of government interference, as considered in the above sections, stabilization may be attempted by government control and operation of industry. This is notably the Russian method, operating through a communistic system. Government-controlled and operated industry is much more common throughout Europe than here; important French and Swedish industries have been socialized for many years. Under the Labor Government, the process of socialization is being speeded up in Britain, and, as a likely aftermath of the war, the same trend probably dominates Europe.

As developed in later paragraphs, totalitarian direction—whether

[17] See Carl Landauer's essay in A. P. Lerner and F. D. Graham, *Planning and Paying for Full Employment*, (Princeton: Princeton University Press, 1946); also his *Theory of National Economic Planning* (Berkeley: University of California Press, 1944).

[18] Morris A. Copeland, "Business Stabilization by Agreement," *American Economic Review*, XXXIV (June, 1944), 328–39. Copeland also proposes agreement for a definite period during which the purchaser "undertakes to place an order for an article to be delivered or job to be done during a definite future period."

it be communist, socialist, or facist—at least theoretically makes stabilization possible. There is little reason to believe that partial socialization without compensatory action would tend to produce improvement. The greater the part of total industry under public direction, the greater are the possibilities of anticyclical variation in spending. However, the pricing policies in the socialized sectors probably have been no more stabilizing than in the private economy.[19] Policies of government pricing have almost entirely ignored repercussions on the cyclical movement. This is illustrated by a freight-rate increase granted by the Interstate Commerce Commission in the autumn of 1931, when all prices established in the private economy were declining.

Yardstick Competition. Yardstick competition is one method of increased socialization of industry which has been recommended because of its stabilizing potentialities. Instead of socializing complete industries, government firms are set up in semimonopolistic industries, in which most of the firms are private, for the purpose of using positive economic competition to push down controlled prices and to push up depressed wages. The only important application which has been made of this method is in the utility field, notably in the production and distribution of electricity. Advocates of the method claim extensive success in this field. Critics hold that the competition provided has been unfair: that the yardstick corporations were not paying the same taxes as private companies, or that the interest-rate allowed was lower than obtainable by private industry, or that current charges for depreciation were too small or not made at all, or that part of the supervision was not charged to the project. Substantial difficulties are faced by the government in attempting to duplicate the competitive setup in any industry. Past difficulties, however, may have been caused more by the failure of the government corporation to provide satisfactory accounting information than by providing unfair competition.

The method of yardstick competition would be most usefully applied to industries with standardized products. In industries with greatly diversified products, the government would find it difficult to handle the specialized markets and to keep abreast of changes in demand. Need to apply the yardstick method would arise if the industry failed to follow the principles of dynamic pricing and if antitrust prosecution proved ineffectual in correcting abuses.

Socialized Industries to Absorb the Unemployed in Depressions. Many experiments have been made with socialized communi-

[19] See TNEC Monograph 32, *Economic Standards of Government Price Control*, ed. D. H. Wallace (Washington: Government Printing Office, 1941), Part I, pp. 3–54.

ties, sometimes for the purpose of finding work which the private economy was failing to provide. A notable illustration is Robert Owen's Co-operative Communities set up in 1830.

This type of socialization may be recommended only for the depression emergency, as is illustrated by a proposal made by Frank Graham in 1932.[20] He proposed putting the unemployed to work producing for each other. The government would subsidize the venture to the extent of providing facilities. The workers would be paid money scrip good only for the purchase of goods produced in these socialized ventures and of an amount equal to the value placed on the goods produced.

Actually, a somewhat similar scheme was used by the Federal Relief Administration but on a small scale and largely to produce goods to be given in relief. This plan appears to be much more practical than putting the unemployed to work producing for themselves. The proper assembly of skills and sympathetic management might be difficult. Undoubtedly, going concerns could operate more efficiently than such makeshift outfits.

Totalitarian Control. It can be stated as a theoretical principle that, without psychological resistance and international complications, a totalitarian economy can provide continuous full employment. Activity need not depend upon the dictates of the market. If consumers do not willingly buy the products, they can be forced to take them under rationing schemes; or the unwanted goods can be destroyed.

The variation in investment activity is the source of a large part of the instability under private capitalism. Decisions regarding what investment is to be made are formulated by the government in a totalitarian system and may, under certain circumstances, follow a stable pattern. Saving as an unstabilizing influence loses much of its significance, for investments are owned by the state and are not for sale to individuals; all unused savings can be absorbed by the government, as in the Treasury-supersavings bank plan. Employment is not determined by anticipated market demand, but by quotas established by the government. If, in filling one of these quotas, workers remain unemployed, the quota could be raised, or the workers diverted to other plants where the quotas would be adjusted to absorb them.

Any system must, however, obtain some degree of active co-operation from the country's citizens. Sufficient psychological resistance will in time defeat it. Assume that rationing is not required, but that the consumers buy only half of the product indefinitely because of

[20] See Frank D. Graham, *The Abolition of Unemployment* (Princeton: Princeton University Press, 1932).

dissatisfaction with its quality, type, or price. Continuous destruction or storage of half of the product would overthrow the system. Again, assume that the economy is not self-contained and is subjected to the foreign-trade repercussions of depressions originating in other countries. Investment plans might be upset; foreign exchange might not be available to buy the necessary raw materials. The quotas of industries calling for exports might be disturbed because of a shrinkage of foreign demand. With a flexible enough program, adjustments could be made to provide the necessary shifts to put the economy on a domestic basis. Such quick readjustments might entail painful personal dislocations and might not be worth while in view of the danger of psychological resistance.

We are likely to think of the working of a totalitarian economy in terms of its adaptation to our own economic problems. These differ substantially from those of Russia, because Russia is a much poorer country and because of her very urgent need for investment. Russia has been catching up with the technological advancement of other industrial countries rather than developing new methods and applications; this in itself explains in part why her problems are very different.

The Soviet manager of an industrial enterprise has very slight power in the disposition of property and in production planning, but he has much greater power in the hiring and firing of labor than do managers under private capitalism.[21] Various organs of the Communist party are constantly subjecting the manager to new orders and regulations. He is operating under a comprehensive plan in which his function becomes essentially that of executing orders, although he possesses whatever residual power remains after he attends to the specific orders given by industrial boards and trusts of the People's Commissariats.

REVIEW QUESTIONS

1. Why is not merciless price cutting a completely satisfactory method of correcting the maladjustments existent in a depression?
2. Differentiate between an accounting system in which all idle labor and the costs of overhead in raw-material industries directly related are considered as true overhead of the various companies in a given industry, and an accounting system in which the deviation from the present accounting practice is to charge the capital as overhead only when such capital is in use.
3. List in parallel columns the difficulties faced by a public-work program and the possibilities of overcoming these difficulties.

[21] See Arthur Feiler and Jacob Marschak (eds.), *Management in Russian Industry and Agriculture* (New York: Oxford University Press, 1944); Maurice Dobb, *Soviet Planning and Labor in Peace and War* (New York: International Publishers, 1943).

4. List the ways in which a public-work program and a scheme of federal subsidies to new construction in depressions are similar; list the ways in which they differ.
5. State the importance of long-time trend forecasting in any scheme of state socialism which is devised to prevent the occurrence of business cycles.
6. If depressions are the manifestation of superficial conditions, can they not be ended by exhortation?
7. Classify various schemes according to whether timing or some other indirect effect is the chief difficulty.
8. Discuss the advantages and disadvantages of lodging all monetary and credit control with the Board of Governors of the Federal Reserve System. Could a feasible plan be worked out under our present setup by which the control would be centralized?
9. Considering a limited number of proposals, discuss the different ways they might be handled in secondary depression as compared to less violent declines.
10. Discuss the relation between dynamic pricing and the tendency for prices to rise in a cyclical upswing.
11. Discuss the relation between dynamic pricing and (*a*) development of new and improved products; (*b*) antitrust action; (*c*) encouragement of competition; and (*d*) yardstick competition.
12. Did the undistributed profits tax work out in 1937 as theoretically anticipated?
13. To what extent would accelerated depreciation rates prevent depressions?
14. Compare the results achieved by a last-in, first-out inventory scheme with those of an undistributed profits tax.
15. What is meant by saying that disruptive changes in ownership are due to the existence of debt?
16. Why is the 100 per cent reserve plan less often considered today than before World War II?
17. Compare a tax on deposits with a tax on unused savings.
18. Why should incentive taxation be considered a proposal of the type called "fiscal policy designed to force enterprise"?
19. Is there any inherent difference in taxes and deficits between public-work and consumer-subsidy plans?
20. Comment: "The fact that the Chinese need more and better housing can scarcely maintain employment in the American construction and ancillary industries even though American funds finance housing developments in China." N. S. Buchanan in essay published in A. P. Lerner and F. D. Graham, eds., *Planning and Paying for Full Employment* (Princeton: Princeton University Press, 1946).
21. Compare the various methods of paying consumer subsidies.
22. Trace the derived effects of varying personal tax rates.
23. Why would varying business tax rates operate very differently from varying personal tax rates?
24. In a multiple-commodity-reserve plan is there any advantage in including many rather than few commodities?
25. If one of the commodities in the commodity-reserve dropped drastically, would the plan lend it special support?
26. What part does psychological resistance play in eliminating the business cycle in a totalitarian system?

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CHAPTER XXII

ECONOMIC PLANNING AND FULL EMPLOYMENT

THE PRESENT world-wide demand for security and full employment has never before been equaled in the history of proposals for economic stability. This is partly because of conviction that the cause of World War II and its appalling consequences was firmly rooted in the Great Depression. If this is true, and a possibly much more destructive war is to be prevented, a minimum safety measure is to insure ourselves against any similar depression in the future. These major influences on present-day thought have culminated in the formulation and adoption of programs designed to stabilize economic conditions at high levels for various aggregative magnitudes, such as full employment and a corresponding level of gross national product (GNP).

The demand for full employment is partly due to a revolution in our economic beliefs. John Maynard Keynes's book, *The General Theory*, and the very extensive school of thought arising therefrom have produced a significant reformulation of economic theory which gives greater weight to aggregative magnitudes and their significance with respect to the level of employment. We have learned—and a convincing body of theory now supports the view—that total economic activity does not result simply from the movement of the parts. It is more nearly correct to say that the movement of the parts results from the movement of the total. However, it should not be forgotten that (*a*) much of the Keynesian thinking has swung to the extreme position of attributing change entirely to the movement of over-all totals, and (*b*) *The General Theory* explains the forces determining economic activity in the Great Depression better than it explains other periods.

1. COMMITMENTS OF MAJOR GOVERNMENTS TO A FULL-EMPLOYMENT PROGRAM

The British Government issued a "white paper" on employment policy in May, 1944, stating the unprecedented doctrine that "the Government accept as one of their primary aims and responsibilities the maintenance of a high and stable level of employment after the

war."[1] This is explicitly accepted as involving "a policy of maintaining total expenditure." As Sir William Beveridge puts it in his famous *Full Employment in a Free Society*,[2] this marks "a milestone in economic and political history." Beveridge, however, is very doubtful about the adequacy of the measures proposed in the white paper to accomplish these purposes—principally compensatory spending on public works and anticyclical variation in social-insurance contributions. Beveridge is joined in this opinion by many advisers of the Labor government, and the measures proposed in the white paper are no longer to be considered representative of the British government position. The fact that the white paper was issued by a conservative government over a year before the Labor party came into power, and the fact that in writing it the British government described themselves as pioneers is significant. After due consideration, the British government categorically put themselves on record as accepting responsibility for maintaining total expenditure.

In April, 1945, the Canadian government followed in Britain's pioneering footsteps and adopted "as a primary object of policy" the maintenance of "a high and stable level of employment and income."[3] It is expected that at first fluctuations in the sphere of international trade "cannot be wholly and instantaneously offset," and seasonal fluctuations "are not to be overcome without much patient and resourceful work." The emphasis on international trade is due to the fact that Canada is principally a raw-material country and highly dependent upon export markets. Compensatory fiscal measures are proposed, with deliberately planned deficits in periods of threatened depression, aided by a revised tax system which makes the provinces more dependent upon dominion taxes and assures better timing in the execution of public works. Unemployment insurance and farm floor prices represent measures which have been taken to achieve a more stable flow of consumption expenditures. Efforts will be made to stimulate private investment by pursuing a monetary policy designed to maintain low interest rates and to add supplementary financing facilities for new businesses.

About the same time, the Australian government took the "responsibility for stimulating spending on goods and services to the

[1] The British Ministry of Reconstruction, *Employment Policy* (New York: Macmillan Co., 1944). "White paper" is a term employed to designate official papers of the British government.

[2] Published by W. W. Norton in New York in 1945.

[3] "Canadian White Paper on Employment and Income," *Federal Reserve Bulletin*, XXXI (June, 1945), 536–49; see also Alvin Hansen's excellent chapter in *Economic Policy and Full Employment* (New York: McGraw-Hill Book Co., 1947), pp. 82–91.

extent necessary to sustain full employment."[4] The proposals are similar to those made in the Canadian white paper. Public investment should be expanded in depression. Social insurance and free community services should result in the spending of a higher proportion of total income on consumption goods. Low interest rates and an advisory investment board are recommended to aid in stabilizing private investment.

These are interesting developments, and they mark a new trend of thought; but most of the world is watching to see what the full-employment policy of the United States will be. The British full-employment policy has little application to immediate conditions. With the destruction which the war inflicted on British industry and housing, and with the consumption sacrifices which must be made to provide exports to balance necessary imports, there would appear to be little urgent need for full-employment policies in the near future. Canada and Australia are raw-material countries greatly dependent upon markets in industrial countries. The Canadian white paper frankly recognizes the impossibility of wholly offsetting the fluctuations in foreign trade.

As Miss Joseph of Great Britain states, "If the United States government were ever to accept full responsibility for maintaining a high and stable level of employment and to adopt the measures necessary to carry it out, then there would at last be some real hope for world economic stability."[5] For the time being, the United States appears to be more immediately threatened by cyclical instability than does any other country of the world. The two primary reasons for this situation are (1) it is highly industrialized, and (2) with no war damage to make good, current production will have to be supported by current consumption when the war-created deficit demand is filled. For ten years before the war, consumption was not high enough to support high-employment levels. If there is truth to the Keynesian position that planned saving tends to outrun planned investment in mature economies, the application is more appropriately made to the United States than to any other country of the world.

Seldom has the world looked so eagerly to one country for economic leadership. What leadership have we shown? After President Roosevelt declared in his Message on the State of the Union in January, 1944, that one essential of an Economic Bill of Rights is "the right of a useful and remunerative job," work started on writing a full-employ-

[4] *Full Employment in Australia*, 79th Cong., 1st sess., Hearings on Senate 380 (Washington: Government Printing Office, 1945); see also Alvin H. Hansen, *op. cit.*, pp. 92–97.

[5] M. F. W. Joseph, "The British White Paper on Employment Policy," *American Economic Review*, XXXIV (September, 1944), 561–67.

ment bill. A year later, the Murray Full-Employment Bill was introduced. This bill declared it to be the "policy of the United States to assure the existence at all times of sufficient employment opportunities to enable all Americans" to exercise a right to useful employment if they are able to work and are seeking work. The method proposed by which to achieve this aim is a National Production and Employment Budget to be transmitted to Congress by the President at the first of each year. This would show the current level of national income, the corresponding level of income required to produce full employment, and the levels of these aggregates to be expected in the following year. If a prospective deficiency is indicated, the President is directed, first, to suggest a program to encourage private expenditure; and second, if there is a remaining prospective deficiency, to suggest supplementary government expenditures. If passed, this would have provided an American declaration comparable to the British white paper.

Heated arguments on the Murray Full-Employment Bill continued for a year. In February, 1946, a greatly revised "Employment Act of 1946" became law. This Act states:

> The Congress hereby declares that it is the continuing policy and responsibility of the Federal Government to use all practicable means consistent with its needs and obligations and other essential considerations of national policy, with the assistance and co-operation of industry, agriculture, labor, and State and local governments, to co-ordinate and utilize all its plans, functions, and resources for the purpose of creating and maintaining, in a manner calculated to foster and promote free competitive enterprise and the general welfare, conditions under which there will be afforded useful employment opportunities, including self-employment, for those able, willing, and seeking to work, and to promote maximum employment, production, and purchasing power.
>
> The President shall transmit to the Congress at the beginning of each regular session an economic report setting forth (1) the levels of employment, production, and purchasing power obtaining in the United States and such levels needed to carry out the policy declared [above]; (2) current and foreseeable trends in the levels of employment, production, and purchasing power; (3) a review of the economic program of the Federal Government and a review of economic conditions affecting employment in the United States or any considerable portion thereof during the preceding year and of their effect upon employment, production, and purchasing power; and (4) a program for carrying out the policy declared [above], together with such recommendations for legislation as he may deem necessary or desirable.[6]

A Council of Economic Advisers, comprised of three members with a streamlined staff, and a Joint Congressional Committee designated to act on the Economic Report are now established.

If consistent with other obligations, joint responsibility is now taken

[6] Public Law 304, Chap. 33, 79th Cong., 2d sess. Reproduced in Council of Economic Advisers, *First Annual Report to the President* (December, 1946).

by the government with other groups to provide conditions affording employment opportunities for those able to work, willing to work, and seeking work. The early versions of the Murray Bill would have shouldered on the government the complete responsibility for employment opportunities, for those able to work and seeking work. The President is now left considerable latitude and discretion in preparing the Economic Report, while the Murray Bill would have required a rigid forecast of the deficiency of GNP and employment. No particular method of stabilization is now specified, while the Murray Bill would have required, first, the encouragement of private expenditure and, second, supplementary government expenditure.

Much disagreement has arisen on the significance of the Employment Act. In its *First Annual Report to the President*, the Council of Economic Advisers holds:

> The measure which finally emerged from this process of legislative coalition was a well-balanced and carefully drawn piece of legislation. Although frequently referred to as a "much watered-down version" of the original proposal, it is in fact a broad enabling act of great flexibility as well as vigor. It is far from being a meaningless verbal compromise. The present act does not make any particular method mandatory. Nor does it legislate any specific remedy into use. Instead, the law states quite fully and clearly the general purpose and intention of the Congress and lays down the principle that the executive and the legislature shall seek diligently for any method which, in the particular circumstances of any given situation, appears to them to be sound and to promise helpful results. It is hard to see how a measure can be regarded as "watered down" which so clearly states the "responsibility of the Federal Government to use all practicable means consistent with its needs and obligations and other essential considerations of national policy . . . to coordinate and utilize all its plans, functions, and resources—" for the stated purposes of the act—maximum production, employment, and purchasing power.[7]

The comments of the Council of Economic Advisers do not imply the rigid maintenance of full employment at all times. Such a firm policy would depend partly upon the conviction of decision-makers in the economy that full employment will be maintained; otherwise, they might take anticipatory steps in self-protection, such as increasing their savings or postponing a capital expenditure. Hence, the less convinced decision-makers are that full employment will be maintained, the more drastic will be the measures required to sustain it.

2. THE BEVERIDGE PROPOSAL[8]

Sir William Beveridge has stated most clearly the necessary conditions for a forthright full-employment policy. He is highly critical of

[7] *Ibid.*, p. 3.

[8] See William H. Beveridge, *Full Employment in a Free Society* (New York: W. W. Norton, 1945); *Social Insurance and Allied Services* (New York: Macmillan Co., 1942); "Life, Liberty, and the Pursuit of Happiness (1950 Model)," *Review of Economic Statistics*, May, 1946; See

the British white paper, stating that "the time calls for a total war against unemployment and other social evils, not for a war with inhibitions."[9] He takes exception to the white paper for "treating private enterprise as sacrosanct—a sovereign power independent of the state, and of treating budgetary equilibrium as of equal importance with full employment."

His definition of full employment differs from the one used in Chapter III. He conceives of it as the state of affairs in which there are more unfilled jobs than idle men. In the Murray Bill, the proposal was to have as many jobs as idle men, not more. Furthermore, Beveridge believes the jobs available must not only be in excess of idle men, but they must be "at fair wages, of such a kind, and so located that the unemployed men can reasonably be expected to take them."[10] "If there were 2 million chronically unemployed men in Britain and 2 1/4 million vacant jobs which they could not or would not fill, there would be more jobs than unemployed men, but to call this state of affairs 'full employment' would be mockery."[11] Full employment does presuppose unemployment, however. Some frictional unemployment will occur because labor is not completely mobile or interchangeable. Without some unemployment, a change of jobs would be impossible. Beveridge's definition of full employment is more definite than the American concept; it does not depend upon the degree to which potential workers do or do not enter the labor market because of uncertainty regarding the availability of appropriate work.

Beveridge sees three possible methods of producing full employment:

Route I. An increase of public outlay, leaving rates of taxation unchanged.
Route II. An increase of public outlay, with an all-round increase of taxation sufficient to balance public income and expenditure.
Route III. An all-round reduction of rates of taxation, leaving public outlay unchanged.[12]

He favors Routes I and II rather than III. He favors paying for current services of the government by taxation (Route II), but prefers financing public capital expenditures by borrowing, although no nice adjustment is necessary in that the overriding consideration is the maintenance of a large enough deficit to produce full employment. Nicholas Kaldor has shown that, in order to produce full employment

also theoretical studies to support Beveridge's position by six scholars in the Oxford University Institute of Statistics, *The Economics of Full Employment: Six Studies in Applied Economics* (Oxford, Eng.: Blackwell, 1944).

[9] *Full Employment in a Free Society*, p. 274.

[10] *Ibid.*, p. 18.

[11] *Ibid.*, p. 20.

[12] *Ibid.*, p. 142.

in Great Britain in 1938, the three routes would have brought the following results:[13]

TABLE 14

CONSEQUENCES OF DIFFERENT METHODS OF FORCING FULL EMPLOYMENT
Illustrated by Estimated Effect on Great Britain in 1938

Routes *	Per Cent Government Expenditures Are of Total GNP	Per Cent Government Deficit Is of Total GNP
I	21.1	4.4
II	33.0	0.0
III	15.5	6.6

*See description in the text

Beveridge also advocates: "stabilization of marketing and production of primary commodities, by international agreement so far as possible and by British action in any case," "stabilization of private investment through a National Investment Board, which would plan investment as a whole, using powers of control and loan and taxation policy," and "controlled location of industry and organized mobility of labor."[14]

Beveridge's method of determining the needed deficit expenditure is that outlined in the Murray Full-Employment Bill: an anticipation of deficient expenditure by an analysis of the GNP statement, involving the projection and comparison of past expenditure with the required level to produce full employment. The government would be obligated to set up a new type of budget showing the relation of government expenditure to employment conditions. The traditional budget of receipts and expenditure would become distinctly of secondary importance.

Beveridge sees the problem of full employment positively—it is not one of fighting unemployment, but one of planning for productive employment. If the employment cannot be productive, it is better to have unproductive employment than idleness, because idleness is demoralizing and because those unproductively employed will productively employ others when they spend their incomes.

He is not much concerned with the changes his program might produce on the economic system. "On the general issue of public ownership as against private enterprise in industry, the provisional conclusion is that the necessity of socialism . . . in order to secure full

[13] *Ibid.*, appendix by Nicholas Kaldor entitled "The Quantitative Aspects of Full Employment Problem in Britain," p. 363.

[14] *Ibid.*, pp. 32, 271.

employment has not been demonstrated."[15] But "the problem of maintaining full employment is more complicated in a free society than it would be under a totalitarian regime."[16] Certain essential liberties—freedom of association for business purposes, freedom in the choice of occupations, and freedom in the management of a personal income—must be preserved, but permission cannot be granted to exercise any of these freedoms irresponsibly. The list of essential liberties does not include liberty of a private citizen to own the means of production and to employ other citizens to operate them at a wage. "It is not an essential citizen liberty in Britain, because it is not and never has been enjoyed by more than a very small proportion of the British people."[17]

Beveridge presents a convincing program. If implemented, doubt as to the maintenance of full employment could not long remain. Expenditures of any necessary amount would be made. However, the area of public activity would be deliberately and unpredictably extended. Not only would rigid control be exercised on total expenditure, but direction would be given to various sectors of the economy when necessary to maintain full employment. Beveridge believes both management and labor have in the past exercised a sovereignty inconsistent with the maintenance of full employment. If Beveridge's plan were convincing to all private decision-makers left in the economy, they would not take anticipatory action as a safety measure against future cyclical decline. To be successful, a full-employment plan must forestall such action, or it must be powerful enough to offset it. By keeping attention fixed on the primary economic objective of maintaining full employment, Beveridge has outlined a procedure likely to attain it.

It should be most emphatically stated that the Beveridge plan pursues economic ends at a frightful risk in terms of other values. Few Americans would be willing to go so far as Beveridge is carried by his proposal. Recognizing the importance now attached to stabilization, the solution would appear to be in some approach less consummate than full employment.

3. DIFFICULTIES IN MAINTAINING FULL-EMPLOYMENT LEVELS

Before turning away from the full-employment approach, it is well to examine more directly some of the difficulties to be faced in attempting to maintain full employment. If employment is maintained at as high a level as Beveridge proposes, we would be constantly on

[15] *Ibid.*, p. 37.
[16] *Ibid.*, p. 23.
[17] *Ibid.*, p. 23.

the verge of inflation. Beveridge suggests that the prices of essential goods and services would have to be controlled and that labor would have to relinquish some of its competitive bargaining power. A greater or less degree of price fixing by the government would evolve. If full employment were defined to exist at a somewhat lower level, in order to prevent inflationary developments, competition might be strong enough to avoid state price fixing, but the net accomplishment of the full-employment policy would be reduced. Depending on how restricted the employment level would have to be to prevent inflation, average employment might be no higher than if some more flexible variation were permitted. A policy of less limited variation is considered later in the chapter.

The most difficult problems arise in the case of durable goods, both consumer and producer goods. Certainly control of the aggregate level of expenditure will not of itself sustain the flow of consumer durables in the United States a few years hence when the demand deferred during the war has been made up. Experience in the past has been that demand for consumer durable products has not tended to be sustained indefinitely in prosperity. A typical lead has occurred at the downturn, which means that the markets for these products are among the first to show weakness.

The fact that as a matter of record total consumer expenditures have been a highly stable function of a changing disposable income is not good evidence that any absolute level of total consumer expenditure will be maintained when government expenditures are increased to support income. No case in the test period illustrates an overriding government policy to increase aggregate expenditures enough to sustain total consumer expenditure. The problem certainly is not that consumers may spend any less freely income initiated by the government, but that they may spend other than current income and that they may change materially the type of expenditure which they make. In the first place, the expectation that the government can maintain the total level of expenditure will remove the need for part of the accumulated "rainy-day" savings. In the second place, the change in the flow of expenditure arises from the conditions which made it necessary for the government to support consumer expenditure. For example, if a factor necessitating government expenditure is the saturation of certain *consumer* markets at the prevailing prices, belief that the government could sustain total consumer spending by just maintaining the GNP level would imply that immediate shifts would be made in consumer expenditure to other lines which are not saturated.[18]

[18] L. R. Klein appears to take this position in "A Post-mortem on Transition Predictions of National Product," *Journal of Political Economy*, LIV (August, 1946), 289–308, when he

The theoretical tendency for propensity to consume to show a slow and steady decline as higher-income levels are reached in the business cycle does not indicate that consumer expenditures can be held up by only a slight increase in GNP. The past record discloses a secular horizontal or rising movement in the propensity to consume. The fact that the propensity to consume varies over the business cycle must be faced. Such variation does not necessarily make impossible the maintenance of full employment; but, as Beveridge notes, efforts to implement full-employment policy must begin with the unbalanced condition existent in prosperity. To ignore the cyclical unbalance which now occurs in the distribution of demand for nondurable and durable goods begs the question. Beveridge recognizes that special measures probably will be necessary to bring investment under control. He thinks that some state planning of aggregate investment would be essential, that the public sector of business would have to be expanded to enlarge the area within which investment can be stabilized directly, and that possibly full-fledged socialism would have to be adopted.

Logically, investment should be determined by long-term growth potentialities; but, as we have seen in earlier chapters, short-term considerations are probably more controlling in most cases. In whatever manner investment plans are made, most companies are likely to be too optimistic regarding their share in a period of prosperity.

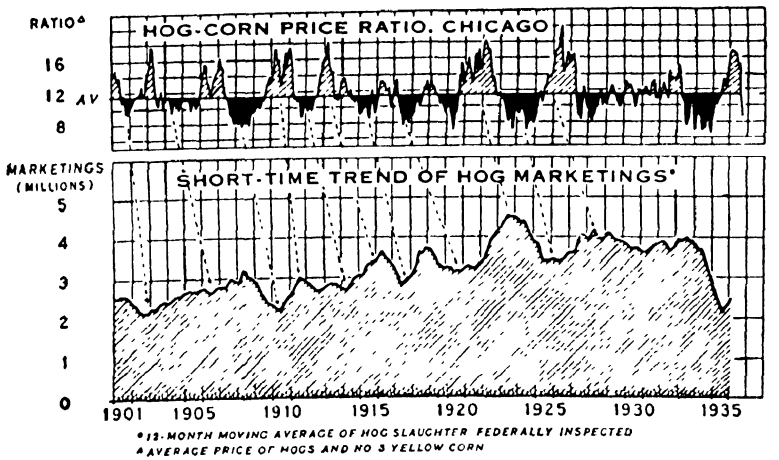
The corn-hog cycle illustrates the way overoptimism of each enterpriser regarding his share of the market creates a cyclical movement. The corn-hog cycle has moved in a fairly uniform four-year period, as shown by Chart 59. To start with, assume that there is an extremely small corn crop because of drought. The price of corn will be high, and since hogs will have to be sent to market because of an inadequate supply of corn, hog prices will be low. The farmer will decide to plant a larger corn acreage and to keep only the best sows for breeding. The succeeding corn crops will tend to be above average, but the supply of hogs will be below normal. The price of hogs will be high, while the price of corn will be low. The farmer will decide to plant less acreage in corn and to keep as many brood sows as possible. When this plan has been carried out, the supply situation will be reversed. In such a way, the cycle tends to continue. Each farmer goes too far in expanding or contracting his hog production. A reasonable estimate could be made of the total demand; but as long as farmers do not act in unison, each farmer is likely to overestimate the expansion he should provide.

says: "It is one thing to say that there is a stable peacetime relationship between total consumption and income, and something else again to say that there is a stable relationship between each of several categories of expenditures and income. The forecasters adopted the latter formulation and ended up with poor forecasts." Klein, however, appears to accept a relatively rigid relationship between the *total* aggregates.

The same thing happens in the investment market unless industries are permitted to plan co-operatively. It should further be borne in mind that an estimate of investment requirements is very difficult. If we encourage co-operative planning, the competitive system is likely to lose its effectiveness. Entry of new businesses into any given industry would become difficult or impossible. If business managements had the deciding vote on the total expansion to be divided among themselves, they would be likely to underestimate the demand and restrict expansion in order to keep prices high. This might tend

CHART 59

HOG-CORN PRICE RATIOS AND HOG MARKETINGS*



* Taken, with permission, from Mordecai Ezekiel, "The Cobweb Theorem," *Quarterly Journal of Economics*, LII (February, 1938), 271

to stabilize investment, but prices would not be set to sell a capacity output. If stabilization resulted, it would be at less than full-employment levels. The type of problem presented in this section is sometimes developed in terms of a classification of autonomous and induced variation. Induced variation is defined as that which is determined by the level of GNP; autonomous variation is defined as a variation not determined by GNP.[19] Private investment is frequently accepted to represent autonomous variation, with the implication that its fluctuations would tend to create a cycle even if total expenditure were maintained at levels satisfactory to produce full employment. The trouble with this classification for the purpose of analyzing stabiliza-

[19] See further the analysis of these concepts in Chapter V, Section 3 (investment multiplier), pp. 118–21.

tion proposals is that at certain times in the cycle a process may be largely determined by total expenditure but move independently at other times. Private investment can be largely explained by GNP if GNP is at relatively high and rising levels (the determining factor, however, is the increase in GNP and not its level); at other times, the relationship is not reasonably close. Demand for durable consumer goods tends to be determined by disposable income at most times. Rigid classification into autonomous and induced variables ignores the cyclical cumulation of forces. Demand for durable products is abnormally large in prosperity, and artificial maintenance of total expenditure after this overexpansion has continued for some time would not be likely to result in a condition that would satisfy the community's long-run requirements for various types of goods and services.

4. IMPOSSIBILITY OF SETTING MINIMUM LEVELS

The great danger in uncertain variation over the business cycle is that the decline may continue indefinitely. To prevent major depressions is the prime purpose of full-employment proposals. An important argument for a rigid full-employment policy is that once a decline gets under way there is no determining how far it will go; less powerful measures would be required to stop it at the upper turning point than after the reinforcing forces have developed substantial momentum.

If full employment cannot be sustained at all times at a cost we are willing to pay, minimum permissible levels are frequently suggested to limit the decline. The proposal is to decide on some figure beforehand as the absolute minimum of employment—say the level reached when six million persons are unemployed. Flexibility would be permitted within these limitations, and hence the constant hazard of inflation at full employment would be avoided. It would not be necessary to attempt to force buyers to shift their purchases immediately to new markets before they have had an opportunity to develop carefully new expenditure patterns.

Intriguing as these points are, they do not suggest a practical method for setting minimum levels. Assume six million unemployed is the limit agreed to, and that with a downswing under way this limit is being approached. Immediate implementation of control measures would be required, because the limit loses most of its value if it is not to be respected. If powerful deflationary forces were under way at the time, it might be necessary to administer an undesirably large "dose" of public expenditure to be absolutely certain of stopping the decline short of minimum levels. If the measures taken are not powerful enough to stop the contraction, under certain circumstances,

they might even tend to stretch it out; in other words, they might make matters worse. For example, the knowledge that the government intended to spend in an effort to limit the contraction might influence enterprisers to postpone action, or they might hold prices which they otherwise would have reduced.

Perhaps a better procedure would be to implement the stabilizing measures before the minimum limit was being approached. Less drastic measures might be required, but it is possible that measures insufficiently powerful to stop the incipient contraction could temporarily increase its violence, thereby making the problem of stopping short of the limit as great as if action had been delayed until its necessity were more obvious. The major difficulty of starting early to avoid the application of unduly stringent measures, however, is that the minimum limit would have to be set much lower than the point where control is desired to provide latitude for operation. If six million unemployed marked the permissible limit, and if frictional unemployment were three million, early application of measures within this narrow range might run the risk of inflation.

A price floor is a more reliable limit because it is more direct. We know that fiscal control measures, if used to an adequate extent, will support any specified level of employment. But we have only a hazy idea of what the adequate extent is. On the other hand, price floors are put into operation by the purchase of the goods in question. Sufficient buying will be seen to hold the prices from day to day. The trouble is that price floors are limited in coverage and at best are only a means to the goal of employment or expenditure minimums. The part price floors under raw materials can play in achieving that goal is considered in Section 6.

5. STABILIZING THE SECONDARY TREND

Rather than attempt to provide direct support for minimum levels of employment or expenditure when the danger of severe contraction arises, it might be better to adopt continuous policies which not only would seek to eliminate the causes of major depressions but also would be more universally accepted as effective for this purpose. Emphasis would then be shifted from stabilizing the business cycle to stabilizing the secondary trend. The secondary trend represents protracted departures of the long-period movement from the secular trend which moves parallel to the growth of capacity to produce.[20] Major depressions are periods when persistent maladjustments continue indefinitely. As developed in Chapter III, full employment as used in America is a symbolic expression meaning operation reason-

[20] See Chapter III.

ably close to capacity to produce. By eliminating the secondary trend, full employment would not be assured, but major departures from it would be avoided.

Elimination of the secondary trend does not require the forcible type of control measure necessary to eliminate the business cycle. Stabilization measures can be applied much more flexibly in terms of a goal to offset fairly long-run influences of undesirable character. Stabilization of the secondary trend may be compared to continuous maintenance of a physical structure rather than the taking of measures to prop it when it begins to sag.

If the exclusive requirement were correction for an excess of planned saving over planned investment, the need would be for a gradual policy that took into account the pattern of social institutions and human habits. The author submits the proposition that the continuous-policy approach is the appropriate one, whether or not the major difficulty is assumed to lie in continuous insufficiency of planned investment. The irreducible minimum requirement agreed to by everyone is that major depressions must be avoided. If continuous policies prevent the long-period movement from falling significantly below an acceptable secular-growth level, this irreducible minimum requirement will be satisfied.

The continuous-policy approach is very different from Lerner's "functional finance" policy, which involves fiscal control leading to the planning of large enough deficits to produce full employment.[21] Any program of full employment promising complete stabilization will at times inevitably be involved in compensation for short-period shifts in deflationary forces.

Many of the implements for compensatory adjustment could be easily integrated with a continuous-policy approach of the type suggested in Section 6. For example, the application of a continuous-policy approach does not prevent the introduction of lower tax rates when GNP is declining, the establishment of certain broad limits on the amount of public-work expenditure with stated levels of unemployment, or resort to a shelf of public works when it becomes expedient to exceed the aforementioned limits. The application of continuous-policy control would not necessarily prevent its supplementation by more short-run compensatory action; but if the approach is that of continuous policy, major reliance would not be placed on direct compensatory action.

[21] A. P. Lerner, *Economics of Control* (New York: Macmillan Co., 1944). Note should be made of the excellence of this book in explaining the *approach* assumed by a full-blown policy of fiscal control. The approach lends itself just as logically to one method of producing deficits as to any other. See also Lerner's essay in A. P. Lerner and F. D. Graham, *Planning and Paying for Full Employment* (Princeton: Princeton University Press, 1946).

It is well at this point to distinguish more clearly between direct compensatory action and continuous policy designed to keep the long-period movement near capacity levels. The author proposes that the continuous-policy approach should involve (*a*) measures with a working mechanism largely predetermined by law and with a minimum of administrative decision; (*b*) measures which do not require violent variation in action; (*c*) a purpose, not of preventing any decline, but of preventing long-period drift away from capacity levels of operation; and (*d*) measures so constructed that satisfactory achievement of its purpose will be universally accepted. Measures for direct compensatory action may involve (*a*) and (*d*) to some extent if only partial compensation is attempted but, as established earlier in the chapter, the American people seemingly are not willing to accept the measures essential for the rigid maintenance of full employment, and it is very doubtful if the compensatory mechanism could be made to operate without a large area of administrative decision. Compensatory action should be continuous, but it must move negatively with the business cycle; it therefore differs fundamentally from the continuous-policy approach. *Continuous-policy in the sense employed here does not necessitate important variation in the action taken over the business cycle.* The purpose (*c*), of course, differs fundamentally from that of compensatory action.

Unless we are willing to accept the changes which the Beveridge plan points to, the continuous-policy approach is more honest than the full-employment approach. To achieve continuous full employment it is probable that we would have to give up more in the way of liberties and other cherished American ideals than most American citizens would willingly sacrifice against any other than a Hobsonian choice. It is not for the economist to say how much liberty we should sacrifice for world economic security. It is not for the economist to say what ideals we must discard. The job of the economist is to balance the relative costs of these alternatives as well as he can.

We have been fed with oversimplifications with respect to the efficacy of control measures on the sound principle that such measures must be accepted by the majority of the citizens in a democracy or the measures will not work. Universal demand has arisen for the government to promise several things which cannot be had at the same time.[22] Most persons who are busily engaged in implementing continuous full employment will admit, if forced to, that for the time being all cyclical declines cannot be prevented; that it is enough to

[22] This point is made by W. A. Brown in *The Future Policy of the United States* (Boston: World Peace Foundation, 1943).

moderate the violence of the business cycle. The principle followed is that the truth is too complicated for the average citizen to understand and that little white lies are justified if they move the trend of thought in the right direction. The difficulty with this procedure, the author believes, is that it leads to action based on short-run expediency and emotional responses to immediate economic developments rather than to action based on values desirable in the long run.

If the business cycle is likely to continue because we are unwilling to pay for its elimination through the sacrifice of liberty and ideals, it would be better to concentrate on the elimination of the secondary trend. This would involve setting up a continuous policy aimed at preventing protracted drift of total industry's long-period movement from capacity to produce. The type of action required involves a minimization of the risks entailed in the failure of total industry to move close to the line of potential growth. If the secondary trend can be stabilized, we will be in a position to avoid (*a*) international repercussions caused by a period of long, drawn-out, depressed conditions, (*b*) the infliction upon our own citizens of intolerable economic conditions, and (*c*) the uncertainty with respect to total demand which prevents enterprisers from rationally planning for the production of the goods and services offered for sale.

The action required for cyclical stabilization, viewed as a short-run problem, is expedient compensation for inflationary and deflationary forces. The uncertainty as to what minimum over-all reform would be necessary to eliminate the business cycle is so great that only the most daring analysts are likely to give much attention to it. Such daring analysts are not inclined to quibble much about the social cost but are likely to add to it with abandon where probabilities are obscure. On the other hand, the wary analysts produce so ineffectual a program that it shortly condemns itself. The difference in required action for cyclical and secondary-trend stabilization arises from the fact that action on the former must provide immediate compensation for an intricate maze of mutual cross effects arising in the competitive economy; action on the latter looks only to reforms which will produce a stabilizing effect in the longer run. The costs entailed by thoroughgoing cyclical stabilization, or provision of full employment as it is more popularly described, are substantially greater than by secondary-trend stabilization. The goal, of course, is to eliminate all variation of total demand about its line of growth. The accomplishments depend largely on the procedures followed. In any case, all consequences arising from the superimposition of the effects of variation in total demand would be avoided, which would cover as a minimum

all of the accomplishments noted for secondary-trend stabilization in the preceding paragraph.

6. A PROGRAM FOR STABILIZING THE SECONDARY TREND

The student must avoid the impression that the program implemented to stabilize the secondary trend would be painless. Reform is almost never painless. The purpose is to bar action which will produce a long-term drift away from capacity operation. To be certain of avoiding such action, it is likely that some persons would be denied the right to conduct permissible in the past, because it has been the decisions that individuals have made and the actions they took to carry them out that produced the secondary trend. On the other hand, in the end no one benefits from the type of persistent maladjustments which make for secondary trend decline. Partly, what is required is an integration which will prevent results favored by no one, even when the action is taken.

It is possible that the required program must be unduly severe merely to be relatively certain that it will be effective. The repercussions of another major depression are accepted by thoughtful persons as likely to be so great that they believe a depression must be avoided at all costs. Furthermore, any uncertainty regarding the possibility of a major depression would make impossible individual planning in accordance with long-run considerations. In such a contingency, individuals would find it desirable to take precautionary action against the possible occurrence of a major depression, which itself would add greatly to the probability of one occurring.

The author makes no pretense of ability to set up the most satisfactory program for eliminating secondary-trend decline. Just as "functional finance" is an approach which may involve infinite combinations of shifts in taxes, subsidies, and spending, continuous policy to avoid secondary decline is an approach satisfied by a wide range of programs. On the other hand, some illustration of a plausible program is essential to bring concreteness to the proposal and visualization of what is involved. The program presented must be accepted as very tentative, because no one can tell precisely what would be a universally convincing program until the proposals are tested by the fire of public opinion.

The following list would appear to constitute a minimum program:

1. A co-ordinated, long-range government program from the point of view of its effect on the aggregate level of economic activity
2. Dynamic-price policy
3. Encouragement of small business
4. Private planning of long-term changes in demand

5. An international buffer-stock plan for raw materials
6. A national wage policy
7. A national credit policy
8. A national housing program
9. Contingent upon failure of planned investment to equal planned saving before prosperity levels are reached, institution of monetary control to force expenditure

Long-Range Government Program. There is need for co-ordination of government programs between different agencies of the federal government and between different levels of government with respect to their aggregate economic influence. Further, there is need for governmental responsibility in this regard, so that, as a minimum, the government will not be contributing an unintended unstable influence.

In the twenties, for example, the federal government was contributing a deflationary influence by paying off the federal debt at the rate of roughly a billion dollars a year, while state and local governments were borrowing approximately a similar amount for the building of public works, thereby canceling the federal government influence. There is no reason to believe that these conflicting influences produced ill effects in this instance, but they illustrate the lack of co-ordination. If the size of the government establishments was relatively small, perhaps we could afford to disregard the aggregate economic influence produced by them. However, since government activity has come to represent a major factor in economic life, it is highly important that proper consideration be given to their influence on total economic activity.

Further, there is need for a carefully developed, long-range point of view in subjecting the private economy to economic controls. If, for example, reform is needed along the line of management-employee relationships in major companies, it is in the interest of stability that slow adjustments be made rather than violent action be taken after long delay has created a disturbing situation. A carefully developed, long-range point of view also would be of major importance in preventing ill-considered expedient action taken to lighten the burden of a business-cycle downswing.

Analysis of the machinery for effecting a co-ordinated long-range government program in relation to aggregate economic effects is beyond the scope of this book. Perhaps the Council of Economic Advisers would be the appropriate agency for developing the broad outlines of such a program. The major difficulty is lack of public interest or active public resistance. As pointed out above, no stabilization program can be successful without active public support. If, in facing this problem, the public generally comes to recognize its

advantages, development of the appropriate machinery to effect it will become readily possible.

The author does not suggest that such a co-ordinated government program is sufficient to effect stabilization by the continuous-policy approach. *In fact, it is more in the order of eliminating unforeseen obstruction than providing positive measures.*

Referring to the range of factors which might logically be considered responsible for the secondary trend (presented in Chapter III), an effective government program could be expected to eliminate almost entirely the sinister influence of temporary expedients employed to lighten the burden of a business-cycle downswing and to reduce cultural lag.

Dynamic Price Policy. Our major hope for encouraging enterprisers to keep operations close to capacity to produce is the adoption of a dynamic price policy. There is evidence that many enterprisers are beginning to think in these terms. As pointed out in Chapter XX, dynamic pricing is the most effective response management can make to shortsighted labor demands. To the extent that dynamic pricing becomes effective, market readjustment is continuously effected. For reasons developed above, no such continuous readjustment can be expected; price variation is characteristic of the business-cycle process. The advantage of the continuous-policy approach is that complete elimination of such variation is not attempted. Continual attention to dynamic pricing will, however, prevent the development of prices far out of line with those required to reach potential markets. This will represent a major contribution in lightening the essential cyclical readjustments, and it should be particularly effective in avoiding extended business-cycle downswings, in reducing panic in the government administration which might lead to violent action in the downswing, and in developing long-range perspective so that the enterpriser will better visualize potential markets when the depression comes.

A major factor necessary to make dynamic pricing work is confidence that the secondary trend is being eliminated, or at least greatly moderated. Part of the pricing action taken by enterprisers in prosperity represents an effort to "make hay while the sun shines." An opportunity is seen for quick profits, while the future appears very uncertain. When the future comes to be less clouded, the enterpriser may come to reckon his profits over a longer period.

Encouragement of Small Business. Small business can aid the dynamic-pricing program by developing long-range competition and by adding to perspective on investment outlets. One of the most potent competitive forces is provided by new entrants into industrial fields. The realization that new competitors are constantly coming

along will force enterprisers to look more searchingly at their potential markets instead of retiring to what appears to be a reasonably profitable high-price market. As developed in Chapter XX, the encouragement of small business for this purpose involves a consistent, long-range program. Small businesses do not grow large overnight, and they are of little potential force in adding to the competition in semi-monopolistic markets until they do grow large. Most important of all, the development of *new* large businesses must be encouraged, not discouraged.

Whether or not new enterprisers add vision on investment outlets, they are likely to contribute to the problem. The enterpriser in old companies has a dual responsibility in this regard—he must protect vested interests in existing capital investment, and he must search out new ventures. Sometimes conflict may arise between these two interests. The new entrant, however, is not impeded in his action by the need to protect vested interest in existing capital assets.

New businesses will, in one way or another, contribute in reducing the force of all of the logical factors which may be held responsible for the secondary trend. The tendency is to hurry adjustments which might otherwise be delayed. When the cyclical downswing arrives, new enterprisers will provide areas where there is an immediate interest and desire to adjust to changed technological requirements, which would necessitate some continuation in capital expansion.

Private Planning. Long-term changes in demand could, if properly planned, make a major contribution to the continuous-policy approach. However, enterprisers would have to become confident that the secondary trend would cause no drift away from secular-trend levels, which represent effective employment of capacity, before such planning would be effective. Extensive long-term planning would also add meaning to the concept of the marginal efficiency of capital: expected yield of an added capital asset would describe a basic estimate made by the enterpriser in deciding where and how much to add to his capital investment. Capital investment programs might come to depend much less on the current *increase* in consumer expenditure for products in question and also much less on the enterpriser's emotional evaluation of the market. These programs would come to depend more on long-term need for products, as represented by secular trends; they would, therefore, conform more closely to capacity requirements. The secondary trend is a vicious movement in this respect. The enterpriser cannot plan effectively for his long-term capital needs, because the secondary trend makes long-term demand deviate from requirements which might rationally be expected if capacity were employed effectively. Without such rational

planning, capital investment comes to be highly undependable as a support for total expenditure, resulting in the multiplier effect described in Chapter V. Expectation that a secondary trend will occur becomes a major factor in producing it.

In terms of the logical factors which may be thought to produce a secondary trend, private long-term planning would aid most in reducing the shift in perspective which occurs in depression. Perspective would come to depend less on current market demand and much more on basic consumer requirements at production levels for each industry, consistent with capacity output for total industry. This would be a truly major contribution to the elimination of the secondary trend because capital investment represents the most disturbing decline in depression. The reduced cost of capital expansion in depression would then become a major incentive for building capital at that time. No minor depression could develop into a secondary one if substantial increases occurred in capital expansion at an early date.

Private planning of long-term changes in demand on a more effective basis would also aid materially in developing a dynamic-price policy. Enterprisers know too little about potential markets because they are guided by market demand at established prices. If they could better visualize the growth in demand for any given product, they would have a better measure of the market potential.

Buffer Stock for Raw Materials. An international buffer-stock plan for raw materials would operate internationally in a manner similar to the domestic multiple-commodity-reserve plan discussed in Chapter XXI. A fixed sum of dollars, or other internationally acceptable money, would be paid for a fixed distribution of standard, storable raw-material products, which, in effect, would establish a minimum weighted average price for the raw materials included in the plan. It should be emphasized that no minimum would be set for the price of any individual raw-material product.

An international buffer-stock plan for raw materials would accomplish three major purposes: (*a*) limit the extent of cyclical price decline and rise; (*b*) provide greater stability in raw-material industries and in inventory values; and (*c*) provide productive activity by inventory accumulation to offset part of the decline in demand at cyclically low levels.

In the United States, we have come to recognize the instability which tends to occur in agriculture. The price floors for various agricultural products in terms of 90 per cent of parity price is a policy far inferior to stabilizing a raw-material price average. There is need for a mechanism which will keep price variation from producing devastating instability, both in domestic raw-material industries and in

foreign raw-material countries. After the World Economic Conference in 1933, international agreements were entered into to set price floors for an increasing number of raw-material products. An international buffer-stock plan is far better. At best, the individual commodity price floor represents an agreement to resist competitive forces. If backed by an agreement to accumulate an inventory of the commodity, the price floor may hold for an indefinite period, such as occurred in the prewar support of agricultural commodities in the United States. The inventory accumulation may become distressingly large, however.

The international buffer-stock plan, by contrast, could become an effective measure for protecting the aggregate level of activity. Substantial inventories might have to be accumulated in a depression period, but the price of each of the raw materials would be subject to competitive forces and would decline as long as supplies offered on the market were relatively great compared with the supplies of other raw materials. If the minimum average price on which the plan operated were set at a conservatively low figure, stock-piling would become necessary only when depression levels were reached. As developed in Chapter III, the extreme lows to which raw-material prices tend to go in a secondary depression become a major factor in disrupting international trade and in perpetuating the secondary depression.

The buffer-stock plan might also prevent the extreme rise which tends to occur in raw-material prices in high prosperity. Raw materials are produced under conditions of increasing cost, and when prosperity demand reaches high levels, raw material prices become disproportionately high. Sale from buffer stocks at such a time might make it unnecessary to draw into operation high-cost resources. Thus, it might limit the price rise.

A buffer-stock plan might make the price of finished goods more stable. As developed in the following section, wage rates are not likely to decline readily in future depressions. If raw-material prices also could show only a limited average decline, variable costs involved in making finished goods could decline only to a limited extent. Therefore, the likelihood that prices would decline in an indefinite spiral would be greatly reduced. This fact, together with the support given to raw-material countries would reduce the probability of an extended downward movement.

National Wage Policy. Three major purposes should be kept in mind when instituting a national wage policy: (*a*) provision for greater employment security, such as is represented in the annual-wage plans; (*b*) clarification of the part wage rates are expected to play in eco-

nomic policy; and (*c*) within broad limits enactment of restrictions that will discourage labor from pricing itself out of the market and discourage management from paying wages below the level of fair competition.

With assurance that major departures from capacity levels of operation for total industry will be avoided, industry can greatly increase the area of application of annual-wage plans. This will make it possible for wage earners to plan their expenditures on a much more rational basis and should promote the development of higher living standards. With the encouragement of assured steady income, the consumer would be less likely to accentuate economic instability through variation in his expenditures.

Until recently, our implied national policy assumed that wage rates influence economic conditions only as a business cost. More recently, the implied national policy has viewed wage rates as purchasing power. Both these points of view visualize wage rates as an important element in the process of cyclical change, although from opposite points of view. According to the first point of view, wage-rate declines in depression reduce costs and make possible prices low enough to induce consumers to buy. According to the second point of view, maintenance of wage rates in depression limits the decline of purchasing power and prices.

Whether one prefers in principle the old or the new implied national wage policy, it must be accepted that the new policy is the only one now practicable. Wage rates are not likely to show substantial declines in any future depression until the secondary depression stage has been reached. This fact must be recognized in the continuous-policy approach. Minimum *average* wage-rate levels, not too far below those current in prosperity when the downturn occurs, should be established. As noted above, such minimum wage-rate levels, taken together with minimum *average* levels for raw-material prices, would tend to stabilize finished-goods prices. We can no more than recognize the desirability of a wage-rate policy which establishes such minimum wage-rate levels. It is beyond the scope of this book to develop the mechanics of this problem. Paralleling the raw-material policy, it may be emphasized that average wage rates for the economy as a whole, rather than specific wage rates, should be supported.

National Credit Policy. Continuity of expenditure can be promoted by a national credit policy. It is desirable that credit expansion in prosperity be largely limited to fundamental requirements rather than allowed to grow out of short-period factors which will sooner or later reverse themselves.[23] The greatest danger in the near future

[23] For development of this point, see Chapters V and VI.

appears to lie in the area of consumer credit. If reduction in consumer credit initiates a decline in the purchase of consumer durable goods, it might promote a steady decrease in the level of future expectations and lead to a drift away from the general trend set by capacity levels. Methods of credit control were considered in Chapter XX. The outlines of an effective program at the present time are too involved for consideration here.

National Housing Program. A continuous-policy program cannot be successful unless it includes a national housing program. There are three major reasons for this need: (*a*) the violence of the long cycle in residential building, (*b*) the relative importance of residential building in total investment expenditure, and (*c*) the high rate of use of housing compared to other construction facilities in depression.

Emphasis should be placed on the fact that relative stability in housing applies particularly to the long cycle because the shorter business-cycle variations in building have never been as severe. We can no more than suggest possibilities in stabilizing the long cycle in residential building. A subsidy which permitted extensive reduction of the interest rate charged on new residential building, should its level fall below predetermined levels, might be helpful because of the relatively large part interest plays in the current monthly payments in buying a house. An alternative proposal would be to bring in extensive slum-clearance projects or other preplanned public housing developments if housing construction dropped below a predetermined level. There is no necessity to fix such a predetermined housing level at higher than minor depression lows, since it is not the business-cycle variation which the continuous-policy program intends to eliminate.

Monetary Controls. Under a continuous-policy program, protection must be set up against the possibility of an "underemployment equilibrium," a state which occurs when planned investment fails to equal planned saving before prosperity levels are reached. The gap between planned investment and planned saving cannot be determined directly from the static GNP statement, but it can be inferred from the *changes* from one quarter to the next in the distributed *parts* of both capital formation and individual and corporate saving. If the Council of Economic Advisers finds a tendency for planned saving to be excessive at all times, a tax on deposits (perhaps better a tax on adjusted increases in deposits as developed in Chapter XX), might be tried in a modest way.

The measures, if woven into an integrated program, appear adequate to prevent secondary depression, or at least to so reduce its extent that it would no longer remain a major factor in the outlook. A relatively stable housing program would reduce the long cycle in

construction to such a point that the prospect of extreme decline in construction activity would disappear. Credit expansion, limited to fundamental requirements, would make it possible to avoid the excessive contraction experienced as a result of the spiral of debt deflation. Relatively stable average wage rates would impede the price deflation spiral and thus make an extended downward movement of the business cycle more unlikely. Buffer stocks for raw materials would act similarly, but in the international as well as the domestic field, so that depressive foreign-trade influences would not tend to perpetuate the decline. The buffer-stock plan also would support activity in raw-material industries which tend to be most depressed when depression strikes. The support of average wage rates, taken together with the buffer-stock plan, in supporting finished-goods prices would stabilize the businessman's perspective because of the central attention he gives to prices. Actual dependence on long-time planning would replace the current market as the basis for developing expansion plans; and thus the decline in perspective in depression would be moderated and, at the same time, activity would be provided in the most depressed area. The encouragement of small business in bringing on incipient competition would tend to keep the business situation adjusted to changed conditions. Dynamic prices would produce a similar influence. Alert adjustment would tend (1) to prevent the need for extended cyclical decline, (2) make temporary supports seem less necessary since expansion requirements would be more clearly visualized, and (3) would limit the decline in perspective. A coordinated, long-range government policy should (1) reduce cultural lag, (2) prevent the employment of poorly conceived temporary expedients to halt the decline, and (3) reduce the extent to which government bodies unintentionally take steps which lead to excesses in total economic activity. All of the logical factors listed in Chapter III, except revolution, are covered, and revolution tends to grow out of other factors creating the secondary depression.

Special note should be taken of the fact that in this program it is not possible even to suggest the mechanical means of implementation. The problems of implementation involved go far beyond the reach of this book and, in any case, must be worked out by experience.

7. FINAL REMARKS ON THE CONTINUOUS-POLICY APPROACH

Possibly, re-emphasis should be placed on the tentative nature of the proposals summarized in the preceding section. What will work cannot be determined until reasonably universal agreement on what to try is achieved. The chances of establishing clearly defined long-term policies of the type outlined above appear to be much greater

than the chances of setting up a workable scheme of cyclical compensation.

Re-emphasis of the significance of the continuous-policy approach from the point of view of maintaining total demand is desirable. Enterprisers are widely convinced that a support of total demand will make it possible for them to plan and produce more soundly than they are presently able to do by relying on the superficial and transient demand characteristic of widely fluctuating movements around secular levels. They are not, however, convinced of the desirability of artificial supports that prevent any variation from secular levels. Certainly, the position that some variation is essential to produce flexibility is at least debatable. On general grounds, the ability to organize resources so that they will always add up to a rigid total product and still provide flexibility is doubtful. It is recognized that labor cannot be fully used because of frictional factors. This condition is also true of other resources. Therefore, the combination of these various resources would not always yield the same total product.

It remains possible that the program developed for the continuous-policy approach will fail to prevent the development of a major depression. Partly as insurance against the action which might be taken by those who remain unconvinced of the effectiveness of the program developed, a potential program of cyclical compensation might be kept in reserve as a second line of defense. Criteria should be established which mark the approach of major depressions. These should be clearly distinguished from normal cyclical declines by setting sufficiently low the point at which the program would be implemented. Provision might be made for setting a fiscal policy into operation at such a point.

Principal advantages of the continuous-policy approach are that it should not require compensatory measures, and that the policies taken need not change from prosperity to depression. It would, therefore, be very unfortunate if compensatory action were placed on an equal footing with the rest of the integrated program. Great uncertainty as to public acceptance of the effectiveness of the continuous policy makes it necessary to recognize a second line of defense. Unless enterprisers become completely convinced that only short and relatively minor departure from effective use of resources can occur, they cannot afford to make expenditures whose profitableness is dependent upon the effective use of resources.

REVIEW QUESTIONS

1. Comment on the following: ". . . The real limitations on democratic planning are not imposed by any difficulty in controlling the businessman or curbing the

profit motive, but they lie much deeper. They will not be removed by nationalization; what stands in the way of complete planning—and it is fortunate that it is so —is the ordinary man's unwillingness to let other people tell him where he shall earn his living or how he shall spend it." *The Economist*, December 14, 1946.

2. Comment: "Unfortunately the fiscal machinery of the government is not well designed to make quick changes in fiscal policy. So great is the inertia of public opinion that the fiscal machinery is not likely to be changed until the country has had more lessons in the school of experience to teach it that quick changes in fiscal policy are necessary." S. H. Slichter "The Economic Outlook," *The Commercial and Financial Chronicle*, December 12, 1946.
3. Comment: "Big business, big organized labor, big organized agriculture, are more than bargaining agencies. They are all forms of government." J. M. Clark in *Financing American Prosperity*, P. T. Homan and F. Machlup (eds.) (New York: Twentieth Century Fund, 1945).
4. Comment: "It is past time for us to abandon our long-cherished illusion that we live in a world which is safe for the irresponsible pursuit of self-interest." *Ibid.*
5. Comment: "We cannot assume that deficiency of demand in one particular area or of one particular character can be made up just by adding purchasing power in general, for instance, through tax relief." Council of Economic Advisers, *First Annual Report to the President* (Washington: Government Printing Office, December, 1946).
6. Comment: "The methods of cost accounting usually employed are static and retrospective. That is, they look back at the technique, outlays, and volume of output under prevailing conditions rather than forward to what could be attained if dynamic changes were introduced." E. G. Nourse and H. B. Drury, *Industrial Price Policies and Economic Progress* (Washington: Brookings Institution, 1938).
7. Comment: "The business community is planning, and the business community is being exhorted to plan, for full employment. This demand, laudable in intent, misses very important fundamentals. Having in my mind the objective of full employment, I exhort the businessman to do something which he knows how to do and which he will understand, namely to plan to make money in the postwar period. He understands that, and if he does it well he will give employment." B. M. Anderson in *Financing American Prosperity*, P. T. Homan and F. Machlup (eds.) (New York: Twentieth Century Fund, 1945).
8. Comment: "The GI Bill of Rights doesn't mean much unless there is full employment for all. If there were not full employment, most of the veterans who borrow money to go into business would lose it. . . ." Henry Wallace, *Sixty Million Jobs* (New York: Simon & Schuster, 1945).
9. Comment: "If, to conclude these remarks on the British White Paper, *aggregate* expenditures were by the use of the reservoir kept at the required level, there would be no need whatever to keep the several sums of expenditures, in the various sectors of the economy, in any fixed relationship to the whole. To do so would be to freeze the existing economic structure and to prevent free choice from playing the part that we allege is the virtue of our own, as against a totalitarian, system. Aggregate expenditures are all that we need to watch." Quoted from Frank D. Graham in A. P. Lerner and Frank D. Graham, *Planning and Paying for Full Employment* (Princeton: Princeton University Press, 1946).
10. Comment: "We do not believe that sustained full employment is possible unless our economic system provides for a constant flow of small, minor changes re-

flecting changes in costs, supplies and demands. Unless this constant adaptive process goes on, smoothly, silently, relentlessly, economic tensions will, in time, make for abrupt changes—depressions and unemployment." Chamber of Commerce of the United States, *A Program for Sustaining Employment* (Washington, 1945).

11. Distinguish between the continuous-policy and functional-finance approaches.
12. Discuss the extent to which the continuous-policy approach can be employed with the stabilization proposals presented in (*a*) Chapter XXI, Section 3; (*b*) Chapter XXI, Section 4; (*c*) Chapter XXII, Section 1; (*d*) Chapter XXII, Section 2; (*e*) Chapter XXII, Section 3.
13. Discuss the functional effectiveness of different definitions of full employment.
14. How do you think the derived effects of instituting full employment by the method of paying consumer subsidies would compare with those traced by Beveridge?

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APPENDIXES

NOTE

Comments on Appendix A

The summary figures on expenditure shown in Table 1 are broken down according to detailed items in the other tables of this appendix. Table 2 shows personal consumption expenditure for twelve major groups, which, in turn, are subdivided. The summarization at the end of Table 2 agrees with the figures on personal consumption expenditures shown in Table 1. Table 3 presents a breakdown of construction activity, both private and public (see minor exception noted in Table 1, footnote 1); private, but not public, construction appears separately in Table 1. The totals on producers durable equipment, shown in Table 1, are broken down according to industry in Table 4. Net foreign investment, shown in Table 1, is explained in Table 5 by various types of current payments to the United States. Table 6 shows the major types of government expenditures, including, besides goods and services, transfer payments, federal grants-in-aid, interest payments of the government, and subsidies less current surplus of government enterprises; the total government expenditure for goods and services agrees with the totals shown in Table 1. The net changes in business inventories, shown in Table 1, are subdivided according to various categories in Table 7.

General Content of the Appendixes

Appendix A shows as complete a breakdown of gross national product or expenditure as is available, because of the importance of expenditures in studying economic change. Appendix B relates the gross national product aggregate to other major aggregates employed in national-income statistics. Appendix C shows some of the major information on savings. Appendix D presents the major information on transfer payments and social-insurance funds, because transfer payments represent a type which is not conceived to add to the total product. The Department of Commerce publishes quarterly data on the major groups presented in these appendixes.

Tables in these appendixes are taken with permission from the U.S. Department of Commerce, "National Income and Product Statistics of the U.S., 1929–46," Supplement, *Survey of Current Business* (July, 1947).

APPENDIX A

TOTAL NET EXPENDITURES IN THE AMERICAN ECONOMY, 1929–46

TABLE 1

SUMMARY OF GROSS NATIONAL PRODUCT OR EXPENDITURE
(Millions of Dollars)

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
Gross national product	103,828	90,857	75,930	58,340	55,760	64,868	72,193	82,483	90,213	84,683	90,426	100,477	125,294	159,628	192,573	210,551	213,120	203,679
Personal consumption expenditures	78,761	70,789	61,153	49,208	46,346	51,882	56,215	62,515	67,121	64,513	67,466	72,052	82,255	90,835	101,626	110,417	121,698	143,670
Durable goods	9,362	7,275	5,569	3,694	3,503	4,255	5,158	6,374	7,005	5,754	6,729	7,854	9,750	6,845	6,515	6,755	7,977	14,917
Nondurable goods	37,742	34,052	28,955	22,743	22,254	26,732	29,377	32,887	35,232	34,032	35,258	37,594	43,960	52,962	61,205	67,190	75,298	87,061
Services	31,657	29,462	26,629	22,771	20,589	20,895	21,680	23,254	24,884	24,727	25,479	26,604	28,545	31,028	33,906	36,472	38,423	41,692
Gross private domestic investment	15,824	10,209	5,362	886	1,306	2,807	6,146	8,318	11,440	6,311	9,004	12,983	17,211	9,330	4,591	5,658	9,058	24,582
New construction [1]	7,824	5,566	3,561	1,668	1,142	1,420	1,890	2,783	3,687	3,309	3,986	4,600	5,661	3,212	2,010	2,267	3,146	8,525
Producers' durable equipment	6,438	4,926	3,162	1,781	1,783	2,531	3,351	4,531	5,444	3,975	4,577	6,108	7,676	4,702	3,761	5,348	7,134	12,393
Change in business inventories	1,562	−283	−1,361	−2,563	−1,619	−1,144	905	1,004	2,309	−973	441	2,275	3,874	1,416	−1,180	−1,957	−1,222	3,664
Net foreign investment	771	690	197	169	150	429	−54	−93	62	1,109	888	1,509	1,124	−207	−2,245	−2,099	−754	4,773
Government purchases of goods and services	8,472	9,169	9,218	8,077	7,958	9,750	9,886	11,743	11,590	12,750	13,068	13,933	24,704	59,670	88,601	96,575	83,118	30,654
Federal	1,311	1,410	1,537	1,480	2,018	2,991	2,931	4,815	4,552	5,280	5,157	6,170	16,923	52,027	81,223	89,029	74,963	20,671
War [2]	1,344	1,432	1,549	1,484	2,022	2,997	2,935	4,818	4,557	5,286	1,258	2,223	13,794	49,567	80,384	88,638	76,172	21,293
Nonwar [2]											3,908	3,956	3,173	2,664	1,480	1,552	1,011	2,383
Less: Government sales [3]	33	22	12	4	4	6	4	3	5	6	9	9	44	204	641	1,161	2,220	3,005
State and local	7,161	7,759	7,681	6,597	5,940	6,759	6,955	6,928	7,038	7,470	7,911	7,763	7,781	7,643	7,378	7,546	8,155	9,983

[1] Includes construction expenditures for crude petroleum and natural gas drilling not shown in Table 3.
[2] The classification of purchases of goods and services into war and nonwar conforms, in general, to the Daily Treasury Statement classification of general and special account expenditures. War purchases include also that part of the capital formation of government enterprises which is attributable to their war activities. Government contributions to the National Service Life Insurance fund are classified as war; all other government contributions for social insurance as nonwar.
[3] Consists of sales abroad and domestic sales of surplus consumption goods and materials.

TABLE 2

PERSONAL CONSUMPTION EXPENDITURES BY TYPE OF PRODUCT[1]

(Millions of Dollars)

Group	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
I. Food [2] and tobacco	21,374	19,519	16,272	12,719	12,777	15,636	17,693	20,030	21,629	20,662	21,072	22,600	26,476	32,842	38,090	41,564	46,740	55,086
1. Food purchased for off-premise consumption [3] (ndc)	14,520	13,255	10,633	8,033	8,457	10,576	11,960	13,734	14,589	13,889	13,976	15,029	17,441	21,570	23,871	25,570	28,264	35,448
2. Purchased meals and beverages [3]	3,055	2,892	2,590	2,116	1,834	2,332	2,674	3,054	3,583	3,446	3,748	4,094	4,983	6,206	7,854	8,877	10,536	12,217
a. Retail, service, and amusement establishments (ndc)	2,415	2,307	2,130	1,775	1,519	1,927	2,228	2,550	3,047	2,947	3,254	3,581	4,440	5,706	7,423	8,651	10,000	(4)
b. Hotels (ndc)	396	363	301	230	225	322	359	416	447	420	435	459	502	585	753	873	966	(4)
c. Dining and buffet cars (ndc)	35	30	23	14	12	15	16	20	24	21	22	23	30	62	92	98	98	(4)
d. Schools and school fraternities (ndc)	88	88	82	75	71	76	84	90	97	98	99	102	109	118	123	120	125	(4)
e. Institutions, clubs, and industrial lunchrooms (ndc)	269	244	180	121	96	105	117	128	145	130	124	132	152	187	225	222	248	(4)
f. Tips (ndc)	110	104	92	79	64	83	95	108	126	121	131	144	174	224	292	338	386	(4)
g. Less: nonconsumer purchases included in lines a-f (ndc)	258	244	218	178	153	196	225	258	303	291	317	347	424	676	1,054	1,425	1,287	(4)
3. Food furnished government (including military) and commercial employees, and withdrawn by nonfarm proprietors (ndc)	514	490	398	330	324	366	404	431	474	440	441	475	685	1,193	1,959	2,703	3,050	1,660
4. Food produced and consumed on farms (ndc)	1,585	1,428	1,158	915	926	992	1,217	1,271	1,304	1,184	1,134	1,127	1,294	1,573	1,897	1,905	2,021	2,350
5. Tobacco products and smoking supplies (ndc)	1,700	1,454	1,493	1,325	1,236	1,370	1,438	1,540	1,679	1,703	1,773	1,875	2,073	2,300	2,509	2,509	2,869	3,414
II. Clothing, accessories, and jewelry	11,018	9,575	8,115	5,973	5,365	6,479	6,928	7,558	7,964	7,876	8,299	8,791	10,483	13,176	16,279	17,972	20,054	22,163
1. Shoes and other footwear (ndc)	1,675	1,375	1,207	1,022	887	1,072	1,031	1,145	1,279	1,257	1,226	1,270	1,486	1,861	1,920	2,019	2,293	2,832
2. Shoe cleaning and repair (ndc)	164	141	114	100	98	102	106	113	122	118	114	127	144	179	256	256	256	293
3. Clothing and accessories except footwear (ndc)	7,502	6,516	5,606	3,948	3,653	4,497	4,896	5,296	5,414	5,376	5,776	6,061	7,085	8,508	10,574	11,675	13,210	15,530
4. Standard clothing issued to military personnel (ndc)	12	11	9	10	11	7	9	12	13	14	22	54	210	750	1,327	1,673	1,693	490
5. Fur storage and repair (s)	25	21	17	12	10	13	17	20	23	25	26	28	34	38	42	45	47	(4)
6. Cleaning, dyeing, pressing, alteration, storage, and repair of garments n. e. c. (in shops) (s)	448	399	335	240	220	252	285	319	360	366	371	409	479	549	604	645	671	767
7. Dressmakers and seamstresses (not in shops) (s)	58	50	38	27	24	27	28	31	36	30	33	35	36	42	43	53	59	(4)
8. Laundering in establishments (s)	475	458	392	310	252	262	272	304	323	308	312	329	374	420	444	462	484	564
9. Costume and dress suit rental (s)	3	3	3	2	2	2	2	3	3	3	3	3	3	4	3	3	4	(4)
10. Net purchases from second-hand clothing dealers (s)	5	5	5	5	5	5	4	4	4	4	4	4	4	5	6	6	6	(4)
11. Miscellaneous personal services (s)	11	10	8	6	5	6	7	8	8	8	8	10	11	13	16	17	19	(4)
12. Jewelry and watches (dc)	560	513	328	252	172	198	233	265	333	323	355	406	547	723	941	1,012	1,196	1,407
13. Watch, clock, and jewelry repairs (s)	80	73	53	39	26	36	38	38	46	44	49	55	70	84	103	106	116	(4)

See footnotes at end of table.

TABLE 2—*Continued*

Group	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
III. Personal care	1,116	1,039	979	817	660	760	802	864	961	951	1,004	1,107	1,208	1,400	1,687	1,882	2,098	2,321
1. Toilet articles and preparations (ndc)	591	515	504	420	320	377	374	395	428	442	486	510	592	711	851	961	1,074	1,164
2. Barber shop services (s)	350	349	310	253	213	221	230	245	272	254	252	289	295	332	399	426	468	(4)
3. Beauty parlor services (s)	167	167	158	138	122	157	192	217	253	248	258	299	312	347	425	481	541	(4)
4. Baths and masseurs (s)	8	8	7	6	5	5	6	7	8	7	8	9	9	10	12	14	15	(4)
IV. Housing	11,421	10,992	10,235	8,964	7,849	7,538	7,597	7,882	8,378	8,733	8,940	9,217	9,863	10,578	11,085	11,661	12,137	12,690
1. Owner-occupied nonfarm dwellings—space-rental value [3] (s)	5,898	5,581	5,127	4,440	3,865	3,662	3,665	3,778	3,969	4,124	4,200	4,326	4,655	5,088	5,471	5,945	6,404	6,862
3. Tenant-occupied nonfarm dwellings (including lodging houses)—space rent [3] (s)	4,445	4,346	4,139	3,691	3,244	3,099	3,142	3,295	3,560	3,773	3,808	4,039	4,312	4,535	4,572	4,591	4,508	4,488
3. Rental value of farm houses (s)	829	830	754	655	587	616	616	615	638	620	619	624	658	702	755	820	889	978
4. Transient hotels and tourist cabins (s)	124	113	97	74	64	72	79	91	103	103	107	109	116	127	151	163	184	(4)
5. Clubs, schools, and institutions (s)	125	122	118	104	89	89	95	103	108	113	116	119	122	126	136	142	152	(4)
V. Household operation	10,509	9,378	8,264	6,675	6,396	7,107	7,604	8,660	9,340	8,732	9,461	10,292	11,724	12,235	12,559	13,317	14,484	18,009
1. Furniture (dc)	1,167	905	767	486	442	495	648	830	904	809	931	1,044	1,295	1,268	1,217	1,302	1,550	2,170
2. Floor coverings (dc)	485	356	338	232	186	238	273	385	382	321	383	417	513	535	588	553	540	841
3. Refrigerators, and washing and sewing machines (dc)	348	309	268	171	230	280	319	373	439	321	362	422	557	312				
4. Miscellaneous electrical appliances except radios (dc)	132	121	103	55	74	99	113	137	154	167	174	197	254	177	252	153	276	1,241
5. Cooking and portable heating equipment (dc)	288	241	194	118	104	139	182	223	252	223	238	265	354	211				
6. China, glassware, tableware, and utensils (dc)	628	442	429	406	364	404	407	456	515	472	475	517	633	670	633	671	847	1,326
7. Durable house furnishings, n. e. c. (dc)	511	458	353	269	229	265	262	345	392	383	421	457	546	602				
8. Products of custom establishments, n. e. c. (dc)	30	24	21	14	13	16	18	22	23	21	24	26	32	34	747	806	924	1,257
9. Writing equipment (dc)	74	62	47	31	26	30	36	43	47	44	45	53	77	48				
10. Net purchases from second-hand furniture and antique dealers (s)	34	32	29	23	20	19	18	18	19	18	18	18	19	19	19	20	20	(4)
11. Upholstery and furniture repair (s)	24	23	23	22	22	26	30	34	39	44	48	53	57	66	71	76	80	(4)
12. Rug, drapery, and mattress cleaning and repair (s)	20	18	16	11	10	13	16	18	20	20	20	22	26	30	32	35	35	(4)
13. Care of electrical equipment except radios and of stoves (s)	20	19	18	15	13	17	22	24	27	29	32	35	39	49	62	73	68	(4)
14. Semidurable house furnishings (ndc)	799	632	547	408	441	512	536	659	724	641	760	811	950	1,083	1,249	1,356	1,387	1,794
15. Lighting supplies (ndc)	86	76	71	70	76	86	93	98	97	80	66	97	123	134				
16. Cleaning and polishing preparations (ndc)	359	356	309	227	222	260	265	299	334	353	359	353	378	420	674	689	646	711
17. Miscellaneous household paper products (ndc)	44	44	43	34	38	44	49	56	62	58	71	79	81	108				
18. Stationery and writing supplies (ndc)	143	133	103	71	69	87	101	112	131	129	149	162	191	215	255	314	362	378
19. Fuel except gas and ice	1,608	1,542	1,318	1,138	1,152	1,263	1,281	1,411	1,417	1,311	1,398	1,553	1,707	1,946	2,112	2,123	2,225	2,248
a. Purchased (ndc)	1,494	1,433	1,222	1,045	1,055	1,165	1,177	1,308	1,311	1,212	1,288	1,448	1,601	1,835	1,993	1,997	2,103	2,127
b. Produced and consumed on farms (ndc)	114	109	96	93	97	98	104	103	106	99	110	105	106	111	119	126	122	121
20. Household utilities	1,397	1,475	1,484	1,439	1,374	1,427	1,468	1,519	1,574	1,612	1,680	1,785	1,851	1,962	2,032	2,155	2,274	2,395
a. Electricity (s)	616	660	674	662	645	671	697	726	766	810	849	910	965	1,016	1,043	1,123	1,198	1,275
b. Gas (s)	548	567	562	544	504	504	511	520	531	528	544	584	587	634	668	696	729	766
c Water (s)	233	248	248	233	225	252	260	273	277	274	287	291	299	312	321	336	347	354

See footnotes at end of table.

TABLE 2—*Continued*

Group	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
21. Telephone (s)	543	551	536	490	444	428	443	467	487	511	533	568	614	705	776	825	865	963
22. Telegraph, cable, and wireless (s)	16	14	12	9	9	10	10	11	11	11	12	13	16	18	21	22	23	(4)
23. Postage (s)	84	79	72	76	80	84	88	100	106	108	109	117	130	152	191	246	276	(4)
24. Express charges (s)	29	24	20	14	12	14	14	16	16	16	16	17	19	24	31	36	39	(4)
25. Moving expenses and warehousing (s)	89	98	100	79	65	61	62	64	72	76	75	80	90	109	125	148	160	(4)
26. Domestic service (excluding practical nurses)	1,501	1,299	1,003	731	644	749	806	897	1,048	910	995	1,081	1,118	1,285	1,416	1,65	1,828	1,835
a. Cash payments (s)	1,225	1,053	822	601	524	599	637	715	847	738	817	890	919	1,056	1,199	1,457	1,628	(4)
b. Value of meals furnished (s)	276	246	181	130	120	150	169	182	201	172	178	191	199	229	217	208	200	(4)
27. Fire and theft insurance on personal property—net payments [6] (s)	24	20	16	13	15	18	20	19	23	20	22	25	28	26	28	4 29	31	(4)
28. Miscellaneous household operation services (s)	26	25	24	23	22	23	24	24	25	24	25	25	26	27	28	28	28	(4)
VI. Medical care and death expenses	3,620	3,447	3,076	2,575	2,397	2,613	2,762	3,018	3,226	3,209	3,386	3,591	3,961	4,501	5,038	5,441	5,754	6,447
1. Drug preparations and sundries (ndc)	604	568	517	449	427	468	474	509	558	578	612	640	725	849	1,008	1,069	1,146	1,335
2. Ophthalmic products and orthopedic appliances (dc)	131	133	117	93	92	124	131	140	165	157	172	187	226	255	299	324	343	395
3. Physicians (s)	959	924	819	661	617	678	731	820	854	833	866	913	991	1,139	1,213	1,293	1,339	2,533
4. Dentists (s)	482	463	408	312	276	295	302	331	350	356	386	419	468	545	606	631	652	
5. Osteopathic physicians (s)	41	38	34	27	26	26	30	33	36	40	43	47	57	70	74	79	81	
6. Chiropractors (s)	49	46	40	30	26	26	28	32	33	33	34	36	39	45	48	51	52	
7. Chiropodists and podiatrists (s)	20	19	17	14	13	13	14	15	15	14	15	17	18	22	22	24	24	
8. Private duty trained nurses [7] (s)	113	104	88	67	59	62	64	68	67	61	59	58	58	62	67	75	80	
9. Practical nurses and midwives [7] (s)	86	74	56	41	34	39	40	46	52	43	45	48	50	57	63	80	88	
10. Miscellaneous curative and healing professions (s)	27	26	22	16	14	15	15	17	17	15	16	18	19	22	24	25	25	
11. Privately controlled hospitals and sanitariums [8] (s)	403	404	395	386	363	369	406	422	454	467	492	527	555	613	693	778	805	1,320
12. Net payments to group hospitalization and health associations [6] (s)						(9)	(9)	1	3	6	10	16	27	30	35	44	45	
13. Student fees for medical care (s)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
14. Accident and health insurance—net payments [6] (s)	86	90	77	60	56	71	78	87	99	104	115	126	141	164	182	211	250	
15. Mutual accident and sick benefit associations—net payments [6] (s)	20	18	13	10	12	12	13	16	19	22	26	22	25	33	38	41	48	
16. Funeral and burial service (s)	323	291	254	228	214	225	241	259	272	263	272	284	316	340	380	417	464	515
17. Cemeteries and crematories (s)	163	150	137	128	120	128	133	146	151	147	152	159	158	161	178	176	177	180
18. Monuments and tombstones (dc)	111	97	80	51	46	57	60	74	79	68	69	72	86	92	106	121	133	169
VII. Personal business	5,221	4,144	3,595	3,111	3,063	3,106	3,304	3,588	3,865	3,648	3,725	3,845	4,099	4,05	2 4,174	4,514	4,853	5,213
1. Miners' expenditures for explosives, lamps, and smithing (ndc)	15	13	10	7	7	10	10	11	12	10	10	12	14	18	63	68	77	113
2. Tools (dc)	48	37	24	16	18	24	28	33	41	31	35	41	51	56				
3. Theatrical employment agency fees (s)	11	9	9	8	7	8	10	11	13	12	12	12	12	14	18	20	20	(4)
4. Nontheatrical employment agency fees (s)	14	11	7	3	3	5	6	10	11	7	8	9	13	14	11	9	11	(4)
5. Net payments to labor unions [6] (s)	38	33	26	6	15	44	56	60	114	129	140	160	178	211	265	261	241	(4)
6. Employees' dues and fees to professional associations (s)	4	4	4	4	4	4	4	4	4	4	4	4	4	6	6	6	6	(4)

See footnotes at end of table.

TABLE 2—*Continued*

Group	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
7. Brokerage charges and interest, and investment counseling (s)	1,739	764	424	277	378	248	245	322	313	207	195	154	131	118	206	211	292	218
8. Trust services of banks (s)	42	44	41	36	34	40	43	48	53	50	51	52	53	51	54	58	62	(4)
9. Bank service charges for deposit accounts, check collection, and foreign exchange (s)	10	11	15	18	21	28	41	49	54	62	65	71	78	80	91	103	106	(4)
10. Safety-deposit box rental (s)	24	24	24	24	24	24	20	19	19	18	19	19	20	28	31	35	39	(4)
11. Money-order fees (s)	16	15	14	15	16	18	19	20	21	21	21	22	26	31	35	40	43	(4)
12. Services furnished without payment by financial intermediaries except insurance companies (s)	1,278	1,141	1,017	872	757	793	792	843	876	818	817	792	852	904	950	1,192	1,345	1,407
13. Expense of handling life insurance [10]	936	965	947	932	942	981	1,095	1,113	1,192	1,177	1,197	1,238	1,271	1,264	1,337	1,400	1,460	(4)
a. Life insurance companies (s)	889	913	901	895	896	945	1,049	1,074	1,148	1,137	1,152	1,189	1,222	1,213	1,284	1,336	1,394	(4)
b. Fraternal and assessment associations (s)	47	52	46	37	46	36	46	39	44	40	45	49	49	51	53	64	66	(4)
14. Legal services (s)	402	397	410	348	334	359	371	383	402	392	407	423	450	521	552	587	606	(4)
15. Interest on personal debt (s)	577	617	571	503	466	480	520	614	688	660	693	781	887	670	480	449	468	608
16. Classified advertisements (s)	36	31	28	23	20	21	24	27	29	27	26	28	29	31	36	33	34	(4)
17. Net purchases from pawnbrokers and miscellaneous second-hand stores (s)	17	15	13	11	9	9	9	9	10	11	12	13	14	15	16	17	18	(4)
18. Personal business services n. e. c. (s)	14	13	11	8	8	10	11	12	13	12	13	14	16	20	23	25	25	(4)
VIII. Transportation	7,496	6,061	4,928	3,924	3,920	4,514	5,179	6,044	6,432	5,549	6,250	7,007	8,241	5,170	5,229	5,510	6,320	10,862
1. User-operated transportation	5,748	4,498	3,617	2,839	2,940	3,474	4,102	4,825	5,147	4,318	4,967	5,686	6,777	3,127	2,437	2,568	3,281	7,627
a. New cars and net purchases of used cars (dc)	2,588	1,642	1,144	635	779	1,024	1,508	1,921	1,988	1,228	1,679	2,228	2,708	309	278	256	290	2,415
b. Tires and tubes (dc)	419	320	264	189	154	182	175	167	176	193	237	257	318	28	341	429	611	1,211
c. Parts and accessories (dc)	221	196	162	118	117	153	181	220	238	185	220	243	316	245				
d. Automobile repair, greasing, washing, parking, storage, and rental (s)	572	467	386	296	306	346	354	404	421	402	462	489	577	457	444	496	560	(4)
e. Gasoline and oil (ndc)	1,814	1,749	1,540	1,476	1,466	1,640	1,743	1,945	2,143	2,145	2,181	2,264	2,628	1,908	1,198	1,206	1,614	2,951
f. Bridge, tunnel, ferry, and road tolls (s)	40	43	45	43	42	48	42	44	44	41	46	50	57	44	34	35	41	(4)
g. Automobile insurance—net payments [8] (s)	94	81	76	82	76	86	99	124	137	124	142	155	173	136	142	146	165	(4)
2. Purchased local transportation	1,131	1,063	932	794	728	769	799	855	882	848	885	913	985	1,309	1,647	1,730	1,750	1,880
a. Street and electric railway and local bus (s)	810	772	705	624	578	605	626	674	684	660	684	714	760	989	1,231	1,297	1,314	(4)
b. Taxicab—fares and tips (s)	220	208	152	109	96	111	119	127	145	141	153	153	177	261	353	370	372	(4)
c. Steam railway—commutation (s)	77	73	64	53	46	45	45	44	42	41	41	40	41	53	56	57	58	(4)
d. Ferry—foot passengers (s)	14	10	11	8	8	8	9	10	11	6	7	6	7	6	7	6	6	(4)
3. Purchased intercity transportation	521	422	324	252	224	243	245	318	345	327	345	353	409	643	1,032	1,089	1,146	1,163
a. Steam railway (excluding commutation) (s)	375	300	222	153	139	151	135	188	208	188	194	193	209	338	616	604	637	(4)
b. Sleeping and parlor car—fares and tips (s)	38	33	25	17	15	18	18	22	24	21	22	21	23	31	46	50	46	(4)
c. Intercity bus (s)	52	53	50	48	46	44	62	72	78	84	92	97	126	228	317	368	376	(4)
d. Air line (s)	3	2	2	3	3	4	6	8	8	8	11	18	23	22	24	32	54	(4)
e. Coastal and inland waterway (s)	41	24	17	26	17	22	20	23	22	22	22	20	23	17	18	23	21	(4)
f. Baggage transfer, carriage, storage, and excess charges (s)	12	10	8	5	4	4	4	5	5	4	4	4	5	7	11	12	12	(4)
4. Luggage (dc)	96	78	55	39	28	28	33	46	58	56	53	55	70	91	113	123	143	192

See footnotes at end of table.

TABLE 2—*Continued*

Group	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
IX. Recreation	4,327	3,986	3,298	2,439	2,199	2,437	2,625	3,014	3,374	3,235	3,446	3,740	4,225	4,590	4,664	5,131	5,783	7,942
1. Admissions to specified spectator amusement	913	892	854	631	573	625	672	759	818	816	821	876	937	1,102	1,174	1,256	1,393	1,688
a. Motion picture theaters (s)	720	732	719	527	482	518	556	626	676	663	659	709	756	924	987	1,025	1,125	(4)
b. Legitimate theaters and opera (s)	91	61	47	33	19	18	19	21	21	27	32	36	40	48	68	82	84	(4)
c. Entertainments of nonprofit organizations, except athletics (s)	33	32	30	23	21	23	24	27	30	29	30	32	35	39	42	47	52	(4)
d. Professional baseball (s)	17	17	14	12	11	13	15	18	19	20	22	20	21	18	14	18	22	(4)
e. Professional football (s)	1	1	1	1	1	1	2	2	2	2	3	3	3	2	2	3	4	(4)
f. Professional hockey (s)	3	3	3	2	2	2	3	3	3	3	3	3	4	4	3	4	5	(4)
g. Horse and dog race tracks (s)	2	2	2	1	2	6	7	8	9	12	11	12	13	12	11	14	19	(4)
h. College football (s)	22	22	20	18	20	25	27	31	33	37	37	37	39	31	26	32	43	(4)
i. Other amateur spectator sports (s)	18	18	15	12	13	16	16	19	21	19	20	20	22	20	16	25	30	(4)
j. Ticket brokers, mark-up on admissions (s)	4	2	1	1	1	1	1	2	2	2	2	2	2	2	3	4	6	(4)
k. Purchase of programs (s)	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	3	(4)
2. Pari-mutuel net receipts (s)	8	7	6	4	6	19	26	29	38	44	41	55	65	69	79	131	148	(4)
3. Nonvending coin machines—receipts minus payoff (s)	8	6	6	6	9	14	22	34	52	55	58	69	82	85	102	121	128	(4)
4. Specified commercial participant amusements	207	203	175	132	121	135	141	165	194	164	183	189	210	197	202	224	260	(4)
a. Billiard parlors and bowling alleys (s)	58	57	48	35	34	41	44	57	73	57	70	70	82	79	83	83	92	(4)
b. Dancing, riding, shooting, skating and swimming places (s)	30	29	24	18	18	21	21	26	31	23	27	28	33	33	36	48	54	(4)
c. Amusement devices and parks (s)	16	16	13	10	10	11	12	14	17	13	15	16	19	18	20	22	24	(4)
d. Daily fee golf courses—greens fees (s)	13	13	12	12	12	13	14	14	15	16	17	18	19	17	16	20	22	(4)
e. Golf instruction, club rental, and caddy fees (s)	78	76	68	51	41	41	41	43	46	44	43	46	45	43	44	48	61	(4)
f. Sightseeing busses and guides (s)	3	3	3	2	2	3	4	5	6	5	5	5	6	2	1	1	4	(4)
g. Private flying operations (s)	9	9	7	4	4	5	5	6	6	6	6	6	6	5	2	2	3	(4)
5. Informal recreation	2,546	2,273	1,744	1,255	1,114	1,240	1,345	1,566	1,765	1,693	1,857	2,038	2,367	2,550	2,471	2,633	2,962	(4)
a. Books and maps (dc)	307	261	250	150	149	162	179	204	239	217	222	227	247	265	346	423	468	474
b. Magazines, newspapers, and sheet music (ndc)	538	512	479	428	419	441	456	490	518	514	554	581	619	674	794	831	902	1,016
c. Book rental and repair (s)	2	3	3	3	3	3	4	4	4	4	4	4	4	5	6	6	7	(4)
d. Nondurable toys and sport supplies (ndc)	336	281	266	207	181	200	216	242	269	268	285	309	371	415	409	486	595	819
e. Wheel goods, durable toys, and sport equipment (dc)	182	145	136	97	81	102	115	144	179	186	195	210	254	260	229	265	323	598
f. Boats and pleasure aircraft (dc)	24	14	11	4	4	6	9	13	16	10	19	23	30	14	8	10	12	63
g. Boat and bicycle rental, storage, and repair (s)	9	9	8	6	5	6	7	8	8	8	8	8	9	9	9	9	10	(4)
h. Radios, phonographs, parts, and records (dc)	905	840	418	232	171	198	206	278	322	278	356	429	535	556	366	250	254	1,056
i. Pianos and other musical instruments (dc)	107	81	60	36	24	31	42	55	63	61	64	78	101	94				
j. Radio repair (s)	26	27	24	19	14	17	21	21	23	25	28	32	36	57	59	70	64	(4)
k. Photo developing and printing (s)	13	11	10	8	7	8	10	13	15	17	18	21	26	34	44	53	62	(4)
l. Photographic studios (s)	60	53	47	39	31	39	47	55	62	62	61	70	86	114	147	174	206	(4)
m. Collectors' net acquisitions of stamps and coins (s)	2	2	2	1	1	2	4	7	12	9	8	9	9	9	9	10	10	(4)

See footnotes at end of table.

TABLE 2—*Continued*

Group	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
IX. Recreation—Continued																		
5. Informal recreation—Continued																		
n. Hunting dog purchase and training, and sports guide service (s)	8	8	8	7	7	7	7	8	9	9	10	11	11	11	10	10	12	(4)
o. Veterinary service and purchase of pets (s)	27	26	22	18	17	18	22	24	26	25	25	26	29	33	35	36	37	(4)
6. Flowers, seeds, and potted plants (ndc)	221	190	134	89	90	116	130	159	186	176	191	211	247	269	315	391	457	576
7. Camp fees (s)	32	32	28	25	24	26	27	29	31	26	28	28	30	30	26	30	32	(4)
8. Clubs	302	294	277	242	208	199	197	198	203	200	199	203	203	205	217	236	280	332
a. Athletic and social—dues and fees (s)	148	143	127	94	72	71	71	74	79	75	74	76	74	71	73	78	104	(4)
b. School fraternities—dues and fees (s)	14	14	14	14	13	14	14	16	16	17	18	18	18	15	12	11	11	(4)
c. Fraternal, patriotic, and women's organizations except school and insurance—net payments (s)	134	130	130	128	117	108	106	102	101	101	99	100	102	110	122	137	154	(4)
d. Luncheon clubs (s)	6	7	6	6	6	6	6	6	7	7	8	9	9	9	10	10	11	(4)
9. Commercial amusements, n. e. c. (s)	90	89	74	55	54	63	65	75	87	61	68	71	84	83	78	109	123	(4)
X. Private education and research	664	683	665	571	481	483	507	546	600	619	628	639	692	815	961	931	853	975
1. Higher education [3] (s)	219	242	251	227	205	213	228	242	249	256	267	277	283	316	363	372	362	(4)
2. Elementary and secondary schools [3] (s)	162	170	185	158	121	121	122	140	174	192	195	198	202	215	237	244	246	(4)
3. Commercial, business, and trade schools—fees (s)	27	27	25	19	16	18	22	25	28	28	26	24	54	132	204	150	70	(4)
4. Correspondence schools—fees (s)	32	24	20	18	16	17	18	18	20	20	20	21	22	22	22	22	22	(4)
5. Other instruction (except athletics)—fees (s)	133	129	115	88	70	69	70	72	78	75	74	75	84	81	83	89	99	(4)
6. Foundation expenditures for education and research [3] (s)	91	91	69	61	53	45	47	49	51	48	46	44	47	49	52	54	54	(4)
XI. Religious and welfare activities	1,196	1,209	1,125	973	872	870	862	899	900	923	938	1,000	1,014	1,160	1,305	1,490	1,478	1,525
1. Religious bodies [3] (s)	912	893	837	743	665	641	627	621	638	651	659	662	652	662	695	750	783	(4)
2. Social welfare and foreign relief agencies [3] (s)	230	253	244	166	168	182	195	204	219	219	237	268	321	447	568	671	652	(4)
3. Museums and libraries [3] (s)	15	15	15	14	13	13	14	14	15	16	16	16	16	16	16	16	16	(4)
4. Foundation expenditures (except education and research) [3] (s)	30	30	23	20	18	15	16	16	17	16	16	15	16	16	17	18	18	(4)
5. Political organizations [3] (s)	9	18	6	30	8	19	10	44	11	21	10	39	9	19	9	35	9	(4)
XII. Foreign travel and remittances—net	799	756	601	467	367	339	352	412	452	376	317	223	269	316	555	1,004	1,144	437
1. Foreign travel and remittances by United States residents	992	931	727	553	454	443	478	556	620	548	497	387	406	478	740	1,218	1,434	(4)
a. Payments to United States vessels (s)	34	33	25	16	16	17	18	24	23	23	20	13	13	4	3	3	5	(4)
b. Other foreign travel expenditures (s)	598	578	420	318	242	259	285	344	410	356	313	159	176	124	140	172	229	(4)
c. Expenditures by United States Government personnel (military and civilian) (ndc)	21	20	20	20	18	16	20	18	18	18	20	27	77	251	417	822	944	120
d. Personal cash remittances to foreign countries (s)	339	300	262	199	178	151	155	170	169	151	144	188	140	99	180	221	256	(4)
2. Less: expenditures and remittances by foreigners	193	175	126	86	87	104	126	144	168	172	180	164	137	162	185	214	290	(4)
a. Expenditures in the United States (s)	142	132	98	69	70	85	106	122	140	135	144	105	94	122	140	169	196	(4)
b. Personal cash remittances to the United States (s)	51	43	28	17	17	19	20	22	28	37	36	59	43	40	45	45	94	(4)
Total personal consumption expenditures	78,761	70,789	61,153	49,208	46,346	51,882	56,215	62,515	67,121	64,513	67,466	72,052	82,255	90,835	101,626	110,417	121,698	143,670
Durable commodities	9,362	7,275	5,569	3,694	3,503	4,255	5,158	6,374	7,005	5,754	6,729	7,854	9,750	6,845	6,515	6,755	7,977	14,917
Nondurable commodities	37,742	34,052	28,955	22,743	22,254	26,732	29,377	32,887	35,232	34,032	35,258	37,594	43,960	52,962	61,205	67,190	75,298	87,061
Services	31,657	29,462	26,629	22,771	20,589	20,895	21,680	23,254	24,884	24,727	25,479	26,604	28,545	31,028	33,906	36,472	38,423	41,692

See footnotes on next page.

TABLE 2—*Continued*

[1] Commodities and services purchased by government and business as well as consumers have been allocated between nonconsumer and consumer purchases. Only the latter are shown in this table, with the exception of meals and beverages where the deductions made for nonconsumer purchases are indicated. Consumer nondurable commodities are designated *ndc* following group titles, durable commodities *dc*, and services *s*

[2] Expenditures for alcoholic beverages (distilled spirits, wine, and beer) bought both in packaged form and by the drink are estimated as follows in millions of dollars: 1933—626; 1934—2 003; 1935—2,553; 1936—3,164, 1937—3,442; 1938—3 237; 1939—3 425, 1940—3,634; 1941—4,238; 1942—5,246; 1943—6,082; 1944—7,200; 1945—7,850; 1946—8,770.

[3] Off-premise food estimates include fountain or lunch-counter sales of post exchanges, ships' stores meals sold by army messes, etc The meals and beverages estimates, on the other hand cover fountain sales of certain foods especially packaged ice cream for off-premise consumption.

[4] Component service group estimates not shown separately are included in their respective subdivision and division totals.

[5] Space rent covers heating and plumbing facilities lighting fixtures, storm windows and doors, window screens and screen doors, and window blinds or shades, but excludes other furnishings, equipment, and related services—furniture, stoves and ranges, refrigerators, repairs of furniture and appliances, fuel, electricity, etc Purchases of excluded furnishings, equipment, and services are included in the appropriate commodity and service series These housing estimates include housing furnished as part-compensation of nonfarm employees

[6] Net payments are premiums minus claims paid, or in the case of labor unions and fraternal, patriotic, and women's organizations are gross payments minus cash benefits.

[7] Includes value of meals furnished.

[8] These series are defined to include current expenditures of nonprofit organizations providing services principally to individuals, including depreciation, but excluding relief payments within the United States.

[9] Less than $500.000.

[10] Total operating expenses of life insurance companies, excluding payments to policyholders and expenses allocated to accident and health insurance.

TABLE 3

NEW CONSTRUCTION ACTIVITY, BY TYPE
(Millions of Dollars)

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
Total new construction activity	9,913	8,059	5,980	3,200	2,223	2,756	3,110	4,714	5,308	5,018	6,062	6,807	10,308	13,353	7,734	4,073	4,595	10,007
New private construction activity	7,522	5,306	3,416	1,482	1,005	1,221	1,648	2,486	3,274	2,941	3,619	4,199	5,238	2,908	1,669	1,746	2,547	7,856
Residential (nonfarm)	2,797	1,446	1,228	462	278	361	665	1,131	1,372	1,511	2,114	2,355	2,765	1,315	650	535	670	3,300
Nonresidential building, except farm and public utility	2,822	2,099	1,104	499	404	455	472	712	1,088	764	785	1,028	1,486	635	232	350	1,014	3,350
Industrial	949	532	221	74	176	191	158	266	492	232	254	442	801	346	156	208	642	1,689
Commercial [1]	1,296	1,020	483	231	135	177	217	298	400	298	304	365	427	164	34	59	210	1,166
Institutional [2]	350	343	243	125	43	41	52	85	112	119	112	134	158	79	22	46	88	268
Other [3]	227	204	157	69	50	46	45	63	84	115	115	87	100	46	20	37	74	227
Public utility	1,624	1,568	987	482	254	312	335	454	589	470	494	580	684	687	495	648	672	856
Farm construction	279	193	97	39	69	93	176	189	225	196	226	236	303	271	292	213	191	350
Residential	147	107	59	26	43	54	96	104	118	104	120	127	174	144	185	136	116	212
Nonresidential	132	86	38	13	26	39	80	85	107	92	106	109	129	127	107	77	75	138
New public construction activity	2,391	2,753	2,564	1,778	1,218	1,535	1,462	2,228	2,034	2,077	2,443	2,608	5,070	10,445	6,065	2,327	2,048	2,151
Residential						1	9	61	93	35	65	200	430	545	700	190	71	387
Nonresidential building	622	623	578	392	193	256	273	597	459	556	835	519	1,540	3,634	1,800	638	652	319
Industrial	(7)	(7)	(7)	(7)	2	11	2	4	2	12	23	164	1,280	3,437	1,668	507	470	84
Institutional [4]	462	455	373	201	86	151	161	386	283	349	532	182	169	148	105	99	144	186
Public Administration	103	121	173	173	89	44	74	130	110	127	180	96	45	28	9	11	15	16
Other [5]	57	47	32	18	16	50	36	77	64	68	100	77	46	21	18	21	23	33
Military and Naval	19	29	40	34	36	47	37	29	37	62	125	385	1,620	5,016	2,550	837	690	188
Highway	1,248	1,481	1,323	916	675	821	622	876	850	837	835	875	850	675	450	360	342	706
All other [6]	502	620	623	436	314	410	521	665	595	587	583	629	630	575	565	302	293	551

[1] Consists of warehouses, office and loft buildings; stores, restaurants, and garages; and hotels.
[2] Consists of religious, educational, and hospital and other institutional.
[3] Consists of social and recreational, and miscellaneous.
[4] Consists of educational, and hospital and other institutional.
[5] Consists of commercial, social and recreational, and miscellaneous.
[6] Consists of sewage disposal and water supply; miscellaneous public service enterprises; conservation and development; and all Federal not included elsewhere.
[7] Not available separately; amount believed negligible.

TABLE 4

PRODUCERS' DURABLE EQUIPMENT, 1929–45
(Millions of Dollars)

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945
Total producers' durable equipment	6,438	4,926	3,162	1,781	1,783	2,531	3,351	4,531	5,444	3,975	4,577	6,108	7,676	4,702	3,761	5,348	7,134
Special industry machinery	550	399	300	182	198	256	329	435	503	378	405	511	619	601	576	716	853
Mining machinery	107	60	26	20	24	38	59	100	114	72	77	114	242	146	113	168	204
Construction machinery	135	106	61	17	14	28	46	80	105	85	82	129	177	159	164	180	254
Metal working machinery	279	160	87	38	46	81	131	197	192	159	228	449	530	408	331	170	325
Pumps and pumping equipment	147	118	80	46	40	38	61	96	124	101	108	150	213	196	178	239	314
General and miscellaneous machinery and equipment	581	414	312	179	171	237	316	431	508	363	406	467	546	409	401	478	676
Engines and turbines	65	55	32	15	12	20	28	40	51	32	36	48	68	57	72	73	91
Farm machinery and equipment	393	366	189	126	129	142	221	274	344	327	292	375	495	538	405	629	767
Tractors	175	161	99	46	23	58	121	192	254	184	175	236	316	168	110	283	314
Electrical apparatus and equipment	480	376	260	119	87	143	207	264	422	281	352	556	652	451	395	635	724
Office machinery	154	107	75	53	52	64	83	103	129	109	115	145	200	170	119	174	234
Nonresidential furniture and equipment	514	411	278	164	141	192	208	246	307	261	285	341	425	329	277	282	348
Professional and scientific equipment	91	75	54	35	29	33	44	55	80	62	80	83	104	84	118	134	145
Tools	88	68	45	30	34	44	51	61	74	57	65	89	128	82	122	178	160
Durable containers	167	141	99	76	87	111	113	132	166	122	136	143	161	152	197	182	220
Miscellaneous subsidiary durable equipment	349	303	226	157	150	183	214	267	292	247	282	323	395	208	117	139	234
Business motor vehicles	1,656	1,093	753	407	493	709	977	1,264	1,312	836	1,142	1,418	1,746	214	245	310	739
Railroad and transit equipment	391	387	94	52	33	118	125	230	383	162	200	353	463	461	287	385	378
Ships and boats	75	109	83	18	12	21	9	57	65	122	88	145	194	218	178	174	215
Aircraft	41	17	9	1	8	15	8	7	19	15	23	39	35	6	0	0	12
Less: Government purchases, not allocable [1]												6	33	355	644	181	73

[1] Consists of certain Defense Plant Corporation purchases included mainly in special industry machinery; general and miscellaneous machinery and equipment; engines and turbines; pumps and pumping equipment; electrical apparatus and equipment; professional and scientific equipment; and tools.

TABLE 5

NET FOREIGN INVESTMENT[1]
(Millions of Dollars)

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
Net current payments to the United States	771	690	197	169	150	429	−54	−93	62	1,109	888	1,509	1,124	−207	−2,245	−2,099	−754	4,773
Net payments of factor income	810	746	547	393	323	303	367	300	283	386	313	357	363	365	367	423	397	446
Wages and salaries [3]	1	1	1	1	1	1	1	1	1	1	2	3	6	10	14	12	10	8
Interest	577	608	550	426	324	242	207	195	160	138	127	120	126	130	115	118	123	122
Dividends	89	26	−37	−44	−22	8	60	−8	11	217	137	149	109	107	137	103	88	118
Branch profits	143	111	33	10	20	52	99	112	111	30	47	85	122	118	101	190	176	198
Net purchases from the United States	−39	−56	−350	−224	−173	126	−421	−393	−221	723	575	1,152	761	−572	−2,612	−2,522	−1,151	4,327
Net purchases from United States Business [3 4]	993	919	449	391	327	602	101	210	476	1,314	1,123	1,618	1,482	1,058	−490	−422	416	4,285
Purchases from United States business	5,902	4,408	2,870	1,942	1,960	2,532	2,740	2,966	3,971	3,747	3,886	4,785	5,378	4,209	3,433	3,877	4,946	10,210
Sales to United States business	4,909	3,489	2,421	1,551	1,633	1,930	2,639	2,756	3,495	2,433	2,763	3,167	3,896	3,151	3,923	4,299	4,530	5,925
Net purchases from United States Government	−70	−71	−80	−60	−49	−39	−55	−65	−94	−64	−64	−84	−330	−1,193	−1,411	−925	−204	1,139
Purchases from United States Government [5]	33	22	12	4	4	6	4	3	5	6	5	3	37	188	574	952	1,798	2,289
Sales to United States Government [6]	103	93	92	64	53	45	59	68	99	70	69	87	367	1,381	1,985	1,877	2,002	1,150
Net purchases from United States persons	−962	−904	−719	−555	−451	−437	−467	−538	−603	−527	−484	−382	−391	−437	−711	−1,175	−1,363	−1,097
Purchases from United States persons [7]	51	43	28	17	17	19	20	22	28	37	36	59	43	40	45	45	94	125
Sales to United States persons [8]	1,013	947	747	572	468	456	487	560	631	564	520	441	434	477	756	1,220	1,457	1,222
Net capital movement to the United States [9]	−771	−690	−197	−169	−150	−429	54	93	−62	−1,109	−888	−1,509	−1,124	207	2,245	2,099	754	−4,773
Long-term	−240	−221	215	257	77	200	436	777	521	97	27	−73	−642	−159	−147	21	−1,372	−3,342
Short-term	−4	−479	−637	−446	−419	222	1,072	431	356	344	1,470	1,530	−389	67	1,225	356	1,340	−1,176
Change in gold stock [10]	−143	−310	133	−53	131	−1,266	−1,822	−1,272	−1,364	−1,799	−3,174	−4,243	−719	23	757	1,350	548	−623
Errors and omissions	−384	320	92	73	61	415	368	157	425	249	789	1,277	476	−8	34	−37	−128	118
Adjustment for United States territories and possessions [11]	------	------	------	------	------	------	------	------	------	------	------	------	150	284	376	409	366	250

See footnotes on next page.

TABLE 5—*Continued*

[1] The presentation of the international transactions of the United States in this table is adapted to the conceptual framework of national-income statistics and differs somewhat from their current presentation in the official estimates of the United States balance of payments. Subject to one qualification (explained in the following paragraph), the item "Net current payments to the United States" in this table agrees with the item "Excess of receipts over payments" on "goods and services" and "unilateral transfers" published in the regular balance of payments statement In alternative terminology, this item is known as the balance of payments on current account, and measures the excess (positive or negative) of current receipts from abroad over current payments to abroad, and hence also the net foreign investment of the United States. The following major differences between Table 5 and the regular balance of payments statement as currently published should be noted:

a) The territory for which the United States balance of international payments is calculated includes, in addition to the continental United States, United States territories and possessions. United States national income and product estimates are calculated for the continental United States only It is believed that for the prewar years the error involved in this inconsistency is not large. For the years from 1941 to 1946, however, a partial adjustment was made by taking into account United States federal government disbursements in United States territories and possessions, which, from the standpoint of national income statistics, as here presented, constitute purchases from abroad. Accordingly, for the years from 1941 to 1946 "Net current payments to the United States" in Table 5 differ from the "Excess of receipts over payments" on "goods and services" and "unilateral transfers" as published in the regular balance of payments statement by the amount of this adjustment.

b) Gross receipts and payments in Table 5 differ from gross receipts and payments in the regular balance of payments statement because of the exclusion from Table 5 of unilateral transfers in kind, which do not give rise to international claims. (E.g., Lend-Lease, other than reimbursable Lend-Lease, reciprocal aid, UNRRA shipments, transactions in nonredeemable special currency, and personal and institutional remittances in kind.) The regular balance of payments statement enters these transactions twice (once as a credit and once as a debit item). Given the framework of national income statistics, it was more convenient to omit them altogether from transactions with the rest of the world.

c) The transactions classified as government transactions in Table 5 differ from those so classified in the regular balance of payment statement, because they exclude the transactions of government enterprises and the personal expenditures of government civilian and military personnel abroad In Table 5, the former are classified under "business," and the latter under "persons."

d) The regular balance of payments statement distinguishes between "goods and services" and "unilateral transfers," such as gifts and contributions. "Goods and services" are defined to include payments and receipts of property and labor income In Table 5, property and labor income transactions are segregated. On the other hand, unilateral monetary transfers are combined with the remaining goods and services transactions under the heading "purchases" and "sales."

[2] Pay of permanent United States residents employed in the United States by foreign governments and international organizations.

[3] Includes net exports of gold, plus increase in monetary gold stock, which is the equivalent of domestic production less industrial consumption of gold.

[4] The effect of the treatment of gold described in footnotes 3 and 10 is to make the United States production of gold for monetary and export purposes a component of net capital movement ("net foreign investment" component of gross national product).

[5] Includes also unilateral cash transfers. Cf. footnote 1d and also footnote 7, Table 6.

[6] Includes also unilateral cash transfers. Cf. footnote 1d and also footnote 6, Table 6. Includes also adjustment for United States government expenditures in United States territories and possessions described in footnote 1a.

[7] Consists of unilateral cash transfers. Cf. footnote 1d.

[8] Consists of personal expenditures abroad, including those of government civilian and military personnel, and of unilateral cash transfers. Cf. footnote 1d.

[9] Includes "Errors and omissions" which are assumed to reflect largely unreported capital movements rather than unreported current payments and receipts.

[10] An increase (decrease) in the United States gold stock appears as a negative (positive) entry.

[11] Cf. footnote 1a This item offsets the adjustment which has been made to the regular balance of payments statement with respect to United States government expenditures in United States territories and possessions under "Sales to United States government," for which no corresponding adjustment has been made in the other components of "Net capital movement to the United States."

TABLE 6

GOVERNMENT EXPENDITURES [1]

(Millions of Dollars)

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
Total expenditures [2]	10,220	11,020	12,277	10,588	10,600	12,815	13,225	15,809	14,705	16,523	17,270	18,332	28,712	63,994	93,390	103,116	93,189	46,779
Federal	2,648	2,777	4,142	3,170	3,983	6,393	6,516	8,501	7,225	8,451	8,955	10,094	20,545	56,150	85,979	95,559	84,929	36,584
Purchases of goods and services	1,311	1,410	1,537	1,480	2,018	2,991	2,931	4,815	4,552	5,280	5,157	6,170	16,923	52,027	81,223	89,029	74,963	20,671
Compensation of employees [3]	900	935	942	901	1,187	1,718	1,791	3,592	3,036	3,529	3,444	3,537	5,046	10,791	21,288	28,059	30,501	14,862
Net purchases from business	341	404	515	519	782	1,234	1,085	1,158	1,422	1,687	1,649	2,549	11,547	40,043	58,524	60,045	44,258	6,948
New construction [4]	155	209	271	333	334	404	467	502	529	476	537	974	3,588	9,296	5,358	1,761	1,440	835
Other [5]	186	195	244	186	448	830	618	656	893	1,211	1,116	1,581	7,966	30,763	53,233	58,493	43,240	6,829
Less: Domestic sales of surplus consumption goods and materials											4	6	7	16	67	209	422	716
Net purchases from abroad	70	71	80	60	49	39	55	65	94	64	64	84	330	1,193	1,411	925	204	-1,139
Purchases from abroad [6]	103	93	92	64	53	45	59	68	99	70	69	87	367	1,381	1,985	1,877	2,002	1,150
Less: Sales to abroad [7]	33	22	12	4	4	6	4	3	5	6	5	3	37	188	574	952	1,798	2,289
Transfer payments [8]	694	746	1,675	913	695	599	623	2,064	828	1,196	1,240	1,426	1,375	1,428	1,246	1,838	4,298	9,158
Grants-in-aid to State and local governments [9]	117	125	313	134	502	1,633	1,706	724	764	778	988	857	807	888	942	947	870	1,005
Net interest paid	441	380	444	479	517	590	526	485	616	619	643	726	774	1,038	1,707	2,420	3,335	4,190
Interest paid [10]	733	684	679	718	845	1,016	1,025	1,062	1,240	1,158	1,189	1,298	1,379	1,726	2,481	3,262	4,335	5,207
Less: Interest received [10]	292	304	235	239	328	426	499	577	624	539	546	572	605	688	774	842	1,000	1,017
Subsidies less current surplus of government enterprises [11]	85	116	173	164	251	580	730	413	465	578	927	915	666	769	861	1,325	1,463	1,560
State and local	7,689	8,368	8,448	7,552	7,119	8,055	8,415	8,032	8,244	8,850	9,303	9,095	8,974	8,732	8,353	8,504	9,130	11,200
Purchases of goods and services	7,161	7,759	7,681	6,597	5,940	6,759	6,955	6,928	7,038	7,470	7,911	7,763	7,781	7,643	7,378	7,546	8,155	9,983
Compensation of employees [12]	3,456	3,630	3,737	3,565	3,531	3,884	4,178	3,696	3,889	4,121	4,185	4,280	4,368	4,442	4,622	4,883	5,324	6,349
Purchases from business	3,705	4,129	3,944	3,032	2,409	2,875	2,777	3,232	3,149	3,349	3,726	3,483	3,413	3,201	2,756	2,663	2,831	3,634
New construction [4]	2,236	2,544	2,293	1,445	884	1,131	974	1,592	1,410	1,488	1,809	1,559	1,416	1,115	702	566	608	1,316
Other [13]	1,469	1,585	1,651	1,587	1,525	1,744	1,803	1,640	1,739	1,861	1,917	1,924	1,997	2,086	2,054	2,097	2,223	2,318
Transfer payments [8]	218	264	349	502	759	953	1,172	862	1,023	1,209	1,272	1,262	1,242	1,229	1,220	1,244	1,323	1,633
Net interest paid	542	584	640	662	653	640	615	616	588	573	562	565	515	479	433	380	340	301
Interest paid [10]	773	829	842	856	844	833	806	806	779	762	752	761	709	681	660	626	595	568
Less: Interest received [10]	231	245	202	194	191	193	191	190	191	189	190	196	194	202	227	246	255	267
Less: Current surplus of government enterprises	232	239	222	209	233	297	327	374	405	402	442	495	564	619	678	666	688	717

[1] See footnotes on next page.

TABLE 6—*Continued*

[1] For the difference between these figures on government expenditures and figures published by the Treasury Department, see *Survey of Current Business*, July, 1947, Supplement, p. 22.

[2] Adjustment has been made to eliminate duplication between federal grants-in-aid and state and local expenditure.

[3] The value of food and clothing furnished in kind to the armed forces is included in "Compensation of employees" rather than in "Net purchases from business, other."

[4] Cf. Table 3. Includes new construction in the continental United States. Excludes construction in territories and overseas, work relief, and repair and maintenance construction. Compensation of employees employed in force account new construction in the continental United States is reflected both under "New construction" and under "Compensation of employees" and leads to an understatement of "Purchases from business, except construction." It is believed that this understatement is small. The sum of federal, state, and local "New construction" for the years from 1935 to 1943 is smaller than "New public construction" in Table 3, because of the exclusion of Works Projects Administration new construction. In Table 6, all Works Projects Administration construction is reflected under "Compensation of employees" and "Net purchases from business, other."

[5] This item is a residual. It is obtained by deducting from total government expenditures, as reported in government financial statements, expenditures not constituting purchases of goods and services, and purchases of goods and services listed elsewhere under this heading. Includes net inventory change for government enterprises, which may be negative. Cf. also footnotes 3 and 4.

[6] Excludes property income and loan transactions. Includes government cash gifts and contributions. Includes only direct purchases from abroad. Items of foreign origin purchased from domestic business are included in "Net purchases from business, other."

[7] Excludes property income and loan transactions. Major items included are sales of surplus property and cash and credit Lend-Lease.

[8] Cf. Appendix D, Table 1.

[9] See Supplement, *Survey of Current Business*, July, 1947, p. 22, footnote 17.

[10] Consists of general government and government enterprise interest. Intragovernmental interest transactions are eliminated in the net interest paid figures.

[11] Subsidies reflected consist of government payments to farmers, payments for the exportation and diversion of surplus agricultural commodities, shipping and housing subsidies, and the wartime subsidy program administered mainly by the Commodity Credit Corporation and the Reconstruction Finance Corporation.

[12] Room and board furnished in kind to employees of public hospitals and correctional institutions is included in "Compensation of employees" rather than in "Net purchases from business, other."

[13] For years in which total state or local expenditures are reported in government financial statements, this item is a residual obtained by deducting from the reported total those expenditures not constituting purchases of goods and services and purchases of goods and services listed elsewhere under this heading. For years for which total expenditures are not reported, it was necessary to estimate this item directly. Cf. also footnotes 4 and 12.

TABLE 7

NET CHANGE IN BUSINESS INVENTORIES
(Millions of Dollars)

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
Net change in business inventories, total	1,562	−283	−1,361	−2,563	−1,619	−1,144	905	1,004	2,309	−973	441	2,275	3,874	1,416	−1,180	−1,957	−1,222	**3,664**
Farm	−252	−249	308	36	−271	−1,317	478	−1,111	545	140	97	240	458	1,267	−449	−573	−71	**−236**
Nonfarm	1,814	−34	−1,669	−2,599	−1,348	173	427	2,115	1,764	−1,113	344	2,035	3,416	149	−731	−1,384	−1,151	**3,900**
Net change in nonfarm inventories	1,814	−34	−1,669	−2,599	−1,348	173	427	2,115	1,764	−1,113	344	2,035	3,416	149	−731	−1,384	−1,151	**3,900**
Corporate	1,558	191	−1,149	−1,816	−871	182	217	1,589	1,520	−920	251	1,633	3,165	394	−517	−1,271	−1,118	**2,796**
Noncorporate	256	−225	−520	−783	−477	−9	210	526	244	−193	93	402	251	−245	−214	−113	−33	**1,104**
Change in book value	1,200	−4,049	−4,694	−3,941	1,320	852	704	2,973	1,824	−2,297	1,224	2,235	6,677	1,775	231	−970	−564	**9,897**
Corporate	1,086	−3,069	−3,563	−2,863	1,272	807	444	2,327	1,551	−1,883	965	1,781	5,782	1,668	307	−916	−585	**7,485**
Noncorporate	114	−980	−1,131	−1,078	48	45	260	646	273	−414	259	454	895	107	−76	−54	21	**2,412**
Inventory valuation adjustment	614	4,015	3,025	1,342	−2,668	−679	−277	−858	−60	1,184	−880	−200	−3,261	−1,626	−962	−414	−587	**−5,997**
Corporate	472	3,260	2,414	1,047	−2,143	−625	−227	−738	−31	963	−714	−148	−2,617	−1,274	−824	−355	−533	**−4,689**
Noncorporate	142	755	611	295	−525	−54	−50	−120	−29	221	−166	−52	−644	−352	−138	−59	−54	**−1,308**
Net change in nonfarm inventories by industrial groups	1,814	−34	−1,669	−2,599	−1,348	173	427	2,115	1,764	−1,113	344	2,035	3,416	149	−731	−1,384	−1,151	**3,900**
Manufacturing	911	747	−594	−1,155	−578	136	213	1,095	1,344	−631	214	1,274	2,321	1,482	44	−1,316	−1,166	**1,332**
Change in book value	598	−1,553	−2,239	−1,846	828	598	381	1,586	1,340	−1,268	713	1,363	4,053	2,299	675	−1,033	−768	**4,295**
Inventory valuation adjustment	313	2,300	1,645	691	−1,406	−462	−168	−491	4	637	−499	−89	−1,732	−817	−631	−283	−398	**−2,963**
Wholesale trade	31	54	−413	−175	−89	66	1	286	210	−198	77	162	168	−732	−279	1	161	**562**
Change in book value	−74	−527	−832	−358	268	226	9	487	70	−403	236	157	794	−449	−125	30	247	**1,500**
Inventory valuation adjustment	105	581	419	183	−357	−160	−8	−201	140	205	−159	5	−626	−283	−154	−29	−86	**−938**
Retail trade	260	−533	−377	−753	−485	−47	313	703	64	−187	118	575	501	−667	−413	−186	−111	**1,714**
Change in book value	87	−1,390	−1,148	−1,136	223	−16	394	831	209	−490	312	656	1,309	−168	−272	−113	−52	**3,456**
Inventory valuation adjustment	173	857	771	383	−708	−31	−81	−128	−145	303	−194	−81	−808	−499	−141	−73	−59	**−1,742**
All other	612	−302	−285	−516	−196	18	−100	31	146	−97	−65	24	426	66	−83	117	−35	**292**
Change in book value	589	−579	−475	−601	1	44	−80	69	205	−136	−37	59	521	93	−47	146	9	**646**
Inventory valuation adjustment	23	277	190	85	−197	−26	−20	−38	−59	39	−28	−35	−95	−27	−36	−29	−44	**−354**

APPENDIX B

RELATION OF AGGREGATES EMPLOYED IN NATIONAL INCOME STATISTICS, 1929–46

TABLE 1

GROSS NATIONAL PRODUCT, NATIONAL INCOME, AND PERSONAL INCOME
(Millions of Dollars)

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
Gross National Product	103,828	90,857	75,930	58,340	55,760	64,868	72,193	82,483	90,213	84,683	90,426	100,477	125,294	159,628	192,573	210,551	213,120	203,679
Less: Capital consumption allowances	8,816	8,747	8,312	7,663	7,245	7,218	7,369	7,684	7,972	7,992	8,101	8,440	9,294	9,935	10,585	11,773	12,085	11,040
Depreciation charges	7,553	7,653	7,483	6,950	6,608	6,526	6,577	6,607	6,838	6,894	7,082	7,228	7,878	8,666	9,409	10,456	10,557	8,875
Accidental damage to fixed capital	413	389	351	329	275	237	236	381	304	387	222	246	273	484	399	374	384	404
Capital outlays charged to current expense	850	705	478	384	362	455	556	696	830	711	797	966	1,143	785	777	943	1,144	1,761
Equals: Net National Product	95,012	82,110	67,618	50,677	48,515	57,650	64,824	74,799	82,241	76,691	82,325	92,037	116,000	149,693	181,988	198,778	201,035	192,639
Plus: Subsidies minus current surplus of government enterprises	−147	−123	−49	−45	18	283	403	39	60	176	485	420	102	150	183	659	775	843
Less: Indirect business tax and nontax liability	7,003	7,155	6,859	6,768	7,055	7,815	8,190	8,663	9,157	9,154	9,365	10,021	11,296	11,813	12,685	14,029	15,339	16,851
Business transfer payments	587	534	649	737	659	641	594	594	567	429	451	431	502	494	504	549	564	528
Statistical discrepancy	−80	−705	1,188	1,437	1,235	864	−346	862	−1,050	−91	462	658	470	1,050	720	2,599	3,099	−2,101
Equals: National Income	87,355	75,003	58,873	41,690	39,584	48,613	56,789	64,719	73,627	67,375	72,532	81,347	103,834	136,486	168,262	182,260	182,808	178,204
Less: Undistributed corporate profits	2,597	−3,045	−5,381	−5,998	−2,428	−1,619	−613	−284	−8	−906	1,209	2,398	4,921	5,136	5,886	5,239	4,174	6,925
Corporate profits tax liability	1,398	848	500	382	524	746	965	1,411	1,512	1,040	1,462	2,878	7,846	11,665	14,153	13,913	11,283	8,601
Corporate inventory valuation adjustment	472	3,260	2,414	1,047	−2,143	−625	−227	−738	−31	963	−714	−148	−2,617	−1,274	−824	−355	−533	−4,689
Contributions for social insurance	243	253	262	278	285	304	333	598	1,800	1,977	2,136	2,282	2,784	3,468	4,516	5,172	6,140	5,990
Excess of wage accruals over disbursements	0	0	0	0	0	0	0	0	0	0	0	0	0	0	209	−193	14	−30
Plus: Net interest paid by government	983	964	1,084	1,141	1,170	1,230	1,141	1,101	1,204	1,192	1,205	1,291	1,289	1,517	2,140	2,800	3,675	4,491
Government transfer payments	912	1,010	2,024	1,415	1,454	1,552	1,795	2,926	1,851	2,405	2,512	2,688	2,617	2,657	2,466	3,082	5,621	10,791
Business transfer payments	587	534	649	737	659	641	594	594	567	429	451	431	502	494	504	549	564	528
Equals: Personal Income	85,127	76,195	64,835	49,274	46,629	53,230	59,861	68,353	73,976	68,327	72,607	78,347	95,308	122,159	149,432	164,915	171,590	177,217

TABLE 2

PERSONAL INCOME AND DISPOSABLE INCOME
(Millions of Dollars)

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
Personal income	85,127	76,195	64,835	49,274	46,629	53,230	59,861	68,353	73,976	68,327	72,607	78,347	95,308	122,159	149,432	164,915	171,590	177,217
Wage and salary receipts	50,023	45,747	38,735	30,132	28,673	33,363	36,346	41,574	45,382	42,258	45,149	48,929	60,907	80,515	103,489	114,901	115,202	109,225
Total employer disbursements	50,165	45,894	38,886	30,284	28,825	33,520	36,508	41,754	45,948	42,812	45,745	49,587	61,708	81,681	105,328	117,157	117,537	111,143
Less: Employee contributions for social insurance	142	147	151	152	152	157	162	180	566	554	596	658	801	1,166	1,839	2,236	2,335	1,918
Other labor income	520	515	473	416	372	400	428	503	514	512	535	575	589	706	888	1,304	1,516	1,578
Proprietors' and rental income	19,738	15,749	11,834	7,429	7,225	8,698	12,146	12,624	15,389	14,046	14,747	16,280	20,826	28,095	32,101	34,383	37,117	41,816
Dividends	5,823	5,500	4,098	2,574	2,066	2,596	2,872	4,557	4,693	3,195	3,796	4,049	4,465	4,297	4,477	4,689	4,765	5,614
Personal interest income	7,524	7,140	7,022	6,571	6,180	5,980	5,680	5,575	5,580	5,482	5,417	5,395	5,402	5,395	5,507	6,007	6,805	7,665
Transfer payments	1,499	1,544	2,673	2,152	2,113	2,193	2,389	3,520	2,418	2,834	2,963	3,119	3,119	3,151	2,970	3,631	6,185	11,319
Less: Personal tax and nontax payments	2,643	2,507	1,858	1,455	1,464	1,595	1,888	2,258	2,921	2,862	2,440	2,604	3,293	5,962	17,815	18,904	20,878	18,789
Federal	1,263	1,134	607	331	474	595	827	1,130	1,723	1,635	1,235	1,364	2,016	4,668	16,517	17,536	19,379	17,211
State and local	1,380	1,373	1,251	1,124	990	1,000	1,061	1,128	1,198	1,227	1,205	1,240	1,277	1,294	1,298	1,368	1,499	1,578
Equals: Disposable Personal Income	82,484	73,688	62,977	47,819	45,165	51,635	57,973	66,095	71,055	65,465	70,167	75,743	92,015	116,197	131,617	146,011	150,712	158,428
Less: Personal consumption expenditures	78,761	70,789	61,153	49,208	46,346	51,882	56,215	62,515	67,121	64,513	67,466	72,052	82,255	90,835	101,626	110,417	121,698	143,670
Equals: Personal saving	3,723	2,899	1,824	−1,389	−1,181	−247	1,758	3,580	3,934	952	2,701	3,691	9,760	25,362	29,991	35,594	29,014	14,758

APPENDIX C

DATA ON SAVINGS

TABLE 1

SOURCES AND USES OF GROSS SAVINGS, 1929–46

(Millions of Dollars)

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
Gross Private Saving	15,528	11,156	8,357	2,760	2,728	5,591	7,941	11,104	10,817	8,910	11,759	15,039	21,828	40,209	46,567	54,657	47,853	25,903
Personal saving	3,723	2,899	1,824	−1,389	−1,181	−247	1,758	3,550	3,934	952	2,701	3,691	9,760	25,362	29,991	35,594	29,014	14,758
Undistributed corporate profits	2,597	−3,045	−5,381	−5,998	−2,428	−1,619	−613	−284	−8	−906	1,209	2,398	4,921	5,136	5,886	5,239	4,174	6,925
Corporate inventory valuation adjustment	472	3,260	2,414	1,047	−2,143	−625	−227	−738	−31	963	−714	−148	−2,617	−1,274	−824	−355	−533	−4,689
Business depreciation charges	7,374	7,475	7,307	6,776	6,433	6,351	6,401	6,430	6,658	6,710	6,895	7,038	7,686	8,471	9,212	10,256	10,356	8,675
Institutional depreciation	179	178	176	174	175	175	176	177	180	184	187	190	192	195	197	200	201	200
Accidental damage to fixed business capital	413	389	351	329	275	237	236	381	304	387	222	246	273	484	399	374	384	404
Capital outlay charged to current expense	850	705	478	384	362	455	556	696	830	711	797	966	1,143	785	777	943	1,144	1,761
Excess of wage accruals over disbursements	0	0	0	0	0	0	0	0	0	0	0	0	0	0	209	−193	14	−30
Statistical discrepancy	−80	−705	1,188	1,437	1,235	864	−346	862	−1,050	−91	462	658	470	1,050	720	2,599	3,099	−2,101
Gross Investment	16,595	10,899	5,559	1,055	1,456	3,236	6,092	8,225	11,502	7,420	9,892	14,492	18,335	9,123	2,346	3,559	8,304	29,355
Gross private domestic investment	15,824	10,209	5,362	886	1,306	2,807	6,146	8,318	11,440	6,311	9,004	12,983	17,211	9,330	4,591	5,658	9,058	24,582
Net foreign investment	771	690	197	169	150	429	−54	−93	62	1,109	888	1,509	1,124	−207	−2,245	−2,099	−754	4,773
Government Deficit (+) or Surplus (−) on Income and Product Transactions	−1,067	257	2,798	1,705	1,272	2,355	1,849	2,879	−685	1,490	1,867	547	3,493	31,086	44,221	51,098	39,549	−3,452
Federal	−1,185	−276	2,093	1,465	1,310	2,850	2,538	3,475	176	1,960	2,213	1,409	4,889	32,951	46,635	53,582	41,819	−2,255
State and local	118	533	705	240	−38	−495	−689	−596	−861	−470	−346	−862	−1,396	−1,865	−2,414	−2,484	−2,270	−1,197

TABLE 2

LIQUID SAVING ESTIMATES OF THE SECURITIES AND EXCHANGE COMMISSION AND THEIR RECONCILIATION WITH PERSONAL SAVING ESTIMATES OF THE DEPARTMENT OF COMMERCE, 1933–46[1]

(Billions of Dollars)

	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
Liquid saving (S. E. C. estimates)[2]	− 97	2 67	1.60	4 30	4 09	3.12	3 86	4.00	10 67	29 12	38 25	40 30	36.76	14.66
Currency and bank deposits	−1 17	1.78	2.34	3 61	.39	.31	2 76	2 89	4.90	10 92	16 02	17 00	18 99	12.08
Savings and loan associations	− 60	−.31	− 23	−.16	.09	04	.06	.21	.38	.28	.59	.82	1 06	1.14
Insurance and pension reserves	.65	1 49	1.79	2 22	3 14	2 64	3.01	3.15	3 99	5 04	6 77	8 15	8.54	6 44
Private	.57	1 33	1.55	1.67	1 76	1 54	1.72	1.85	2 14	2 49	2 85	3 22	3 46	2 82
Government	.11	.16	.24	.55	1 38	1 10	1.29	1.30	1 85	2 55	3 92	4 93	5 08	3.61
Securities	−.71	23	−1 76	−.34	1 02	−.38	−.59	−.22	2 89	10 03	13 56	14 55	9 15	.71
United States Government	.14	1 14	− 59	1.00	1 06	−.08	−.16	.50	3 59	9 90	13.80	15.39	10.22	1.11
State and local governments	− 93	−1.11	− 13	−.55	−.01	−.14	−.19	−.19	−.17	−.17	.13	−.17	−.31	−.26
Corporate and other	.65	.20	−1.04	−.79	− 03	−.16	−.24	−.53	−.53	.30	−.37	−.67	−.76	−.14
Liquidation of mortgage debt on nonfarm dwellings	.73	−.12	.29	.28	.04	−.20	−.54	−.87	−.93	−.06	.28	.13	−.24	−2 87
Liquidation of debt, not elsewhere classified	.10	−.40	−.83	−1 31	−.59	.71	−.84	−1 16	−.56	2.91	1.03	−.35	−.74	−2.83
Adjustments of liquid saving to Department of Commerce personal saving concept	−1 23	−1 32	−.69	−1.08	−.63	−3.53	0	.20	−.20	.49	−4.70	−6.81	−7.54	−2.49
On account of persons other than unincorporated enterprises:														
Net purchases of nonfarm residences[3]	− 63	01	.26	.90	1.21	1 34	2 37	2 68	3.10	1 60	.96	.77	.72	3.19
New construction by nonprofit institutions	.05	.07	.08	.14	.18	.21	.21	.19	.22	.10	.03	.06	.11	.26
Less: Depreciation	1 55	1.55	1.57	1 59	1.62	1.65	1.70	1.75	1.81	1 86	1.89	1.91	1.93	2.01
Less: Increase in government insurance and pension reserves	.11	.16	.24	.55	1.38	1.10	1.29	1.30	1.85	2.55	3.92	4.93	5.08	3.61
On account of unincorporated enterprises other than farms:														
Increase in inventories	−.45	−.01	.21	.53	.24	−.19	.09	.40	.25	−.24	−.21	−.11	−.03	1.10
New construction and producers' durable equipment	.53	.47	.60	.80	1.00	.71	.87	1.00	1.21	.74	.48	.62	.84	[5] 1.85
Less: Depreciation	.76	.78	.78	.79	.84	.84	.85	.86	.92	.98	.99	1 02	1 03	.94
Less: Increase in net payables to banks	−.22	−.08	.04	.17	.14	−.19	.21	.26	58	−.43	.00	.04	.44	1.27
Less: Increase in net payables to other corporations and financial intermediaries	−1.57	−2.58	−.62	−.49	−.02	1.97	−.20	.14	.85	−1.60	−.75	.16	1.13	1.36
On account of farms:														
Increase in inventories	−.27	−1.32	.48	1.11	.54	.14	.10	.24	.46	1.27	−.45	−.57	−.07	−.24
New construction and producers' durable equipment [4]	.38	.60	.92	1.12	1.35	1 13	1 23	1.36	1 79	1.34	1.23	1.62	1.54	2.52
Less: Depreciation	.80	.83	.87	.94	1.01	1 05	1 09	1.10	1.24	1 36	1 45	1.62	1.72	1.85
Less: Increase in farm holdings by corporations and financial intermediaries	.19	.14	.08	.08	−.03	−.01	.00	−.10	−.18	−.17	−.19	−.11	−.08	−.06
Less: Increase in mortgage debt to corporations and financial intermediaries	−.26	.49	.06	−.07	−.08	−.09	−.12	−.02	−.06	−.31	−.48	−.38	−.23	−.02
Less: Increase in other debt to corporations and financial intermediaries	−.17	−.15	.22	−.10	.26	.55	.05	.38	.22	.08	−.09	.01	−.37	.21
Equals: Liquid saving plus adjustments to personal saving concept	−2 20	1 35	.91	3.22	3 46	−.41	3 86	4 20	10 47	29 61	33 55	33.49	29 22	12.17
Personal saving	−1 18	−.25	1 76	3.58	3 93	.95	2 70	3.69	9 76	25 36	29.99	35 59	29 01	14 76
Difference due to errors and omissions	−1 02	1 60	− 85	− 36	− 47	−1 36	1 16	.51	.71	4 25	3 56	−2 10	.21	−2 59

See footnotes on next page.

TABLE 2—*Continued*

[1] In addition to the estimates of liquid saving, the Securities and Exchange Commission also prepares estimates of gross saving. The following comments apply to liquid saving only. The SEC concept of liquid saving differs in three major respects from the personal saving concept of the Department of Commerce. First, liquid saving includes the increase in the reserves of government-administered insurance and pension funds. This item is not part of personal saving and is shown (on a somewhat different basis) separately under surplus of social insurance funds. Second, liquid saving includes the net liquidation of mortgage debt on residential dwellings, but it does not include net acquisitions (after allowances for depreciation), of such dwellings. Hence, it does not measure net saving in the form of residential dwellings, the item which is included in the concept of personal saving. (A similar difference exists with respect to construction by nonprofit institutions.) Third, liquid saving includes the net change in the liquid assets of unincorporated enterprises, whereas personal saving includes the net income less the personal consumption expenditures of the owners of unincorporated enterprises. On this score, therefore, liquid saving differs from personal saving by the exclusion of net investment by unincorporated enterprises less the increase in their net payables to corporations and financial intermediaries.

Table 2 summarizes the best statistical data that are available to adjust liquid saving to personal saving. The difference between liquid saving adjusted to the personal saving concept and personal saving is due to statistical errors and omissions which may be in liquid saving, in personal saving, or in the adjustments. The data available for the adjustment items are generally not as satisfactory as those used in the preparation of the SEC liquid saving estimates. This is particularly true of the estimated increase in net payables to corporations and financial intermediaries by unincorporated enterprises other than farms which is subject to a substantial margin of error. The SEC data are not available for the period prior to 1933.

[2] For explanatory notes, see current releases of the Securities and Exchange Commission.

[3] Includes net purchases of nonfarm residences by proprietorships and partnerships.

[4] Includes farm dwellings.

[5] Includes purchases of used plant and equipment from the U.S. government amounting to 200 million dollars.

APPENDIX D

TRANSFER PAYMENTS AND SOCIAL INSURANCE, 1929–46

TABLE 1

TRANSFER PAYMENTS
(Millions of Dollars)

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
Total transfer payments	1,499	1,544	2,673	2,152	2,113	2,193	2,389	3,520	2,418	2,834	2,963	3,119	3,119	3,151	2,970	3,631	6,185	11,319
Federal government	694	746	1,675	913	695	599	623	2,064	828	1,196	1,240	1,426	1,375	1,428	1,246	1,838	4,298	9,158
Benefits from social insurance funds	44	51	60	72	82	94	93	95	142	606	696	840	713	754	545	664	1,336	2,357
Old age and survivors insurance benefits	----	----	----	----	----	----	----	----	1	10	14	40	94	137	172	218	287	387
State unemployment insurance benefits	----	----	----	----	----	----	----	----	2	393	429	518	344	344	80	62	446	1,095
Railroad retirement insurance benefits	----	----	----	----	----	----	----	1	40	98	110	118	124	128	132	137	146	159
Railroad unemployment insurance benefits	----	----	----	----	----	----	----	----	----	----	6	16	14	6	1	1	2	40
Federal civilian pensions	18	22	27	32	42	52	57	60	63	65	68	73	78	83	93	130	183	348
Government life insurance benefits [1]	26	29	33	40	40	42	36	34	36	40	69	75	59	56	67	116	272	328
Direct relief [2]	----	----	----	----	----	----	2	20	36	23	22	63	137	108	9	----	----	----
Military pension, disability, and retirement payments	443	468	548	571	456	382	418	433	434	446	462	476	474	475	491	648	1,013	1,678
Adjusted compensation benefits [3]	96	117	955	152	55	27	18	1,430	134	59	36	28	19	10	6	7	189	18
Mustering-out payments to discharged servicemen [4]	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	230	1,403	2,131
Readjustment, self-employment, and subsistence allowances to veterans	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5	142	2,727
Other [5]	111	110	112	118	102	96	92	86	82	62	24	19	32	81	195	284	215	247
State and local government	215	264	349	502	759	953	1,172	862	1,023	1,209	1,272	1,262	1,242	1,229	1,220	1,244	1,323	1,633
Benefits from social insurance funds	72	78	86	95	110	119	127	137	144	151	157	163	175	194	213	223	233	245
Government pensions	72	78	86	95	110	119	127	137	144	151	157	163	175	194	210	218	228	240
Cash sickness compensation	----	----	----	----	----	----	----	----	----	----	----	----	----	----	3	5	5	5
Direct relief	71	105	176	317	558	745	954	635	787	965	1,024	1,013	985	956	929	942	988	1,178
Special types of public assistance	71	105	176	317	72	80	115	218	397	509	566	630	718	778	818	853	901	1,058
General assistance					486	665	839	417	390	456	458	383	267	178	111	89	87	120
Other [6]	75	81	87	90	91	89	91	90	92	93	91	86	82	70	78	79	102	210
Business	587	534	649	737	659	641	594	594	567	429	451	431	502	494	504	549	564	528
Corporate gifts to nonprofit institutions	32	35	40	31	27	27	28	30	33	27	31	38	58	98	159	206	213	175
Consumer bad debts	452	390	497	598	530	508	458	461	428	296	316	287	332	282	245	236	236	236
Other [7]	103	109	112	108	102	106	108	103	106	106	104	106	112	114	100	107	115	117

[1] Consists of payments from Government Life Insurance Fund and National Service Life Insurance Fund.
[2] Consists of Farm Security Administration grants and the value of free stamps issued under the surplus food and cotton stamp programs.
[3] Covers benefits under the World War Veterans Adjusted Compensation Act of May 19, 1924, as amended, and under the Adjusted Compensation Payment Act of January 27, 1936. For the period 1929 through May 1936 this series represents very largely net loans to veterans on the security of their adjusted service certificates from the U. S. Government Life Insurance Fund and the Adjusted Service Certificate Fund; for the period June 1936 through 1946 it consists almost entirely of cash redemptions by veterans of their adjusted service bonds. Additionally, the series includes (1) payments to beneficiaries on certificates matured by death of veterans (1929–46); (2) "adjusted service dependent pay," which comprises cash payments (negligible in amount) to veterans and their beneficiaries where, under certain circumstances, no certificates were issued (1929–46); (3) payments to veterans in settlement of adjusted service certificates not covered by issuance of bonds (1936–46); and (4) payments to veterans holding certificates to maturity (1945–46).
[4] For 1946 includes $51 millions of enlisted men's cash terminal leave payments.
[5] Consists of military and naval insurance payments, payments to nonprofit institutions, profits of military post exchanges and ships' stores and services, and payments under the Panama Canal Construction Annuity Act.

TABLE 2

SOCIAL INSURANCE FUNDS[1]
(Millions of Dollars)

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
Federal:																		
Contributions for social insurance	124	124	123	125	115	121	136	391	1,573	1,734	1,879	2,015	2,504	3,161	4,181	4,816	5,761	5,590
Employee contributions	95	96	96	95	89	92	92	104	450	458	491	546	686	1,044	1,706	2,092	2,181	1,753
Employer contributions	29	28	27	30	26	29	44	287	1,093	1,276	1,388	1,469	1,818	2,117	2,475	2,724	3,580	3,837
Government and government enterprises	29	28	27	30	26	26	37	47	66	79	86	95	104	138	174	446	1,495	1,801
Private						3	7	240	1,027	1,197	1,302	1,374	1,714	1,979	2,301	2,278	2,085	2,036
Less: Transferred to general government						3	7	52	133	138	160	147	186	172	212	182	202	280
Equals: Retained by social insurance funds	124	124	123	125	115	118	129	339	1,440	1,596	1,719	1,868	2,318	2,989	3,969	4,634	5,559	5,330
Plus: Investment income	21	25	26	19	25	25	26	37	154	94	122	152	183	224	279	365	491	593
Equals: Net receipts	145	150	149	144	140	143	155	376	1,594	1,690	1,841	2,020	2,501	3,213	4,248	4,999	6,050	5,923
Less: Benefit payments	44	51	60	72	82	94	93	95	142	606	696	840	713	754	545	664	1,336	2,357
Equals: Surplus (+) or deficit (−)	101	99	89	72	58	49	62	281	1,452	1,084	1,145	1,180	1,788	2,459	3,703	4,335	4,714	3,566
State and local:																		
Contributions for social insurance	119	129	139	153	170	183	197	207	227	243	257	267	280	307	335	356	379	400
Employees	47	51	55	57	63	65	70	76	86	96	105	112	115	122	133	144	154	165
Employer (government and government enterprises)	72	78	84	96	107	118	127	131	141	147	152	155	165	185	202	212	225	235
Less: Transferred to general government	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	5	5
Equals: Retained by social insurance funds	118	128	138	152	168	181	195	205	225	240	254	264	277	303	331	352	374	395
Plus: Investment income	16	19	21	24	28	31	35	39	43	48	53	59	66	69	74	78	82	87
Equals: Net receipts	134	147	159	176	196	212	230	244	268	288	307	323	343	372	405	430	456	482
Less: Benefit payments	72	78	86	95	110	119	127	137	144	151	157	163	175	194	213	223	233	245
Equals: Surplus (+) or deficit (−)	62	69	73	81	86	93	103	107	124	137	150	160	168	178	192	207	223	237

[1] Employer contributions are on an accrual basis.

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