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THE FORMATION OF CAPITAL

THE FORMATION OF CAPITAL

BY

HAROLD G. MOULTON

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DIRECTOR'S PREFACE

This book is the third in a series of four volumes which present the results of a study of the *Distribution of Wealth and Income in Relation to Economic Progress.* The study is being conducted under the personal direction of Harold G. Moulton with funds granted by the Maurice and Laura Falk Foundation of Pittsburgh. The scope of this book and its relation to the others in the series are fully described in the Foreword.

In the preparation of the volume, Hugo Bezdek, Jr. acted as general assistant to the author; Malcolm Merriam aided in the assembling of the data used in Chapter IX; and Robert Weidenhammer, of the University of Minnesota, assisted in the compilation of the data used in Chapter X.

The committee which passed on the manuscript consisted of Leo Pasvolsky, Cleona Lewis, and Charles O. Hardy, with the Director ex-officio. Mr. Hardy is not convinced of the validity of some of the conclusions reached in Chapter X.

EDWIN G. NOURSE
Director

Institute of Economics
February, 1935

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FOREWORD

RELATION TO A LARGER STUDY

This is the third of four volumes devoted to an analysis of the relation of the distribution of national wealth and income to economic progress. The purpose of the investigation as a whole is to determine whether the existing distribution of income in the United States among various groups in society tends to impede the efficient functioning of the economic system.

The study is concerned with something deeper than the causes of business depressions. The economic system, for some reason, never succeeds in operating at full capacity. It has been observed that even in periods of prosperity we have some unutilized plant and equipment and a considerable volume of unemployment. This situation not unnaturally suggests that there must be some basic maladjustment which seriously impedes the operation of the economic machine by means of which the material wants of society are supplied.

The fact that business enterprises seldom produce at full capacity, and that the greatest problem of business managers appears to be to find adequate markets for their products, has raised in the minds of many business men and economists the question, Is not the primary difficulty a lack of purchasing power among the masses? This leads at once to the correlative question, What is the bearing of the distribution of income upon the demand for the products of industry? Concretely, if a larger percentage of our annual income were somehow made available to the purchasers of consumption goods,

would not business managers find it profitable to utilize existing capital equipment more fully, thereby giving to the masses of people higher standards of living, and at the same time promoting a steadier and more rapid rate of economic progress?

In endeavoring to throw light upon the great problem with which we are here concerned, we divided this investigation into four major parts. In the first volume, entitled *America's Capacity to Produce,* we attempted to get an objective and comprehensive picture of our economic society as a producing mechanism. To what extent had we piled up excess productive capacity in the United States during the boom period of the late 1920's? Was the amount of unused capacity increasing over the three decades from 1900 to 1930? We chose this period for study in order to focus attention upon the situation at its best—in a period of great technological advancement.

The conclusions reached may be briefly summarized as follows: Idle productive capacity is not a phenomenon that appeared for the first time in the years just preceding the collapse of 1929. On the contrary, a considerable amount of unutilized capacity existed throughout the period under review. However, with the exception of transportation and a few other special lines, we found in general no persistent increase in the percentage of unutilized capacity. At the height of the boom period the amount of idle capacity, expressed in terms of a generalized figure, was something like 20 per cent. In periods of depression this percentage is, of course, very greatly increased—rising perhaps as high as 50 per cent in the current depression.

In the second volume, *America's Capacity to Consume,* we directed our inquiry to the division of the

money income which arises out of the nation's productive operations. This investigation and analysis was divided into three major parts. In Part I we showed, as accurately as available data would permit: (1) The amount of the national income and the extent of its increase during the first three decades of the twentieth century; (2) the division among the various claimants, such as wage earners and investors, and among the various income groups; and (3) its distribution on a geographic basis.

In Part II we indicated how those who receive the national income dispose of it. We showed (1) the allocation of expenditures among the major types of consumers' goods; (2) how the amount that is spent for consumptive purposes by the several income groups compares with the amount which is saved, and the bearing of this apportionment upon the division of aggregate income as between spending and saving; and (3) whether there was any tendency during the period from 1900 to 1930 for the proportion of the aggregate income set aside as savings to increase as compared with the amount devoted to consumptive purposes.

In Part III, entitled "The Relation of Consumption and Production," our findings were related in a broad general way to the conclusions reached in the preceding volume. We indicated the extent to which the demand for consumption goods would be modified by comparatively slight increases in the purchasing power of the lower income groups and compared these consumptive potentialities with the existing productive capacity of the nation. Finally, the analysis was related to certain important current issues, such as the fear of persistent over-production and consequent demand for restriction of output, the amount of leisure that is compatible with

high standards of living, and the necessary length of the working day.

The conclusions which pertain specifically to the primary issue with which the larger investigation is concerned were as follows: First, the masses of the people had very low standards of living and were able to make savings of negligible importance. Second, the productive capacity of the United States was not adequate to turn out sufficient goods and services to satisfy the unfulfilled consumptive desires of the American people as a whole. Third, owing to the uneven distribution of the national income the bulk of the national savings is made by a small fraction of the population. Fourth, the increasing number of people in the higher income brackets as the years have passed, and particularly in the decade of the twenties, has led to the diversion into savings as distinguished from consumptive channels of an increasing percentage of the total national income.

These two volumes carried us a considerable distance toward an understanding of the modern economic system. They revealed, on the one hand, a persistent failure to make full use of our productive resources, and, on the other, a chronic state of under-consumption on the part of the great masses of the people. It is clearly apparent that consumptive requirements and productive possibilities are not satisfactorily articulated. The uneven distribution of income evidently has an important bearing on the problem.

Before reaching any final conclusions as to the source of our economic difficulties it is necessary to give consideration to the process of capital formation. Having found that an increasing proportion of the national income tends to be saved rather than spent for consumptive purposes, we must inquire whether the result is to

accelerate or retard the growth of capital. This is the task of the present volume. Then in the fourth volume —*Income and Economic Progress*—we shall bring together the various segments of our investigation for purposes of integration and interpretation with a view to indicating ways and means of bringing about a more effectively functioning economic system.

is of capital formation it is not our objective to make a quantitative study either of the accumulation of investments by the American people or the growth of the national supply of productive capital. The purpose is rather to analyze the process of capital creation and the factors which govern the rate of growth of plant and equipment. National income is received by individuals chiefly in the form of money, and the savings of individuals are made, in the first instance, in the form of bank deposits, insurance payments, or investments in securities. Before actual productive capital can eventuate, these money savings of individuals have to be used by business enterprisers in employing labor and materials in the building of new plant and equipment.

In the present volume we attempt accordingly to reveal what is involved in converting monetary savings into actual additions to capital equipment. We consider especially the connection between consumptive demand and the creation of new capital and the part which financial institutions, particularly commercial banks, have come to play in the process of capital formation. The conclusions reached as to the forces which control the growth of capital will be found fundamentally at variance with traditional views on the subject.

The present study was foreshadowed by the author in a series of articles published in the *Journal of Political*

Economy in 1918. The tentative analysis there presented has here been developed and elaborated. Thanks to the accumulation in the intervening years of more adequate statistical data, it has now been possible to subject some of the major issues involved to the test of factual verification.

CHAPTER I

THE NATURE AND SIGNIFICANCE OF CAPITAL

The resources of nature are rendered available for the satisfaction of human wants in the main only through the expenditure of human effort. While a few things, such as air and water, sunshine, mountain scenery, and wild fruits, are commonly classed as "free goods," even these, under most conditions, are not supplied automatically at the place, at the time, and in the quantity needed. While such goods may be free under certain conditions, they are not free under others—as in the case, for example, of a city's water supply. One may therefore say that under practically all circumstances the necessities and comforts of life must be extracted from nature by the application of human energy.

In the long struggle of mankind to conquer nature and make it yield its resources more abundantly, the factor that has been of overwhelming importance has been the growth of capital. So long as man was dependent upon his bare hands alone, life remained mere subsistence, virtually at the level of brute creation. It was the construction of implements and tools which started mankind on the upward path in the struggle against nature and in the achievement of larger and more varied satisfactions. Ultimately it was the development of complex machines, factories, transportation facilities, and productive equipment generally that made possible the material civilization of the modern age.

Under conditions such as we have today, when the supply of plant and equipment and other capital goods may appear, for the moment, to be superabundant, it is easy to forget, or to overlook, the vital importance of a continuing expansion of the supply of capital. Any nation which fails, for whatever reason, to replace or increase its capital supply will in the long run cease to raise the plane of living of the people and will suffer economic retrogression. The growth of capital, it bears repeating, has served to multiply man's power over nature a thousand-fold; it has made possible our material civilization; without it we should still be living pretty much on the plane of *Homo heidelbergensis*.

THE MEANING OF CAPITAL

The term "capital" as we have been using it in the preceding paragraphs relates to implements, tools, machines, industrial buildings, railroad tracks, power houses, and the other concrete material instruments which aid man in the processes of production. This is the meaning which we shall give the term throughout this study. An individual business man may regard the money or funds which he has at his command as his "capital," but from the broad social point of view such funds merely furnish the means for acquiring ownership of or control over the capital goods which alone are of fundamental significance. Similarly, an individual may call his house or furniture or clothing, capital; but from the social point of view such commodities are rather durable consumers' goods.[1] An apartment build-

[1] It is true that some commodities often serve both a productive and a consumptive purpose, such as an automobile, a house used also as an office, or a hotel used alike for pleasure and business purposes. But this fact does not alter the general principle with which we are concerned; it merely complicates the problem of classification.

ing may also be regarded as capital from the point of view of the owner; but again from a functional point of view it furnishes consumptive satisfactions and does not directly enhance productive capacity. Capital, as we shall use the term, consists of commodities resulting from past production which are being directly utilized in the processes of further production—either of consumers' goods or new tools of production.

In current discussions the term capital goods or "capital goods industries" is commonly used in ambiguous and quite confusing ways. It is sometimes used to include all *new construction*—whether of factories, engineering structures, or houses; and also the manufacturing or producing industries which furnish materials for such construction. Thus it is sometimes made to include the so-called heavy industries generally—even though such industries may manufacture many types of consumption commodities besides houses.[2]

The term is sometimes extended to cover all *durable* commodities—including not only houses but furnishings as well, and even automobiles, yachts, and airplanes used for pleasure purposes. This broad, and functionally confusing, classification arises in part from an attempt to differentiate between goods such as current necessities of life, the demand for which holds up comparatively well even during depression, and commodities for which the demand declines very greatly, such as new factories and new houses and luxuries which can readily be foregone when times are hard. Durable consumers' goods and factories have the common characteristic that their production is greatly curtailed in time of depression; but this does not alter the fact that the

[2] See pp. 51-53.

one class ministers directly to the satisfaction of human wants while the other does not.

Another reason sometimes assigned for classifying durable goods as capital is that such goods yield their consumptive satisfactions but gradually, and hence only that portion which is used up in a given time period, such as a year, constitutes consumption goods. A new house, or furnishings, for example, may thus be looked upon as in the nature of a capital investment which yields interest, in the form of consumer satisfactions, over a period of years. This consideration, however, does not change the nature of the use to which such goods are devoted; it remains true that they are not directly used in the further production of wealth.

The fact that houses and apartments are very frequently constructed on a commercial basis also identifies them with capitalistic enterprise. The savings of individuals may be invested in the bonds or mortgages of apartment buildings and houses as well as in securities of industrial or public utility corporations; and interest is thus received on capital invested in such durable goods. An individual also commonly looks upon a house of his own as a capital investment. These facts, however, again do not change the character of the function which houses or apartments perform, and convert them into instruments of production.

We do not wish to stress unduly the definition of capital as productive equipment—for it is recognized that the term may be defined somewhat differently for varying purposes. For the purposes of this study, however, the conception of capital which we have outlined is essential. We are interested in the processes by which society expands its power to make nature yield its re-

sources more abundantly; and from this point of view we are concerned with procreative property.

CAPITAL FORMATION UNDER PRIMITIVE CONDITIONS

As indicated in the introduction, in this volume we are interested in the process by which capital is created in a highly developed capitalistic society. As a point of departure and for purposes of contrast it may be useful first to indicate what is involved in capital formation under simpler forms of social organization.

The creation of capital in a primitive society was a very direct process. A fisherman in off hours contrived a rude net of grass or reeds, thereby increasing his future capacity to catch fish. Or a farmer used a sharp stone to convert a branch of a tree into a rude spade or a plough with which to loosen the soil. Capital formation, under such circumstances, was a purely individual matter, dependent solely upon devoting a portion of one's energies to producing capital goods. For the moment there may have been a decrease in the amount of consumption goods that might have been produced during the hours devoted to the creation of capital; but as a result of the temporary sacrifice an expansion of consumptive satisfactions was realized in the future.

The illustrations which we have been giving relate to the remote origins of capital. The process is, however, similar in any relatively primitive agricultural community. Under the conditions of pioneer life in America, for example, capital goods were largely created by direct apportionment of the farmer's energy to that purpose. The farmer, as a matter of routine, devoted those portions of the year during which it was impossible for him to plant, cultivate, or harvest his crops, to the clearing and improving of land, the digging of

ditches, and the construction of fences and farm buildings. He could not produce goods for the satisfaction of his consumption wants at certain periods of the year even if he desired to do so;[3] consequently, he devoted time that would otherwise have been idle to the improvement of his property.

Since the farming classes until the middle of the nineteenth century made up the bulk of our population, the larger portion of the capital equipment of America until comparatively recent times was the result of an individual process of utilizing off seasons of the year which could not in the nature of things be turned to account in the creation of consumers' goods. This method of capital formation continues in greater or less degree in various sections of the country today.

Throughout the greater part of our history, also, public highways, which represent community capital, were constructed by a direct process. Property owners were required, in lieu of taxes, to contribute "days' work" in proportion to the amount of their property holdings. The highways were thus built and improved by the direct labor of farmers in off seasons. This practice continues to some extent even today in the building of local roads; but highway construction has become increasingly a function of state and county governments and has come to be carried out as a large-scale enterprise, financed by tax revenues or the sale of securities.

CAPITAL CREATION IN A COMMUNISTIC SOCIETY

Under a communistic form of economic organization the allocation of the productive power of society to the creation of capital depends upon the decision of a central authority. Instead of allowing the amount of capi-

[3] Allowance should be made for hunting or fishing.

tal to be determined by the decision of individuals concerning the use of their time, the government decides how much capital *ought* to be created, say, in the next five- or ten-year period. A labor force is then set to work on the designated capital enterprises, the remainder of the working population being allocated to the production of consumers' goods.

Under communism capital formation is in the main a specialized function. Instead of each individual's working a portion of his time in the creation of consumers' goods and the remainder of his time in the creation of capital goods, as in a primitive individualistic society, one portion of the population devotes its entire time to capital construction while another is continuously employed in the production of consumers' goods. Each of these specialized groups is paid by the government for the services performed. Payment is made directly in food, clothing, shelter, etc., or through the intermediation of some form of money or warrant.

CAPITAL FORMATION IN A CAPITALISTIC SOCIETY

Under a highly complex economic system organized on a pecuniary and profit-making basis, the process of creating capital is fundamentally different from what it is either in a primitive society or under a communistic system. It is not, as in the case of primitive communities, an off-season occupation of people who spend the bulk of their time in producing consumers' goods. In a society where production is highly specialized the greater part of the population is necessarily employed all the year round in the creation of particular types of commodities or in specialized services. One is a factory hand or miner, a preacher or a teacher, a stenographer

or a bookkeeper, a clerk or a telephone operator, a plasterer or a plumber, a barber or a beautician, or, for that matter, a lawyer, an engineer, a corporation official, or a banker. For people employed, there is practically no opportunity in slack time or off hours to engage directly in the production of capital goods for themselves.[4]

Under these circumstances, the only way in which one can accumulate capital for himself is by saving a portion of his money income for investment. If actual capital goods are to result from these money savings, other people must take these funds and employ labor and materials in the construction of plant and equipment or other forms of material capital. The creation of capital under such a system involves, as in the case of a communistic method, an allocation of the energy of a certain portion of society more or less continuously to the specialized task of constructing capital. But here the analogy ends.

As we have seen, in a communistic society the amount of capital to be created depends upon a more or less arbitrary decision by the government as to the proper apportionment of the labor power of its people. In a capitalistic society, the allocation of energy between the creation of capital and consumers' goods depends (1) upon the extent to which individuals set aside funds for investment out of their earnings; and (2) upon the possibility of profit foreseen by business enterprisers who may use these funds in hiring labor and purchasing materials for the construction of plant and equipment. In addition, as we shall see, commercial credit plays an

[4] One may, of course, make improvements around the place if one is fortunate enough to own a home; but, as already indicated, from the social point of view a house or yard is not productive capital.

important role in furnishing funds for purposes of capital creation.

In short, the formation of capital under a capitalistic system involves a complex and roundabout process: Individuals, business corporations, and banks provide funds for investment; business enterprises float bonds and stocks in exchange for these funds and then labor and materials are employed in the construction of new capital equipment which, it is hoped, may yield profits in the future.

This brief statement gives but a very inadequate idea of the great change that has taken place in the process by which capital is created. It is enough to note here in a preliminary way that the shift from the direct to the indirect method of capital formation has profoundly affected the working of the whole economic system. The problems to which the changed process gives rise will be discussed in ensuing chapters.

CHAPTER II

THE FLOW OF MONEY INCOME

In a preceding volume of this series [1] we showed how the productive activities of the nation generate the money income received by the people. We were there concerned with measuring the amount of the income received in the course of a year, and with the way in which its distribution among the various income groups in society affects the division of the aggregate income as between spending and saving. We were thus interested in only a part of the process; we did not undertake to trace the flow of funds from the hands of the people onward through trade and production channels. In order to reveal the role that money income plays in the functioning of the economic system, it will be necessary to recall briefly what was said in the preceding volume and then to carry the analysis much further.

Our farms, mines, factories, railroads, public utilities, and other enterprises produce the goods and services required by society. Those who participate in the production of these goods and services receive payment in the form of money—as wages, salaries, rents, interest, or profits. The wages and salaries are paid to the individuals who are employed by the producing organizations; the rent and interest go to those who have loaned property or funds for business purposes; and

[1] *America's Capacity to Consume* by Maurice Leven, Harold G. Moulton, and Clark Warburton.

the profits accrue to the owners of business enterprises as compensation for the investment which they have made and the risks which they have assumed. The selling price of the commodities produced must, of course, cover the sums disbursed in connection with their production—otherwise the payments could not be made. This means that the sum of money incomes received by the people is equal to the value of the goods and services which are sold in the market.[2]

It must also be understood that the goods and services produced by the people must in the aggregate be purchased by the people who have produced them. That is to say, we use the money which we have received for our services as producers in currently purchasing the commodities which we, the people as a whole, have produced.[3] In a simple barter society commodities would be directly exchanged. In a highly specialized society, they are exchanged by means of the money we receive as income for our respective contributions to the productive process.

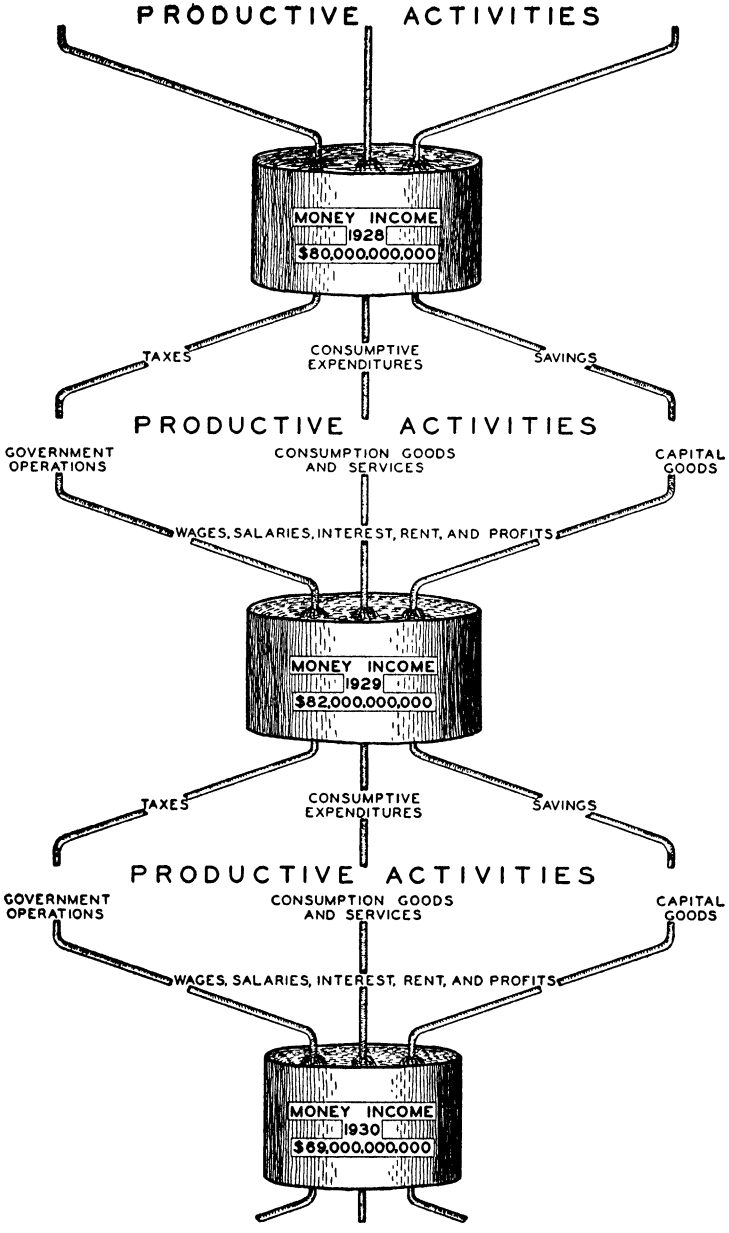
THE DISPOSITION OF INCOME

The flow of funds from productive operations into the hands of individuals and in turn from these individuals into continuing productive operations is illustrated in the diagram which follows. The size of the several streams of income is roughly in accord with the actual division of income among the various claimants in the years covered, and its distribution as it flows

[2] As we have shown in *America's Capacity to Consume,* however, individuals often receive money income which is not strictly the result of current production, such as inflation profits.

[3] Allowance must, of course, be made for the possibility that a portion of the product may be sold in a foreign country either in exchange for imports, or on credit.

THE CURRENT FLOW OF FUNDS



onward is in line with the actual distribution that occurred.[4]

In order to indicate the magnitude of the income flow for a given time period it has been necessary in the chart to impound this income for the moment in a series of reservoirs, each of which represents the entire income for a year's time. It goes without saying, however, that what we have is a continuous flow rather than a periodical impounding and release of income. As individuals receive wages or salaries from week to week or month to month they make payments for current purchases or deposit the funds for investment purposes. Interest, rents, and dividends are received at longer intervals, but these funds are also commonly utilized as received rather than at the end of a calendar year. Indeed, by virtue of the system of purchasing on credit, money income is to no small extent expended before it is actually received.

Although the receipt and disposition of income is thus a more or less continuous *flow* it is nevertheless necessary for the purpose of measurement and of simple exposition to view the process as though it were a periodic matter. It can be measured only by reference to some time period—a year, month, week, day, hour, or minute. Because of the way in which income is disbursed and data are compiled, the year has been found to be the most satisfactory period for its measurement.

It should be noted in connection with this concept, that income earned in December 1927, but received in January 1928, gets counted as a part of the total income of the year 1928. It is only disbursements near the end

[4] There are numerous technical problems involved in the determination of national income and its utilization which make precise estimate impossible. These are fully discussed in *America's Capacity to Consume.*

of the year, which accrue as income in the ensuing year, that would not get into the 1928 accounting; but this amount would of course be roughly matched by the carry-over from the end of the preceding year.

The amount of income in 1928 shown in the reservoir near the top of the diagram was about 80 billion dollars. This monetary income was disbursed in three directions, or for three major purposes. First, the largest proportion of the total was expended for consumption goods and services. A second portion was saved and rendered available for the creation of additional capital goods. A third portion was taken from individuals by governments in the form of taxes.

It may be noted in passing that the amount which goes respectively for consumptive expenditures and for savings is determined chiefly by the decisions of individuals. Some savings are, however, also made by corporations before dividends are disbursed, a portion of the earnings being set aside as surplus. The amount of funds diverted to government treasuries is determined not by the voluntary actions of individuals but by society collectively through its taxation laws.

It is these outgoing streams of income that make the wheels of business and of government revolve. The money which flows through trade channels as purchasing power for consumption goods and services calls forth from week to week and month to month new production of consumption goods and services—which, in turn, generates money income which flows again into the hands of the people at successive intervals of time. The money income which is saved by individuals is made available for business enterprisers who may wish to purchase materials and employ labor in the construction of additional capital goods. As these funds are used

by business enterprisers for the construction of capital goods, the disbursements made, like those made by the producers of consumption goods, flow once more as money income to individuals, to be distributed again in ensuing periods of time.

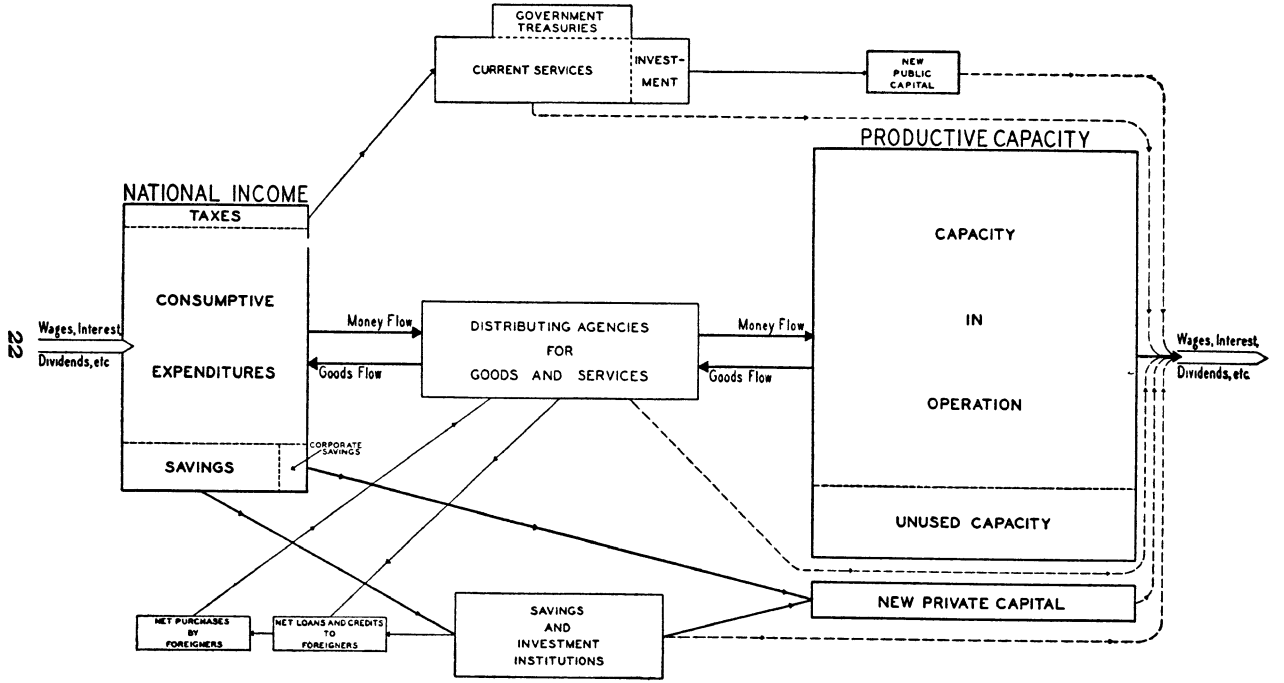
The funds which are taken by governments as taxes may be used either for the purpose of financing current services rendered by governments, such as providing military and police protection and educational facilities, or for the creation of public forms of capital, such as highways and armaments. In either case the funds as paid out by public treasuries become a part of the newly forming streams of individual income.

In the diagram we have made the size of the reservoirs representing the aggregate income in successive years from 1928 through 1930 vary in proportion to the actual changes in the amount of the income realized in those years. As a result of the depression which began near the end of 1929 the amount of the income of course shrank tremendously in the years which followed. The flow of funds through both trade and savings channels was accordingly greatly reduced, as was also the amount of revenue which the government was able to obtain from taxation.

THE FINANCIAL AND BUSINESS STRUCTURE

In the preceding diagram we have indicated the flow of funds without specific reference to the variety of institutions or organizations involved in the complex processes of the modern economic system. We now give, in the diagram on page 22, a bird's-eye view of the financial, business, and governmental system by means of which this flow is directed and controlled.

The Operation of the Economic System



The rectangle at the left of the chart is the reservoir of national monetary income received by individuals in the course of a year in the form of wages and salaries, interest, rents, and dividends. This national income flows out (in continuous process) in three directions, as already indicated. A first portion goes to federal, state, and local government treasuries, where it is disbursed, in part as remuneration for current government services and in part as compensation for the construction of public forms of capital.

A second, and much the largest portion, is disbursed at retail stores, hotels and restaurants, automobile filling stations, railway and steamship agencies, educational institutions, theatres and places of recreation and amusement, barber shops and beauty parlors, and other places where services are purchased. In the case of commodities, as distinguished from services, one or more intermediary institutions are commonly found between the ultimate consumer and the producer. That is to say, in addition to the retail agency, wholesalers or commission houses may act as intermediaries between the manufacturer and the consumer. However this may be, the purchasing power expended at retail and service agencies constitutes the demand for consumers' goods which calls forth production from existing service organizations, agricultural and manufacturing enterprises, and the raw material industries dependent thereon.

The funds saved flow from the hands of individuals through a variety of savings and investment institutions. Included in this category are mutual and stock savings banks; postal savings institutions; insurance companies; trust companies; commercial banks, to some extent; building and loan associations; and investment

banking institutions engaged in the marketing of agricultural and urban real estate mortgages, the bonds and stocks of railroad, public utility, financial, commercial, and industrial corporations, and the bonds of governments. It is impossible to indicate all of these various institutions in proper perspective in the diagram; hence we have grouped them under the broad general heading of savings and investment institutions. Discussion of the significant position of the commercial banking system in connection with the furnishing of funds for both fixed and working capital is reserved for subsequent chapters.

The savings assembled by these financial intermediaries are transmitted to borrowers who desire to use such funds for the expansion of productive capacity.[5] It should be borne in mind, however, that even under modern conditions there are substantial investments made directly by individuals without the aid of financial intermediaries. Thus corporations may use their own surplus funds for the purpose of expanding plant and equipment; individual enterprisers, such as farmers and merchants, may use a portion of their earnings for capital expansion; or a group of individuals may organize a corporation and themselves furnish the money without resort to the sale of securities to the general public. In the main, however, and increasingly as the economic system becomes more highly pecuniary in character, funds for the expansion of capital are obtained from the *financial markets.*

At first glance, the process which has been described in the foregoing discussion and diagrams may appear

[5] It should be recalled here, however, as was pointed out in Chap. I, that a considerable amount of such monetary savings goes to finance the creation of consumers' goods, chiefly in the form of houses and apartments.

to be practically automatic. It would not seem to make any difference whether more or less of the income received by individuals in any given period of time were expended for consumption goods or diverted to investment channels. In either case it would appear to put men to work and generate new income. If a larger proportion of income were spent, more consumption goods would be called forth; if a larger proportion were saved and invested, the result would be a greater supply of capital goods, thereby expanding our powers of production in the future.

Economists and business men alike have traditionally rested the analysis at this point. We shall hope to show in the ensuing discussion that the problem of capital formation and of economic organization merely begins rather than ends at this place.

CHAPTER III

IS THERE AN ECONOMIC DILEMMA?

The development of a complex pecuniary organization involving specialized production and exchange has, as suggested in the opening chapter, profoundly influenced the problem of capital formation. Instead of the direct process of creating capital through the application of a portion of each individual's time to the construction of capital goods, the formation of capital has in the main become what may be called a social process. That is to say, individuals set aside a portion of their money incomes for investment purposes, and these funds become available, through the machinery afforded by financial intermediaries, to capitalists interested in the construction of plant and equipment. Individual monetary savings enter what may be regarded as an investment pool, to which business enterprisers, seeking funds with which to purchase materials and employ labor for the production of capital goods, resort.

The creation of capital involves the transformation of monetary savings into tangible goods. The funds saved by individuals constitute merely the means by which genuine capital may be produced. While the individual may regard money set aside for investment as personal savings or personal capital, such savings do not become capital from the national point of view until the funds saved have been utilized by others in the actual construction of plant and equipment or other

forms of capital goods. The making of individual savings is thus but the beginning of the process of capital formation.

It has been generally assumed that the amount of new capital goods created will always be roughly equal to the aggregate volume of money set aside as savings by individuals and corporations. In other words, it has been thought that pecuniary savings are automatically transformed in due course into capital equipment—that, for example, if 10 billion dollars in money be saved new capital will shortly be created having a value of 10 billion dollars—less allowance for commissions or other charges made by financial intermediaries and for the fraudulent diversion of funds from their intended purpose.[1] We shall, however, show in the course of our analysis that such a general conclusion is quite unwarranted, that money savings may at times be greatly in excess of the new capital actually being created, and that, on the other hand, new capital may at times be created in excess of the volume of pecuniary savings which are being set aside by individuals and corporations.

The change from the direct to the roundabout process of capital formation has in fact given rise to a fundamental economic difficulty. In order to set the problem forth in the clearest and most challenging way we shall present it, in this chapter, as an economic dilemma. Then in subsequent chapters we shall endeavor to ascertain whether this dilemma has been or can be circum-

[1] It is recognized, also, that savings, tentatively made, may subsequently be drawn upon for consumptive purposes. And as we have pointed out in the preceding chapter individual savings also go for the financing of certain types of consumptive expenditures, such as houses and apartments.

vented. Our first task then is to reveal the character of the suggested dilemma.

THE NATURE OF THE DILEMMA

The dilemma may be summarily stated as follows: In order to accumulate money savings, we must decrease our expenditures for consumption; but in order to expand capital goods *profitably,* we must increase our expenditures for consumption. The proposition may be made clearer by once more contrasting the roundabout process with the direct process of relatively primitive agricultural communities. When a pioneer farmer created capital by the direct process he did not need to curtail consumption in order to obtain funds with which to increase his capital; he merely devoted his energy, in off seasons, to the improvement of land or to the construction of fences or buildings. But under the modern system of specialized production and exchange the pecuniary savings of individuals are in the main necessarily at the expense of consumption. If an individual with an income of $2,000 elects to save $500 he reduces his potential consumption by one-fourth. Moreover, the aggregate of individuals who make up society must in a given time period restrict aggregate consumption if funds are to be provided, out of savings, for additional capital construction.

It should be noted, also, that when creating additional capital in the form of improved land, buildings, or tools, the primitive farmer was not, immediately speaking, confronted with the question of money profits. The improvements made appeared to add directly to the value of his property holdings; and the increased output which might result from the improvements could presumably be used by the farmer himself or sold in

the market. In any event, he was not concerned with the payment of dividends or interest on borrowed funds. He was dependent solely upon himself, and the additions to capital equipment represented the direct fruits of his own labor.

In contrast, when the managers of modern business corporations contemplate the expansion of capital goods they are forced to consider whether such capital will be profitable. They must begin to pay interest upon borrowed funds immediately and they must hold out the hope of relatively early dividends on stock investments. To be sure, there are certain types of speculative enterprise in which capital will be risked for considerable periods of time in the hope of large ultimate profits; but, in the main, returns have to be in prospect relatively soon.

Now the ability to earn interest or profits on new capital depends directly upon the ability to sell the goods which that new capital will produce, and this depends, in the main, upon an expansion in the aggregate demand of the people for consumption goods. A particular corporation may, to be sure, construct new plant and equipment in the face of a declining aggregate demand from consumers, hoping by lower costs and price concessions to take business away from competitors, whose capital will thereby be rendered obsolete; but if the aggregate capital supply of a nation is to be steadily increased it is necessary that the demand for consumption goods expand in rough proportion to the increase in the supply of capital. (The truth of this general statement will be tested in later chapters.)

THE PROCESS ILLUSTRATED

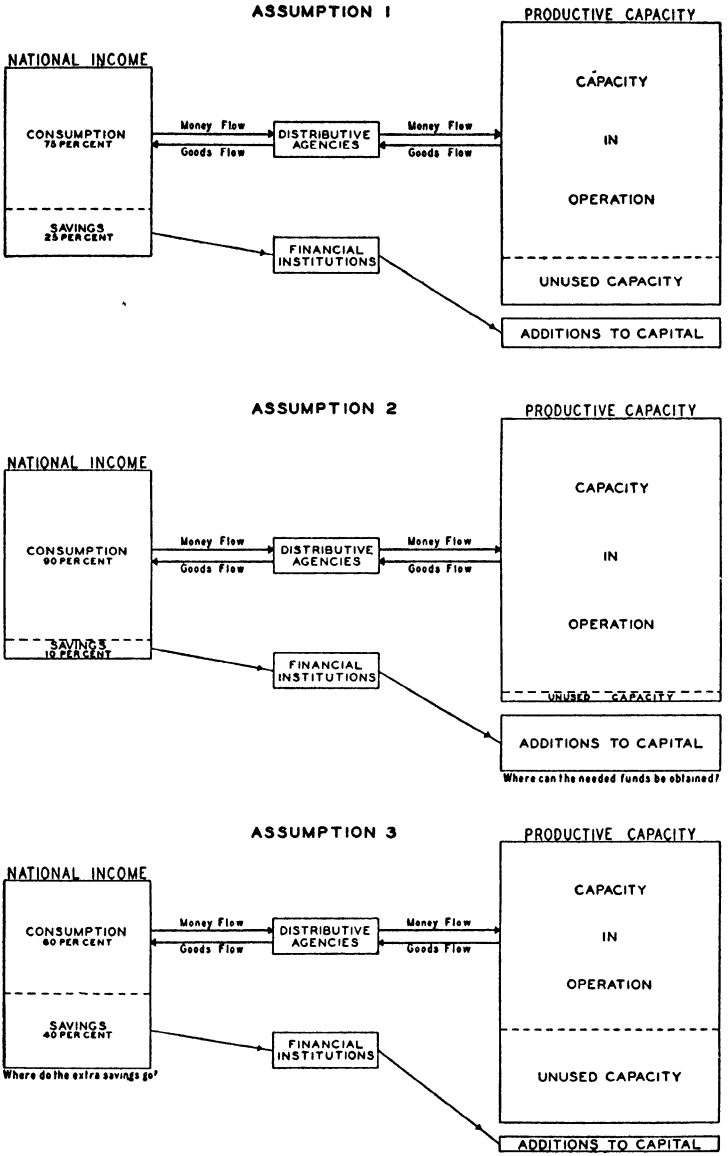
The fundamental question with which we are here concerned may perhaps be illuminated by a series of

simple diagrams. We shall ignore in these diagrams the flow of funds through government channels, and assume for the moment that the national income is divided simply between consumptive expenditures and savings. We shall assume that, at the beginning of the period, only 80 per cent of the existing capital supply was being utilized, and that there was a corresponding amount of idle labor. We shall assume also that 75 per cent of the existing income was spent for consumption goods and 25 per cent was saved. This division of income is indicated in the large square at the left of the diagram on page 31. Production is indicated at the right of the diagram, where the supplementary area, labelled "Additions to Capital," indicates the amount of new capital created.

Now let us see first what would happen to the demand for capital goods in the following year if the flow of funds into consumption channels were increased at the expense of savings. We shall assume that 90 per cent of the income received by individuals is devoted to consumption purposes, and that only 10 per cent is saved. As a result of the expansion of the flow of funds through trade channels, organizations producing consumers' goods would immediately find it profitable to employ idle labor and to utilize their existing plant and equipment at nearly full capacity. The change is indicated in the second diagram by the expansion of the area in the square at the right marked "Capacity in Operation" and the contraction of the portion marked "Unused Capacity."

The decrease in savings from 25 to 10 per cent of the national income would reduce the flow from individuals into savings and investment institutions; but it would evidently not reduce the demand for capital

The Dilemma in Graphic Form



goods. The assumed increase in the demand for the output of existing establishments—with unused capacity virtually eliminated—would obviously create a situation favorable to the construction of additional capital goods—this because of the increasing demand for the products which such capital would be expected to produce. We have therefore enlarged the "Additions to Capital" area; but we have raised the question—Where could funds be procured with which to create this additional capital?

To illustrate the problem further: Let us next assume that, instead of an increase in the percentage of national income that is spent, there is an increase in the percentage that is saved. Let us assume that only 60 per cent is spent, while 40 per cent is set aside for the purpose of investment. As is indicated in the third diagram, the resulting decrease in the demand for consumption goods would lead to the discharge of workers engaged in the production of such goods and increase the amount of idle plant and equipment. Under these circumstances the opportunity for profit in expanding plant and equipment would be diminished and the effective demand for new capital construction would accordingly decline. Hence we have reduced the "Additions to Capital" area and raised the question—What becomes of the excess money savings?

It will be observed from these illustrations that when the flow of funds through consumption channels is increased there arises a demand, from consumers, for the construction of additional capital goods; but that, at the same time, funds with which to create the additional capital become less available. Contrariwise, it will be seen that when the flow of funds through consumption channels is reduced an increased supply of

money for capital expansion is rendered available; but that the business incentive to use it for such purpose is diminished.

The nature of the problem in which we are interested may be more precisely indicated if we assume that the total flow of money and credit remains unchanged over the period covered by the preceding illustration. It is evident that *any* increase in the supply of funds rendered available for capital construction would mean a *corresponding* decrease in the demand for consumption goods, and hence in the demand for the new capital goods which the available funds might be expected to bring into existence. On the other hand, any increase in the flow of funds through consumption channels would mean a corresponding decrease in the flow through savings channels; thus the demand for new capital flowing back from the demand for consumption goods would be expanding, but the funds with which to create new capital goods would be declining.

It may be objected, in connection with this discussion, that an increased flow of funds into investment channels would not proportionately reduce the flow through consumption channels. Would not the disbursement of these funds in connection with the process of creating additional capital provide individuals with funds for the more or less simultaneous expansion of consumption? Unless the total volume of money income is expanding, the answer is No—for the reason that we have assumed, in the illustrations, that over the period of an entire year a larger percentage of the incomes flowing to individuals, from whatever source, is being week by week and month by month diverted to savings channels. Accordingly it cannot be argued that money currently paid out in connection with the creation of

new capital will serve to restore the former ratio between spending and saving. If the volume of money income remains unchanged, there cannot be—over a period of a week, a month, a year, or several years—an increasing flow of funds through savings channels unless there is a decreasing flow through consumption channels. A clear understanding on this point is crucial to an appreciation of the whole problem at issue.[2]

The question should be raised at this juncture, however, whether the apparent dilemma does not rest upon the preliminary assumption made in the illustrations given. Had we assumed 100 per cent utilization of our plant and labor supply, with, say, 80 per cent engaged in the production of consumption goods and 20 per cent in the production of capital goods, should we not have found a satisfactory adjustment which could be continued indefinitely? One answer that may be made is that, granted such an adjustment, it would be possible to maintain it only if we had some means of precisely controlling the percentage of the income that would henceforth be saved; and in an individualistic society no such means exists. The proportion of the income saved varies with changes in people's habits; it fluctuates at different stages of the business cycle; and, as we showed in the preceding volume of this series, the percentage saved depends strikingly upon the way in which the total income is divided.

The fact is, moreover, that such a perfect adjustment would be impossible of attainment. With no expansion in the total supply of circulating medium, the

[2] The position here taken is strictly in accord with the traditional view of the savings process, which assumes that an increase of savings involves not only a shifting of the flow of funds but also a transfer of productive resources from the production of consumption goods to the production of capital goods.

funds with which to devote 20 per cent of our energy to the creation of capital goods could not have been procured except by an antecedent restriction of consumption, a restriction which would automatically have resulted in some unemployment of the labor force and of the existing capital supply. To get to the bottom of this problem one would have to go back to the beginnings of the roundabout system of capital creation; to the time in the development of our economic system when funds—which might otherwise have been used for consumption purposes—began to be set aside for investment. There we should find the beginnings of the maladjustment.

In summary, it would appear that difficulties are encountered whichever way we turn. If a larger percentage of the national income is saved, we have abundance of funds with which to create new capital; but such capital is not profitable. If, on the other hand, a larger percentage is diverted to consumption channels it is profitable to construct new plant and equipment; but there are inadequate funds for the purpose.

A PRIMARY CONCLUSION

The first conclusion to which the foregoing analysis leads is as follows: If the formation of capital is to take place, at least on an expanding scale, there must be an increasing flow of funds through both consumption and investment channels. There must be an expanding flow of funds through consumption channels in order to make it profitable to operate existing establishments at full capacity and to induce additional capital formation; at the same time there must be an increase in the flow of funds through investment channels if the new capital is to be created. If, when looking at the preceding dia-

grams, one could picture an expansion each year in the flow of funds through consumption channels, while at the same time there was an expansion in the flow through savings and investment institutions, he would expect to see business activity increased both in the production of consumption goods and in the creation of new capital.

If we are really to answer the question, "Is there an economic dilemma?" we must therefore consider whether it is possible to have a simultaneous increase in the flow of funds through both consumption and savings channels. This will be the task of Chapters VI to VIII inclusive.

It will be observed that the foregoing discussion also implies that the construction of new plant and equipment actually takes place only when the output of consumption goods is expanding. Instead of devoting less energy to the creation of consumption goods when we expand our supply of capital goods, it would appear that we are simultaneously devoting more energy, also, to the production of consumption goods. The truth of this apparent phenomenon will be tested in the two chapters immediately ensuing.

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CHAPTER IV

THE RELATION OF CONSUMPTION TO CAPITAL FORMATION

The general analysis of the preceding chapter, as already indicated, carries the implication that an expanding consumptive demand is essential to an expansion of new capital. We must turn now from this theoretical approach to a study of the actual relationships between consumption and capital formation as revealed in the world of business. As a preliminary to our factual study it is, however, desirable to indicate how this problem has been traditionally analyzed, particularly by the so-called "classical" writers who formulated the basic principles which were supposed to govern the economic world.

THE CLASSICAL ROAD TO PROGRESS

The truth is that the classical writers on economics did not squarely face the fundamental issues which we have been considering. This failure is primarily attributable to the fact that the approach of these late eighteenth and early nineteenth century writers to economic problems was essentially individualistic rather than institutional. To state the matter more simply, most of them were concerned with the incentives or forces which influence the activities of *individuals,* and they gave little consideration to the interrelated parts of a complex economic machine. This emphasis is perhaps not surprising in view of the comparatively simple economic

system under which our forbears lived. In any event, these early writers were concerned primarily with *individual savings* rather than with *capital formation.*

They argued that an individual would save more or less, depending upon the rate of interest which he might obtain on his savings; but they gave little consideration to the processes involved in the transmutation of pecuniary savings into capital equipment. Indeed, the classical economists were concerned chiefly with the phenomenon of interest rather than with capital formation—which they assumed occurred automatically, once pecuniary savings had been effected. They asked, Why is interest paid on capital? And they usually argued that it was a reward to the individual for abstinence from consumption, or in any event a necessary inducement to the foregoing of present satisfactions. If one is to deny himself consumptive pleasures at the moment, he must be reasonably assured of larger satisfactions in the future—satisfactions made possible by the productivity of the capital goods resulting from savings.

Concentration of attention on the individual served to obscure the issue in another way. If Mr. *A* practiced self-denial and economized, saved money and put it in the bank or bought securities, he got ahead in the world. His ownership of capital gradually increased his income and also gave him protection for a rainy day and security for declining years. What was true of *A* appeared to be equally true of *B* and *C,* and of everybody else. This meant, however, everybody else considered *individually.* The question was not raised whether if everybody *simultaneously,* which means society *collectively conceived,* reduced consumptive expenditures with a view to accumulating capital, society *collectively*

conceived would find it profitable to expand the power to produce consumption goods.

In view of the scarcity of productive capital at the beginning of the modern era it was naturally assumed that the fundamental requirement for economic progress was increasing savings. Not only were capital goods in the form of plant and equipment lacking, but there was also a shortage of available funds with which entrepreneurs might engage in new constructive enterprises. Accordingly, more and yet more savings appeared essential not only to individual welfare but also to the growth and development of the nation as a whole. This appeared to be especially the case in an era of industrial evolution, when we were developing the so-called roundabout processes of production—making machines which would make other machines, which in turn would produce still other machines. The high road to national economic progress appeared to involve the following steps: (1) The restriction of consumption; (2) the diversion of energy hitherto engaged in producing consumers' goods to the creation of capital goods; and (3) the subsequent expansion in the output of consumers' goods—with resulting benefit to everyone.

While an ultimate expansion of consumption was thus always in view, the first step, and the propelling force, was conceived to be the restriction of consumption. And it was assumed, moreover, that increasing expansion of capital goods could proceed for a more or less indefinite period, without any accompanying increase in consumption. Indeed, the assumption was that there could be no increase in capital formation unless the production of consumption goods was decreasing—because the creation of capital appeared to require the *transfer* of labor and materials from the production of

consumers' goods to the production of capital goods. Accordingly, it seemed that if we were to produce more of the latter we had to produce less of the former. In the diagram on page 31 this process would assume that the labor and materials displayed in the area marked "Capacity in Operation" would be transferred to the area marked "Additions to Capital."

In view of this basic assumption that the fundamental requirement for progress was the restriction of consumption as a prerequisite to the formation of capital, it is not surprising that the doctrine of economic salvation through individual thrift should have been so strongly emphasized. The restriction of consumption and the setting aside of funds for investment purposes were regarded not only as the means by which the individual obtained security and got ahead in the world, but also as the road to social progress.

In line with this reasoning, institutional devices which promoted inequality in national wealth and income were held to be not necessarily disadvantageous—from the long-run point of view. Economists have been wont to point out that the growth of economic inequality might even turn out to be a blessing in disguise. For example, Alvin Johnson once urged that the protective tariff has tended to divert income from the masses (thereby keeping general consumption low) to the entrepreneur class, which automatically saves large portions of it, depositing it in banks, purchasing securities, or putting it directly back into productive business. This has "played a part in equipping modern society with the vast stock of capital goods which it now possesses." [1] Walton H. Hamilton has argued that the unequal dis-

[1] Alvin S. Johnson, "Protection and the Formation of Capital," *Political Science Quarterly,* Vol. 23, p. 230.

tribution of wealth which characterized the nineteenth century was a potent factor in the rapid growth of capital equipment, for it restricted the expansion of consumption and promoted a rapid increase in saving.[2]

CONSUMPTIVE DEMAND AND DEMAND FOR CAPITAL

In emphasizing the individual as the center of economic organization, classical writers ignored the process by which money savings are transformed into actual capital equipment. That is to say, they failed to consider the forces which determine whether it will be profitable to utilize money savings in the construction of new capital. They simply assumed that when an individual decides to save rather than to spend, he merely exercises a demand for capital goods rather than for consumption goods. If one has an income of $5,000 he may pay out the entire amount for consumption goods, or he may devote $4,000 of it to consumption goods and $1,000 to capital goods. The aggregate demand for goods is in either case the same, though in the latter case 20 per cent of the demand is for *capital* goods. According to this type of analysis, it would not make the slightest difference in the total volume of production whether 5 or 50 or 75 per cent of the total income were saved. Always we should have 100 per cent employment of the existing labor and capital supply; but sometimes we should be creating more capital and other times less.

This analysis, it will be seen, involves the assumption that the demand for capital goods flows directly from the individuals who save. Such an assumption is, however, clearly not in accordance with the actual situation. When an individual buys consumption goods, he orders the goods delivered to his door; but when he saves

[2] Lecture delivered at the University of Chicago, July 1917.

$1,000 he does not, as a rule,[3] exercise in the market place a direct demand for $1,000 of *new* capital goods, which he asks to be delivered. He has no concern with the purchase of plant and equipment; he is merely interested in the income which his deposit account or his purchase of securities may yield him. All that he does is to render $1,000 available to business enterprisers who will utilize it in the construction of additional plant and equipment *if* they can see the opportunity for a profit in so doing.

The demand for capital goods is a derived demand —derived, that is, from the demand for consumption goods. Reference again to the diagram on page 31 will help the reader to appreciate that demand for the construction of new capital equipment does not flow from savers, but from consumers. Savers of money income merely supply funds with which capital goods may be created. It is the flow of orders for consumption goods through trade channels that not only constitutes the demand for the goods which existing productive capacity can turn out, but renders profitable the construction of additional capital. When existing capacity is well utilized and orders are expanding, it appears profitable, as we have seen, to expand plant and equipment. At such times the savings of individuals will be utilized in employing labor and buying materials with which to create additional capital goods.

A basic question will, however, be raised at this point. Granted that the object of new capital is to make possible an expansion of consumption goods, does it follow that such new capital construction cannot precede the expansion of demand for the new consumption

[3] Exception has to be made for farmers and other individual enterprisers, who may purchase some capital goods for their own direct uses.

goods which the new capital will be able to produce? What reason is there for believing that capital construction cannot expand *prior to* and *independently of* any increase in consumptive demand? This issue will have to be considered in two steps. The first is to ascertain whether, as a matter of historical fact, the expansion of capital and the expansion of consumption occur simultaneously, or whether capital increases only when consumption is being curtailed. The second is to determine—Which leads?

CONCURRENT INCREASE OF CONSUMPTION AND CAPITAL FORMATION

According to the traditional viewpoint, an expansion in the rate of capital accumulation can be accomplished only by a reduction in the rate of output of consumption goods—because labor and materials have to be transferred from one type of activity to the other. Evidence shows conclusively, however, that consumption and capital formation do expand and contract together. That is to say, when consumption is declining, new capital does not get created at a more rapid rate; on the contrary, the rate of capital increase declines. Similarly, when consumption expands the rate of capital formation does not decline but rather increases. We are not, for the moment, interested in determining which leads the way, but only in establishing the more or less simultaneous movement of both types of activity in the same direction. It is necessary to say *more* or *less* simultaneously, because at the beginning of recovery or depression the two movements do not always start at precisely the same time.

First, it may be noted that those periods in our industrial history which have been characterized as eras of

extravagant living have been periods in which the creation of new capital has been proceeding most rapidly. For example, the middle 1830's has frequently been described as a time of great speculation and extravagance; and it was also a period of great increase in capital equipment, particularly in the form of transportation facilities. The decade from 1847 to 1857, except for a moderate reaction in 1853-54, was a period of great expansion accompanied by rising standards of living. Official reports of the time repeatedly referred in glowing terms to the "new commercial era." It was a period of rising wages and of large immigration. The growth of new capital is illustrated by the statistics of railroad construction, the number of miles increasing from about 5,000 in 1846 to 25,000 in 1857. Industrial plant and equipment also grew rapidly, the capital invested in manufacturing enterprises, as revealed by census figures, increasing from about 500 million dollars in 1850 to a billion dollars in 1860.[4]

The years immediately preceding the crisis of 1873 were also looked upon as a "new era," accompanied again by extravagant standards of living. This was at the same time a period of extremely rapid capital formation. From 1868 to 1873 inclusive 28,000 miles of new railroad track were laid, which was three-fourths of the total mileage which had been constructed prior to that time. The growth of manufacturing establishments was also unprecedentedly rapid during these years.

In more recent history, it may be recalled that the period preceding 1907 was one of rising standards of living and was commonly characterized as an age in which the principles of thrift were being forgotten. It

[4] Victor S. Clark, *History of Manufactures in the United States, 1607-1860*, p. 369.

was nevertheless a time of extraordinarily rapid growth in capital equipment in manufacturing and public utilities, as well as in the field of transportation. As everyone will remember, the boom era of the late twenties was one of extravagant consumptive expenditures, accentuated by the growth of installment credit. It was also a period in which the expansion of fixed capital in nearly every field of enterprise was exceptionally rapid.

The more or less simultaneous expansion and contraction of the flow of goods through consumption and capital channels may be more precisely and conclusively shown by certain available production indexes. The first of the following tables shows the value of "goods destined for human consumption" and "goods destined for capital equipment" produced in the years 1901-13 inclusive. These indexes cover both raw ma-

PRODUCTION OF CONSUMPTION GOODS AND CAPITAL GOODS, 1901-13[a]
(Based on current prices, with 1900 = 100)

Year	Consumption Goods		Capital Goods	
	Index	Rise or Fall	Index	Rise or Fall
1901	100	—	100	—
1902	116	+16	115	+15
1903	115	− 1	114	− 1
1904	120	+ 5	106	− 8
1905	126	+ 6	140	+34
1906	132	+ 6	158	+18
1907	128	− 4	162	+ 4
1908	128	—	117	−45
1909	134	+ 6	145	+28
1910	137	+ 3	167	+22
1911	136	− 1	155	−12
1912	150	+14	189	+34
1913	146	− 4	197	+ 8

[a] Frederick C. Mills, *Economic Tendencies in the United States*, p. 21

terials and manufactured products, but they do not include buildings or other fixed properties as such. It will be seen that the indexes usually move in the same direction, though in some years there is an apparent lag.

For the years 1919-32 inclusive more comprehensive data are available. The indexes shown in the table on this page include residential construction under consumers' goods and non-residential construction under

PRODUCTION OF CONSUMPTION GOODS AND CAPITAL GOODS, 1919–32[a]
(Based on current prices, with 1929 = 100)

Year	Consumption Goods				Capital Goods[d]	
	Excluding Residential Construction[b]		Including Residential Construction[c]		Index	Rise or Fall
	Index	Rise or Fall	Index	Rise or Fall		
1919.....	88 4	....	86.2	....	75 7	....
1920.....	96.8	+ 8.4	93 3	+ 7 1	87.8	+12.1
1921.....	71.9	−24 9	70 6	−22.7	65.1	−22.7
1922	73.8	+ 1 9	73 9	+ 3.3	69 9	+ 4.8
1923.....	83 9	+10 1	84.2	+10 3	88.6	+18.7
1924.....	84 4	+ 0 5	85 6	+ 1 4	84.2	− 4.4
1925.....	91.8	+ 7.4	94 3	+ 8 7	84.7	+ 0.5
1926.....	94.7	+ 2.9	96 9	+ 2.6	89 2	+ 4.5
1927.....	93.6	− 1 1	95 6	− 1.3	91.3	+ 2.1
1928.....	95 0	+ 1.4	97.7	+ 2 1	96 9	+ 5.6
1929.....	100 0	+ 5.0	100.0	+ 2 3	100.0	+ 3.1
1930....	85 9	−14.1	84 1	−15 9	85.4	−14.6
1931.....	67.2	−18.7	65 6	−18.5	60 8	−24.6
1932.....	52.4	−14.8	50.2	−15 4	39.0	−21.8

[a] Based on the more comprehensive and longer series of Simon Kuznets, "Gross Capital Formation, United States, 1919–1933," *National Bureau of Economic Research Bulletin No.* 52, Nov. 15, 1934. See also Kuznets' index of *physical volume* of production based on 1929 prices (Appendix D, Table I, p. 193), which tells substantially the same story.

[b] Includes durable, semi-durable, and perishable goods.

capital goods. For purposes of added information the data for consumers' goods, with residential construction excluded, are also given. The index is based on current prices, with the year 1929 taken as 100.

In only two years out of the fourteen was there a movement in opposite directions, namely, 1924 and 1927, and even in these cases there was but slight variation. In general, and whether residential construction is included or not, there is a striking parallelism in the output of consumption goods and capital goods respectively. This is true whether we consider the value of commodities produced or the physical volume of such production.

CONCLUSIONS

The data which have been assembled in this chapter show conclusively that the formation of capital is accompanied by a virtually concurrent expansion in the production of consumption goods. The traditional theory that an expansion of capital construction and consumptive output occur *alternately*—that the process of capital formation necessarily involves the curtailment of consumption and the transfer of labor and materials from the production of consumption goods to the creation of capital goods—finds no support whatever in the facts of our industrial history. The process involves rather a larger utilization of our productive energy at certain periods when an expansion occurs in

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[c] The estimates of residential construction are very rough. Dr. Kuznets' figures for 1925–32 have been raised to allow for "unallocable" construction. Prior to 1925 the estimates are based on the Federal Reserve Board index of residential construction.

[d] Includes non-residential construction and public works. The figures represent *gross* capital formation since they include depreciation and replacements.

the output of both capital and consumption goods and then a smaller utilization of our productive energy when the construction of both capital and consumption goods is declining.

We find no support whatever for the view that capital expansion and the extension of the roundabout process of production may be carried on for years at a time when consumption is declining. The growth of capital and the expansion of consumption are virtually concurrent phenomena.

CHAPTER V

WHICH LEADS: CONSUMPTION OR CAPITAL FORMATION?

Granted that the more or less simultaneous expansion of consumptive demand and capital formation has been established as an historical fact, it remains to inquire, Which leads the way? Do changes in business activity occur first in connection with the output of capital goods, or in connection with the output of consumption goods? So far as any evidence thus far presented goes, the increase in consumption might as well follow as precede an increase in capital formation. Is there any evidence to show whether changes in consumption lead or whether they follow changes in the rate at which new capital goods are being created?

It is obvious that once a period of general expansion is under way an increase in the rate of capital formation will bring in its turn an expansion of consumption, made possible by the fuller employment of labor and capital and the consequent increase of wages and profits; and it is equally clear that such an expansion of consumption will give a further stimulus to the creation of additional capital goods. Once begun, the process of expansion is interacting and cumulative in its effects. Similarly, once depression is under way, a reduction in wages and profits, in connection with either the creation of new plant and equipment or the production of consumption goods, will have cumulative ef-

fects throughout the economic system. But the fact that the process is interacting and cumulative in character does not indicate the order of precedence in a chain of economic consequences. It will be our purpose in this chapter to throw such light as is possible on this question by assembling relevant data drawn from the records of business activity.

CONFLICTING THEORIES OF RECOVERY

The issue with which we are here concerned has been much discussed in connection with the current depression, and two sharply diverging schools of thought are in evidence. One group of writers holds that the decline of consumptive demand has rendered the construction of new capital goods quite unnecessary, and that we cannot expect the production of new plant and equipment to be resumed on any significant scale until an expansion of consumptive demand has absorbed in considerable measure the slack in the utilization of existing capital equipment. It is this general point of view which underlies the efforts that have been made by the government to generate recovery through an expansion of purchasing power.

The other point of view is that recovery begins, or depression occurs, as a result of changes in the production of capital goods. In connection with the present depression, it is pointed out that the output of consumption goods, generally speaking, has been reduced by about 25 per cent only, while the output of capital goods has been reduced by something like 75 per cent. Capital goods are thus regarded as a sort of pivot around which the whole economic system revolves; and it is urged, accordingly, that recovery must be

initiated where the depression is greatest and unemployment most pronounced.

In considering this question it is necessary to point out that the basic issue has been greatly confused by the way in which the term "capital goods" is sometimes employed. In current discussions the term is frequently defined to include not only commodities used, or destined to be used, in the construction of plant and equipment and other fixed properties, but also commodities destined for individual consumption, if they are durable in character. Some writers employ the term "durable goods" instead of "capital goods." They include under this term, "homes, automobiles, and the unending list of goods of a more or less durable nature which add to the comfort and satisfaction of living"; and they consider as "consumption goods" only "such items as food, clothing, tobacco, gasoline, and fuel for domestic purposes." [1]

Thus the term "consumers' goods" is limited to commodities which are relatively short-lived. In accordance with this classification all iron and steel products, for example, whether used for structural engineering purposes, in the making of pleasure automobiles, in the manufacture of household equipment, or for baseball cleats, are classified as capital goods. However, not all consumption goods which are durable in character are placed in the durable category. For example, dried fruits and nuts, bottled wares, and seal-skin coats—which have a durability equal to or even greater than that of automobiles, household furnishings, and baseball cleats—would be classified under consumption commodities.

[1] Durable Goods Industries Committee, *Report to the President of the United States on National Recovery and Employment,* May 14, 1934, pp. 10-11.

Such a classification confuses the issue because it fails, in the main, to differentiate between goods which are created in direct response to the disbursement of purchasing power by individuals and goods which are created with the savings set aside for investment purposes. For example, automobiles, household furnishings, and other commodities which "add to the comfort and satisfaction of living" (tobacco and gasoline might well be included in this list) are purchased as a result of the allocation of a part of the income received by individuals for the procurement of these commodities. Recovery in such industries is quite as dependent upon an expansion of consumptive demand as it is in the food, tobacco, and clothing industries.

It is only in the case of houses and apartments, constructed on a commercial basis with funds derived from savings channels or credit operations, that durable goods are analogous to construction of plant and equipment. As a rule, such consumption goods are not built in response to orders from purchasers but rather in anticipation of possible sale after completion. Such residences may be constructed in large volume even though individuals are not at the moment increasing their outlays for housing accommodations.

The extent to which production schedules in various lines of activity are curtailed in a period of depression depends upon the *dispensability* of the product, rather than upon its *durability*. When economies become necessary consumers forego first those things which are least essential, whether durable or ephemeral in character. Witness the falling off in attendance at places of amusement and athletic contests, the decrease in the consumption of ice cream and candy, and the decline in travel, as well as the reduction in purchases of new

houses and furnishings, automobiles, and jewelry. The extent of the curtailment of demand for the various types of consumption goods reflects the degree to which they can, respectively, be foregone. In view of the restricted demand for the products which existing capital goods can turn out, it is natural that *additional* plant and equipment, railways and transportation facilities, and other forms of fixed capital should fall in the class of commodities that is for the time dispensable.

Though much confusion has been created by the exclusion of many forms of consumers' goods from the consumption goods category, and the more or less synonymous use of the terms "durable goods" and "capital goods," it remains true that the most drastic curtailments of production, typically speaking, have occurred in connection with the production of fixed forms of capital and in the commercial construction of houses. The argument that the process of recovery must begin with the expansion of activity in the creation of fixed forms of capital must therefore still be considered on its merits.[2]

Inasmuch as periods of expansion and contraction, in the output of both consumption goods and capital goods, are associated with the ups and downs of the business cycle, it will be necessary to consider our present problem in relation to cycle phenomena. The focus

[2] The relative importance of the so-called capital goods industries, as compared with the consumption goods industries, is of course profoundly changed if "durable consumer goods" be placed in the latter category. It is frequently stated that about 60 per cent of the workers are engaged in the production of consumption goods and 40 per cent in the production of capital goods. If "durable consumer" goods be classified as consumption goods, these percentages become something like 80 or 85 per cent for consumption goods, with the balance for capital goods proper.

of our inquiry will be the point or time at which a change in general business activity occurs, both at the beginnings of depression and at the beginnings of recovery.

One may make a plausible argument, on theoretical grounds, in support of either order of precedence. Some writers have argued, for example, that the gradual reduction of wages, interest, and prices of materials, during the course of a depression, creates a situation which will automatically lead to the construction of new plant and equipment. It is pointed out that by virtue of the low cost and improved quality, new factories and equipment would be able to undersell those which had been previously constructed on a higher cost basis. This production of new capital goods would create employment and enlarge purchasing power for consumption goods and would thus bring about general expansion. Such an argument certainly is not lacking in plausibility.

Some writers have argued, on the other hand, that depressions pass away when the accumulated stock of consumers' goods in the hands of manufacturers, wholesalers, and retailers becomes sufficiently reduced. It is pointed out that during a depression consumption remains at, say, a 75 per cent level, whereas current production of consumption goods may be reduced to 25 or 50 per cent of the normal level—with the result that inventories are gradually used up. A point is reached sooner or later where it is necessary to expand the output of consumption goods for the purpose of meeting current demands. When this expansion in production schedules begins, additional employment will be given in the consumer industries, the amount of purchasing power distributed will be enlarged, and the

process of general recovery will begin. This theory is also not without plausibility.[3]

If we are to clarify the problem it will be necessary, however, to turn from theoretical considerations to a study of actual cases. We shall not attempt to make any exhaustive survey of the history of business cycles; nor is there any thought of setting forth a "true theory" of the more or less periodic fluctuations in business conditions. It is our view that the search for some *single cause* of business fluctuations has on the whole been as confusing as it has been fruitless. A highly complex and delicately adjusted economic machine may well be thrown out of gear by different types of maladjustment; and, similarly, recovery may come about as a result of varying combinations of circumstances. It will be our plan, accordingly, to study those periods for which available data indicate the immediate steps in the process of change from prosperity to depression, or from depression to recovery.

DOES DEPRESSION BEGIN WITH CURTAILMENT OF CAPITAL CONSTRUCTION?

We may consider first the depression which began in 1929. What does the evidence show as to the place of initial maladjustment? Did the depression start with a reduction in the construction of plant and equipment or other forms of productive capital? Or was a decline in the output of consumption goods the source of the difficulty?

[3] The theory that high interest rates cause business recession and that low interest rates stimulate recovery implies, in the form in which it is most commonly stated, that changes in production begin as a result of changes in the flow of short-term credits, which would affect the output of both consumption goods and goods destined for capital construction. This theory is, however, sometimes related solely to long-term interest rates.

The evidence shows no monthly decline in the value of contracts awarded for the construction of factory and commercial buildings, prior to October. In fact, the value of *contracts awarded* for such buildings in the year 1929 as a whole was in excess of the amount in 1928.[4] The expenditures on additional railroad structures and equipment were also higher in 1929 than in 1928, increasing from 677 million dollars to 854 millions. *Contracts awarded* for "public works and utilities" were greater in the first nine months of 1929 than in the same period of 1928. This index, it may be recalled, included non-residential construction and public works along with capital equipment. The only division of the construction industry in which there was evidence of a decline was in residential buildings. The value of *contracts awarded* in 1928 was 232 million dollars, as against 160 millions in 1929, and each month in 1929 was somewhat below the corresponding month in 1928. (See also the chart on page 68.) There are no data as to the *actual construction* month by month, but it is not improbable that there was some slight tapering off in the rate of actual construction.

Aggregate production destined for capital equipment, as is shown by the index given on page 46, was substantially higher in 1929 than in 1928. While monthly figures are not available, it is reasonably clear from the fact that the average for the whole year 1929, including the months after the depression began, was so much above that of the whole year 1928, that the volume of production of capital equipment must have been substantially higher in the first nine months of 1929 than during the corresponding months of 1928.

[4] Annual supplement to *Survey of Current Business*, U. S. Department of Commerce, 1931, pp. 193-95.

The depression of 1929 cannot, on the other hand, definitely be said to have been precipitated by changes beginning on the side of consumption. The output of consumption goods as a whole, exclusive of residential construction, increased for the year 1929 by more than 5 per cent; with residential construction included the percentage was 2.3. Here and there weaknesses were in evidence; an example was the recession in automobile construction from the extraordinary level attained during the period when the Ford Company was making up for its period of suspension incident to the change of models. But, in aggregate terms, no actual decline in the flow of goods through consumption channels occurred, nor was there any general break in the prices of consumers' goods.[5]

The break in October 1929 occurred in the security markets rather than in either capital goods or consumers' goods markets. The effects manifested themselves first, however, in the demand for consumption goods. Many individuals who were losing money in the stock market immediately began to curtail orders for dispensable luxury goods. The resulting decline in demand led quickly to a curtailment in production schedules in some of the consumption goods industries, with an accompanying shrinkage of purchasing power. For example, the production of automobiles, with allowance for seasonal factors, declined nearly one-half from October to December. Even textiles, and leather and shoes, showed a material decline during the first two months of the depression.

We are not here interested in discussing the under-

[5] Composite indexes of production show some decline from a high peak attained in May–June 1929; but this decline was no greater than similar decreases in nearly every year back to 1922.

lying factors responsible for the break in the stock market [6] or for the intense character of the world depression which ensued. The truth is that the economic situation in 1929 was vulnerable at more than one spot; but we are at the moment concerned only in locating the place at which the break actually occurred.

The sharp but relatively short-lived depression of 1920-21 clearly began with maladjustments on the consumption side of the economic structure. The boom from the spring of 1919 to the spring of 1920 had been accompanied by very rapidly rising prices, and by the accumulation of large inventories in the hands of manufacturers and middlemen. There was some decline in the output of consumption goods between January and May 1920, but the real break came with what was known as the buyers' strike of the latter month, and resulting sharp reduction in prices. This led to a wholesale cancellation of orders for consumers' goods and for the materials which were entering into the production of such commodities; and with the curtailment of orders came a reduction in employment and in purchasing power. The production of consumers' goods destined for human consumption showed a decline from an average of 67.2 in 1919 to an average of 62.7 in 1920, whereas the production of goods destined for use in capital equipment rose from 70.8 to 73.5.[7]

Some of our depressions have been precipitated by "tight money" and bank failures, followed by panic conditions. Regardless of the cause of a banking panic, there is, under such circumstances, a quick slowing down of activity in the production of both consumption goods

[6] For discussion of factors responsible for the preceding enhancement of security prices, see Chap. X.

[7] See Kuznets' physical volume index, Appendix D, Table I, p. 193.

and new capital goods. The fear and the financial difficulties engendered by the panic cause a halt in business commitments in every direction, with resulting unemployment and rapid shrinkage of purchasing power.

The case which comes nearest to showing a depression resulting from curtailment in the construction of capital goods is that of 1873. During the early part of the preceding boom period, the construction of railroads was expanding with great rapidity, rising from 2,979 miles of new track in 1868 to 7,379 miles in 1871. In 1872, however, there was a shrinkage to 5,878 miles, and the decline continued in 1873. However, trade reports indicated that business in general continued to be good until the time of the panic in September.

While the declining rate of construction in the most important capital goods industry of that time may well have been a significant factor, the situation was complicated by financial difficulties both in this country and abroad. In the spring of 1873 panics occurred in Vienna, Berlin, and other cities of Continental Europe. In Great Britain, high money rates were held to be a cause of the contraction which occurred in the second half of the year. These European difficulties were not without their effects upon the New York financial markets. Our conclusion would be, therefore, that the recession in railroad building was a contributing, though not perhaps a controlling, factor in the situation.

DOES RECOVERY BEGIN WITH THE EXPANSION OF CAPITAL CONSTRUCTION?

In analyzing this aspect of our problem, we shall confine our attention to those depressions where the steps in the process appear to be most clearly revealed. No

statistical data are available with reference to the recoveries following the crises of 1837 and 1857; but it is possible to show with a considerable degree of reliability how the recovery from the great depression of the late seventies started. While no general indexes are available with reference to the construction of new capital, there are figures relating to the construction of railways.

The depression of the seventies began with the banking crisis of 1873, and continued to be extremely acute for a period of nearly six years. The beginning of recovery is usually given as the summer of 1879, though, as we shall see, there was some slight evidence of improvement before that time. The steps in the recovery process appear to have been as follows: The wheat crop in 1877, thanks to an exceptional yield per acre, was substantially larger than it had been in any preceding year, amounting to 395 million bushels as compared with 309 million bushels in 1876.[8] At the same time, owing to a restricted world crop, the price was somewhat higher than in 1876, being $1.06 on December 1 as compared with 97 cents for the same date the preceding year. The acreage was sharply expanded in 1878 and the crop increased to 449 million bushels; but owing to a decline in the price to 78 cents, as of December 1, the income received by the farmers was less than in the preceding year. In 1879 there was a crop of 459 million bushels which, in consequence of an acute shortage outside the United States, was marketed at substantially higher prices, the quotation for December 1 being $1.11. Exports increased from 92 million bushels

[8] Wheat figures given here are the latest revision, published by the U. S. Department of Agriculture in September 1934.

in 1877 to 150 millions in 1878 and to 182 millions in 1879.

Turning to the situation as to railroad construction, we find that although population had been increasing, particularly in the Middle West, throughout the depression period, the construction of new railway lines was at a low ebb. Whereas 7,379 miles of line had been built in 1871, only 1,711 miles were constructed in 1875 and 2,280 in 1877. At the same time the purchase of rolling stock was at a very low level. In 1878, however, orders for locomotives showed some increase throughout the year, and new construction increased to 2,697 miles. It was not, however, until 1879, particularly the second half of that year, that sharp expansion occurred in the railroad industry. For the year as a whole the construction of new lines increased to as much as 4,817 miles.

It is evident from the foregoing data that the favorable agricultural situation in 1877, together with an expansion of tonnage which continued through 1878, gave a slight impetus to railroad construction. Then the bumper crop of 1879, accompanied by high prices, gave to the very important wheat-farming section of the United States a substantial expansion of purchasing power which stimulated, first, railroad expansion and, in due course, all phases of business activity. The additional income of the farmers was paid out in part for the purchase of consumption goods and in part for the purchase of capital equipment required on the farm.

Recovery from the great depression of the seventies did not begin with increased construction of capital goods. It resulted rather from a fortuitous development affecting the value of a great staple consumption

commodity—large wheat crops in the United States, both in 1877 and 1879, being marketed at relatively high prices, the result of a short crop in other countries. The recovery movement in 1879 was also aided by the failure of the cotton crop in India. The American crop in 1879 was 5,755,000 bales, as compared with 5,244,000 bales the year before, but the price in 1879 averaged 12.02 cents a pound as compared with 10.83 cents in 1878.[9] The forward movement thus begun in agriculture spread in cumulative fashion throughout the entire industrial system.[10]

Another factor in the situation in the seventies should be mentioned here. The greenback currency, or United States notes, originating during the Civil War, was not redeemable in gold, and for 16 years the United States was on a paper money standard. A law passed in 1875 required the Secretary of the Treasury to accumulate gold for the purpose of making the greenbacks redeemable after January 1, 1879. The Secretary gradually accumulated a meagre balance for this purpose, and the paper money rose to par in December 1878. This return to "sound money" doubtless increased business confidence; but there was no immediate response. Trade reports of the first half of the year were extremely

[9] Alexander D. Noyes also lists the completion of the first pipe lines to the Atlantic seaboard as a helpful factor in the export trade. See *Forty Years of American Finance*, p. 57.

[10] The gain to the American farmer was not for any very long period at the expense of the industrial producers in Eastern states or in foreign countries. The resulting increase in purchases made by farmers, and in turn by the railroads, led to increased activity in manufacturing centers both in the United States and abroad. The high-priced grain which was purchased by Great Britain, for example, in quantities larger than usual, was in reality paid for after the lapse of a few months by expanded sales of British steel rails and other manufactured products in the United States.

gloomy; and it was not until the impetus was given by agricultural improvement that long-term capital commitments began to be made in any significant volume. The return to the gold standard was thus helpful, but it was evidently not the initiating factor in recovery.

The recovery of 1897 also was rooted chiefly in agricultural improvement resulting from accidental events. Acute depression had continued without interruption through 1893 and 1894. The first half of 1895 showed a slight revival, but the depression was renewed in the autumn of the year and continued throughout 1896 and the first half of 1897. The slight recovery in the spring of 1895 appears to have been associated with the sharp advance in the price of wheat—which was lost by the following September—and with increasing purchases of railway equipment which can be ascribed only partially to the improvement in the agricultural situation. There were increasing purchases of railway cars throughout the year 1895, and the explanation advanced at the time by some railroad officials was that such purchases were necessary to replace worn-out cars, though to some extent an anticipated increase in railroad traffic was assigned as the reason for the increase in orders.[11] This brief recovery movement thus appears to have been based in part on replacement of capital goods and in part on a temporary improvement in the agricultural situation.

Turning now to the events of 1897, we find that the wheat crop was 606 million bushels, as compared with an average of 527 millions for the four years preceding. As the result of a restricted yield in other wheat-produc-

[11] See John E. Partington, *Railroad Purchasing and the Business Cycle*, p. 96.

ing countries the price on December 1 was 81 cents a bushel, as compared with 72 cents in 1896 and around 50 cents in 1893, 1894, and 1895. In 1897, as in 1879, there was also some increase in the value of the cotton crop. The marked improvement in the agricultural situation, which became evident by the middle of 1897, was quickly followed by a general expansion of business activity.

In the closely associated field of railway equipment, purchases of freight cars and passenger cars were few in the first half of 1897 but increased thereafter. Purchases of locomotives and rails, however, increased all through the year 1897, the increase in the latter being ascribed in part to a collapse of a steel rail pool which had restricted purchases of rails in the years immediately preceding. In this case it might perhaps be argued that a genuine recovery movement would have emanated from the increased purchases of railroad equipment independently of any expansion in the general purchasing power of the farm community. While it is impossible to prove that such would not have been the case, it is clearly evident that the agricultural improvement was a powerful aid; and it is not impossible that, had the agricultural situation been unfavorable in the autumn of 1897, the slight improvement noted would have flattened out as it did in 1895.[12]

[12] In studying this period it is interesting to note that Russian recovery began in 1893, two years before any improvement began in Western Europe or the United States. Russia had exceptionally large wheat crops and large exports in 1893, 1894, 1895, and 1896, whereas the American crop was relatively small in each year. In 1897 the situation was reversed—a small Russian crop and a bumper American crop.

It may also be noted in passing that the American revival of 1891-92, unmatched in European countries, was evidently the result of the extraordinary wheat crop of 1891, amounting to 678 million bushels, which was over 100 million bushels larger than the previous record crop.

It should not be understood from the foregoing illustrations that the writer holds that recovery is always due to favorable agricultural conditions resulting from accidental factors in the world crop situation. These cases have been cited simply because they are actual instances in which recovery was stimulated by a rise in the value of a staple consumption commodity. To guard against the danger into which nearly all students of the business cycle have fallen, namely, of ascribing business fluctuations to some single cause or force, we now direct attention to other recovery movements of an essentially different character.

The recovery of 1915 was generated by the demand for war supplies emanating from European governments. The funds for such expansion were derived in part from taxation and in part from the sale of securities to individuals and banking institutions. In either case the funds obtained by governments were used to buy increasing quantities of war supplies of every kind and description. A large part of this purchasing power was laid out for consumers' goods, such as food and clothing, thus stimulating the consumption goods industries and leading to an expansion of productive equipment in those industries. Munitions might also properly be

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Owing to a relatively small world crop the price was fairly good and substantially higher than in the ensuing years. Exports increased from 109 million bushels in 1890 to 229 millions in 1891.

Again in 1924, recovery from the sharp industrial reaction of the spring and summer appears to have been greatly stimulated by a very large wheat crop which was sold at high prices. The American wheat crop of 1924 was 840 million bushels, as against 759 millions in 1923; but the price on December 1 was $1.30 a bushel as compared with 92 cents the preceding year. As a result of a short world crop exports from the United States increased from 132 million bushels to 255 million bushels.

classed as consumption goods in that they are immediately used up and destroyed in the process of waging war. Such war-time goods as ships and other transportation facilities, as well as government munitions establishments, would, however, clearly be classed as capital goods. But quite regardless of the character of the goods purchased, the process of recovery was generated by an outpouring of purchasing power by way of government treasuries. It did not begin with either an expansion of ordinary consumptive demand or an increase in the production of private capital goods.

The cases thus far reviewed have related to major swings in business activity. It will be useful to turn now to a period in which the swings were less pronounced in character, such as that from 1901 to 1913. The facts as to the fluctuations are: From 1901 to the middle of 1903 there was great prosperity. The latter half of 1903 and the first half of 1904 was a period of mild depression. This was followed by very active business until October 1907, the ensuing depression extending through the year 1908. The year 1909 and the first part of 1910 constituted a prosperous period, and then came another mild depression extending to the end of the following year. The year 1912 and the early months of 1913 showed recovery, but this was followed by a new recession continuing into the first half of 1915.

The evidence shows that changes usually occurred first on the consumption side. The table on page 45 shows the *annual* indexes of production of "goods destined for human consumption" and "goods destined for capital equipment." Without monthly or quarterly indexes it is impossible, in some cases, to determine the order of precedence. For example, one cannot tell whether the recession of 1903 began on the consump-

tion side or the capital side, for the *annual* indexes show merely a corresponding decline in both. It is evident, however, that recovery began on the consumption side, for in 1904 the consumption goods index rose, while the capital equipment index showed a further decline. Again in 1907 the consumption goods index fell, whereas the capital goods index continued to rise.[13] No priority is indicated in connection with the recession of 1911 or the pick-up of 1912; but the depression of 1913 began with a decline in consumption, the capital goods index showing a rise for the year. The lag, where revealed by these indexes, is thus in every case on the side of capital goods.

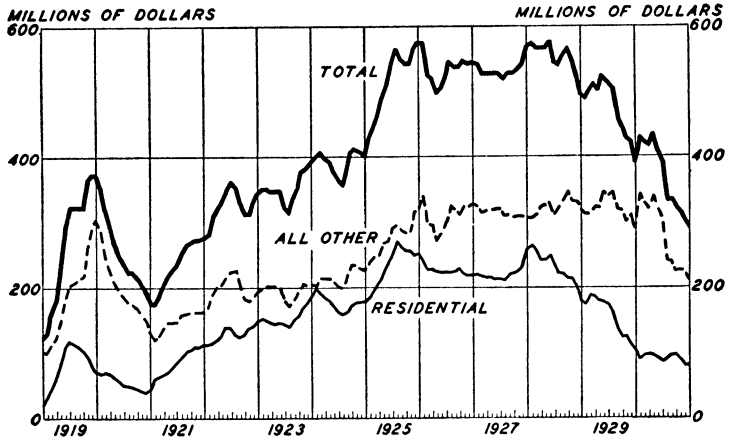
RESIDENTIAL CONSTRUCTION AND BUSINESS FLUCTUATIONS

The contention has frequently been made that business fluctuations are initiated by changes in the volume of construction, particularly of residences. Before concluding this analysis we must, therefore, survey the evidence bearing on this question. Unfortunately, no adequate monthly or quarterly data are available prior to 1919 with which to compare changes in the volume of construction with changes in the volume of business. However, certain annual data with reference to building *permits,* as distinguished from actual contracts, are available for a selected group of cities as far back as 1875, though these data do not show residential construction separately from non-residential. The available data do not indicate any close relationship between

[13] It is of interest to note, however, that prices of producers' goods, according to Mitchell's classification, showed a slight decline before a fall occurred in the prices of consumption goods. See Wesley C. Mitchell, *Business Cycles,* 1913, p. 99.

fluctuations in the volume of construction and changes in business conditions prior to the war.[14]

BUILDING CONTRACTS AWARDED, 1919–30 *



* Estimated value of building contracts awarded in 37 Eastern states. The figures are three-month moving averages centered at the middle month of each group of three and are adjusted for seasonal variations. See *Federal Reserve Bulletin*, July 1931, p. 359.

In the post-war period changes in the volume of residential construction have evidently played an important part in business fluctuations. The sharp recovery of 1919 was largely attributable to the replacement of depleted stocks of ordinary consumption goods, both in this country and abroad. While there was some pick-up in residential construction, building activities were held back by the high costs of construction. Recovery from the depression of 1920-21 was undoubtedly stimulated by the increase of construction, as gauged by contracts awarded, which began in February and continued to expand throughout the year. Since there had been little residential construction from the beginning of the war,

[14] See John R. Riggleman, "Building Cycles in the United States, 1875-1932," *Journal of the American Statistical Association*, June 1933.

housing facilities were quite inadequate for the demands of an enlarged population. The resulting expansion of residential construction not only contributed in bringing a quick revival from the early post-war depression, but it helped to give us a period of great prosperity.[15] The monthly figures of construction, both residential and other, from 1919 to 1930 inclusive, are shown in the accompanying graph.

It will be observed that residential construction began to increase before there was an upswing in other construction, and that the upward movement continued, with some fluctuations, until the early part of 1928. As was noted on page 56, the volume of contracts awarded in each month of 1929 was below the corresponding month in 1928. Other construction held up throughout the year. It is clear from these facts that, in so far as construction has been a potent factor in post-war business fluctuations, the changes have manifested themselves first in buildings used by consumers.

NEW INDUSTRIES IN RELATION TO RECOVERY

Consideration must also be given to a widespread opinion that recovery usually occurs as a result of the development of some great new industry. The statement is frequently made that one of the most discouraging features in the present outlook is the impossibility of discerning any incipient industry which might play a role in recovery similar to that performed by railroads, public utilities, automobiles, etc., in connection with former depressions.

It is apparent from the foregoing analysis that recoveries from great American depressions in the past were not typically *initiated* by a growth of new industries *dur-*

[15] The shifting of population to suburban areas, prompted by automobile transportation, of course played an important part.

ing the depression. The first period of railroad development in this country, for example, did not begin in a depression but was a feature of the expansion era of the 1830's. The rapid growth of electric and other public utilities did not begin in the midst of the depression of the nineties, but rather in the boom period which followed. Nor did the automobile industry, then in its infancy, bring us out of the depression of 1907.

The truth is that new industries are most likely to be developed after a period of expansion is well under way. Witness, for example, the expansion of the radio, the airplane, the chemical, the motion picture, and the natural gas industries in the boom period of the late twenties.[16] New inventions are made and new developments are planned in times of depression, but new industries are apparently not launched on a sufficiently extensive scale to bring about a general business revival.

Those who have argued that periods of business expansion and contraction always begin with changes on the side of capital goods have simply failed to distinguish sharply between the forces which produce a change in business conditions and the situation which develops after a change has occurred. They have merely noted that during a period of expansion the rate of increase in the output of capital goods is greater than the rate of increase in the output of consumption goods, and *vice versa* during a depression. This is quite a different matter, however, from showing that changes on the capital goods side usually initiate fluctuations in business conditions.

CONCLUSIONS

In the foregoing brief survey of business oscillations in the United States we have not been concerned with

[16] For data see Chap. X.

discovering the fundamental or underlying cause, or causes, of business cycles. We have entered into a discussion of cycle phenomena merely for the purpose of throwing light upon a single question, that is, whether evidence shows that fluctuations occur first in the construction of capital goods or consumers' goods.

We have found that in most cases changes in business conditions appear to have originated in forces affecting the output of goods destined for consumption. These changes, it should be emphasized, may be the result of factors affecting the purchasing power of large groups of consumers, or they may come as a result of increases or decreases in production schedules intended to bring about a better adjustment between the output of goods and the current demand therefor. With reference to capital goods the most that can be said is that in some cases a recession or a pick-up in the construction of such goods has been a supplementary factor in bringing about business fluctuations. In the post-war period, however, fluctuations in the amount of residential construction have been an important factor in initiating changes in general business conditions.

The general conclusion reached in this and the preceding chapter, that a growth of capital does not take place unless expansion of consumption is also occurring, does not appear upon close analysis to be surprising. The motivating force in all economic activity, under a system of private initiative, is the wants and demands of people. The base of the economic pyramid is the production of consumption goods—first, primary necessities, and then comforts and luxuries. In the ascending scale of goods that are relatively indispensable we find new plant and equipment at the top. This is

simply because the demand for plant and equipment is derived from the demand for the consumption goods which such plant and equipment can produce.

The mere fact that the curtailment of business activity during the course of a depression is very much greater in connection with the construction of plant and equipment than in the output of consumption goods in no way indicates that the capital goods industries are the pivot around which the economic system revolves. The moment the demand for consumption goods declines—for whatever reason—the demand for new capital goods declines also, *and in vastly greater proportion.* A slight shrinkage at the base of the pyramid very nearly eliminates the top. As the amount of unutilized plant and equipment increases as a result of the curtailment of demand, the production of new plant almost entirely ceases; and in the course of a depression capital construction is confined in the main to necessary replacements and to such installations of new equipment as will effect immediate reductions in operating costs. The percentage change in the output of capital goods is thus naturally very much greater than the percentage change in the output of consumers' goods.

The fundamental significance of the demand emanating from consumers in relation to all phases of business activity may be seen most clearly under conditions where standards of living are very low and the margin available for the purchase of other than primary necessities is meagre. In England, during the "hungry forties," it appears that whenever the prices of foodstuffs rose in consequence of a bad harvest, virtually all the income of the English laboring classes went for food, much of which was imported, with the result that manufacturing industry languished and unemployment be-

came widespread. When food prices fell as a result of larger harvests, a demand again arose for manufactured goods, and employment became once more relatively plentiful.[17] The economic life of China, as has often been observed, ebbs and flows with fluctuations in the food situation. In years of scarcity there is no income available for the support of any of the industries which minister to the comforts and conveniences of life.[18] Under such conditions the formation of new capital would naturally be in suspense, even though funds were available for its construction.

The conclusion that economic recovery usually begins with changes affecting the consumption side is based, it must be borne in mind, upon the history of a period in which there was practically complete reliance upon the system of *individual initiative*. It remains possible that, through *collective action*—either under private auspices or through the instrumentality of government—recovery might be generated by developments in connection with the capital goods industries. The problem of recovery is to get a forward movement of substantial proportions started *somewhere*. If a large-scale expansion movement, through some form of concerted action, were begun in connection with the purchase of railway equipment or the rehabilitation of industrial establishments, employment would obviously be increased, consumptive demand would expand, and the consumption goods industries would themselves be stimulated. Similarly, a great housing development or an extensive program of public works might possibly initiate a recovery movement.

It is thus in no sense necessary to assume that recov-

[17] See Brougham Villiers, *Britain after the Peace*, p. 116.
[18] See, for example, Alice Tisdale Hobart, *Oil for the Lamps of China.*

ery *must* come solely from one side or the other. Indeed, it would seem from the analysis which we have been making in this and the preceding chapter that the best hope of success in stimulating a strong recovery movement through concerted action would be to operate on both the consumption side and the capital side simultaneously, for each might be expected to reinforce the other.

CHAPTER VI

COMMERCIAL BANKS AND THE SUPPLY OF FUNDS

In order to set the stage for the analysis in this and following chapters, it is necessary briefly to summarize our findings up to this point. We raised at the beginning a basic problem of economic organization, asking whether the apparent necessity of reducing the flow of funds through consumption channels in order to provide funds for capital formation did not result in an economic dilemma. At the end of Chapter III we arrived at the conclusion that if capital formation is to take place on an extensive scale, there must be a *simultaneous expansion* in the flow of funds through consumption and investment channels. In Chapter IV a second conclusion was reached, namely, that expansion and contraction in the output of capital goods and consumption goods, in fact, occur not alternately but concurrently. In Chapter V we found that fluctuations in business activity in the United States have usually manifested themselves *first* in changes in the output of consumption goods rather than of capital goods.

The analysis of consumption in relation to capital formation which we have made in the last two chapters has run in terms of the actual production of goods and services. We must now return to a consideration of the flow of funds by means of which economic enterprise is carried out. It is evident that if the creation of new capital, as we have indicated, occurred chiefly

when consumption was also expanding, there must somehow have been a simultaneous increase in the flow of funds through consumption and investment channels. How has this been made possible?

In Chapter II we presented a general picture of the financial institutions which are involved in the transfer of funds saved by individuals to business enterprisers interested in expanding productive plant and equipment. Among these institutions the commercial bank was mentioned as playing some part in the accumulation of savings deposits which were rendered available for long-term investment. Besides acting as an intermediary institution in the transfer of funds from savers to capitalistic enterprisers, the commercial banks, taken as a system, create or manufacture great quantities of funds which are rendered available, like any other money, for the manifold requirements of business enterprise. As we shall hope to show, these institutions have played a role of fundamental significance in connection with the formation of productive capital. It is the commercial banking system, in fact, which has enabled a pecuniarily organized society to escape, in considerable measure, from the dilemma which has been outlined in Chapter III.

We are here interested not in the role which commercial banks play in *transferring* funds but in their capacity to create credit instruments which are ordinarily the equivalent of money. In this respect they are a generating force, a sort of economic pulmotor.

In analyzing the significance of commercial banks in connection with capital formation it will be expedient to break the discussion into three parts. The present chapter will be devoted to an explanation of the process by which the commercial banking system manufactures

credit in general; Chapter VII will show the purposes for which bank credit is extended; and Chapter VIII will indicate the way in which the commercial banking system has facilitated the production of new capital goods.

HOW THE COMMERCIAL BANKING SYSTEM MANUFACTURES CREDIT

It is the operation of the commercial banking system, taken as a whole, that results in the creation of credit currency and thereby adds to the total volume of circulating media. In order to make the process of credit creation clear, however, it will be necessary first to analyze the operations of an individual commercial bank. For this purpose we shall assume a self-contained community, that is, one having no financial relations outside its own borders and having as yet no commercial banking institutions. Such an assumption is not unrealistic, for it was under such conditions that the actual development of banking began. We shall then broaden the analysis, in successive steps, to include the several banks which may exist within a given community, and, finally, all of the banks within a nation as a whole.

Let us assume, then, that a group of individuals within an isolated community decides to form a commercial bank with a capital of a million dollars. Ten thousand shares of stock are issued at $100 per share. This stock is set down as a liability of the bank, inasmuch as it represents the obligation of the banking corporation to the shareholders. After an outlay of $100,000 for a bank building and the necessary furniture and fixtures, the preliminary financial statement of such a bank would stand as follows:

Assets		Liabilities	
Cash	$900,000	Capital stock....	$1,000,000
Banking house and equipment	100,000		

Two types of operations may be expected to begin almost immediately. First, certain individuals—stockholders, and others—will deposit with the bank cash which has hitherto been held in their own strong boxes. If, in the course of a few months, deposits in the amount of $100,000 are made and there are no withdrawals, the balance sheet will show, in addition to the foregoing items, new assets in the form of cash of $100,000, and new liabilities in the form of deposits (owing to depositors) of $100,000. Such deposits would be identical in character with those which individuals would make at a savings bank.

It is the second type of operation, however, which constitutes the essential characteristic of the commercial bank. The bank, when it opens its doors, states not only that it solicits deposits of cash but that it is in a position to make loans to merchants, manufacturers, and others. These loans, as we shall see, result in new deposits against which checks may be drawn in the same way as they are drawn against deposits of actual cash.

Let us assume that business men, in response to this invitation, come to the bank for loans with which to conduct their business operations. Mr. *A* is given a loan of $100,000 for four months, the interest at 6 per cent being deducted in advance. He has the option of withdrawing $98,000 in actual cash from the bank or of having it credited as a deposit account against which he may draw checks. Since drawing checks is a safer and more convenient means of making payments,

A elects to take a deposit account covering the entire $98,000. Inasmuch as we wish to focus attention upon this particular transaction, we shall omit from the balance sheet the $100,000 of new deposits which we assumed had been made in the form of cash. The balance sheet would then stand as follows:

Assets		Liabilities	
Loans and discounts	$100,000	Capital stock	$1,000,000
Banking house and equipment	100,000	Deposits	98,000
Cash	900,000	Undivided profits	2,000
	$1,100,000		$1,100,000

Suppose now that Mr. *A* writes a check for $98,000 in favor of Mr. *B*. Suppose also that *B* desires to be a customer of this bank, and upon receipt of the check presents it at the bank and asks that an account be opened in his name and that the $98,000 check be deposited to this account. It is evident that the result of this operation, so far as deposits are concerned, is merely to deduct $98,000 from *A's* account and add $98,000 to *B's* account. The total deposits owed by the bank remain unchanged. While *B's* deposit account comes over the counter in the form of a check presented to the bank, it is obvious that it is still indirectly the result of the loan that was made to *A*.

Since it is more convenient for *B* to meet his obligations by means of checks rather than in the form of actual cash, we may assume that he will write checks to those to whom he is indebted. Let us assume that he writes four checks of $24,500 each; and that Messrs. *C, D, E,* and *F,* desiring to do business with this bank, in turn present these checks for deposit. The net result still is to leave the total of deposits unchanged; though

instead of being credited to *A* or *B* the deposits are now credited to the accounts of other individuals. In their turn *C*, *D*, *E*, and *F* may write checks against their deposit accounts for varying amounts and to the order of sundry persons. If all the people receiving such checks in turn present them to this bank for deposit to their respective accounts, it is obvious that, while there would be an ever shifting personnel among depositors, the total deposits would remain at $98,000.

In fact, however, some individuals would wish to withdraw a portion of their deposit accounts in the form of actual cash, because some of their needs could be more conveniently met with actual cash than by means of checks. Hence, it is essential that the bank be prepared to meet such demands for cash as may arise. The primary problem is to determine what percentage of outstanding deposits at any one time is likely to be called for in the form of actual cash.

Let us assume that experience shows that not more than 25 per cent is ever demanded in cash. Under these circumstances it would be possible for the bank to make loans and create new deposit accounts not only up to the full amount of the capital of one million dollars, but much beyond that amount. In fact, under the conditions assumed, the bank could gradually expand its loans to the extent of $3,530,000. The balance sheet would then read:

Assets		Liabilities	
Loans and discounts	$3,600,000	Capital stock	$1,000,000
Banking house and equipment	100,000	Deposits	3,530,000
Cash	900,000	Undivided profits	70,000
	$4,600,000		$4,600,000

It is apparent that, to the extent that checks are presented for cash, the cash reserve of $900,000 will be drawn down. But this reserve of cash will also be periodically replenished by the repayment of loans falling due—or by the actual deposits of cash made by new customers. There will be a more or less continuous outflow of cash from the bank and also a more or less continuous inflow. The primary task of the managers of such a bank is to schedule the maturities of the loans in such a way as to bring a steady backflow of funds to the bank. In this connection, allowance will, of course, have to be made for known seasonal variations in the demand for cash.

Let us now complicate the problem by assuming that there are two banks in this community. When bank No. 1 makes a loan of $100,000 to *A*, who writes a check in favor of *B*, the latter now deposits the check not in the same bank but in bank No. 2. This second bank will present the check to the first bank for payment. Now in the event that the first bank had not, on the same day, received for deposit checks which had been drawn against bank No. 2, it would be necessary for this bank to turn over $100,000 in cash to the second bank. But under the conditions which would gradually develop in any community, both banks would be making loans simultaneously, and each would be receiving checks drawn against the other bank. Accordingly, there are always substantial offsets; and it is only the *balance* owed by one bank to the other which has to be settled in actual cash.

The situation may be complicated still further by assuming that eventually a considerable number of banks are organized in this community and that each is daily making loans and creating deposit accounts

against which checks are drawn and deposited in one bank or another. This approaches the actual situation that exists in large financial centers. Under these circumstances each individual bank finds that claims are presented against it by all the other banks and that it, in turn, has counter-claims against all the other banks in the community. By means of a clearing-house association a single balance may be struck for each bank with all the other banks—which balance, only, need be paid in cash.

The situation may now be complicated yet another degree by articulating the activities of this community, which we have thus far assumed to be self-contained, with the business and financial activities of other communities in which commercial banks have also been developed. Some of the checks drawn against deposit accounts in the community in question will be sent to individuals in other communities and these checks will be deposited in banks outside the community in which they originate. Will it not now be necessary, when these checks are presented for payment, for the second community to draw funds away from the first? The answer once more is that cash will move only to settle net balances which cannot be offset by counter-claims.

There tends to develop a network of interrelations between the banks of different communities and, as a result, cash moves only as a last resort—to settle balances that cannot be otherwise offset. Since the establishment of the Federal Reserve system the movement of cash between communities has been almost entirely eliminated, the obligations being adjusted by debits or credits against balances held by the member banks with Federal Reserve banks.

It should also be pointed out at this place that the

commercial banking and credit system which we are describing operates more or less on a world plane. Checks—or rather, in this instance, bills of exchange—drawn against American banks are deposited in the banks of other countries; and in turn bills of exchange on the banks of other countries are presented for payment at banks in this country. Thanks to the mechanism of the foreign exchange market these counter-claims are in the main offset, not only as between the United States and a single country such as Great Britain, but between the United States and all other countries; and also, for that matter, between Great Britain or any other country and the rest of the world as a whole. That is to say, each country settles its financial operations with the outside world in the main without any substantial movements of cash.

In all the foregoing discussion we have been referring to a normal situation in which the commercial banking credit system and the exchanges are functioning smoothly. At times a particular bank may be subjected to a very heavy pressure for funds; and, if its cash is insufficient to meet the demands and if it cannot sell some of its assets or borrow from other banks, it will have to close its doors. Similarly, the banks of a whole community or of the whole nation may, as a result of a loss of confidence on the part of depositors, be subjected to demands for funds beyond their capacity to meet. In case of a panic of this kind all the banks naturally have to suspend payments in specie, and the commercial credit structure and the international exchange system break down. We are not, however, concerned at this place with the causes of panics, or with the control devices which might possibly be established for the prevention of credit debacles.

In summary, the evolution of the commercial banking system has served to create a vast quantity of circulating media equivalent, under ordinary circumstances, to money. This credit currency was gradually created through the process of making loans, which gave rise to deposits in the banking system as a whole. In the absence of this phenomenon, deposits would have been limited to the metallic and government paper money actually placed with the banks; and such deposits would have been but a fraction of those arising out of our credit mechanism. Some idea of the extent to which this credit system has expanded the supply of funds available for business uses is indicated in the following section.

EVOLUTION OF THE CREDIT STRUCTURE IN THE UNITED STATES

While commercial banking in the United States had its beginnings in colonial times, it was not until after the Civil War that the credit structure of which we have been speaking may be said to have developed on anything like a national plane. Prior to that time banking was conducted, in the main, on a local scale with operations confined to a single community or state.[1] The regulations pertaining to banking operations were also widely divergent and in many cases non-existent. In view of the chaotic situation that prevailed for most of the period and the almost complete disruption of our banking machinery following the great crisis of 1837, it is impossible to show any consistent evolution of the commercial credit structure before the Civil War period.

[1] The outstanding exception was the Suffolk banking system which flourished in the early part of the eighteenth century, the operations of which extended pretty much throughout New England.

During the Civil War the national banking system was established, and in the ensuing decades there was also a great increase in the number of banks organized under state laws. While the number of the latter has been greatly in excess of the former—there were 19,603 state commercial banking institutions in 1920, for example, as compared with 8,030 national banks[2]—the latter are typically much larger in size. Though organized under different laws and subject to varying methods of regulation, both national and state banks have nevertheless been to a considerable extent integrated in a common credit system. For example, national and state banks alike have been members of clearing-house associations through which checks against each other are exchanged; and state banks in outlying parts of the country have maintained correspondent relations with national banks in the larger centers. In consequence of these connections—however inadequately maintained—both state and national banking institutions have been in a way united in the process of erecting the general credit structure which we have been considering.

In illustrating the extent to which the commercial banks have created credit currency we shall, however, here consider only national bank data. The omission of state banks is dictated by two considerations: First, comparable data are not available for the entire period; and second, the state institutions include many savings banks as well as commercial banks. We will thus have a clearer picture, though less inclusive, if we confine our analysis to the national banking system.[3] In any event,

[2] There were also 799 private banks and 1,707 savings banks.

[3] The data for the national banks necessarily include *time* deposits as well as *demand* accounts, for it is impossible to separate the two types of deposits for the period as a whole. Their inclusion may perhaps

we are concerned here with the general process of credit currency creation rather than with precise measurement of its amount.

The growth of the credit structure relative to cash reserves from 1864 to 1933 is shown in the accompanying chart. We have included under "Credit Currency" national bank notes as well as deposits—this because national bank notes, like deposits, arise out of loan transactions.[4] In order to indicate the interrelations of loans and investments on the asset side and deposits and notes on the liability side, we are also superimposing on the chart the growth of loans and investments. These items indicate the volume of credit that was being extended by the national banks in one form or another for business requirements in each successive year.

Attention should first be directed to the striking parallelism in the growth of loans and investments on the one hand and deposits and note circulation on the other. Sometimes loans and investments exceed deposits and notes, and sometimes the opposite is true; but always the lines cling closely together. Note next the widening gap between the line for cash reserves and

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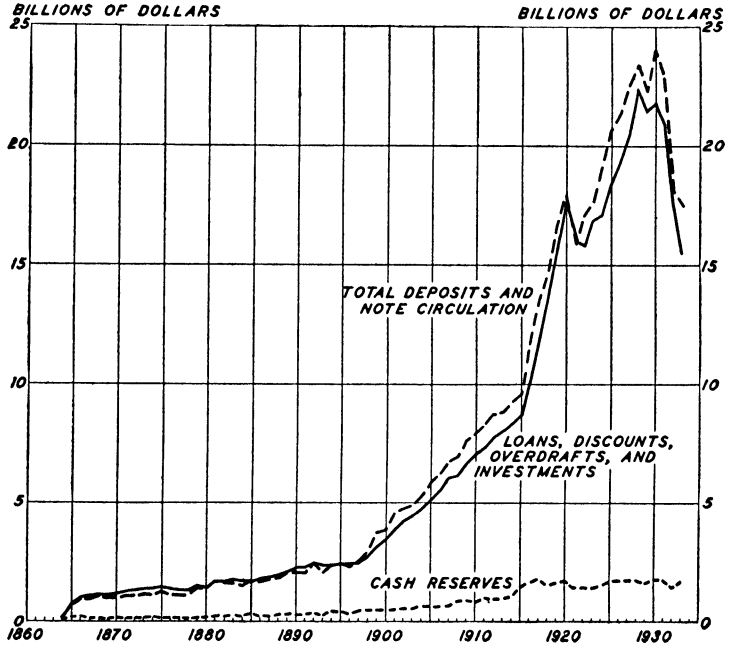
be regarded as offsetting in substantial measure the omission of the *demand* deposits of state banking institutions.

Since 1914, when the Federal Reserve banking system began to operate, we have included in the cash reserves of national banks their lawful reserve with the Federal Reserve banks, plus cash on hand. The reserves of the Federal Reserve banks themselves were, most of the time, capable of supporting a much larger volume of credit than was in fact outstanding.

[4] Under the national banking law, however, the bank notes, unlike deposits, had to be backed by a special reserve of 5 per cent in cash and 100 per cent in government bonds. The amount of notes outstanding, since the early days, has always been negligible as compared with deposits. For instance, in 1915 the national bank notes amounted to 723 million dollars, as compared with 8,821 millions of deposit accounts.

that for deposits and note circulation. At the beginning of the period the ratio was about one to four; in the eighties it ran about one to six or seven; from 1900 to 1914 it was about one to eight or nine; after 1920 it ranged around one to twelve or thirteen. Were state banks included the spread would appear even greater.

GROWTH OF THE CREDIT STRUCTURE OF NATIONAL BANKS, 1864–1933 [a]



[a] For data, see Appendix D, Table II, pp. 194-95.

This gradual widening of the spread between cash reserves and deposits and notes in circulation requires special explanation. For the period prior to 1914 it was not attributable to any reduction in reserve requirements. That is to say, we did not keep modifying our laws so as to permit demand obligations to be backed

with progressively smaller reserves of cash. The decreasing ratio was rather the result of a more complete development of the credit system on a national scale.

In the earlier years it was necessary for each bank to hold much larger reserves in its own vaults than was the case after the system became more highly integrated. In due course the organization of clearing houses, where counter-claims could be balanced off, served to lessen the payments that had to be made in cash, and thus enabled each bank to get on with smaller reserves than before. Similarly, the development of correspondence relations between the banks of the financial centers and outlying institutions made it possible, ordinarily, for the banks of the smaller cities to borrow funds, in case of need, from the larger banks. The development of security exchanges where stock collateral and bond investments could be quickly converted into cash also served gradually to lessen the amount of cash that each bank had to hold in its own vaults.

The system of re-depositing reserves, whereby the same money counted as reserves in two places at once, was also gradually developed during this period. The law provided for varying reserve requirements for the banks in the largest cities, in cities of intermediate size, and in the smaller cities and towns. These banks were classified respectively as central reserve city banks, reserve city banks, and country banks. The reserve requirements were 25 per cent, 25 per cent, and 15 per cent respectively; but the reserve city banks were permitted to keep half of their reserves on deposit in central reserve banks, while the country banks might keep three-fifths of theirs on deposit in reserve city or central reserve city banks. Hence they needed to keep only 12.5 per cent and 6 per cent respectively in their own

vaults. These reserves, which were deposited with the central reserve and reserve city banks, also counted as a part of their own legal reserves. With the growth of extensive correspondent relations this practice gradually became virtually universal. Thus, though the reserve requirements were 25 per cent in the larger cities and 15 per cent in the smaller towns, the net reserves, with duplications eliminated, came to be very much smaller than these ratios would indicate.[5]

After the organization of the Federal Reserve system in 1914, a further expansion of the credit structure became possible. By virtue of a concentration of reserves in Federal Reserve banks to which each member bank would have access in time of need, it became possible to reduce the amount of reserves which each class of member banks should hold. They were legally reduced to 13 per cent for the banks of the central reserve cities, 10 per cent for those of the reserve cities, and only 7 per cent for the country banks. The Federal Reserve banks were, however, required to maintain a reserve in gold of 40 per cent against Federal Reserve notes outstanding and 35 per cent against deposits. It should be noted here that the full possibilities of credit expansion under the Federal Reserve system have been reached only once, namely, in the spring of 1920. In recent years there have been large unused credit potentialities.

The gradual development of a closely interrelated national banking system thus made it possible for a given volume of cash reserves in the system as a whole to support an ever larger superstructure of credit.

[5] The system of re-depositing reserves worked satisfactorily enough in ordinary times; but in times of crisis the demands of outlying banks for a return of their reserves produced serious difficulties for the metropolitan banks.

While this credit structure broke down periodically it cannot be said that it collapsed more frequently in the later than in the earlier years of the period. In any event it gave us progressively larger supplies of liquid funds with which to meet the requirements of business.

We have been interested in this chapter merely in making clear the process by which the commercial banking system creates credit currency and thus adds to the supply of circulating media. The significance of this phenomenon for the purposes of our general analysis remains to be considered.

CHAPTER VII

THE PURPOSES FOR WHICH COMMERCIAL BANKS EXTEND CREDIT

In the preceding chapter our attention was focussed upon the role which the commercial banking system plays in creating circulating media which serve the purpose of money. While there incidental reference was made to the making of bank loans and investments as a part of the process of creating deposit currency, no attention was there given to the various purposes for which credit is extended or to the relationship of the commercial banks to the financial and economic system as a whole. This will be the purpose of the present chapter.

THE ORIGINAL CHARACTER OF THE "COMMERCIAL" BANK

In their earliest development, particularly in Great Britain, commercial banks were associated with the financing of commercial as distinguished from industrial activities; hence the term "commercial" bank. Loans were made chiefly to middlemen concerned with the distribution of commodities from producers to consumers. It should be borne in mind in this connection that large-scale business enterprise, requiring the use of great amounts of money, developed much earlier in the field of commerce than of production. Such commercial enterprise was mainly of a seasonal character, requiring a large amount of currency at certain periods of the year and relatively little at other times. Accordingly, it was economical for the business enterpriser

to borrow the funds needed to meet peak seasonal requirements. The commercial bank thus came to be regarded as an institution which was primarily concerned with the furnishing of seasonal funds, and it was assumed that each borrower would be entirely out of debt to the bank for a considerable part of each year. If the seasonal peaks of the various borrowers occurred at different times the bank would, however, be able to keep the bulk of its funds out more or less continuously, lending now to *A* and again to *B*.

With the development of large-scale corporate enterprise in the field of production as well as of distribution, and with the growth of security markets and a complex economic and financial system in general, the range of credit operations engaged in by the commercial banks has been enormously enlarged. These banks not only make loans for the marketing of consumption goods, but also help finance the productive process both in agriculture and in industry; and, what is more significant, for purposes of our present inquiry, they engage also in the purchase of securities, both corporate and government, and in the financing of new capital enterprise.

We cannot here enter into a detailed discussion of the numerous types of commercial bank credit extensions, for this would carry us afield from our main purpose. It is necessary, however, to show the general extent to which commercial banks grant credit for long-term investment or fixed capital operations, as well as for short-term commercial or working capital purposes.

INVESTMENT OPERATIONS OF COMMERCIAL BANKS

The fixed capital of a business enterprise is that which is embodied in plant and equipment or other permanent structures. The working capital represents

that used for operating purposes and consists of materials and supplies used in the producing process, as well as funds with which to meet payroll and miscellaneous requirements. The traditional theory has been that a corporation should obtain the funds required for fixed capital purposes through the sale of stock. Then bonds may be issued, on the security of the plant and equipment, for the purpose of raising the permanent working capital. The extra working capital that might be required to meet seasonal peaks could thereafter properly be obtained from the commercial banks. In practice, however, we find that many business corporations have not infrequently secured some of their permanent working capital, and even fixed capital, from the commercial banks.[1]

The character and range of commercial bank loans and investments can be made clear only by the presentation of actual data drawn from bank balance sheets. In the table on page 94 are given the classified loans and investments for the national banking system as a whole for the year 1929, this year being chosen because it antedates the period of heavy purchases of government securities which began with the depression.

The investments in this year constituted a little over 30 per cent of all credit extensions. The investments proper do not, however, adequately measure the extent to which bank credit has been used for fixed capital purposes. The loans on real estate and a large part of the loans made on securities as collateral are also devoted to the financing of capital operations; and it is even true that many loans which are short term or

[1] For evidence and discussion with reference to the furnishing of permanent working capital by the banks, see the author's "Commercial Banking and Capital Formation," *Journal of Political Economy*, June 1918, pp. 714-23.

LOANS AND INVESTMENTS OF NATIONAL BANKS IN 1929[a]

(In thousands of dollars)

I. Loans	
Real estate loans, mortgages, etc.	
On farm land	308,785
On other real estate	1,104,220
Loans on securities	5,113,792
All other loans[b]	7,909,324
Total	14,436,121
II. Investments	
United States government securities	2,803,860
State, county, and municipal bonds	757,207
Railroad and other public service corporation bonds	1,286,615
Foreign government bonds and other foreign securities	494,076
Other bonds, notes, warrants, etc.	1,121,306
Total	6,463,064

[a] *Report of the Comptroller of the Currency,* 1929, call date, June 29. This table does not include two small items, "loans to banks," and "stock investments in Federal Reserve banks and other corporations."

[b] Includes commercial paper bought in the open market and "bills, acceptances, etc. payable," amounting to $326,001,000.

commercial in form are renewed more or less indefinitely, with the borrower using the funds in connection with fixed capital enterprises.[2] This has been particularly the case with loans to farmers.[3] Accordingly it is not possible to show with precision what percentage of

[2] See Charles O. Hardy and Jacob Viner, *Report on the Availability of Bank Credit in the Seventh Federal Reserve District,* submitted to the Secretary of the Treasury, 1935.

[3] Prior to the organization of the Federal Reserve system it was not lawful for national banks to make loans on real estate security; but loans on the short-time promissory notes of farmers were almost regularly renewed at maturity, and such funds were used to finance fixed capital operations on the farm quite as much as were those procured through the sale of mortgages. There are many such loans even today.

total loans and investments goes to finance fixed capital operations. However, if it may be assumed that all the loans on real estate and two-thirds of the loans on securities are related to fixed capital operations, but that all the unsecured short-term loans are commercial in character, it would appear that over 50 per cent of all loans and investments made by national banks are utilized for fixed capital purposes. If state banks and trust companies be included the percentage is materially increased.[4]

Investment operations by commercial banks are in no sense a recent development. In the period before the Civil War, state banking institutions commonly made loans for fixed capital purposes, particularly in connection with real estate and transportation enterprises. It may be recalled that the great financial collapse of the late 1830's has been commonly ascribed to the investment and speculative activities of the so-called wildcat banks. These state banking institutions also invested to some extent in government and corporate securities—though their holdings of corporation bonds were necessarily small because of the restricted range of corporate activities at that stage of our economic evolution.

From the very beginning the national banks have had substantial investments in United States government and other securities. At the same time many loans which were short-term in form were investment in character. It is not possible to present continuous data for the whole period because of numerous changes in classifica-

[4] The author once made a careful analysis of bank loans and investments for the year 1916 and reached the conclusion that in that year 55 per cent of all advances made by national banks went to promote fixed capital operations, while the percentage was 62.1 in the case of state banks and 68.2 in the case of trust companies. *Journal of Political Economy,* June 1918, pp. 643-58.

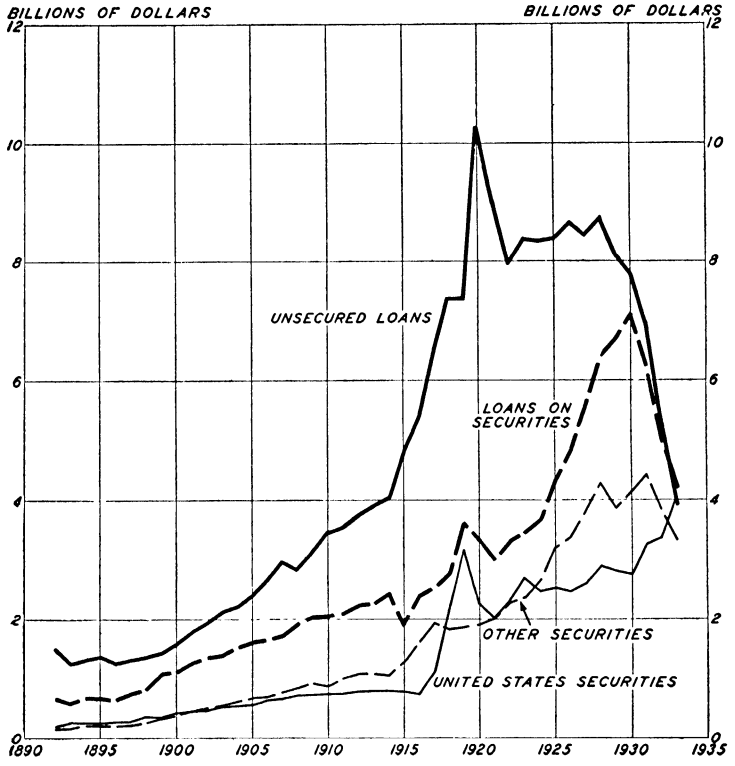
tion. However, in 1875 investments in government bonds amounted to 402 million dollars and in other bonds to 32 millions. These figures may be compared with aggregate loans of 973 millions. By 1890 United States bond holdings were down to 171 millions, but other bonds aggregated 116 millions.[5] It should be borne in mind that the United States government bonds were mainly held as security for bank note issues, and that the volume both of note issues and United States bonds outstanding was declining during the generation following the Civil War.

For the period since 1892 it is possible to present continuous data with loans classified under two headings: "Unsecured Loans" and "Loans on Securities"; and with investments classified as "United States Securities" and "Other Securities." After 1915 the reports of the Comptroller of the Currency show a more detailed breakdown under both loans and investments; but for our present purposes we shall confine ourselves to the general categories already mentioned. The expansion of these loans and investments from 1892 to 1933 is shown in the accompanying diagram.

Attention may be directed first, very briefly, to the holdings of United States securities. There was a slow but steady growth throughout the period until the establishment of the Federal Reserve system in 1914. This expansion was largely attributable to an increase in the number of banks and their purchase of bonds as security for note issues. In 1914, for example, of the 795 millions outstanding, 713 millions were held as security. The rapid increase beginning in 1917 was related to war finance, and the new expansion since 1930 to the financial exigencies created by the depression.

[5] *Report of the Comptroller of the Currency*, 1915.

GROWTH OF LOANS AND INVESTMENTS OF NATIONAL BANKS, 1892–1933 [a]



[a] For data, see Appendix D, Table III, p. 196.

The unsecured loans increased gradually until 1914 and then very rapidly during the war and early post-war periods. From 1923 to 1929, however, there was a remarkable uniformity in the total amount outstanding—this in spite of the great expansion of business which occurred. This phenomenon is due to the fact that many business corporations issued stock during this period and used the proceeds to reduce their bank loans. The

decline after 1929 is of course the result of the depression.

Both loans on securities and direct investments in securities increased during the period taken as a whole—gradually before the war and rapidly in the post-war era. Between June 30, 1922 and June 30, 1929 the total volume of loans on securities more than doubled, increasing from 3,279 million dollars to 6,678 millions. Investments in other than United States government securities increased during the same period from 2,278 millions to 3,853 millions.

In the chart on page 97 we have included loans on real estate under the general heading "Loans on Securities." The volume of such loans in the national banks was small until after 1921, aggregating in that year only 280 million dollars. In addition to making loans on real estate securities the banks made direct purchases of real estate bonds issued by real estate companies. Such investments were, of course, confined principally to urban real estate securities. Between 1922 and 1929 real estate loans increased steadily to a total of 1,413 million dollars.

The foregoing data, as indicated, relate only to the national banks. State banking institutions to an even greater degree have been furnishing funds for fixed capital operations. Since the state banks are not so distinctly commercial in character and have a larger proportion of savings and time deposits than do national banks, we shall not bring the loans and investments of such institutions into our present analysis. We are in any event not primarily interested in showing on any precise quantitative basis the amount of commercial bank credit extensions for fixed capital purposes. It is sufficient for our present purpose merely to show

that such credit extensions have been very substantial in amount, that the practice has existed from the very beginning of our banking system, and that it has become more pronounced since the development of large-scale corporate enterprise.

The reader should bear in mind that the purpose of this chapter has been merely to present the facts as to the participation of commercial banks in fixed capital operations. We are not here interested in determining whether loans on real estate, loans on stock exchange securities, and investments in bonds constitute unsound banking practice which endangers the liquidity of our banking system. This question is another story, and could not be considered here without diverting attention from our main objective.

To guard against possible misunderstanding at this juncture it should also be emphasized that we are not implying that loans and investments of commercial banks for fixed capital purposes represent real capital equipment. That is to say, the mere fact that in 1929 the security investments of national banks amounted to more than 6 billion dollars does not indicate that 6 billions of real capital goods had been actually created merely through credit expansion—that we had obtained something for nothing, or that real capital can be created without human effort. The significance of commercial credit expansion in connection with the process by which a portion of the energy of society is allocated to the production of capital goods remains to be considered in the following chapter.

CHAPTER VIII

COMMERCIAL BANKS AND CAPITAL FORMATION

Having revealed the process by which the commercial banking system manufactures credit, and having shown the character of commercial bank loans and investments, we are now in a position to come to the heart of our analysis. We shall endeavor to show in the present chapter the way in which the commercial banking system has enabled us to escape—in part—from the dilemma outlined in Chapter III.

It will be recalled that, at the end of that chapter, we reached the conclusion that if the economic system is to function effectively there must be an expansion in the flow of funds through *both* consumption and savings channels—this because the production of new capital goods is dependent upon an expanding demand for consumption goods. It will be useful at this point for the reader to turn again to page 31, where the nature of the problem with which we are concerned is shown graphically. It was there indicated that if the flow of funds through consumptive channels increased, the amount of unutilized plant and equipment would decline and the demand for new capital construction would accordingly expand. But the question was raised—How could new capital construction be financed if the flow of savings through investment channels were declining? The answer, as we shall see, is to be found in the operations of the commercial banking system.

THE CENTRAL POSITION OF COMMERCIAL BANKS

We have already indicated, in a general way, the varied types of credit transactions in which commercial banks under modern conditions engage. We have not, however, as yet revealed the ramifying character of commercial credit operations or the central position occupied by the commercial banking system in the general financial and economic organization. The significant position of the commercial banks is indicated in a general way in the diagram on page 103.

We have again shown at the left of the diagram the reservoir of national monetary income and have indicated its disbursement by way of trade channels and investment banking institutions respectively. We have omitted the flow through government treasuries; for this will be considered in the following chapter. In this diagram are shown both private commercial banks and Federal Reserve banks, which constitute the final reservoir of credit. A line is also drawn from commercial banks to investment institutions, indicating that loans are made to such institutions. (The purposes for which such loans are made will be considered later.) Another line connects the commercial banks with the security exchanges, denoting the making of collateral loans to stock exchange speculators. (The relation of such loans to the problem under consideration will also be discussed presently.)

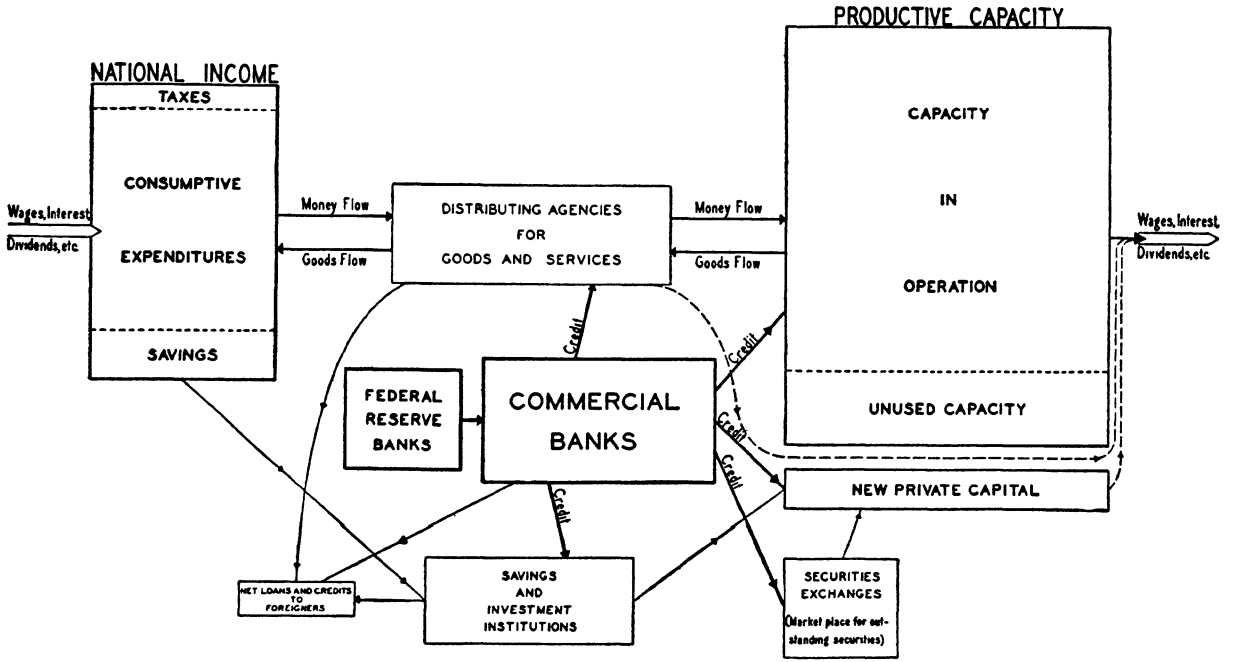
It will be observed that lines connect the area at the lower left-hand corner, entitled, "Net Loans and Credits to Foreigners," with distributing agencies for goods and services and also with commercial banks. This indicates that distributing agencies—and for that matter manufacturing establishments as well—

sell goods abroad on a time or credit basis; and also that the commercial banks often finance on short-term credits the sale of goods to foreigners. There are times, however, in which the net flow of credit is to this country rather than in the reverse direction.

It will be observed finally that, as in preceding diagrams, dotted lines have been drawn, indicating that funds disbursed in conducting the various types of business operations in the form of wages, interest, dividends, etc., flow onward as streams of income which, as they pass through the hands of individuals, will in due course again be allocated in part for consumption and in part for investment purposes.

THE PROCESS OF SIMULTANEOUS EXPANSION

We have now reached a stage in our analysis where we can show how it is possible to have an expanding flow of funds through consumption channels and at the same time an expanding supply of liquid funds available for the construction of new capital goods. We must consider first the situation that exists in the early stages of a period of recovery from depression, when—for whatever reasons—business in general has begun to expand. The flow of money income from consumers through distribution channels to productive enterprises is increasing, and, in consequence, the backflow of goods from productive enterprises through distribution channels to consumers is also expanding. This expansion process gradually reduces the amount of unutilized plant and equipment and creates a situation, as we indicated in the diagram on page 31, which makes the construction of plant and equipment more likely to be profitable. The question is, If consumptive expendi-


PRODUCTIVE CAPACITY
NATIONAL INCOME
TAXES
CONSUMPTIVE
EXPENDITURES
SAVINGS
CAPACITY
IN
OPERATION
UNUSED CAPACITY
Wages, Interest
Dividends, etc.
Money Flow
Goods Flow
DISTRIBUTING AGENCIES
FOR
GOODS AND SERVICES
Money Flow
Goods Flow
Wages, Interest
Dividends, etc.
Credit
Credit
Credit
Credit
FEDERAL
RESERVE
BANKS
COMMERCIAL
BANKS
NEW PRIVATE CAPITAL
NET LOANS AND CREDITS
TO
FOREIGNERS
SAVINGS
AND
INVESTMENT
INSTITUTIONS
SECURITIES
EXCHANGES
(Market place for out-
standing securities)

tures are increasing, how are funds obtainable for capital formation?

In order to make the problem of *financing* this capital expansion appear as difficult as possible, let us assume, for the moment, that the increasing flow of funds through consumption channels has been accompanied by a decreasing flow through savings channels. (We shall presently show, however, that this would not long continue.) Under these conditions would not the formation of new capital be rendered impossible? The answer is that even though the flow of funds from individual savings for investment purposes may, for the moment, be inadequate, it is still possible to procure liquid funds with which to buy essential materials and employ the necessary labor.

Funds with which to finance new capital formation may be procured from the expansion of commercial bank loans and investments. In fact, new flotations of securities are not uncommonly financed—for considerable periods of time, pending their absorption by ultimate investors—by means of an expansion of commercial bank credit. The process involved requires a few words of clarification.

When securities are floated through regular investment channels, the underwriting houses agree to furnish the borrowing corporation on a given date the funds required whether or not the securities have been marketed by that time. This furnishing of funds in advance is made possible by loans from the commercial banks, which are "collaterally secured" by the very stocks or bonds which are being marketed. This process involves a flow of funds (see the chart) from commercial banks by way of investment institutions to business men engaged in capital operations. When in due course

these securities are sold by the underwriters, the commercial bank loans will be paid off out of the proceeds. But for a time, it will be seen, the new capital operations of business corporations have been financed from an expansion of commercial bank credit.

It should also be understood that new issues of securities, particularly those of a speculative character, may have to be carried for several years by professional speculators. Institutional and individual investors do not ordinarily purchase securities until they are "seasoned," that is, until enough time has elapsed to demonstrate earning power. During the seasoning period such securities are held by speculators who, like the underwriters, borrow a large portion of the funds required for their operations from the commercial banks—commonly using the securities which they purchase as collateral for their loans. There are periods when the volume of "undigested securities," on deposit with investment houses and speculators as collateral for bank loans, runs into large totals—probably several billions of dollars.

It should be borne in mind in this connection that new securities are not in the main issued *through* the stock exchange. The usual route is by way of investment institutions, and it is not until after they have been sold by underwriters to speculators or to ultimate investors that securities are traded in on the exchanges. This is why we have designated the securities exchanges, on the chart, as a market place for "outstanding" issues. Sometimes, however, the stock exchange is used in raising new capital through issuing to "old" stockholders salable "rights" to subscribe for additional stock.

The commercial banks, as we have seen in the preceding chapter, also make large direct investments in

the bonds of railroad, public utility, industrial, and other corporations. In the case of very high-grade bond issues, such investments may be made at the time the bonds are floated; though perhaps in the majority of cases the bond investments of commercial banks represent the purchases of securities already outstanding. This does not alter the situation, however, since the purchase of existing securities by the banks releases funds of those from whom they are purchased and renders such funds available for the purchase of newly issued securities. In a period such as that between 1922 and 1929, as is evident from the preceding chapter, the national banks alone increased their holdings of securities to the extent of approximately 2 billion dollars.

It must also be pointed out that it is possible for consumptive demand to be augmented—for a time—by purchasing power derived from the commercial banks. In order to make possible an expansion of sales of consumption goods, merchants and manufacturers may sell to consumers on credit. The simplest form is what is known as ordinary open account store credit. Such credit has always been large in amount, particularly in agricultural communities where income is received seasonally instead of on a weekly or monthly basis. More recently the practice of selling many types of commodities on the installment plan has developed. In either case it is usually necessary for the merchant or manufacturer to borrow, from commercial banks, funds with which to carry the goods until they are paid for. At certain times the flow of goods through consumption channels is materially expanded by this process; but subsequently the payment for goods previously bought is likely to involve a restriction in the volume of new purchases of consumption commodities.

To the question raised in the diagram on page 31—Where could funds be procured for capital purposes if consumption were expanding and savings declining?—the answer is, From commercial bank credit expansion.[1] Such expansion relieves the possibility of shortage in the "money market" and enables business enterprisers to assemble the labor and materials necessary for the construction of additional plant and equipment.

This is, however, by no means the end of the story. Attention must next be directed to the effects of the expansion of commercial credit—for the production of both consumption and capital goods—upon the aggregate income of the people and upon spending and saving in subsequent intervals of time. It will be necessary again to start the analysis at the beginning of a recovery movement.

An expansion in business activity involves increases in wage payments, in outlays for raw materials and supplies, and in due course, as earnings expand, in disbursements to the owners of capital in the form of interest and dividends. The funds with which to finance these enlarged outlays are derived chiefly[2] from the expansion of commercial bank credit. Producers of raw materials obtain from commercial banks the funds with which to meet enlarged payrolls and other operating costs; manufacturers borrow the money with which to finance payrolls and the purchase of raw materials; and distributing agencies likewise obtain from commercial bank loans the means with which to stock their shelves with larger inventories and to finance installment pur-

[1] This commonly involves drawing upon unused resources of central banking institutions at home or abroad.

[2] To some extent, of course, corporations have idle funds on deposit with commercial banks, which are available for purposes of expansion. A more rapid turnover in the use of money and credit also occurs.

chases. New construction of plant and equipment also involves enlarged payments both to workers and to producers of raw materials. Thus in every direction the disbursement of funds is increased.

The funds paid out by business enterprisers constitute the income of those into whose hands they flow. Thus, as a result of the expansion of credit, whether for the production of capital goods or consumption goods, the stream of money income, flowing along the dotted lines on the chart, is enlarged. The aggregate money income of the nation in the ensuing period of time is in consequence augmented. Accordingly, the volume of funds available for disbursement by individuals and families is increased. They are able to expand consumptive expenditures and at the same time to expand savings.

It should be carefully noted in this connection that the accompanying increase in time deposits both in savings banks and commercial institutions—which may appear as a growth in "real" savings—is made possible largely by the antecedent expansion of commercial bank loans. Similarly, an increase in personal investment in securities is made possible as a result of the expansion of money income. There has thus been an increasing flow of funds, originating in commercial bank credit expansion, through the hands of business men to individuals and thence to savings institutions and other investment channels.

LIMITATIONS UPON EXPANSION

Granted that there may be an expansion in the flow of funds for a time through both consumption and investment channels, and that there is a simultaneous increase in the production of consumption goods and

capital goods, does not the process quickly run its course? Have we not merely been indicating the situation in the early stages of recovery from depression, and will not the process, if continued, either soon exhaust itself or prove disastrous? We shall have to give consideration to a number of possible limiting factors.

1. Capital equipment. We shall discuss first the adequacy of our productive resources in the form of plant and equipment. It will be advisable to begin with consideration of the situation in the great expansion period of the twenties.

As the indexes of production clearly show, the period from 1922 to 1929, with minor fluctuations, was one of marked expansion in productive capacity; and, as Table I in Appendix D indicates, it was a period in which the output of consumption goods was increasing. For seven or eight years, therefore, the process of simultaneous expansion continued. And even at the end of the period we were not fully utilizing our productive resources, as measured by plant and equipment, transportation facilities, etc.

On the contrary, as our study of the utilization of our productive resources has shown,[3] we continued to have a substantial margin of unutilized capital resources. Our raw material industries were geared to turn out a much larger flow of materials than was being currently demanded by manufacturing and processing establishments. Our basic fuel furnishing industries, such as coal and oil, were suffering from excess productive capacity; our manufacturing industries, generally speaking, were not operating beyond 80 per cent of capacity, while the extent to which our transportation facilities were utilized was even less.

[3] *America's Capacity to Produce,* by Edwin G. Nourse and Associates.

The truth of the matter is that at the peak of the boom period in 1929 the amount of unutilized capacity in raw material and manufacturing industries was slightly greater and in the transportation field very much greater than it had been five years earlier. The creation of new capital served to perpetuate the excess of productive capacity. Not only were new units of capital constructed, but efficiency expanded as the new units replaced old and obsolescent plant and equipment.

The situation was substantially the same in the great period of expansion which began in 1897 and continued with minor interruptions to 1907. The growth of new and increasingly efficient forms of equipment gave us a continuous expansion of productive capital; and there was unutilized capacity in most lines even in the boom days of 1906 and 1907.

It must be pointed out, however, that in some earlier periods of expansion, American productive resources were supplemented in a large way by importations of capital goods. For example, in the period from 1869 to 1873, and again in the great expansion period of the early eighties, we imported large quantities of industrial machinery and railway equipment. Such purchases were made possible by the flotation of American loans in foreign markets. Thus, during the era before our own industrial producing capacity was highly developed, possible limitations on productive capacity were prevented by loans from abroad.

2. *Labor supply.* In considering the possible limitations imposed by the supply of labor, we begin once more with the situation in the twenties. After recovery began in 1922 did we shortly exhaust the supply of unemployed labor? The answer is that even at the height of the boom period there remained a considerable

amount of idle labor. This idle labor was of two kinds. First, there were those who were completely unemployed or but partially employed as a result of the failure to make full use of our productive resources. Second, there were those who had been displaced as a result of the development of more efficient forms of capital—the so-called technologically unemployed.

In addition, as we have shown in *America's Capacity to Produce,* there was a considerable *potential* labor supply which, if needed, could have been drawn from low pressure agricultural areas and from among those engaged in the distribution of goods and services. While for certain types of labor there was probably no excess, the labor supply of the country as a whole materially exceeded the demand therefor.[4]

In earlier periods of expansion the labor supply of the United States was greatly augmented by the importation of foreign workers. Immigration began long before an outright shortage of labor had appeared—being attracted by the lure of high wages, and being directly contracted for in many cases by industrial managers who found in European labor a *cheaper* source of supply. In any event, in no period of expansion—except during war times—have we been confronted with a general shortage of labor.[5]

3. Credit resources. With a double stream of money income flowing through trade and investment channels, do we not soon reach the limits imposed by bank reserve requirements? The answer in this case is

[4] On the basis of a very careful study of the labor supply in 1929 we reached the conclusion in *America's Capacity to Produce* that an expansion of productive output amounting to as much as 25 per cent would not have been rendered impossible for want of an adequate labor force. (See Chap. XIX and Appendix E of that study.)

[5] A possible exception was in 1920 when the supply of certain types of labor was apparently short.

sometimes Yes and sometimes No, depending upon varying situations with respect to the reservoir of credit resources. In the period from 1922 to 1929 we did not exhaust our credit resources, the reserve limits at the Federal Reserve banks not being even approached. Rather than a shortage of credit resources the United States has a superabundance of reserves.

In numerous earlier periods, however, the situation in this respect was essentially different. Early in the year 1920, chiefly as a result of the war and post-war rise in prices, we reached the legal limits of reserves set by the Federal Reserve Act. Between 1900 and 1914, before the establishment of the Federal Reserve system, we were often near the reserve limits,[6] and the same situation frequently prevailed between 1865 and 1900. Even though reserve limits were thus sometimes reached, it remains true that the periods of expansion, in which the flow of funds through both consumption and investment channels was increasing, usually continued for many years at a stretch.

THE LONG-RUN GROWTH OF CAPITAL

The analysis in the preceding pages has been related to what may be regarded as short-run periods. Granted that on the upswing of a business cycle the relevant data support our contention that the creation of new capital and the expansion of consumptive demand are concurrent phenomena and that this twofold growth is made possible by means of the expansion of commercial bank credit, it still must be asked, Does capital formation in the long run not depend solely upon the restriction of consumption and the diversion of funds to investment markets?

[6] For diagram and detailed data with reference to the excess or deficiency of bank reserves, see *America's Capacity to Produce*, p. 402

The simplest and perhaps most conclusive answer to this query is that the growth of capital in the long run is dependent upon the factors which govern its growth in the short run—a long run being but the sum of the series of short runs comprised within it. In periods of depression the growth of capital is held in abeyance. Some new capital is, to be sure, being created even in the depth of depression, but this tends to be offset largely, if not wholly, by the wearing out of other capital goods without current replacement, and it is open to question whether there is any *net* increase in the supply of capital goods in the course of a severe depression. In any event, the real growth in capital always occurs in connection with the prosperity periods associated with the so-called upswing of the business cycle. Add together the net amounts created in these periods and we obtain, substantially speaking, the total growth of capital.

Attention must now be focussed on the fact that during such a period as that from 1865 to 1929 the United States underwent an enormous *general growth,* as measured from decade to decade or from the peak of one prosperity period to another. Population increased rapidly and at the same time the amount of wealth production per capita expanded greatly. Now it was during this period, as we indicated in Chapter VI, that the commercial banking structure evolved. Owing to the gradually improving credit organization, a given quantity of monetary reserves was enabled with each passing decade to sustain a larger volume of outstanding credit.

Thus not only was it possible for us to have an expansion of credit as business recovered from depression and moved to prosperity, but it was possible in

each succeeding prosperity period to finance—at a given level of prices—a larger aggregate volume of output of both consumption and capital goods. In this connection it may be noted that the cash reserves of the national banking system increased between 1866 and 1929 from 232 million dollars to 1.6 billion dollars, while during the same period the loans and investments increased from about one billion to 21.5 billions. If the ratio of cash to loans and investments had remained at 22.8 per cent, as it was in 1866, we should have had in 1929 only 7.2 billions of loans and investments instead of 21.5 billions.

CREDIT EXPANSION AND THE LEVEL OF PRICES

There remains to be considered the relation between the expansion of commercial bank credit and the movement of commodity prices. Does not the expansion of credit result merely in an increase in prices? And is not this particularly the case when such credit is extended for the growth of fixed capital? In analyzing this problem we shall consider first the expansion of credit for financing the production of consumption goods in the upswing period of a business cycle.

It is evident that, at least in the early stages of expansion, business men borrow funds from the commercial banks for the purpose of employing labor and materials in producing additional quantities of consumption goods. While it is true that the volume of credit in circulation increases, it is also true that the volume of goods moving from raw material producers into the manufacturing processes and through distribution channels to consumers soon increases. Such an expansion, indeed, is in accordance with the generally accepted principle that credit currency should be "elastic."

In a period of recovery the situation is favorable for some increase in prices. Funds borrowed from the banks are disbursed almost immediately in paying for labor and materials, while it may be some time before the new output of consumers' goods reaches the market. The fact is that a recovery of business is nearly always accompanied by a gradual advance in prices. But the striking characteristic of a recovery period, typically speaking, is not the moderate increase in prices but rather the great expansion in the volume of production.

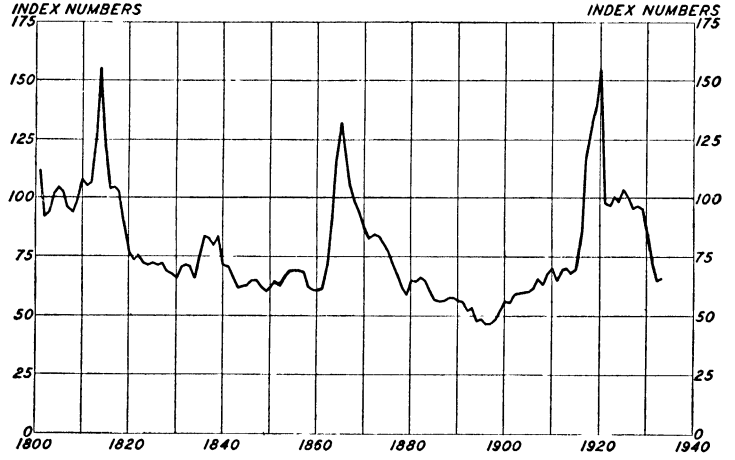
Granted that, in the early stages of recovery, there may be an expansion of production more or less proportionate to the increase of currency, it may still be contended that, if the expansion of currency continues *after* our full productive powers are absorbed, the only result of credit expansion from that time on will be an increase in prices. It must here be recalled, however, that in the prosperity period of the twenties no appreciable rise in commodity prices occurred at any time; in fact, the level of wholesale prices was slightly higher in 1924 than it was in 1929. During this five-year period, however, the index of production for consumers' goods increased from 85.6 to 100.[7] It must again be recalled that even at the peak of this prosperity period we had not reached the limit of our productive capacity. As previously indicated, the prevalent assumption that on the upswing of a cycle we soon reach a stage where all of our productive resources are fully utilized, is quite unfounded.

The growth of the credit structure over a long period of time has not been accompanied by steadily rising prices. The chart on page 116 shows the move-

[7] Excluding residential construction, the increase was from 84.4 to 100. See also index of production goods, p. 46.

ment of wholesale prices from 1801 to 1933. It will be observed that while there have been a number of high peaks, occurring in war periods, the level in the first third of the present century averaged no higher than in the first third of the last century. Considering more particularly the period from the Civil War to the

WHOLESALE COMMODITY PRICE MOVEMENTS, 1801-1933 [a]



[a] Based on index numbers of the *U. S. Bureau of Labor Statistics Bulletin No. 572*, p. 14. Index numbers of prices have undergone a great evolution, in the last 50 years particularly, and accordingly the price data here presented are by no means strictly comparable over the period as a whole. There is no doubt, however, that the diagram gives a roughly accurate idea of the general level of prices at different periods.

present time, during which the volume of commercial bank credit was so greatly expanded, we find wide fluctuations, but no appreciable rise for the period as a whole.

As the banking chart on page 87 indicates, the volume of commercial bank credit outstanding was much larger in the nineties than in the late sixties, but prices were substantially lower. Beginning in the late nineties, prices rose for many years, but it also should

be noted that by 1932 they were back to the level of 1907 and 1880. During the period as a whole, it is clear that the increase in credit must have been roughly matched by an increase in the volume of wealth production.[8]

The argument that credit expansion merely raises prices has been especially advanced in connection with the furnishing of bank funds for fixed capital operations.[9] It is contended that only when funds for capital operations are obtained through the restriction of consumption (actual savings) can an inflation of prices be avoided—this because a restriction of consumption is deemed necessary to release productive power which can then be shifted to the construction of capital goods. When funds are shifted, and productive energy is shifted in like degree, the total volume of both money and goods will, it is argued, remain unchanged; but we shall have a larger output of capital goods and a smaller output of consumption goods.

This traditional type of analysis, as we have repeatedly pointed out, ignores the relation of consumptive demand to the formation of capital. It is merely

[8] Even though prices should not rise while an expansion of credit is occurring, it is still argued by some that the expansion of credit nevertheless raises prices, *negatively.* Thus Alvin H. Hansen, in seeking to refute my analysis of the effects of credit expansion as set forth in the *Journal of Political Economy,* November 1918, argues (giving credit to D. H. Robertson for the viewpoint): "Had it not been for this expansion of bank credit the price level would have fallen, which fall would have increased the value of the public's money incomes. The expansion of bank credit prevented this fall in prices, and so robbed the public of the increased value of their money. Thus . . . capital came out of enforced savings." (*Business-Cycle Theory,* p. 92.)

This argument assumes that the volume of production (and of capital creation) increases independently of any monetary or credit considerations—that finance and production are independent variables, instead of interrelated parts of a business process.

[9] See discussion of Von Hayek's theory. Appendix A, p. 164.

taken for granted that capital will be expanded regardless of the existing state of consumptive demand. It is also assumed that our productive energies are *normally* utilized at 100 per cent capacity. Our analysis has shown conclusively that there are ordinarily unemployed materials, unutilized capacity in the raw material producing industries, and unemployed labor power —even in periods of great business activity. We have also demonstrated that the expansion of capital occurs only when the output of consumption goods is also expanding; and that this is made possible by the expansion of credit for production purposes.

In concluding this discussion of the relation of credit to prices, we should not wish to give the impression that the process of credit expansion is never carried to excess and never accompanied by sharply rising prices. There have been times, as in the war and early post-war years, when rapid credit expansion promoted speculative advances in prices, particularly of consumption goods; and in the late twenties a huge flow of commercial bank funds into investment channels contributed greatly to the ensuing sharp rise in the prices of stocks which occurred. This aspect of the problem will be discussed in Chapter X.

CHAPTER IX

THE FORMATION OF PUBLIC CAPITAL

In the preceding analysis numerous references have been made to the fact that some capital is created through the instrumentality of government. That is to say, a portion of the money income received each year by the people finds its way into government treasuries where it is disbursed either in meeting current operating costs or in financing the construction of social forms of capital. In this chapter we shall first indicate the nature and extent of such capital creation in normal times, and then reveal what is involved in financing a great expansion of such undertakings in time of depression.

By way of introduction it should be recalled that, over the span of history, governments have played no small role in the development of fixed forms of capital. The great Roman highways and aqueducts, for example, were constructed under government auspices. However, with the coming of capitalistic organization based on private initiative, the part played by the state in the creation of capital declined greatly in importance. Indeed, in the heyday of the laissez faire system the role of government in the development of capital was regarded as wholly negligible, as confined mainly to structures of military significance.

Governments everywhere continued nevertheless to participate in the financing of certain types of capital development. The construction of streets and roads, for example, has nearly always been deemed an essential

function of government, though to be sure many "toll roads" were at one time built by private enterprise. In the United States a very extensive program of highway, canal, and even railroad, development was undertaken in the 1830's under the auspices of state governments. Owing to disastrous financial results following the crisis of 1837, public opinion turned against state participation in such enterprises, and for many years thereafter the development of transportation was left to private initiative. But, since the beginning of the present century, governments, both federal and state, have again participated extensively in this field of capital development. Such activity has been confined in the main to the canalization of rivers, the construction of canals, and the building of public highways, though the federal government has ventured into the field of railway enterprise in the construction of the Alaskan Railway.[1]

THE CHARACTER AND THE GROWTH OF PUBLIC CAPITAL

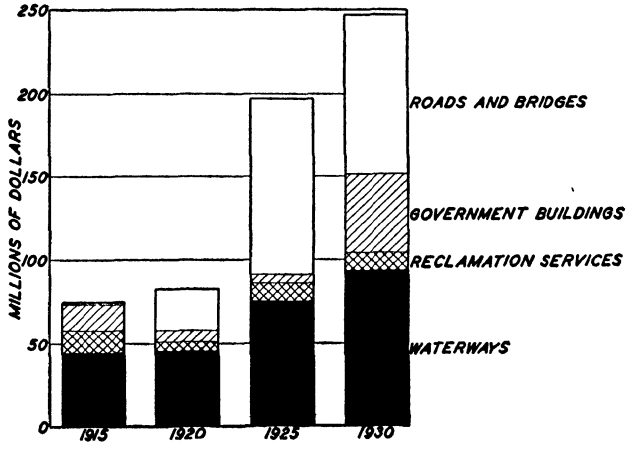
During the last two or three decades in this country the function of government in the development of public forms of capital has been rapidly increasing in importance. This is particularly true of state and municipal governments which have financed a wide variety of capital enterprises intended to serve a social purpose. Data are not available with which to present a complete picture of the development of public forms of capital in the United States, but for the period since 1915 it is possible to show the general magnitude and character

[1] In other countries the participation of government in the development of capital has been even more extensive than in the United States. Railway construction, for example, has in most countries usually been carried out in whole or in part under government auspices. The granting of subsidies from public treasuries for the support of private enterprise has also come to be increasingly extensive as the years have passed.

of federal, state, and municipal capital formation, classified by major types of enterprise.

The increase of expenditures by the federal government for social forms of capital by five-year intervals from 1915 to 1930 is shown in the following diagram. This chart does not include the widely varying military expenditures for fixed capital purposes, such as the building of forts and naval vessels. It will be seen that there was a nearly fourfold increase in this 15-year period and that the expansion was accounted for chiefly by expenditures on waterways, roads, and bridges.

PUBLIC CAPITAL FINANCED BY THE NATIONAL GOVERNMENT, 1915-30 [a]



[a] See C. H. Wooddy, *The Growth of the Federal Government, 1915-32*. The waterway data include expenditures for rivers, harbors, and flood control.

The expenditures of the federal government for capital enterprises, including the military establishment, in the single year 1930 were as follows, in thousands of dollars:

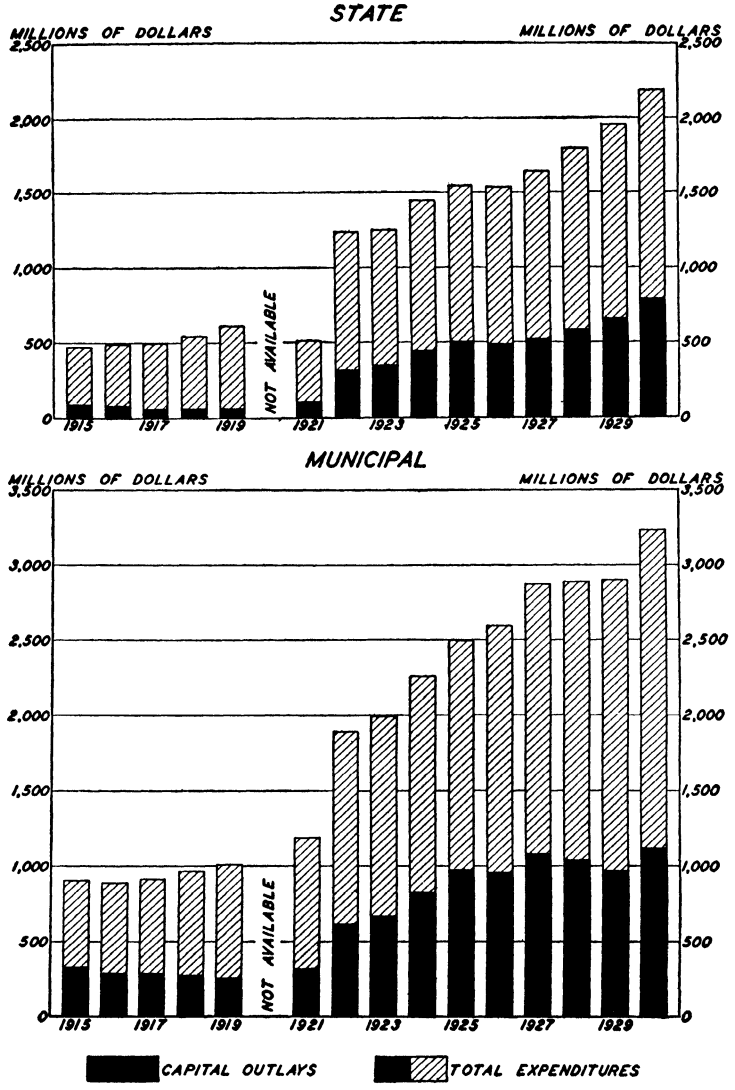
Military capital....	112,338	Government buildings	44,921
Public roads.....	86,239	Flood control.....	26,690
Rivers and harbors..	69,195	Miscellaneous	42,261

State and municipal expenditures for public capital enterprises over the same 15-year period are shown in the chart on page 123. The municipal figures include only cities having a population in excess of 30,000. For purposes of comparison we have also shown in this chart the growth in total state expenditures, including outlays for current operation and maintenance of properties. It will be seen that the percentage of total state expenditures going for capital purposes increased very rapidly in the post-war years, rising from about 21.9 in 1921 to 36.2 in 1930. Municipal expenditures for such purposes, however, remained fairly constant, at about one-third of the total.

The table on page 124 shows the relative importance of the various forms of capital enterprise financed by state and municipal governments in the single year 1930. The figures given represent outlays for the construction of buildings and other properties, and not for current services in such fields as education, health conservation, etc.[2] In the case of state governments, disbursements for highway construction represent nearly 80 per cent of the total. The expenditures of municipalities having a population in excess of 30,000 materially exceed the disbursements of state governments. It will be observed, however, that their expenditures on highways and streets account for a much smaller percentage of the total, outlays for public service enterprises, educational facilities, and sanitation being of substantial importance.

[2] The figures, however, include the purchase price of land, the amount of which cannot be segregated from the totals.

Public Capital Financed by State and Municipal Governments, 1915-30[a]



[a] State figures taken from *Financial Statistics of States, 1915-30,* and municipal data from *Financial Statistics of Cities, 1915-30,* both compiled and published by the U. S. Department of Commerce.

STATE AND MUNICIPAL EXPENDITURES FOR PUBLIC CAPITAL DEVELOPMENT, 1930

I. State Governments [a]

Highways	$635,203,045
Charities, hospitals, and corrections	63,117,652
Education	40,091,187
General government	14,566,641
Recreation	10,579,488
Development and conservation of resources	9,492,540
Public service enterprises	5,757,132
Protection to person and property	5,075,891
Conservation of health, and sanitation	3,255,361
Miscellaneous	1,635,254
Total	788,774,191

II. Municipalities [b]

Highways	$427,526,121
Public service enterprises	227,480,020
Education	200,256,175
Sanitation	124,596,496
Recreation	50,807,999
Protection to person and property	26,972,760
Charities, hospitals, and corrections	24,502,431
General government	23,438,212
Conservation of health	5,434,924
Miscellaneous	4,205,186
Total	$1,115,220,324

[a] *Financial Statistics of States*, 1930, p. 100.

[b] *Financial Statistics of Cities, 1930*, p. 440. Includes only cities in excess of 30,000 population.

The financing of these public capital developments has been accomplished partly out of current tax revenues and partly by means of borrowing operations. The federal enterprises, except those undertaken during the war, have been financed entirely out of current revenues.[3]

[3] The Panama Canal, opened for traffic in 1914, was, however, financed in part by the sale of bonds.

The cost of the major state enterprise—highway development—has been met in part out of current revenues derived from general taxation and from special "highway user" taxes, in part by federal aid, and in part by bond flotations. The proceeds from borrowing in 1930 constituted about 20 per cent of the total cost. Highway construction by local government units has been similarly financed, except that the state rather than the federal government has been the source of outside aid. The amount derived from bond flotations in 1930 was 11.6 per cent of the total.[4] Other capital enterprises undertaken by city governments were financed in large part by means of municipal loans.

FEDERAL GOVERNMENT EXPENDITURES FOR CAPITAL PURPOSES, 1930-34

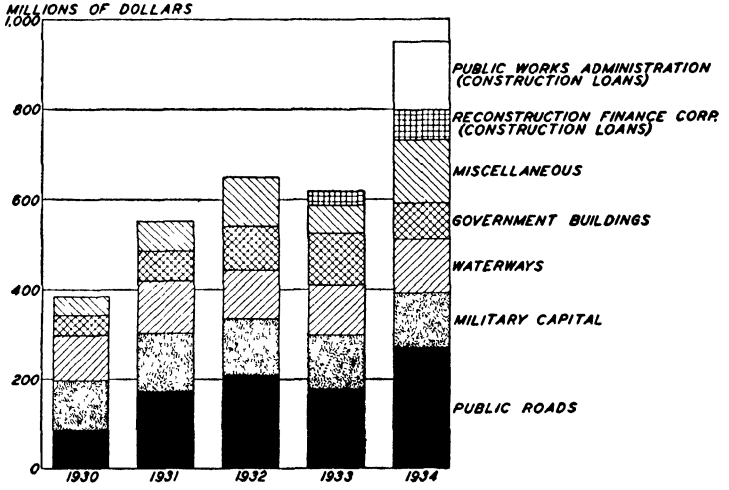
With the coming of the depression the federal government assumed a new importance in supporting and developing the economic life of the nation. As the depression deepened, it became increasingly necessary for the National Treasury to come to the support of a wide range of institutions and agencies—railroads, banks, insurance companies, state and local governments—to provide work on a vast scale for unemployed persons, and to furnish relief funds for distressed individuals. The first step, taken as early as 1930, was to increase expenditures for public works. The second stage was the organization, in 1932, of the Reconstruction Finance Corporation, designed primarily to give support to a tottering financial fabric. The third effort, undertaken in 1933, involved an enormous increase in federal out-

[4] For detailed data on methods of highway financing, see Harold G. Moulton and Associates, *The American Transportation Problem,* Chap. XXV.

lays for employment relief, as well as for recovery purposes carried out under the Public Works Administration and other agencies.

The chart below shows the growth of federal expenditures for new capital construction in the fiscal years from 1930 to 1934. The figures on which the chart is based include the outlays provided for in the regular budget, plus those assigned to the emergency budget in the fiscal year 1934.

CAPITAL CONSTRUCTION FINANCED BY THE FEDERAL GOVERNMENT, 1930-34 [a]



[a] For data see Appendix D, Table IV, p. 197. Waterways include harbors and flood control. Military capital includes veterans' hospitals. Under loans of the Reconstruction Finance Corporation and the Public Works Administration are included only those for the construction of physical properties.

It will be seen that outlays for the construction of new capital more than doubled during the five-year period. The largest increases were in connection with

public roads and public works. The reader should bear in mind in considering these figures that we have included here only expenditures and loans which were for the purpose of constructing physical capital as distinguished from loans to support existing capital structure of private business enterprises. The chart does not include appropriations for the Commodity Credit Corporation and other emergency organizations, the loans of which have gone for purposes other than to finance the production of new capital. In other words, this chart reveals as nearly as it is possible to do so expenditures made for the purpose of actually furthering capital development. The second table on page 129, however, shows aggregate expenditures classified into two groups—for general purposes, and for recovery and relief.[5]

Capital expenditures, classified by major groups, which were financed by the Public Works Administration in 1934, are shown in the table on page 128. In this table are also given the expenditures of the Public Works Administration for relief and miscellaneous purposes. All of the expenditures and loans listed under the heading "Capital Expenditures" were for the purpose of constructing fixed properties and equipment. It may be recalled that the aggregate appropriation for public works in the Deficiency Appropriation bill of 1934 was $3,300,000,000. Of this amount only

[5] The expenditures of the Agricultural Adjustment Administration during this period were fully covered by the processing taxes. The Home Owners' Loan Corporation and the Federal Farm Mortgage Corporation are engaged in refinancing rather than in the construction of new capital. Their operating expenses are included in the recovery and relief expenditures shown on p. 129.

$1,460,105,000 had been expended by the end of that fiscal year.

EXPENDITURES OF PUBLIC WORKS ADMINISTRATION, 1934

(In thousands of dollars)

CAPITAL EXPENDITURES:[a]			
Federal Public Works Projects—			
Public highways	267,882		
Boulder Canyon	19,445		
Rivers and harbors	72,450		
Tennessee Valley Authority	11,037		
Departmental allocations[b]	133,328	504,142	
Non-Federal Financing Projects—			
Loans to railroads	70,739		
Loans to states and municipalities, etc.	78,596	149,335	653,477
OTHER EXPENDITURES:[c]			
Relief Organizations—			
Civil Works Administration	400,005		
Emergency conservation work	331,941	731,946	
Miscellaneous		74,682	813,447
TOTAL			1,460,105

[a] *The Budget of the United States Government*, 1936, p. A-10.

[b] Includes Army, $38,023,000; Navy, $22,641,000; total $60,664,000—representing Public Works expenditures for national defense.

[c] Computed from the daily statements of the U. S. Treasury.

The expenditures of the Reconstruction Finance Corporation in the fiscal year 1934 are shown in the following table. The loans under "Financial Relief" went to strengthen the financial structure of existing business enterprises rather than to create new tangible capital.

DIRECT OUTLAYS OF RECONSTRUCTION FINANCE CORPORATION, 1934[a]

(In thousands of dollars)

CAPITAL EXPENDITURES:	
Loans for self-liquidating projects.....	59,809
Loans for repair of flood damage, etc.....	7,622
	67,431
FINANCIAL RELIEF:	
Loans to banks and financial institutions.....	846,837
Investments in preferred stock, capital notes, etc.	777,210
	1,624,047

[a] *The Budget of the United States Government,* 1936, p. 701. These "direct operations" do not include allocations to government departments and agencies for relief and other purposes; but the amount of such outlays going for "public capital" is of negligible importance.

Having considered the expenditures for capital purposes as well as the general expenditures of the two principal emergency credit agencies, it will now be of interest to note the extent to which these and other expenditures of the government have been covered by current revenues. The table given below shows the revenues of the federal government in the fiscal year 1934, together with the expenditures, classified by major purposes.

FEDERAL GOVERNMENT RECEIPTS AND EXPENDITURES, 1934[a]

(In thousands of dollars)

REVENUES		3,115,554
EXPENDITURES:		
General	2,821,735	
For recovery and relief	4,283,315	
Total expenditures		7,105,050
Deficit		3,989,496

[a] *The Budget of the United States Government,* 1936, p. A-3.

HOW PUBLIC CAPITAL DEVELOPMENT IS FINANCED

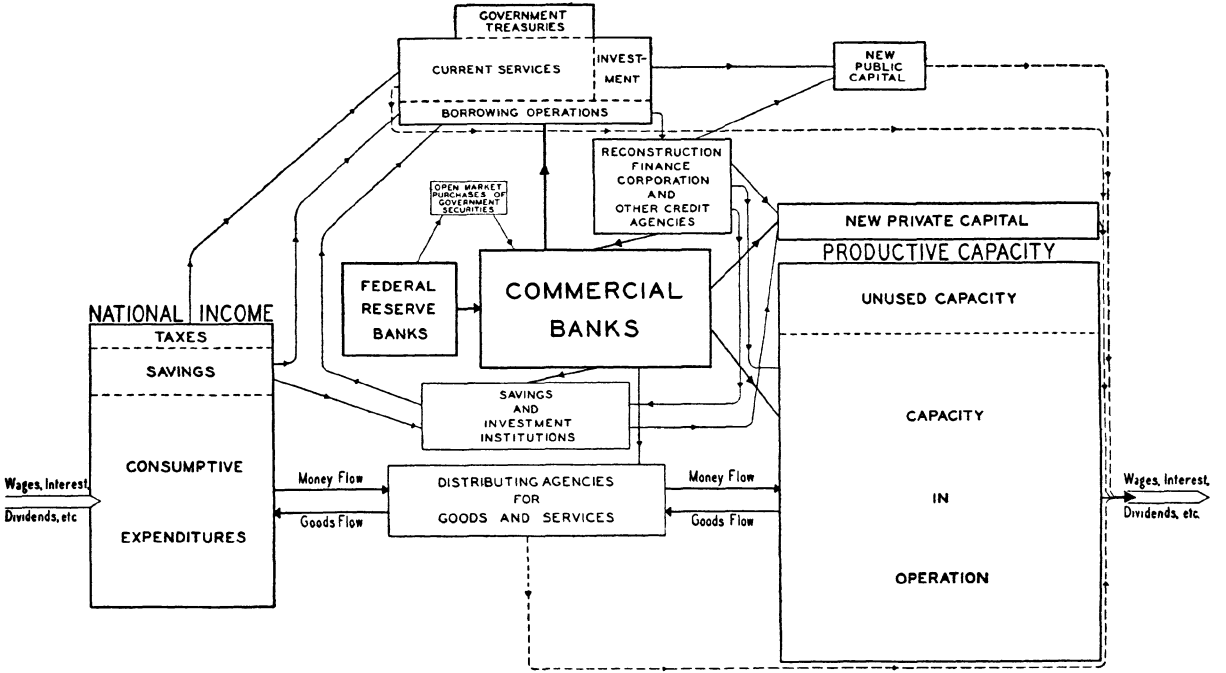
It has already been pointed out that the financing of public forms of capital is made possible in part by means of tax revenues and in part by borrowing operations. The financial institutions and processes involved in obtaining the necessary funds, particularly during the depression, remain, however, to be considered. In the diagram on page 131 we have indicated in a general way the character of the process and also outlined its relation to the economic and financial structure as a whole.

Under normal conditions the funds required by the federal government are derived from taxes. State and municipal governments, however, have commonly procured a considerable portion of the money required for capital development from the sale of bonds. These obligations, as the diagram indicates, are purchased by individual investors and by savings and investment institutions. To some extent, also, funds are procured from the commercial banks, even in normal times. They buy both federal and local government securities and they also play an important role in advancing funds on short-term Treasury certificates pending the receipt of tax revenues.

In time of war and in periods of depression, deficits incurred by the federal government are financed in part by the savings of individuals and in part by means of commercial bank credit expansion. Discussion will here be focussed on the period of the current depression.

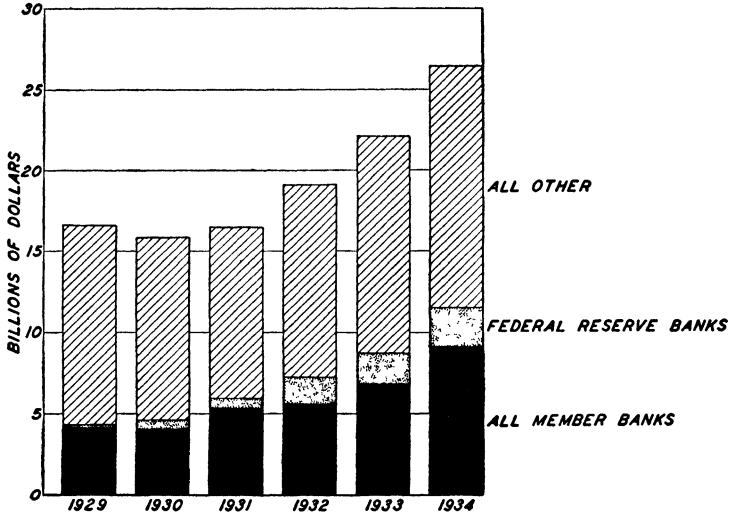
It will be observed from the diagram on page 131 that there has been a flow of funds from the commercial banks to government treasuries and also from the Federal Reserve banks to the commercial banks. Owing to the contraction in the demand for commercial

Interrelation of Governmental and Private Institutions in Public Capital Formation



bank loans with which to finance ordinary private productive operations, the commercial banks have had available large resources with which to purchase government securities. They have not only used idle reserves for this purpose, but they have also obtained large additional amounts through the sale (in the open market) of government securities to the Federal Reserve banks.

GROWTH OF PUBLIC DEBT AND SOURCES OF FUNDS, 1929-34 [a]



[a] As shown by U. S. Government securities outstanding in June of each year. For data, see Appendix D, Table V, p. 197.

The chart on this page shows the amount of the public debt annually from 1929 to 1934 and the volume of government securities held by member banks, by Federal Reserve banks, and by other institutional and individual investors. The public debt increased by 10.6 billion dollars between 1930 and 1934. The increase in the holdings of government securities by member banks during this period was over 5 billion dollars,

while the holdings of the Federal Reserve banks increased by nearly 1.8 billion dollars. Inasmuch as the reserves of the Federal Reserve banks are very large, there is still the possibility of absorbing great quantities of additional government securities.

A large portion of the savings of individuals and business corporations has gone to finance government deficits. In addition to the funds which commercial banks have invested in government securities, about 3.5 billions of other savings have gone into government issues either by means of direct purchases or through the intermediation of savings and other investment institutions. From the preceding tables it is evident that the greater part of such savings has gone to finance deficits incurred in connection with financial and human relief activities rather than for the construction of new physical capital.

It will be noted that in the diagram on page 131 no line has been drawn directly between Federal Reserve banks and government treasuries. Thus far, the tapping of the resources of Federal Reserve institutions has been roundabout, that is, by way of the commercial banks. Under the Thomas amendment of 1933, however, the Treasury is empowered to sell its obligations direct to the Federal Reserve banks. Hence, should the government be unable to obtain in the regular financial markets (that is, from individuals, institutions, and commercial banks) all of the funds required, it would still be able to procure the needed funds from the ultimate reservoirs of commercial credit—that is, the Federal Reserve banks. The process would involve the issuing of short-term interest-bearing government obligations in exchange either for non-interest-bearing Federal Reserve notes,

payable on demand, or for deposit accounts against which checks may be drawn. It was this method of financing which was resorted to with unfortunate results by Germany and various other countries during the World War and the difficult years which followed.

Mention should also be made of an alternative means of obtaining funds for government uses, namely, the direct issue of non-interest-bearing notes. That is, instead of going to the trouble of exchanging its interest-bearing notes at the Federal Reserve banks for notes or deposits, the Treasury might meet its obligations by the manufacture of legal tender United States notes, popularly known as greenbacks. This method of financing government deficits also has been tried by numerous governments at various times. The disastrous consequences are known to all students of finance.

It will be observed from the diagram that disbursements are made directly by the Treasury both for current services and for the construction of new public capital. But during the emergency, as has been indicated in the tables on pages 128-29, vast sums have also been paid out by way of the Reconstruction Finance Corporation and other credit agencies, particularly the Public Works Administration.

The varied purposes for which these emergency funds have been used are indicated by the lines with arrows which radiate from the Reconstruction Finance Corporation and other credit agencies. Money has been furnished for the creation of new public capital; loans have been made for the construction of new private capital; credits for operating purposes have been extended to existing productive enterprises; and financial assistance has been given to distressed savings and investment institutions, and even to the commercial

banks themselves. In addition, a large part of the burden of human relief has been financed by the National Treasury.

A substantial portion of the relief loans to private enterprise is expected to be repaid. In fact, of the loans extended to the end of the fiscal year 1934 by the Reconstruction Finance Corporation 51 per cent, or nearly 2.5 billion dollars, have been repaid. The degree to which such loans will ultimately be liquidated will of course depend largely upon the extent to which we have general business recovery. Some of the new public works are of a self-liquidating character, but many of them are not, the justification for them being found in the provision of relief and in the stimulus which it is hoped such outlays may give to recovery.

If government credit is to be preserved, it will obviously be necessary in the future to impose added taxes with which to meet interest and sinking-fund charges. Again it is hoped that a restored prosperity will make it possible for the national economy to carry the increased charges involved.

We are not here interested in making an appraisal of the policies being pursued by the government in its efforts to relieve distress and promote recovery, or in gauging the ultimate effects upon public credit. Our purpose is merely to reveal the growth of public enterprise during recent decades and especially since 1930; and to indicate the processes by which the vast depression program of the government has been financed.

CHAPTER X

THE MALADJUSTMENT BETWEEN SAVINGS AND CONSUMPTION

The complex character of the process of capital formation under a highly developed capitalistic system has been described and the forces which govern the rate of capital growth have been analyzed. It remains to articulate the analysis which we have been making with the larger investigation of which this study is a part, namely, the relation of the distribution of income to economic progress. In the present chapter we shall relate our analysis to two major tendencies or developments. The first is the tendency of aggregate money savings to increase faster than consumptive expenditures; and the second is the failure of new plant and equipment to grow as fast as money savings.

THE DISPROPORTIONATE INCREASE OF MONEY SAVINGS

The preceding volume of this series, *America's Capacity to Consume,* analyzed the effects of the distribution of income upon the percentage of the total income which is saved. It was found that in 1929 the savings of the great masses of the population constituted a negligible proportion of the total savings. For example, 59 per cent of the population, or 16.2 million families, saved in the aggregate only 250 million dollars; while 91 per cent of the families, comprising all

those with incomes below $5,000, saved only about 4 billion dollars, or a little over 25 per cent of the total. On the other hand, 2.3 per cent of the families, those with incomes in excess of $10,000, contributed over two-thirds of the entire savings.

In a period of rapid economic growth, like the twenties, the volume of money savings increases much more rapidly than the volume of consumptive expenditures. This is due to the fact that as the money incomes of individuals increase a larger proportion is set aside as savings, particularly by those in the higher earning groups whose incomes are greatly expanded as a result of increasing profits. The primary purpose of the ensuing analysis is to trace the economic consequences of this growing disparity between the amount of funds expended for consumption and the amount of money savings available for investment. In Chapter III we were concerned with analyzing what would happen on the side of capital formation if consumption were positively declining. Now we are to consider a situation in which the flow of funds into consumptive channels is actually increasing but at a less rapid rate than the flow into savings channels.[1]

According to the classical analysis there could not be any disparity between the growth of money savings and the growth of real capital. An increase in savings was supposed to result automatically in a corresponding expansion of the volume of new plant and equipment. It has sometimes been argued, however, that if savings are expanding faster than consumptive expenditures, there will eventually be a maladjustment in consumer markets. It is contended that the excessive growth of

[1] Data are not, however, available with which to show the year-to-year growth in the percentage of the total income which is saved.

new plant and equipment will in due course increase the flow of goods into distribution channels, pile up inventories, break the prices of consumers' goods, and so bring on depression.[2]

THE RESTRICTED RATE OF CAPITAL FORMATION

The maladjustment did not, however, work itself out in this way, in the period of the twenties.[3] A growing disparity between the amount of funds available for consumption and the money savings for capital formation was in evidence throughout the expansion era. But this did not lead to any serious congestion of goods in consumer markets. It will be remembered that during this period economic analysts were continuously stressing the fact that no undue accumulation of unsold goods was in evidence. There was, to be sure, some growth in the amount of inventories, but in the main only such as was incident to an expanding total volume of business.[4] Nor, as we have seen, did the depression of 1929 begin with a break in the prices of consumers' goods.

There are two reasons why a huge piling up of inventories did not occur. In the first place, the output of consumption goods in most manufacturing lines tended to be adjusted more or less closely to the existing

[2] See the theory of John A. Hobson, Appendix A, p. 173.

[3] This theory finds more support in the period 1919-20. The depletion of stocks of goods at the end of the war led to a replacement boom, with rapidly mounting prices and a piling up of manufacturing and trade inventories; and the break of 1920, as shown in Chap. V, first manifested itself in consumer markets. There had not, however, been any inordinate previous growth in plant and equipment—that is, outside of the distinctly war industries.

[4] The increase in the inventories of corporations, other than financial, during 1929 was officially reported at 913 million dollars, not all of which was in consumers' goods. (*Statistics of Income*, U. S. Bureau of Internal Revenue, 1928 and 1929.)

rate of consumptive demand—including purchases on installment—even though this meant failure to utilize fully the existing plant and equipment. It must be recalled again that the data compiled in *America's Capacity to Produce* reveal a substantial amount of unutilized capacity all through the boom period. Instead of producing all of the goods possible and pressing them into consumptive channels, business enterprisers held production in leash with a view to the maintenance of prices and of "stable conditions." [5]

Second, and of more fundamental significance, the actual rate of growth of new plant and equipment during these years was held in hand. Instead of being expanded to the fullest degree possible, the growth of new capital was adjusted to the growth of consumptive demand. Our studies reveal in general no marked increase in the amount of unutilized capacity, the percentage of unused plant and equipment in 1929, for example, being only slightly above the average for the five-year period 1925-29. Funds were available, labor was available,[6] and materials were available with which to expand productive capital much more rapidly than it was in fact expanded. The extent of the disparity between the growth of money savings and the growth of plant and equipment during the period will be indicated in the following section. The reader will bear in mind that the new capital goods here under consideration include only those financed through the sale of securities (see note 13, page 145).

[5] The question whether it would not have been a better policy to reduce prices with a view to expanding the real purchasing power of the masses need not be considered at this place; we are here concerned only with the situation which existed.

[6] There were about 270,000 idle workers in the construction industry in the month of peak employment.

WHAT BECOMES OF "EXCESS" MONEY SAVINGS?

Attention must now be given to an issue which has thus far been held in abeyance, although it is basic to our whole analysis. Superficially viewed, our conclusions may seem to involve a contradiction. We have been arguing in the preceding paragraphs that the supply of funds available in the capital market in a period of business expansion increases faster than the flow of money through consumptive channels; and yet at the same time we have been contending that the amount of new plant and equipment does not increase appreciably faster than the demand for the goods which such capital can produce. The question therefore arises, Where does the money made available in the capital market go if not into the building of excess productive capacity? This question, it may be recalled, was also sharply raised in the diagram on page 31.

In fact, this basic issue was first noted at the end of the preceding volume of this series of studies—*America's Capacity to Consume.* Attention was there called to the fact that in the first volume, *America's Capacity to Produce,* we had shown that neither over the first three decades of the twentieth century taken as a whole, nor in the boom period of the twenties, was there any progressive or cumulative piling up of unutilized productive capacity. In the second volume, on the other hand, the conclusion was reached that the percentage of the aggregate income saved tended to increase over this period and especially in the post-war years. The question was then raised, If there has been no appreciable increase in the amount of unutilized plant and equipment how can it be true that the proportion of the income annually diverted into savings channels has been increasing faster than that into consumptive chan-

nels? If such is the case, what has become of the excess money savings? Since this issue presents itself most strikingly in the decade of the twenties, we shall direct our major attention to this period of expansion.

Individual savings compared with security flotations. Capitalists procure the money savings of individuals through the issuance of securities. If all money savings of individuals were automatically used to construct new capital, one would expect to find an identity between the volume of money savings and the volume of new securities floated. In attempting to clarify the problem before us, we shall, therefore, first compare the volume of savings available in the investment market with the volume of new securities offered for sale. The aggregate savings of American individuals and families in 1929, according to estimates made in *America's Capacity to Consume,* were over 17.7 billion dollars, while corporate savings amounted to an additional 2.2 billions. Some of the "savings" of individuals and families represented direct investments on farms or in other personal enterprises and thus did not result in any flow of money into the investment market. Moreover, only a small part of the corporate savings entered the securities market. It is thus impossible to state precisely the amount of money savings seeking investment in securities, but our data indicate 15 billions as a minimum figure in 1929.

For the years just prior to 1929 we do not have as reliable data as to the aggregate savings. On the basis of figures showing the general growth in the national income, as expressed in monetary terms, between 1922 and 1929, and the known fact that very large profits from speculative activities were realized in the later years, we would estimate that the aggregate savings,

including corporate surpluses, gradually increased from something like 12 or 13 billions in 1923 to approximately 20 billions in 1928 and 1929. Making allowance for direct savings in the form of improvements on farms or in other personal enterprises, the amount of *investment money* available in 1923 and 1924 must have been around 8 or 9 billion dollars, as compared with something like 15 billions in 1928 and 1929.

It must also be borne in mind that throughout this period a substantial amount of investment money was annually being released in consequence of the paying off of the debt of the United States government. The aggregate reduction of the public debt for the seven-year period preceding June 30, 1929 was over 6 billion dollars, averaging 867 millions annually. This money was also available for the purchase of new securities, thus making a total of approximately 16 billions available for security purchases in 1929.

We may now compare the amount of money available to buy securities with the volume of new issues. In analyzing the flotations of securities, it is necessary to distinguish carefully between "total" financing, "net new" financing, and "net productive" financing.

"Net new" financing represents the difference between total issues and the amount of such issues which was used for refunding previously existing obligations. Since refunding operations do not provide money for the creation of new capital, the amount of such issues should obviously be deducted from the total of security flotations. In 1929 security issues aggregated about 11.6 billion dollars, of which 1.4 billions were for refunding purposes, leaving 10.2 billions as the amount of "net new" financing. The net figure for 1928 was

8.1 billions; in 1927 it was slightly less than 8 billions; and in 1926 and 1925 a little over 6 billions.[7]

These security flotations do not, however, account for all new financing in the United States. They do not include direct issues of farm and urban mortgages, as distinguished from real estate bonds secured by mortgages. There are no directly comparable data as to the volume of mortgage financing, but according to the best estimates available the increase in farm and urban mortgages outstanding in the year 1929 was something like 1.5 billion dollars.[8] Adding this amount to the volume of security flotations gives a total of around 11.7 billions of issues absorbed in 1929, as compared with approximately 16 billions of available investment money. Before accounting for the discrepancy we must consider the difference between "net new" financing and "net productive" financing.

A substantial portion of the funds raised from security flotations was used for purposes other than financing the construction of capital goods. Hence the figure of net new financing does not afford an accurate gauge of the growth of new productive capital. Securities are often floated for the purpose of providing working capital, and for acquiring the securities or properties of other companies. Such issues must also be eliminated if one is to ascertain the amount of funds going into actual capital construction.

The deficiency of "productive" security issues. A careful compilation designed to show the amount of

[7] As computed by the *Commercial and Financial Chronicle.* For the detailed figures for the five years 1925-29 inclusive, see Appendix D, Table VII, pp. 200-01.

[8] Estimate based on a special study of the volume of bonds and mortgages outstanding over a period of years, by George Terborgh.

"net productive" financing as distinguished from "net new" financing has been made by *Moody's Investors' Service*. The figure of net productive financing given in this compilation excludes all issues where the proceeds have been used for the purchase of securities already outstanding, or for any other purposes not associated with the construction of new capital. By examining each issue separately it was possible to determine, with rough accuracy, the extent to which the funds raised were utilized for productive purposes.[9] *Moody's* figure of net new financing differs somewhat from that of the *Commercial and Financial Chronicle* given above because it does not include the securities of foreign governments and corporations and those of territorial possessions.[10] The results of *Moody's* computation for the years 1922-33 are shown on page 145.

The addition of foreign financing to these figures would not greatly increase the total. Satisfactory figures of net foreign financing are not available for all years; but the *net* amount for 1928 has been computed by the Department of Commerce at 863 million dollars and for 1929 at 221 millions.[11]

Let us concentrate attention for the moment upon the situation in the years 1922-25. The security flotations devoted to "productive" financing averaged a little over 3.2 billion dollars annually. In addition the net flotations of mortgages averaged approximately 2

[9] For details of the method employed, see Appendix C.

[10] For the period since 1929, when federal government flotations became important, the *Chronicle* includes government issues, whereas *Moody's* excludes them, as going merely for financing deficits. However, such government guaranteed securities as Federal Farm Loan bonds and recent issues of the Home Owners' Loan Corporation are included on the theory that the proceeds are devoted to productive purposes.

[11] *U. S. Department of Commerce Trade Information Bulletin No. 814*, p. 35.

billion dollars a year,[12] making a total of a little over 5 billions annually. Thus the amount of securities of a productive character being offered in the markets was materially less than the volume of money savings avail-

NET PRODUCTIVE FINANCING, 1922-33 [a]
(In millions of dollars)

Year	Net New Financing [b]	Net Productive Financing [c]	*Net Productive Financing as Percentage of Net New Financing*
1922	3,568	2,721	*76.3*
1923	3,812	2,954	*77.5*
1924	4,521	3,466	*76.2*
1925	5,141	3,318	*64.5*
1926	5,208	3,168	*60.8*
1927	6,152	3,259	*53 0*
1928	6,682	2,947	*44.1*
1929	9,155	3,186	*34.7*
1930	6,068	3,446	*57.2*
1931	2,835	2,022	*71.3*
1932	1,148	702	*61.1*
1933	711	262	*36.8*

[a] Compiled by *Moody's Investors' Service*, but not published in yearly figures heretofore.

[b] Excluding refunding, United States government, and foreign issues.

[c] Excluding all "non-productive" financing. (For method of computing, see Appendix C.)

able for the purchase of such securities.[13] A substantial portion of the extra funds available in these years, as indicated by the table, was used for purely financial

[12] Special study by George Terborgh.

[13] This 5 billions represents only that portion of new capital which was financed through security issues. A large amount of new capital is created without resort to the security markets for funds. Farmers, as we have noted, increase the productivity of their land and construct buildings by the direct utilization of their own labor. Much industrial capital is financed directly out of corporate earnings; and bank credit is also extended for fixed capital purposes.

purposes such as the liquidation of short-term banking credits. Some of it went into foreign loans, and some no doubt was absorbed in the purchase of fraudulent issues. It may be noted also that the prices of outstanding securities began to advance rapidly after the middle of 1924.

Attention should next be directed to the rapidly decreasing percentage of the money savings which eventuated in the actual construction of new plant and equipment. Whereas in the recovery years 1922-24 three-fourths of the new security flotations were for productive capital purposes, in the three years 1927-29 well under 50 per cent went for capital formation. The percentage, moreover, steadily decreased from 1924 through 1929. The recurring low percentage in 1933 is a direct reflection of the large government flotations for purposes of deficit financing.

In summary, we had savings available for investment in securities ranging from around 8 or 9 billions in 1923-24 to as much as 15 or 16 billions in 1928-29. On the other hand, the volume of new corporate issues for productive purposes, including mortgages, remained practically stationary at about 5 billions. The amount of the savings that passed into the hands of business enterprisers for use in buying materials and hiring labor for the construction of new plant and equipment was thus about 5 billion dollars annually. The question is what became of the balance.

The inflation of security values. When the amount of money seeking investment is vastly in excess of the supply of new securities being offered for sale, prices are certain to rise—unless other factors are distinctly untoward. But other factors were here conducive to the same end. The volume of business was expanding year

by year,[14] and the earnings of corporations were increasing. Under such conditions the prices of securities may be expected to rise precisely as would the prices of commodities if demand were two or three times the available supply. After the rise has occurred a larger volume of money than before is used in transacting a given volume of business.

We have already noted that security prices began to rise rapidly after the middle of 1924. In due course the plethora of funds available encouraged and made possible the rapid growth of such business instrumentalities as the investment trust and the holding company. The amount of securities floated by investment trust and public utility holding companies in the years 1924 to 1930 inclusive was as follows.[15]

Year	Investment Trusts	Public Utility Holding Companies
1924	$44,700,000	$246,300,000
1925	208,500,000	401,900,000
1926	96,600,000	532,900,000
1927	418,700,000	883,500,000
1928	1,026,000,000	1,104,900,000
1929	2,951,000,000	1,039,000,000
1930	401,700,000	647,600,000

Such issues served to confuse the true economic picture. They added to the volume of security offerings; but the funds procured were employed almost entirely in the purchase of corporate securities already outstanding. Instead of adding to productive capital, these financial operations merely served to multiply the number of pieces of paper (shares of stock) constituting claims to existing properties. Ordinarily such

[14] Except for the recession of 1927, occasioned largely by Ford's change of model.

[15] Data compiled from Standard Statistics Co., *Standard Trade and Securities*. All securities sold through public offerings or by subscription rights are included.

a diluting process might be expected to depreciate the value of each piece of paper outstanding; but owing to the fact that the money was used mainly to buy existing securities it served instead to boost their prices.

Precise information showing the extent of the rise in the market value of *all* securities is not available. But for the period since January 1, 1925 the market value of common and preferred stocks listed on the New York Stock Exchange has been compiled. These securities represent roughly half the market value of *all* securities, and will serve to illustrate well enough the effect of the situation we have been discussing upon the prices of securities generally. The following table shows the market value of bonds and preferred and common stocks combined listed on the Exchange from January 1, 1925 to January 1, 1934 (in millions of dollars):

	Bonds	Stocks
January 1, 1925	13,676	27,072
1926	14,632	34,489
1927	16,014	38,376
1928	17,683	49,736
1929	17,613	67,478
September 1, 1929	16,047	89,668
July 1, 1932	10,060	15,633
January 1, 1934	12,406	33,095

This threefold increase in the five-year period 1925-29 reflects, of course, the growth in the volume of issues outstanding, as well as the rise in security prices. The increase in stock values, especially in the years 1927-29, bore virtually no relation to the real growth of national wealth and income.

"Capital gains" and a vicious circle. The enormous rise in security values generated a rapid growth of monetary income which was in no way the result of productive operations. A share of stock bought by

A at a price of $100 and sold to *B* at $120 yields a "capital gain" of $20 to *A*. If *B* later sells this stock to *C* for $150 he pockets a capital gain of $30; and if *C* in turn sells it to *D* at $200, he makes a gain of $50. So long as security prices continue to rise, these successive speculative profits accrue to all individuals who dispose of their stock at an advance; it is not until the tide has turned that counterbalancing losses appear. The amount of these capital gains in 1929 reached a total of more than 6 billion dollars;[16] and it was probably not less in 1928.

Income in the form of capital gains is available, like any other income, either for consumptive expenditures or for new investment. A considerable amount of such windfall profits during the recent boom was used to expand purchases of consumption goods and services, particularly of the luxury variety. But there was a strong temptation to put such gains directly back into the market in order to make further fortune while the making was easy. It should be borne in mind also that the largest gains were those realized by wealthy operators whose consumptive wants were reasonably well satisfied and who accordingly were likely to return the bulk of such income to investment channels.

The capital gains were thus largely the result of an antecedent and growing disparity between the volume of money flowing into investment channels and the volume being currently required by corporations for productive purposes. Although derived from inflation such money income functioned, when disbursed, like any other money—as demand for consumers' goods or as demand for securities in the market. When such money was reinvested it served to push up security prices anew

[16] See *America's Capacity to Consume*, p. 175.

and thus to make possible another harvest of money income—to be once again invested in the security market "gusher."

Rapid expansion in new industries. While the growth of capital in established lines of industry was relatively slow, a very rapid expansion occurred in the

FINANCING OF NEW INDUSTRIES, 1924-30[a]

(In millions of dollars)

Year	Aviation	Radio	Chemical	Natural Gas	Motion Picture
1924.....	—	17.7	15.1	3.0	12.2
1925.....	1.9	9.5	56.2	15.5	91.1
1926.....	—	3.8	35.0	39.3	100.8
1927.....	0.2	49.6	26.1	100.5	141.2
1928.....	55.1	29.8	86.5	107.5	77.9
1929.....	172.8	61.3	237.7	51.9	50.3
1930.....	4.2	4.7	57.8	59.7	172.7

[a] Compiled from *Standard Trade and Securities.*

later years of the boom period in certain new lines of business. The table on this page shows the total financing annually between 1924 and 1930 of a group of such developing industries. Though the peak of new financing varied a bit in different lines, it is evident that rapid growth usually occurred in the height of the boom period.

In consequence of the plethora of investment money available, and the loss of all sense of values which the rising markets engendered, investment in new lines of enterprise went to extremes. The most remarkable case of rapid growth was perhaps that of the aviation industry. Inspired by the *Spirit of St. Louis,* and encouraged by generous subsidies, the future of air trans-

port appeared as boundless as the heavens themselves. Between January 1, 1925 and October 1, 1928 only $24,742,000 of new securities were offered to the public to finance aviation enterprises. Then in the ensuing 15 months $219,513,000 of new aviation issues were marketed. There were 73 aviation companies organized between 1925 and 1929, of which only 17 remained in operation in 1934.

Excess savings lead to security inflation. It is now possible to answer the question, What became of money savings which did not eventuate in new plant and equipment? The answer is that they were utilized in purchasing the ownership (stock) of existing corporations, thereby bidding up the prices of outstanding securities. Instead of producing new plant and equipment they raised the prices of that already built.

The process is identical with that of commercial inflation. As the prices of securities rise a greater volume of savings is required to purchase a given number of shares of stock, just as when the prices of commodities rise a greater amount of expenditure is necessary to purchase the same volume of goods. The speculative profits which accompany the process are not in either case hoarded, but simply become a part of the onward flow of money income to be either spent or invested.

In view of the superabundant supply of investment money derived from individual and corporate savings during the boom period, it is evident that it was not necessary at that juncture to draw also upon the credit resources of the commercial banks for investment money. The expansion of commercial bank loans for investment and speculative purposes served in fact to intensify the disorder in the financial markets. The situation was here essentially different from that in

earlier years when the supply of securities being floated exceeded the volume of investment funds currently originating in the savings of individuals and corporations, as, for example, in the expansion period following 1900 when there was a very large volume of "undigested securities" in the financial markets.

In this discussion of the maladjustment between savings and consumption our attention has been focussed upon the expansion period of the twenties. A word must now be said about the situation in earlier years of the general period under review. What became of the large savings accruing to individuals and corporations in the war years, for example? Were they dissipated in a similar way?

The answer is that some billions were invested in the securities of foreign governments and corporations, the larger part of which was not repaid. Other billions were lost in the acute though short-lived depression of the early post-war years. For example, corporate surpluses were built up in years like 1916 and 1917 at the rate of nearly 5 billion dollars annually, while in 1921 there was a net decrease in the accumulated surpluses of American corporations to the extent of 2.7 billion dollars.[17] The outcome was thus similar though the process was somewhat different.

When the amount of the national money income that is saved increases faster than the amount that is disbursed through consumption channels, there are various possible outlets for the excess savings. Funds not demanded for the construction of new plant and equipment may be invested abroad, as during the World War and again in 1925-29. They may be ab-

[17] For the figures annually from 1909 to 1929, see *America's Capacity to Consume*, p. 109.

sorbed in bidding up the prices of existing securities, as in the recent boom years. They may stagnate in bank deposits—or go to finance government deficits—as has been the case during the depression. (See Chapter IX.)

Having ascertained how excess money savings may be dissipated in non-productive and economically disturbing ways we may now return to the discussion of the restricted rate of capital formation begun early in the chapter. The most striking thing brought out by *Moody's* compilation of productive financing is the practically uniform increase over the period from 1922 to 1929 notwithstanding the phenomenal increase in savings and in total security issues. Indeed, the absolute amount of new productive financing appears to have been greater in the years 1924-26 than in the period 1927-29. This evidence proves conclusively that money saved is not necessarily "spent for capital goods."

The growth of productive capital in established lines of business enterprise is evidently maintained in reasonably close adjustment to the growth of consumptive demand—regardless of the volume of funds currently rendered available for the construction of new capital. To be sure, business men will expand productive capacity somewhat in excess of current needs—even in such developed lines as iron and steel, clothing, and automobiles. Such creation of excess capacity is partly the result of the hope of particular business men that they can, by building new plant and reducing costs, capture a larger share of the existing market; and it is in part attributable to the lack of co-ordination of production plans among competing concerns and an exaggerated notion in periods of expansion of the probable future

rate of growth. But while productive capacity may for these reasons be built somewhat in excess of needs, there are very definite limits to such expansion. The growth of capital is held in check by the possibilities of profit in the manufacture and sale of consumption goods.

The unequal distribution of income among the various classes of society tends to promote a more rapid increase of savings than of consumptive expenditures. But the expanding rate of flow into investment channels does not correspondingly accelerate the growth of productive capital. On the contrary, it tends to restrict the rate of capital formation as compared with what it might be were a larger proportion disbursed for consumption purposes. Our findings in this volume thus reinforce the basic conclusion reached in *America's Capacity to Consume.*

CHAPTER XI

CONCLUSIONS

The foregoing analysis of the process by which capital is created in the modern world has necessarily been of a somewhat involved character—tending no doubt toward some confusion as to the precise import of the conclusions reached. It may be helpful accordingly if the fundamental elements of the analysis and the primary conclusions be here restated in as concise and simple form as possible.

At the outset, we called attention to the fact that under any form of economic organization the formation of capital involves an allocation of the productive energy of society. Under primitive conditions the process was a simple matter, involving a direct apportionment by each individual of his own labor power as between the creation of consumption goods and capital goods. Under a communistic form of organization, the allocation of the energy of society is determined by centralized authority—one portion of the population being set to work producing consumers' goods and another portion capital goods. In a capitalistic system, however, the allocation of energy results from a multitude of individual decisions and is dependent upon the functioning of a complex financial and business mechanism. The creation of capital here involves a roundabout process, which, operating in response to the profit motive, transforms monetary savings into capital goods.

In neither economic nor business literature is there to be found any thorough analysis of the economic implications of the process of capital formation in a capitalistic society. According to the traditional analysis, the amount of new capital goods that will be created depends merely upon the proportion of the national money income that is set aside in the form of savings. When individuals save money instead of buying consumers' goods, they express a demand for capital goods; and it is assumed that in response to this demand new capital goods will shortly be created. To produce such capital goods, however, it is necessary to shift labor and materials from the creation of consumption goods, this being accomplished by the operation of the so-called price and profit mechanism. The curtailment in the demand for consumption goods is matched by an increase in the demand for capital goods, and the resulting fall in the price of the former and rise in the price of the latter serve to induce a shifting of productive energy in response to changing profit opportunities.

In accordance with this analysis all the productive energies of society are employed regardless of how the total money income may be apportioned as between consumptive expenditures and savings for investment. Since all monetary savings are assumed to be transformed automatically into capital equipment, it follows that the greater the proportion of the national income that is saved, the greater the growth of capital and the more rapid the rate of economic progress.

Our analysis of the process of capital formation may be summarized as follows. To begin with, we challenged the assumption that money savings enter the market as direct demand for capital goods. We contended that such savings merely constitute a supply of

money available to business enterprisers for use in the construction of new plant and equipment. Whether it will be profitable to use such funds in the formation of new capital depends upon the possibility of selling the commodities which such capital can produce. The demand for capital goods is *derived* from the demand for consumption goods. Hence, an increase in savings *at the expense of* consumptive demand will decrease rather than increase the output of capital goods.

In the light of this general analysis we reached a preliminary conclusion that if new capital is to be created there must be an increasing flow of funds through consumption channels as well as through savings channels. We then turned to a study of the evidence afforded by our industrial history as to the conditions under which a growth of capital does in fact take place. The evidence led us to the following conclusions.

1. The facts show incontrovertibly that new capital is constructed on an extensive scale when consumption is expanding rather than when it is contracting. The bulk of our capital is created in periods of general economic expansion, when productive resources are being more fully utilized than at other times. The process does not involve an extensive shifting of labor and materials from consumption goods industries to the formation of capital. Nor do the prices of consumption goods and capital goods tend to move in opposite directions.

2. The evidence indicates that in a period when the output of both consumption and capital goods is being increased, there is an expanding flow of *funds* through both consumption and investment channels. This simultaneous increase is made possible by the expansive quality of our commercial banking credit system.

3. The available evidence also supports the view that the growth of capital is directly related to the demand for consumption goods. In the first place, changes in the direction of business activity in most cases appear to have begun with factors affecting the consumption side of the economic picture. In the second place, the growth of new capital is adjusted to the rate of expansion of consumptive demand rather than to the volume of savings available for investment. Between 1923 and 1929, for example, the volume of securities floated for purposes of constructing plant and equipment remained practically unchanging in amount from year to year, despite the fact that the volume of money available for investment purposes was increasing rapidly. Regardless of the amount of money available for the construction of new plant and equipment, the growth of capital goods was adjusted to the rate at which consumptive demand was increasing.

Although the traditional analysis recognized that new capital is created with a view to a subsequent expansion in the output of consumption goods, it was assumed that business enterprisers would proceed for years to create new capital, thereby extending the "roundabout processes of production," even though consumptive demand might for the time be declining, or lagging. The facts which we have assembled afford no support for this assumption.

The conclusions which we have reached with reference to the dependence of the growth of capital upon the concurrent expansion of consumptive demand have an important bearing upon the relationship of the distribution of the national income to economic progress. If, in consequence of wide variations in the distribution

of income, the proportion of the national income that is saved expands rapidly, there results a maladjustment which retards rather than promotes the expansion of capital.

The rapid growth of savings as compared with consumption in the decade of the twenties resulted in a supply of investment money quite out of proportion to the volume of securities being floated for purposes of expanding plant and equipment, while at the same time the flow of funds through consumptive channels was inadequate to absorb—at the prices at which goods were offered for sale—the potential output of our existing productive capacity. The excess savings which entered the investment market served to inflate the prices of securities and to produce financial instability. A larger relative flow of funds through consumptive channels would have led not only to a larger utilization of existing productive capacity, but also to a more rapid growth of plant and equipment.

The phenomenon of an excessive supply of funds in the investment markets had never been anticipated. Not only had it been assumed that all savings would automatically be transformed into capital equipment, but it seemed impossible to conceive of a situation in which savings might become redundant. Such a point of view is natural enough in the light of our historical evolution.

In the early history of this country the volume of funds available for the purposes of capitalistic enterprise was persistently inadequate. Business men often found it difficult to obtain the liquid capital, at any price, with which to expand the size of their business undertakings or to exploit new fields of enterprise. In colonial days, for example, the shortage of funds was a con-

tinual source of difficulty and a primary cause of irritation with the mother country, which opposed the issuance of bills of credit by colonial governments. Until well into the nineteenth century the volume of savings rendered available through investment channels for the needs of business enterprisers was negligible in amount. The philosophy which emphasized the fundamental importance of increased savings was a realistic one for that age.

In the period since the Civil War, however, two factors have combined to produce a profound change in this situation. The first has been the growth of a well-to-do middle class, with funds available for investment. The second has been the development of the commercial banking system, making possible an expansion of credit to business enterprise for both fixed and working capital purposes. It is these developments which account for the emergence of the United States as a great financial power. Not only do we now have an abundance of funds with which to finance American enterprise, but we are also able to extend credits to the world at large. In this development we have followed the road which England travelled at an earlier date.

At the present stage in the economic evolution of the United States, the problem of balance between consumption and saving is thus essentially different from what it was in earlier times. Instead of a scarcity of funds for the needs of business enterprise, there tends to be an excessive supply of available investment money, which is productive not of new capital goods but of financial maladjustments. The primary need at this stage in our economic history is a larger flow of funds through consumptive channels rather than more abundant savings.

APPENDIXES

APPENDIX A

OTHER ANALYSES OF THE SAVINGS PROCESS

In the course of our analysis we have had occasion to indicate the existence of conflicting viewpoints and to challenge certain widely accepted assumptions, particularly those underlying what we have called the classical theory of capital formation and economic progress. Since we were concerned primarily with setting forth our own analysis in as concise a form as possible, we deemed it advisable not to confuse the larger picture by bringing into our discussion any consideration of the writings of others. It may, however, help to clarify some of the larger issues involved if at this place we give specific consideration to a selected group of studies relating to the problem with which we are concerned. We shall not attempt in this analysis to review all of the literature pertaining to this subject, but will confine our discussion to widely known writings or to those which serve best to illustrate the issues involved.

The studies which we shall discuss fall into two major classes: first, those which are essentially different in approach and arrive at conclusions fundamentally divergent from those which we have reached; and, second, those which at first thought may possibly be regarded as embodying a point of view and analysis similar to our own. None of these studies deals with the problem of capital formation in a comprehensive way. As a rule they relate only to certain specific phases of the problem with which we are concerned; and most of them are concerned only with the causes of depressions The reader is asked to bear in mind that we are confining our discussion to those aspects of the various studies under review which relate specifically to the process of

capital formation. Our main task is to examine the validity of the assumptions on which the several authors have reached their conclusions.

THE THEORY OF F. A. VON HAYEK

We may first consider the analysis of the Austrian economist, Dr. F. A. von Hayek, now at the London School of Economics. The following statement is based upon his little volume entitled *Prices and Production* and upon subsequent articles elaborating his point of view.[1] The basic assumptions which underlie Mr. Hayek's analysis are indicated in the following summary statement:

"What happens . . . when somebody saves a part of his income hitherto devoted to consumption . . . ? Clearly the demand which is directed to means of production [capital goods] increases, and that directed to consumption goods correspondingly decreases." (*Economica,* May 1931, p. 142.) "At first the new savings will serve the purpose of *transferring a portion of the original means of production previously employed in producing consumers' goods to the production of new producers' goods.*" [Italics Hayek's. This transfer is induced by changes in the relative prices of capital goods and consumers' goods.] (The same, p. 140.) "The immediate effect of the increase in the demand for producers' goods and the decrease in the demand for consumers' goods will be that there will be a relative rise in the prices of the former and a relative fall in the prices of the latter." (*Prices and Production,* p. 70.)

It will be observed from these quotations that Hayek assumes that the formation of capital involves a transfer of labor and materials from the creation of consumers' goods to the creation of capital goods—this being accomplished by the price mechanism. It is implied, it will be seen, that our productive forces are normally fully employed and that it is impossible in consequence

[1] "The Paradox of Saving," *Economica,* May 1931, pp. 125-69; and *Econometrica,* April, 1934, pp. 152-67. Mr. Hayek's analysis may be regarded as typical of that of a continental school of writers whose point of view is derived from the theories of Böhm-Bawerk of Austria and Wicksell of Sweden—first synthesized by Professor Ludwig von Mises of the University of Vienna.

to increase the production of capital goods and consumption goods simultaneously. Hayek submits no evidence to show (a) that the expansion of capital occurs when consumption is declining, or (b) that the prices of capital goods rise while the prices of consumers' goods fall. These are mere assumptions, and they find no support in the data which we have assembled in the course of our investigation.

Hayek notes that in periods of depression there is some slack in the industrial system, but he bases his primary argument on the assumption that we have full productive capacity. He states that "the assumption of an 'industrial reserve army' is incompatible with the known facts and theoretically inadmissible as a starting point for a theory which attempts to show the causes of crises on the basis of the modern 'equilibrium theory' of price determination." (*Economica,* May 1931, p. 140.) As our studies conclusively show, there remains a large amount of slack in the industrial system even at the peak of boom periods.

Hayek next considers the effects of expanding bank credit upon the formation of capital. When bank money is loaned to business men with which to employ labor and materials for the construction of capital, he argues, "entrepreneurs are in this case enabled to attract factors of production . . . , not by a corresponding transfer of funds from consumers' to producers' goods but by additional money handed to them. This means that they will bid up the prices of these factors without there being a corresponding fall in the prices of other factors. Total money income will, therefore, increase, and this increase will in turn lead to an increase in the amount of money expended on consumers' goods." (*Econometrica,* April 1934, p. 158.) While the prices of consumers' goods will thus rise, they will lag behind the rise in the prices of capital goods. Eventually, after the issue of new bank credit ceases, the prices of consumption goods will rise in relation to the prices of capital goods and depression will ensue. Hayek finds the basic source of maladjustment to be the extension of credit; and he believes

a "neutral money" policy would give us permanent stability.

Again it will be observed that Hayek assumes that the creation of new capital necessarily involves a diversion of labor and capital from the production of consumption goods to the creation of capital goods. Again he cites no evidence either in support of the diversion theory or to show that the prices of capital goods and consumers' goods move in the ways indicated.

Hayek's analysis breaks down at its very beginning. The assumptions on which he predicates his whole argument are not in accordance with the facts of the business world. Moreover, the central issue in the problem of capital formation, namely, the relationship between consumptive demand and the demand for capital goods, has not been analyzed.

BENJAMIN M. ANDERSON'S ANALYSIS

Dr. Benjamin M. Anderson has given consideration to the problem with which we are concerned in two bulletins issued by the Chase National Bank of the City of New York. The first is entitled *Bank Money and the Capital Supply,* and the second *Bank Expansion versus Savings.*[2] Mr. Anderson states the problem of capital expansion as follows:

> It is possible to accumulate new productive equipment only if the current consumption of the people can be supplied with less than the full productive capacity of the people. If labor and existing equipment are to be employed in producing machines and railroads, then the consumers of the country must be content with *less goods for immediate consumption* [our italics] than they might have if the whole productive power of the country were devoted to consumers' goods. The decision as to how the productive power of the country shall be used rests with those who have control of the available funds for expenditure. If an individual spends for consumption all that he makes in the course of the year, . . . he draws labor and equipment away from the production of capital and devotes it to the production of consumers' goods. If this individual . . . saves and invests in rail-

[2] Nov. 8, 1926, and June 25, 1928 respectively.

road bonds, he gives the railroad funds which *may* [our italics] be spent for new rolling stock or for the improvement of the roadbed. A correspondingly smaller number of laborers is then devoted to making consumers' goods and a larger number to the production of capital goods. . . . The difference between thrift and extravagance is not the difference between hoarding money and spending money. What is saved is also spent. The difference is simply as to the way in which it is spent.[3]

It will be seen from this general statement that Anderson assumes that an expansion of capital goods occurs only when the output of consumption goods is being reduced—the process involving a shifting of labor and capital from the production of consumption goods to the production of capital goods. The basic assumption underlying this point of view, of course, is that 100 per cent of our labor and capital supply is always employed, and that if we are to employ more in one direction we must necessarily employ less in the other. In this general statement there is no recognition of two problems basic to our analysis; namely, (1) the relation of expanding consumption to expanding capital formation, and (2) the amount of unutilized capital equipment and labor supply which normally exists.

At a later section of his analysis, however, Anderson notes the possibility that both an increase in capital formation and an increase in consumption goods might occur simultaneously. When funds with which to expand plant and equipment are obtained from the commercial banks rather than from savings—

The borrower, armed with the new bank credit, is able to divert labor and existing equipment from the production of consumers' goods to the production of producers' equipment, with the result that in the course of the succeeding months more actual physical capital comes into existence than would have come into existence if the loan had not been made. This may even take place without diminution of the current flow of consumers' goods, if at the time the loan is granted the industrial resources of the community are not fully utilized, if there is idle labor and a slack condition of industry. If the resources of the community

[3] *Bank Money and the Capital Supply*, pp. 21-22.

are fully utilized, the new capital is created at the expense of the current flow of consumers' goods. None the less, new capital is created.[4]

It will be noted that he recognizes that "if there is idle labor and a slack condition of industry" the expansion of capital creation is not necessarily at the expense of the production of consumers' goods. What Anderson has not apparently recognized is that there is *always* a large amount of industrial and labor slack—except at periods when both capital formation and an expanding output of consumption goods are occurring simultaneously. Indeed, as our analysis in *America's Capacity to Produce* has so clearly shown, there was slack to the extent of approximately 20 per cent even at the height of the recent boom period.

From this second quotation, it is again apparent that Anderson has not faced the question as to whether an expansion of consumption is essential to an expansion of capital, for he again assumes that the process in the main involves *diversion* of energy from the production of consumption goods to the production of capital goods.

Anderson is, however, essentially right in his apparent conclusion that the extensive use of commercial bank credit for the purchase of bonds and in the financing of stock market speculation in the late twenties did more harm than good. As we have indicated in our analysis, there was a superabundance of investment money rather than a shortage of funds with which to finance industrial expansion. If anything, Anderson concedes too much in stating that between 1922 and 1929 business was "markedly accelerated by the immense flood of new money market funds put out and expended."[5] While some use of commercial bank credit was essential in connection with underwriting activities, our analysis indicates that the primary result of the use of commercial bank funds for investment purposes during these par-

[4] The same, p. 25.

[5] The same, p. 20.

ticular years was to intensify the maladjustment in the financial markets.

THE CRITIQUE OF E. F. M. DURBIN

The most comprehensive and systematic study of the problem of oversaving is found in a little volume recently published by a young British economist.[6] In considering the relation between consumption, saving, and capital formation, Mr. Durbin analyzes the problem both in connection with short-run cyclical fluctuations and under long-run normal conditions. Interestingly enough, he finds serious difficulties for the short-run periods but none over the long run. He does not, however, indicate how one can add up a series of bad short runs and get a satisfactory long-run result.

Durbin concurs in the view that an increase in saving relative to consumption will produce a business crisis. He says:

> An increase of saving will inevitably cause the appearance of net losses in the production of consumption goods despite the fall in the rate of interest, . . . and the appearance of these losses will involve a sympathetic contraction in the demand for capital goods. From these two propositions it follows that an increase in savings may be accompanied by a contraction in the output of both consumption goods and capital goods and that this will result in general unemployment. [Page 129.]

From this quotation it will be seen that Durbin recognizes that the demand for new capital is dependent upon the demand for the consumers' goods which such capital might turn out; and that an increase of savings will reduce the demand for and the actual construction of capital goods. His view about the satisfactory adjustment in the long run is evidently based upon the observation that, despite the dilemma to which the saving process appears to give rise, we have somehow had great economic progress.

[6] E. F. M. Durbin, *Purchasing Power and Trade Depression,* revised January 1934.

If we reflect upon the economic history of the last hundred years it is apparent that saving cannot always be disastrous. There has been during this period a great rise in the general standard of living and this increase has been accompanied by, and is clearly related to, the equally enormous growth in capital. Over the long period saving therefore appears to promote rather than to check consumption. To the individual the process of saving involves a reduction of consumption, and yet the saving of the nineteenth century accounts for the multiplication of the output of consumption goods by five, ten, and twenty fold. [Pages 57-58.]

He then adds, "How is this apparent contradiction to be reconciled?" and explains the way out as follows:

The reconciliation lies in the double nature of the process we are analyzing. The first activity, the mere abstention from consumption, is not the end of saving. All that this does is to release part of the purchasing power from the purchaser in the first instance and a fraction of the real productive resources in the second instance from the manufacture of consumption goods, so that they become free to increase the stock of capital instruments. This second activity of "capital building" Mr. Keynes has distinguished by the term "investment." It is the purpose of *investment* to increase the productive resources of society and, in so far as it is successful, it must lead to an increase in the output of consumption goods. Moreover the increase in productive efficiency will enable those who carry a process of investment to a successful conclusion to pay a rate of interest either to themselves or to those from whom they borrowed the money in the first instance. . . . This process makes a rise in the standard of living possible and causes the paradox of continuous saving accompanied by increasing consumption to appear. [Pages 58-59.]

It will be observed that it is here *assumed* that money savings *will be used* to build new plant and equipment, with the result that employment will expand and consumptive demand will follow suit. This is, of course, the very point at issue—whether savings resulting from a restriction of consumption will be used in creating new capital goods. Durbin does not ignore this issue, but thinks he has found a way out. Having shown that in the short run an increase of savings will check capital

formation, he escapes the dilemma, for the long run, by assuming a *constant* rate of saving.

> The solution is to be found in the analysis of a *continuing process* [italics ours] of saving, and in the necessary effects upon productive efficiency of a *constant rate* of capital construction. If we ask, not what is the effect of the first process of saving upon monetary equilibrium, but what is the effect of a continuous process of both saving *and* investment . . . we shall arrive at a very different conclusion. [Page 72.]

His continuing argument is, in brief, that entrepreneurs will use savings for the construction of new capital because such capital will reduce costs sufficiently to enable them to pay the current rate of interest on the borrowed funds. Indeed, the productivity of the new capital will more than pay the rate of interest and will make possible a reduction in commodity prices as well.

If this resort to a constant rate of saving as a way out of the dilemma is to be regarded as significant, it must be shown that we have had over the last century a constant rate of saving. Durbin does not actually contend that such has been the case; and it is, of course, not the case. The rate of saving changes more or less continuously with the ups and downs of the business cycle, and, as we have shown in *America's Capacity to Consume,* there appears to be a tendency for the rate of saving to expand as the general level of incomes rises and, particularly, as incomes rise among the higher income groups. Durbin's argument at this place must, therefore, be regarded as purely hypothetical and without relevancy to the fundamental issues involved.

Durbin himself apparently recognizes this, for he says that he has been explicitly assuming that "the conditions are *artificially* constant in all the important determining quantities." Accordingly, he goes on to inquire whether the economic system can adjust itself "to an *increase* in the rate of saving which involves a fall in the rate of interest." He says, "There is an *a priori* assumption that it can." (Pages 78-81.)

The adjustment is accomplished, in his view, by changes in prices. An increase of savings reduces first,

the prices of consumption goods, and, second, the rate of interest. The fall in the rate of interest "must be of such a sort (if there is such a thing as a demand *curve* for new savings) that it equates the supply of, and the demand for, new savings at the new and higher rate of saving." (Page 87.) He notes that the existence of such a curve implies the existence of a continuous rate of new inventions (which he evidently does not think is assured). He notes also that the reaching of a new equilibrium implies that there are sufficient avenues of investment which are capable of reducing costs to absorb the whole supply of savings. If not, the rate of interest must fall still lower. "It must ultimately reach a point at which equilibrium can be maintained—if any supply and demand theory of interest holds true." (Page 88.)

Durbin, however, does not believe, as do many price mechanism theorists, that an equilibrium will occur automatically and immediately. "I doubt if the reaching of it is a short period phenomenon, and I believe that it could only be reached through a period of *general* disequilibrium"—in other words, through the medium of a business depression more or less protracted. (Page 89.)

Having admitted, then, that when the rate of savings increases, a depression will inevitably occur, and that equilibrium will be re-established only after a period of depression, Durbin proceeds to inquire whether a reduction of the interest rate will eventually bring about business recovery. It comes as a surprise to find him attributing recovery rather to a combination of factors. It comes

> because entrepreneurs are convinced after a time that the low level of prices . . . is in a large part permanent and they then look about them for other methods of increasing their profits. They can only do this by reducing their costs. Now they can reduce their costs either by wage reductions or by capital improvements. . . . (With) inventions and improvements available, the rate of interest upon new capital very low, monetary conditions very easy, and prices no longer falling catastrophically but still showing no tendency to rise and deflect the entre-

preneurs' interest away from the reduction of costs, investment will begin again. [Pages 175-76.]

Despite the "*a priori* presumption," Durbin evidently does not find that new equilibrium is brought about through "equating the supply of, and the demand for, new savings at the new and higher rate of savings," for he attributes recovery to a combination of factors, of which the low interest rate is of relatively minor importance. It should be borne in mind, moreover, that the low interest rate prevailing at the end of a depression is not the result of a higher rate of savings, for savings are very greatly reduced in the course of a depression. The low interest rate is merely a reflection of the lack of demand for banking accommodations.

Durbin's analysis is thus defective in two principal respects. First, his analysis of long-run phenomena, which runs in terms of automatic adjustments, is in no way articulated with his discussion of short-run or cyclical phenomena. He evidently fails to appreciate that there is no *long run* independent and distinct from a succession of cyclical fluctuations.

Second, Durbin has completely overlooked the rôle played by the commercial banking system in the capital formation process. He has assumed, in his long-run analysis, that funds are procured for capital creation by an antecedent restriction of consumption, and it has appeared to him, therefore, that—since we do get capital formation—the process must work satisfactorily in the long run even though it never works in the short run. The truth is, as we have shown in our analysis, that the commercial banking system makes possible a simultaneous increase in the flow of funds through consumption and investment channels. The growth of industrial capital over the last century, moreover, has occurred chiefly on the upswing of business cycles.

JOHN A. HOBSON'S THEORY OF UNDER-CONSUMPTION

One of the earliest and perhaps the most vigorous exponents of the theory that business cycles are caused

by a maladjustment between consumption and savings is the English writer, John A. Hobson. In fact, the under-consumption theory of depression is commonly regarded as Hobson's theory, though, as we indicated in the foreword to *America's Capacity to Produce,* the same general approach is found in numerous earlier writers. In view of the thought in the minds of some people, perhaps not unnaturally, that our general study of the distribution of wealth and income in relation to economic progress is intended primarily to test the validity of the Hobson thesis, it seems essential at this place to indicate precisely what Hobson's position has been and to show wherein our own analysis differs therefrom.

Mr. Hobson finds the cause of business depressions in the failure of consumptive demand to expand as rapidly as the output of goods intended for consumption expands. This failure is due to what he calls a "chronic attempt to oversave income." He argues that "if savings rise above a certain definite proportion to spending . . . the first effect of such oversaving (underconsumption) is to employ labor to produce more forms of capital than are economically requisite to supply consumptive goods at the rate at which they are demanded." In consequence there is "a congestion of the industrial system with goods, productive and consumptive, which are not bought as fast as they are produced." Depression inevitably follows; and recovery comes only after a painful process of readjustment in which large quantities of existing capital representing oversaving are destroyed and the rate of saving for new investment has been retarded, while on the other hand the consumption of a growing population has been gradually increasing.[7] Mr. Hobson concludes that if a "right proportion between saving and spending of income" were preserved, prosperity would be perpetual. A wrong apportionment occurs because of the character of the distribution of income, which results in chronic oversaving.

[7] Mr. Hobson has set forth this point of view in various publications. These quotations are taken from *The Industrial System,* 1910, pp. 305-06.

Hobson's analysis differs from our own in several important respects. In the first place, he follows the classical assumption with reference to the identity of money savings with capital formation. He says: "Spending means buying consumptive goods; saving means buying production goods. Spending causes more commodities to be produced; saving causes more forms of capital to be produced." (Page 50.) It is thus assumed that money savings, whatever the volume, automatically eventuate in the construction of new capital goods. He fails to recognize that the volume of money savings may be greatly in excess of the volume of new securities being issued in the markets; and no appreciation is here shown of the dependence of capital formation upon a concurrently expanding consumptive demand. They appear—for considerable periods of time—to be independent variables. Only ultimately, after the markets become congested with the new consumption goods which the enlarged plant and equipment will produce, does trouble arise. It will be seen that it is assumed not only that the money savings will eventuate in new capital equipment, but that the new capital equipment will be employed at full capacity in turning out goods until such time as the industrial machine becomes clogged with excess inventories.

In contrast, our analysis has indicated that the construction of new capital is held in abeyance by the relatively slow rate at which consumptive demand is concurrently expanding; and that the output of consumption goods tends to be adjusted fairly closely to the volume of orders originating in consumptive demand. The period from 1925 to 1929 was not marked by a much more rapid rate of increase in capital equipment than of consumptive demand, nor was there a cumulative congestion in the consumer markets which finally produced the break in the autumn of 1929.

In the second place, Hobson's thesis is related solely to the phenomenon of economic depressions. He has not recognized that the rate of expansion in the construction of capital goods, even in periods of prosperity,

may be held in check by virtue of a restricted consumptive demand. He has not appreciated the possibility that even in periods of active business a considerable proportion of our productive capacity may be unutilized for want of an adequate flow of demand through consumption channels.

There is nothing in Mr. Hobson's analysis which suggests the economic dilemma which arises out of the necessity of restricting consumption in order to provide funds for capital expansion. As already indicated, he believes that if there were only a "right rate" of saving everything would work out satisfactorily. The only difficulty that he has noted is *oversaving;* whereas our analysis has indicated that difficulties inhere in the very process of providing funds for capital formation through an antecedent restriction of consumptive demand.

Since Mr. Hobson's approach is the classical one, which assumes that a restriction of consumptive demand is necessary in order to make possible an expansion in the demand for capital goods, and that new capital goods will be created in great volume even though consumptive demand is declining, it is not surprising that he gives no consideration to the rôle of commercial banking in connection with the problem under consideration. Only when it is understood that capital formation and expanding consumption occur not *alternately* but *concurrently,* does it become apparent that the flow of funds both through consumption channels and investment channels must be expanding simultaneously.

Our analysis is akin to Hobson's in that we are considering the significance of the distribution of income to the rate of economic progress. But we are not primarily concerned with the cause of depressions, nor do we ascribe the beginnings of depression always to gluts in consumer markets. The focus of our study as a whole is the relation of consumptive demand to the rate of production and the rate of capital growth in general—in periods of expansion as well as in periods of depression.

THE VIEWPOINT OF FOSTER AND CATCHINGS

A comparatively recent study which superficially bears some resemblance to our analysis is that by William T. Foster and Waddill Catchings.[8] A brief summary will serve to show, however, that their line of reasoning and their conclusions differ essentially from our own.

They begin with the classical line of analysis that savings are automatically invested in new capital goods, thereby increasing productive power. The trouble arises when these new capital goods expand the production of consumption goods; for they say that then "industry turns out more consumers' goods than consumers can buy with their incomes. . . . The deficiency of income comes about because industry does not pay consumers as much money as it expects consumers to pay for its products—as much money as consumers *must* pay if business is to expand and prosper." This is because the price of goods includes an *allowance for profits*—which, it is assumed, do not constitute income available for consumers. "Consequently, as the flow of goods into consumers' markets increases, the flow of money into consumers' pockets does not long increase proportionately. Presently, there are more goods on hand than the people can buy and pay for out of income, at the going price level." [9]

The continued output of production goods in excess of demand reduces consumer prices and causes a business depression. Their way out of the difficulty is to expand the flow of money through consumer channels by increasing wages at just the right rate to provide for the purchase of all the consumers' goods that come onto the markets.

It will be seen that the analysis of Foster and Catchings resembles that of Hobson, but there is one essential difference. Hobson believes that a better distribution of income might lead to a *right rate* of savings

[8] See *Business Without a Buyer*, 1927.
[9] The same, pp. 58-59.

relative to consumption, so that equilibrium could be permanently maintained. Foster and Catchings, however, argue that, since the prices of consumers' goods must cover profits as well as wages and other costs, there is inevitably a deficiency of income with which to buy the total actual output of consumers' goods. Their argument in this connection must be closely scrutinized, for it is the heart of their analysis.

It is undoubtedly true that the prices at which consumers' goods are sold in the market must cover not only outlays in the form of wages, salaries, and materials (the basic element of cost in materials also being wages), but also profits to those who furnish the capital. It therefore follows that the income of workers *engaged in the production of consumers' goods* is not adequate to take off the market the total volume of consumers' goods produced. But other workers are at the same time *engaged in the production of capital goods* and they receive wages which are not used to buy the capital goods being produced but are available to augment the demand for consumers' goods. It is, of course, true also that a portion of the income received as profits both in the consumers' goods industries and the capital goods industries will be used in the purchase of consumers' goods. It does not follow, therefore, from the mere fact that profits have to be realized that the income available for the purchase of consumers' goods is less than the amount of consumers' goods which has been produced.

Foster and Catchings apparently recognize that workers engaged in the production of capital goods also receive income with which to buy consumers' goods. But, incredible as it may seem, they apparently exclude the receivers of profits from the consuming class, and argue that a deficiency in consumptive demand exists to the precise extent that profits exist. Thus they arrive at the conclusion that "presently there are more goods on hand than the people can buy and pay for out of income."

The only way in which Foster and Catchings' position could be justified would be by showing that the paying out of profits is deferred, thus producing a fatal lag in market demand. Deferred payments of profits are, however, largely offset by advance payments of other distributive shares. The authors make no effort to prove any net lag in disbursements of income.

The truth of the matter is, as we indicated in Chapter II, that total disbursements of money income in the form of wages, salaries, commissions, interest, rents, and dividends, exactly cover the total value of all goods produced in the course of the year—including both consumers' goods and capital goods. Foster and Catchings get a deficiency of income simply by excluding profits from the income category. Their striking illustration, "Making a dollar watch does not yield consumers a dollar of income," is made possible only by eliminating the profit of the watchmaker from national income.

Foster and Catchings go on to add that the lack of purchasing power is still further intensified by the necessity of diverting some portion of the income received by the people from consumption channels to savings channels. This, they argue, restricts consumptive demand and leads directly toward depression. If this be true, it cannot at the same time be held that increasing savings will automatically result in an increase of capital and an ultimate expansion in the flow of consumers' goods to market. The process of capital formation would be checked by the depression resulting from the restriction of consumptive demand.

THE DIAGNOSIS OF MAJOR C. H. DOUGLAS

No little publicity has been given to an analysis of the sources of economic difficulty by Major C. H. Douglas of the British Royal Air Force.[10] Major Douglas finds the roots of the economic disease in the discrepancy between payments for wages, salaries, and

[10] *Credit Power and Democracy,* 1920, and *The Control and Distribution of Production,* 1922.

dividends, and the prices of products. He argues that since the aggregate price of all goods offered for sale greatly exceeds the aggregate disbursements to consumers, depression is inescapable unless bank credit is issued to individuals in sufficient amounts to make up the deficiency in purchasing power.

Douglas arrives at the conclusion that the money income available for the purchase of commodities is deficient by a process which eliminates from the picture a large part of the national income. He contends that the price of a given commodity must cover "(*A*) all payments made to individuals (wages, salaries, and dividends); (*B*) all payments made to other organizations (raw materials, bank charges, and other external costs)."

> Now the rate of flow of purchasing power to individuals is represented by *A*, but since all payments go into prices, the rate of flow of prices cannot be less than $A + B$. The product of any factory may be considered as something which the public ought to be able to buy, although in many cases it is an intermediate product of no use to individuals but only to a subsequent manufacturer; but since *A* will not purchase $A + B$, a proportion of the product at least equivalent to *B* must be distributed by a form of purchasing power which is not comprised in the descriptions grouped under *A*.[11]

This means that if the payments made by a given business under *A* amounted to one dollar and the payments made under *B* amounted to another dollar, the price of the commodity produced would be two dollars; but there would be only the *A* dollar available with which to buy it.

The fallacy in Major Douglas' analysis is that he concentrates attention upon a single business rather than upon the national economy as a whole. These "external" payments to other organizations do not involve sending the money outside the country, and hence their disbursement is a part of the national income as a whole. That is to say, the payments for raw materials, bank charges, etc., are also disbursed to indi-

[11] *Credit Power and Democracy*, pp. 21-22.

viduals by raw material producing industries and "other organizations" in the form of wages, salaries, and dividends. Taking the national economy as a whole the aggregate prices of goods and services simply cover the aggregate disbursements of wages, salaries, rents, commissions, and profits to individuals engaged in the processes of production.

The analysis which we have made in *America's Capacity to Consume,* revealing a demand for consumption goods insufficient to call forth the full output of our productive establishment, is not to be regarded as supporting either the position of Major Douglas or of Foster and Catchings. Our analysis did not show that the aggregate disbursements of national income to individuals were less than the aggregate prices of the goods and services turned out; on the contrary, we contended that they were virtually identical. We were concerned with the allocation of the national income as between savings for investment and expenditures for consumptive purposes; and we showed merely that the proportion of the total income received by individuals which found its way into consumptive channels was inadequate to induce full capacity production.

A RECENT CONTRIBUTION BY PAUL H. DOUGLAS

In a volume of essays just published, Professor Paul H. Douglas contributes an article [12] in which certain data are assembled for the purpose of testing the general theory of under-consumption. One section of the analysis is concerned with the general problem of savings and capital formation, while another deals with the question whether the depression of 1929 was a result of restricted purchasing power among the masses of the people.

Professor Douglas begins his analysis of the relation of consumption, savings, and capital formation with a general endorsement of the classical position. In an-

[12] "Purchasing Power of the Masses and Business Depressions," *Economic Essays in Honor of Wesley Clair Mitchell,* 1935.

swer to the question whether an expansion of savings might not increase productive power (capital) more rapidly than consumptive demand, and hence create a serious maladjustment, he says:

> The immediate answer to this is clear. . . . Whatever is saved is in some form or other spent. Indeed, if, after virtually the entire working force is employed, there is then an increase in the proportion of the national income which is devoted to savings, the immediate effect is to decrease the relative proportion of consumers' goods and to increase the proportion of capital goods. . . . For a period, at least, there is a balance between the forces of production and consumption, since the altered distribution of productive energy will have resulted from prior changes in the way the ultimate consumers will have distributed their income. [Pages 109-10.]

Since all savings are *spent* for capital goods, it would appear that, no matter how great the volume of monetary savings relative to consumptive expenditure, the total would all automatically be utilized in constructing new capital goods.

He goes on to point out, however, that this new capital will *in due course* be used in producing additional quantities of consumers' goods; and he argues that if the purchasing power of the masses is not expanding as rapidly as the production of consumers' goods, the prices of such goods will fall, sooner or later. When this price decline begins, there will occur a contraction in the output of consumption goods, with a resulting increase in unemployment, which cumulatively affects the volume of purchasing power.

At this juncture of his analysis, Douglas argues that a decline in the output of consumers' goods, resulting from a restricted demand,

> . . . is followed by a still greater decline in the volume of producers' goods. . . . When the consumers' goods industries actually begin to decline, the producers' goods industries fall at an even more accelerated rate. But this necessarily destroys much of the monetary purchasing power distributed by these industries. . . . This causes a further decline in the consumers' goods industries, which causes an additional contraction in the output of producers' goods, and so on. [Page 115.]

He here makes formation of capital goods depend directly upon the volume of consumptive demand. This is the direct reverse of the position taken in the quotation given above, in which it is assumed that capital formation expands when consumption is declining—at least declining relatively—and that the process of capital formation involves the transfer of productive energy from the creation of consumption goods to the creation of capital goods.

We may now turn to the second part of his analysis. He assembles statistics purporting to show that between 1922 and 1929 the income of the masses of the people, including wage and low salary groups and farmers, increased less rapidly than the output of consumption goods intended for these classes.[13] The inevitable result of such a shortage of purchasing power, according to Douglas, was ultimately a fall in the prices of consumers' goods, though the decline was prevented for a time by organized resistance on the part of producers. "Industry adopted the fundamentally disastrous policy of pegging prices (more or less) in the face of technical advance and yet not increasing wages, lower salaries, and the like, sufficiently to permit these goods to be taken off the market." He cites the increasing disparity between incomes of the masses and the volume of output of consumption goods as lending "a very considerable degree of support to the belief that here was one of the causes of the great depression." (Page 127.)

No evidence is advanced, however, to support the conclusion that the depression which began in the autumn of 1929 was occasioned by a cumulative piling up of inventories or by a break in the prices of consumers' goods, or for that matter of commodities in general. The truth of the matter is that commodity prices rose slightly in both 1928 and 1929 as compared with 1927.

[13] In passing it should be noted, however, that the figures of income and consumption goods produced which are submitted as evidence are not correlative. Whereas the income figures are for special classes only, the production figures cover goods intended for all classes.

The maladjustment between savings and consumptive expenditures did not, as our analysis shows, lead to a proportional expansion of capital goods and, in due course, to an excessive output of consumers' goods, which ultimately broke the commodity markets. On the contrary, the restricted rate of expansion of consumptive demand held the growth of capital in check; while the excess savings wrought havoc in the financial markets.

APPENDIX B

NATIONAL WEALTH AND CAPITAL, 1929

Before attempting to present any data, a distinction should be made between the national wealth of the country and the supply of productive capital. As we have indicated in Chapter I, capital, from the social point of view, consists of material instruments resulting from past production, which are used in the processes of further production. From this standpoint land, which is a natural resource and a part of the national wealth, would not be classified as capital—even though the individual owner thereof might so regard it. Only improvements to the land would properly be classified as capital. Similarly, residential buildings, though a part of the nation's wealth, would not be counted as capital from the social point of view, being consumption goods rather than instruments directly used in further production. Personal effects and chattels would likewise be classified as consumption goods rather than as productive capital.

Inventories, or stocks of goods in the hands of producers and traders, are more difficult to classify. Some of them are consumers' goods, actually completed, or at some stage in the process of evolution toward finished goods. Others are capital goods already produced, such as machinery or materials intended for ultimate absorption into fixed capital properties. Since there are no available data with reference to the precise nature and character of such inventories, we cannot make a separation as between capital and consumers' goods. In the table which follows we have arbitrarily regarded manufacturing inventories as capital goods, and raw materials inventories as not.[1]

[1] It is, of course, not possible to tell in advance what portion will go for the creation of capital goods and what portion for consumption goods.

Unfortunately no comprehensive study of the capital supply of this country has been undertaken by any official agency, nor have any private estimates been made which attempt to separate the supply of capital from the supply of wealth. We have not attempted, for the purposes of this study, to supply this deficiency. We are, however, able to present a broad classification of the nation's supply of wealth and capital, based on a study made by W. R. Ingalls for the year 1929. We have grouped the data in such a way as to show productive establishments and equipment separately from other forms of wealth.

In the table on page 187 Mr. Ingalls' estimates of the national wealth are shown in the first column, while the second column indicates the amounts which we have allocated as representing productive establishments, equipment, and other capital assets. The reader will bear in mind that the wealth estimates themselves are admittedly but rough approximations; and that the figures for capital assets represent in many cases somewhat arbitrary allocations. For example, farm buildings include houses (consumption goods) as well as barns, while on the other hand land improvements (capital goods) are not separated from land. Similarly, the figure for investment in mines and quarries does not show the investment in structures separately from that in the mine or quarry itself; and in the petroleum industry the value of leases on oil lands is not separate from that of refineries and other improvements. Railway land is shown separately from other railway property; but such is not the case with the land investment of other transportation agencies, public utilities, and factories. Nevertheless, the data presented give a fairly reliable indication of the extent and character of the capital equipment of the country, as well as of the national wealth as a whole.

A word should be said about the treatment of investments abroad. In the table we have put down an item "Net Foreign Investments." A given nation may, of course, be either a net debtor or a net creditor of other

THE WEALTH AND CAPITAL SUPPLY OF THE UNITED STATES, 1929[a]

(In billions of dollars)

Item	Wealth		Productive Establishments, Equipment, and Other Capital Assets	
AGRICULTURE:				
Farm lands	35.0			
Farm buildings	13.0		13.0	
Farm implements	3.3		3.3	
Livestock	6.0			
Irrigation and enterprises	0.5		0.5	
Forests	10.0	67.8		16.8
MINERAL INDUSTRY:				
Mines and quarries	5.0			
Petroleum industry—leases, tanks, pipe lines, tank cars, refineries	6.0	11.0		6.0
BUSINESS BUILDINGS:				
Offices, clubs, warehouses, repair shops, garages, and miscellaneous		25.0[b]		25.0
NON-FARM RESIDENCES:				
Hotels	5.0			5.0
Houses and lots in small towns	42.0			
Houses and lots in large cities	55.0	102.0		
CHATTELS:				
Furniture, musical instruments, clothing, jewelry, private libraries, and personal effects generally		48.0		
MANUFACTURING:				
Machinery and tools	17.5		17.5	
Factories (and land)	25.0		25.0	
Meat-packing plants	0.5		0.5	
Inventory and working capital	10.0	53.0	10.0	53.0
MERCANTILE ESTABLISHMENTS:				
Land and buildings		10.0		10.0
INVENTORIES: Raw materials in process, in transit, in warehouses, etc. (excluding manufacturing inventory)		35.0		

Item	Wealth		Productive Establishments, Equipment, and Other Capital Assets	
TRANSPORTATION:				
Wharves and dry docks	0.6		0.6	
Railways, steam:				
Land	3.8			
Other assets	27.7	31.5	27.7	
Railways, electric		5.3	5.3	
Railway cars privately owned		0.6		
Automobiles		5.3		
Highways and bridges		1.5	1.5	
Canals		1.0	1.0	
Merchant marine		1.5	1.5	
Yachts and motor boats		0.5		
Aircraft		0.1	0.1	
		47.9		37.7
PUBLIC UTILITIES:				
Telephone and telegraph		5.0	5.0	
Light and power plants		10.3	10.3	
Gas lighting plants		5.0	5.0	
Waterworks, privately owned		0.9	0.9	
		21.2		21.2
TAX-EXEMPT PROPERTIES:				
Govt. (State, county and municipal) land and buildings, colleges, schools, museums, libraries, churches		22.6		22.6
THE NAVY		1.5		1.5
SPECIE:				
Gold and silver		5.2		5.2
FOREIGN INVESTMENTS (net)		10.0		10.0
Total		460.2		214.0

[a] A reclassification of data published by W. R. Ingalls, in the *Annalist*, Oct. 23, 1931, pp. 667, 668, 702.

[b] Ingalls' estimate for this item is 45 billion dollars. He makes an allowance, however, of 20 billion dollars for duplication in the two classes of business buildings and non-farm dwellings and deducts this entire amount from the business building category.

countries. In a nation that is highly developed commercially and financially there is likely to be a large amount of both foreign borrowing and foreign lending. That is to say, there may be both debtors and creditors simultaneously—some corporations or individuals being investors in foreign securities while others are borrowers of funds in foreign markets. Indeed, a single individual or corporation might be simultaneously a borrower in country *A* and a lender in country *B*. Or certain business corporations may be borrowers in foreign countries at the same time that the government is a lender abroad.

Because of the two-way character of international financial operations, it is necessary, in ascertaining a nation's capital position, to strike a balance between foreign debts and foreign investments and arrive at a *net* position. The United States in 1929 was a net creditor to a substantial extent. We have included this amount as a single figure without endeavoring to break it down into sub-classes of investments in government securities, public utilities, commercial enterprises, or what not. All direct investments abroad and all long- and short-term loans, other than the war debts of foreign governments, have been included under investments abroad; and all American obligations to foreigners, other than the repudiated debts of the Southern states contracted approximately a century ago, have been taken into consideration.

The capital embodied in productive establishments, in equipment, and other assets comprised a little less than half of the accumulated wealth of the country. The most important wealth items, aside from capital goods, in order of their magnitude, were: Urban and village houses and lots (97 billion dollars); personal chattels (48 billions); and farm lands, inclusive of improvements (35 billions). The major items in the supply of productive capital were: Manufacturing industry (53 billion dollars); transportation (37.1 billions); business buildings (25 billions); public and other tax-exempt properties (22.6 billions); public util-

ities (21.2 billions); and farm buildings and implements (16.8 billions). Inventories of raw materials aggregated as much as 35 billions. As already indicated, these stocks, and also manufacturing inventories to some extent, constitute a sort of fluid stock of partially produced wealth which may eventually be turned into either capital or consumption goods.

APPENDIX C

PRODUCTIVE *vs.* UNPRODUCTIVE CAPITAL FINANCING

In Chapter X (page 145) a table was submitted showing *Moody's* compilations of net productive financing during the period 1922-30, as compared with net new financing exclusive of refunding operations. *Moody's* method of making these compilations of new productive capital issues may be summarized as follows:

The source of the data used is the *Commercial and Financial Chronicle,* and in cases where the description of the purposes of the issue there given is inadequate the prospectuses accompanying new issues are also consulted. The stated purpose of each issue is examined, and its "productive," "non-productive," or "indeterminate" character broadly determined on the basis of the following classification. The "x" in each case shows the classification made.

NEW PRODUCTIVE CAPITAL ISSUES, 1922-30

Purpose	Productive	Non-productive	Indeterminate
General corporate purpose (except where purpose can be definitely ascertained)			x
Refunding		x	
Construction, additions, etc.	x		
Acquisitions		x	
Working capital		x	
Funds for interest purposes		x	
New capital, new plants, etc.	x		
Construction of building, etc.	x		
Real estate mortgage			x
Capital for insurance companies, banks, etc.		x	
New equipment	x		

In many cases funds are of course devoted to more than one purpose. Where two or more purposes are combined, investigation or good judgment is needed. Where refunding is combined with any other purpose, the amount constituting the refunding can generally be ascertained in consultation with *Moody's* industrial, utility, or railroad specialists familiar with the given situation. Where no clear idea of the purpose of the issue can be thus obtained it is placed in the "indeterminate" group.

Sometimes the purpose of the issue is repayment of bank loans contracted for the purpose of capital extension or improvement. Such cases are seldom clearly explained in the circulars and there is risk of a "productive" issue being placed in the "non-productive" class. Some effort is made to ascertain whether what appears to be formally a "non-productive" issue should really be classed as "productive"; but this is not done with any exactness. If there is a net error it is somewhat in the direction of understatement of "productive" issues, but it may be offset by unintentional overstatement in other cases.

The compilation excludes all federal issues but includes state and municipal issues of $100,000 or more, which usually comprise about 90 per cent of such issues. The remainder is apportioned on the basis of results obtained for the larger issues. Considerable difficulty in classification has arisen for the period since the depression began. Up to about 1930 practically all state and municipal issues, except of course refunding issues, were considered "productive." Since then a more careful examination of the purpose of issue has had to be made because most of the state and municipal financing has been for financial or relief purposes.

The classification of all issues into "productive," "non-productive," and "indeterminate" shows that the latter group is usually relatively small, comprising on the average only from about 5 to 6 per cent of the total. It has, therefore, been considered relatively safe to assume that one-half of the "indeterminate" group

has been of a "productive" character. Accordingly, 50 per cent of the "indeterminate" amount is added to the strictly "productive" amount and the total represents the final "productive" amount.

In order to determine the ratio of "productive" to all issues, the former is related to a total of all issues which is obtained from the *Chronicle* and which includes all new issues (other than refunding) except United States government, territorial, and all foreign government (including Canadian) and corporate issues.

In view of the character of the material and the element of judgment involved it is apparent that the compilation of "productive" issues cannot pretend to be anything more than a reasonable approximation to the truth.

APPENDIX D

STATISTICAL TABLES

I. Physical Volume of Production of Consumption Goods and Capital Goods, 1919-32[a]

(Based on 1929 prices)

Year	Consumption Goods				Capital Goods[d]	
	Excluding Residential Construction[b]		Including Residential Construction[c]		Index	Rise or Fall
	Index	Rise or Fall	Index	Rise or Fall		
1919.....	68.3	...	67.2	...	70.8	...
1920.....	64.8	−3.5	62.7	−4.5	73.5	+ 2.7
1921.....	68.9	+4.1	67.8	+5.1	63.8	− 9.7
1922.....	74.2	+5.3	74.4	+6.6	74.1	+10.3
1923.....	81.4	+7.2	81.4	+7.0	84.6	+10.5
1924.....	84.6	+3.2	85.3	+3.9	79.7	− 4.9
1925.....	88.3	+3.7	90.8	+5.5	83.1	+ 3.4
1926.....	91.9	+3.6	94.0	+3.2	87.6	+ 4.5
1927.....	94.0	+2.1	95.8	+1.8	89.8	+ 2.2
1928.....	94.0	0.0	96.6	+0.8	96.3	+ 6.5
1929.....	100.0	+6.0	100.0	+3.4	100.0	+ 3.7
1930.....	92.9	−7.1	90.8	−9.2	88.8	−11.2
1931.....	84.5	−8.4	82.3	−8.5	68.6	−20.2
1932.....	77.2	−7.3	74.0	−8.3	50.6	−18.0

[a] Based on estimates of Simon Kuznets, "Gross Capital Formation, United States, 1919-1933," *National Bureau of Economic Research Bulletin No. 52*, Nov. 15, 1934.

[b] Includes durable, semi-durable, and perishable goods.

[c] The estimates of residential construction are very rough. Dr. Kuznet's figures for 1925-32 have been raised to allow for "unallocable" construction. Prior to 1925 the estimates are based on the Federal Reserve Board index of residential construction.

[d] Includes non-residential construction and public works. The figures represent *gross* capital formation since they include depreciation and replacements.

II. SELECTED RESOURCES AND LIABILITIES OF NATIONAL BANKS, 1864-1933[a]

(In thousands of dollars)

Year	Cash Reserves	Loans, Discounts, Overdrafts	U. S. Government and Other Securities	Total Deposits	Note Circulation	Ratio of Deposits and Notes to Cash Reserves
1864	47,628	70,747	92,531	146,796	25,826	3.6
1865	199,515	362,443	393,988	614,242	131,452	3.8
1866	231,921	550,353	467,601	694,892	267,799	4.2
1867	130,334	588,450	521,967	685,384	291,770	7.5
1868	136,338	655,730	507,307	744,607	294,908	7.6
1869	112,718	686,348	466,204	716,044	292,753	9.0
1870	144,201	719,341	452,668	705,518	291,184	6.9
1871	163,325	789,417	455,689	791,066	307,794	6.7
1872	165,574	871,531	449,790	805,397	327,093	6.8
1873	179,290	925,558	444,912	836,227	338,789	6.6
1874	199,026	926,196	451,203	827,928	338,539	5.9
1875	180,646	972,926	442,780	897,387	318,148	6.7
1876	166,396	933,687	427,417	841,716	294,445	6.8
1877	165,008	901,731	431,044	818,360	290,002	6.7
1878	155,474	835,078	460,213	813,894	299,621	7.2
1879	151,704	835,875	714,717	1,090,110	307,329	9.2
1880	198,783	994,713	451,494	1,085,140	318,088	7.1
1881	218,912	1,144,989	484,303	1,364,386	312,223	7.7
1882	208,539	1,208,933	471,138	1,364,960	308,922	8.0
1883	226,607	1,285,592	464,729	1,337,362	311,963	7.3
1884	230,644	1,269,863	448,726	1,232,761	295,175	6.6
1885	305,568	1,257,656	432,238	1,419,594	269,148	5.5
1886	276,467	1,398,552	407,405	1,459,240	244,893	6.2
1887	270,982	1,560,372	328,970	1,650,149	166,626	6.7
1888	297,579	1,628,125	356,331	1,716,215	155,313	6.3
1889	313,731	1,779,055	322,983	1,919,579	128,867	6.5
1890	302,887	1,933,509	310,698	1,978,771	126,324	7.0
1891	332,297	1,963,705	309,399	1,974,086	123,916	6.3
1892	388,616	2,127,757	347,366	2,327,251	141,062	6.4
1893	310,343	2,020,484	356,546	1,939,235	155,071	6.8
1894	459,624	1,944,441	435,204	2,228,310	171,715	5.2
1895	403,368	2,016,640	447,171	2,278,892	178,816	6.1
1896	362,657	1,971,642	463,820	2,140,953	199,214	6.5
1897	435,107	1,977,554	484,268	2,385,668	196,591	5.9
1898	492,883	2,163,682	554,993	2,798,748	189,866	6.1
1899	512,415	2,507,955	651,543	3,538,612	199,358	7.3

II. Selected Resources and Liabilities of National Banks, 1864–1933 (*Continued*)[a]

(In thousands of dollars)

Year	Cash Reserves	Loans, Discounts, Overdrafts	U. S. Government and Other Securities	Total Deposits	Note Circulation	Ratio of Deposits and Notes to Cash Reserves
1900	529,273	2,644,237	774,551	3,621,542	265,303	7.3
1901	567,371	2,981,053	885,570	4,250,281	319,009	8.1
1902	597,287	3,246,517	944,930	4,468,058	309,337	8.0
1903	581,446	3,442,305	1,025,464	4,561,884	359,261	8.5
1904	688,997	3,621,814	1,096,301	4,836,024	399,584	7.6
1905	679,888	3,929,537	1,204,576	5,407,455	445,456	8.6
1906	681,509	4,236,925	1,241,338	5,692,805	510,861	9.1
1907	721,895	4,664,014	1,362,280	6,190,385	547,919	9.3
1908	889,213	4,640,380	1,519,647	6,330,521	613,664	7 8
1909	932,447	5,061,199	1,612,978	7,009,225	641,312	8.2
1910	865,453	5,455,902	1,576,343	7,257,038	675,633	9.2
1911	998,062	5,634,236	1,725,529	7,675,740	681,740	8 4
1912	996,143	5,973,754	1,823,033	8,064,193	708,691	8.8
1913	969,102	6,162,034	1,846,475	8,143,929	722,125	9.2
1914	1,022,564	6,445,555	1,871,401	8,563,751	722,555	9.1
1915	1,490,772	6,665,145	2,026,496	8,821,241	722,704	6.4
1916	1,662,993	7,769,096	2,320,871	10,963,030	676,116	7.0
1917	1,798,813	8,991,809	2,962,286	12,798,915	660,431	7.5
1918	1,512,258	10,164,623	3,837,494	14,047,849	681,631	9.7
1919	1,633,424	11,027,280	4,811,488	15,941,926	677,162	10.2
1920	1,695,584	13,637,115	4,050,896	17,166,570	688,178	10.5
1921	1,414,554	12,014,485	3,921,927	15,148,519	704,147	11.2
1922	1,477,786	11,257,412	4,517,953	16,328,820	725,748	11.5
1923	1,433,844	11,828,101	5,031,774	16,906,549	720,001	12.3
1924	1,543,889	11,988,803	5,107,221	18,357,293	729,686	12.4
1925	1,686,469	12,683,419	5,705,230	19,921,796	648,494	12.2
1926	1,741,122	13,427,393	5,842,253	20,655,044	651,155	12.2
1927	1,770,256	13,965,484	6,393,218	21,790,572	650,946	12.7
1928	1,768,496	15,155,133	7,147,448	22,657,271	649,095	13.2
1929	1,642,954	14,811,323	6,656,535	21,598,088	649,452	13.5
1930	1,764,183	14,897,204	6,888,171	23,268,884	652,339	13.6
1931	1,786,685	13,185,275	7,674,837	22,198,240	639,304	12.8
1932	1,488,979	10,286,377	7,196,652	17,460,913	652,168	12.2
1933	1,700,605	8,119,772	7,371,631	16,774,115	730,435	10.3

[a] On or about June 30. *Reports of the Comptroller of the Currency*, 1931, pp. 1021-22; 1933, p. 640.

III. Loans and Investments of National Banks, 1892-1933 [a]

(In millions of dollars)

Year	Unsecured Loans[b]	Loans on Securities[c]	United States Securities	Other Securities
1892	1,513 4	640 1	183 4	154.5
1893	1,256 1	574.6	224 0	148.6
1894	1,317 1	674.8	225 5	193.3
1895	1,376 6	665.3	234.8	195.0
1896	1,250 0	626.9	262.4	189.0
1897	1,317 5	733.6	260 0	208.8
1898	1,356 5	799.5	339.2	255.2
1899	1,433.1	1,063.7	329.9	320.4
1900	1,583 4	1,103.4	408.7	367.3
1901	1,766 9	1,251 8	444 4	448.6
1902	1,930 9	1,349 2	456 9	493.1
1903	2,108 7	1,372 7	522.7	540.7
1904	2,207 5	1,518.6	540 2	600.9
1905	2,391 4	1,607.1	551 5	673.5
1906	2,652 8	1,646.1	628 8	687.6
1907	2,976 5	1,702 1	660 3	768.6
1908	2,830.5	1,920 2	716 3	840.1
1909	3,111 5	2,017 4	731.0	916.4
1910	3,435 1	2,032.1	740 6	865.1
1911	3,539 6	2,071.3	744 8	1,007.6
1912	3,743 3	2,210.6	776 0	1,077.8
1913	3,897 8	2,245.2	788 6	1,094.2
1914	4,020 3	2,409 8	795.3	1,058.8
1915	4,758 7	1,901 2	783.5	1,284.9
1916	5,329 9	2,349.2	731.2	1,620 8
1917	6,446 3	2,511.3	1,076.3	1,936 8
1918	7,372 5	2,763.3	2,116 8	1,840 5
1919	7,387 8	3,622.4	3,171.9	1,875.6
1920	10,263 7	3,347.7	2,269.6	1,916 9
1921	9,025.1	2,979.4	2,019.5	2,005.6
1922	7,969 4	3,278.8	2,285.4	2,277 9
1923	8,372 5	3,445.2	2,693.8	2,375 9
1924	8,338 3	3,640 5	2,481.8	2,660 5
1925	8,376 3	4,297.7	2,536.8	3,193.7
1926	8,655 5	4,762.1	2,469.3	3,373.0
1927	8,454 5	5,501.2	2,596.2	3,797.0
1928	8,745 4	6,399.6	2,891.2	4,256.2
1929	8,122 8	6,678.3	2,803.9	3,852.7
1930	7,788 8	7,099.0	2,753 9	4,134.2
1931	6,929 1	6,248.3	3,256.3	4,418.6
1932	5,285 4	4,996.3	3,352.7	3,844.0
1933	3,916 9	4,200.1	4,031.6	3,340.1

[a] On or about June 30. *Reports of the Comptroller of the Currency*, 1915, 1925-33.

[b] Includes, besides unsecured loans, loans on personal securities, 1915-33, and loans on all forms of acceptances.

[c] Includes loans on personal securities, 1892-1914; loans on all forms of real estate, 1911-33; and loans on stocks and bonds for whole period.

IV. Federal Government Expenditures for Capital Construction, Regular and Emergency [a]

(In thousands of dollars)

Item	1930	1931	1932	1933	1934
Government buildings	44,921	67,941	95,989	117,112	78,706
Military capital[b]	112,338	130,349	125,960	119,065	124,109
Public roads	86,239	172,534	207,860	177,135	267,882
Waterways and harbors	69,195	77,424	78,421	70,220	79,115
Flood control	26,690	38,136	29,740	40,459	40,984
Public Works Administration loans (capital construction)	—	—	—	—	149,335
Reconstruction Finance Corporation loans (capital construction)	—	—	—	30,176	67,434
Miscellaneous other[c]	42,261	65,844	108,649	62,341	140,235
Total	381,644	552,228	646,619	616,508	947,800

[a] Computed from the *Budget of the United States Government*, 1930-33. 1934 data assembled from the *Budget* and other official sources.

[b] Includes expenditures for homes and hospitals for war veterans as follows (in thousands of dollars): 1930, 9,948; 1931, 10,613; 1932, 12,048; 1933, 14,302; 1934, 3,319.

[c] Includes Shipping Board construction loans as follows (in thousands of dollars): 1930, 20,384; 1931, 28,705; 1932, 50,818; 1933, 24,550; 1934, 483; and miscellaneous other unclassified "public works."

V. Growth of Public Debt and Sources of Funds, 1929-34 [a]

(In millions of dollars)

Year	Total Interest-Bearing Public Debt[b]	U. S. Government Securities Held by all Member Banks[c]	U. S. Government Securities Held by Federal Reserve Banks[c]	All Other
1929	16,639	4,155	179	12,305
1930	15,922	4,061	571	11,290
1931	16,520	5,343	610	10,567
1932	19,161	5,628	1,697	11,836
1933	22,158	6,887	1,933	13,338
1934	26,480	9,137	2,424	14,919

[a] All figures for June.

[b] *Annual Report of the Secretary of the Treasury*, 1934.

[c] *Annual Report of the Federal Reserve Board*, 1933, and *Federal Reserve Bulletin*, October 1934.

VI. SUMMARY OF CORPORATE, FOREIGN GOVERNMENT,

(In millions

Type of Financing	1925			1926		
	Total	Refunding	Net New Financing	Total	Refunding	Net New Financing
Corporate—						
Domestic:						
Bonds and notes	2,667.3	436 0	2,231 3	3,059 1	641 4	2,417 7
Short-term obligations	308 0	87 3	220 7	294 5	45 3	249.2
Preferred stocks	636.8	42 5	594 3	543 6	34 3	509 3
Common stocks	610.1	51 8	558.3	676.6	98 8	577.8
Canadian:						
Bonds and notes	79 3	10 0	69 3	197.1	62 5	134 6
Short-term obligations	22.5	2 5	20 0	1.3	0 1	1 2
Preferred stocks	7.9	2 6	5 3	4.0	.....	4 0
Common stocks	2.6	2 6	.....	1.0	.....	1 0
Other foreign:						
Bonds and notes	293 6	2.0	291 6	394 8	50 8	344 0
Short-term obligations	56 5	.....	56.5	35 0	6 0	29 0
Preferred stocks	38 0	.....	38 0	47 7	.....	47 7
Common stocks	15 6	.....	15 6	44 9	3.4	41 5
Total corporate	4,738.2	637.3	4,100 9	5,299 6	942.6	4,357.0
Foreign government	645 4	104 6	540.8	514 2	32 9	481 3
Farm loan issues	188 2	19 5	168 7	131 3	40 2	91 1
War Finance Corporation	.....	.....	.....	.....	.....	.....
States, cities, etc	1,399 6	47 5	1,352 1	1,365 0	21 5	1,343 5
Canadian government	146.0	96 8	49 2	109 8	49 0	60 8
U. S. possessions	8.7	.....	8.7	10 4	.....	10.4
Grand total	7,126.1	905.7	6,220 4	7,430.3	1,086.2	6,344.1

[a] Twelve months ended December 31. *Commercial and Financial Chronicle,*

FARM LOAN, AND MUNICIPAL FINANCING, 1925-29 [a]

of dollars)

1927			1928			1929		
Total	Refunding	Net New Financing	Total	Refunding	Net New Financing	Total	Refunding	Net New Financing
4,466.2	1,504 2	2,962.0	3,174 1	999 3	2,174 8	2,369 4	495 9	1,873 5
302 5	81.8	220.7	264 9	54 4	210 5	250 6	45 9	204 7
1,054 7	180 5	874 2	1,397 1	248 0	1,149 1	1,694 7	178.0	1,516.7
683 6	83.7	599 9	2,094 1	282 5	1,811 6	5,071 8	654 7	4,417 1
244.7	49 8	194 9	221 1	72 8	148 3	285 6	.....	285 6
2.0	.....	2 0	0 2	.....	0 2	.....	.....	.....
16 8	.....	16 8	52 1	26 0	26 1	10.4	.....	10 4
2.0	.....	2.0	8 6	.....	8 6	18.2	.....	18.2
479.5	23 8	455 7	521 3	55.3	466 0	187.4	2.0	185 4
51.0	4 5	46 5	10 0	.....	10 0	12 0	10.4	1 6
.....	.....	.....	14 0	.....	14 0	103 8	.....	103 8
16.4	.....	16 4	60.2	.....	60 2	32.4	.....	32.4
7,319 4	1,928.3	5,391.1	7,817.7	1,738.3	6,079 4	10,036 3	1,386 9	8,649.4
777.1	39 5	737 6	651 1	100.5	550 6	68 2	.....	68 2
179 6	92 8	86 8	63 8	.....	63 8	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
1,509 6	34.6	1,475 0	1,414 7	35 6	1,379 1	1,432 7	12.8	1,419.9
135 3	46 0	89 3	38.1	3 0	35 1	61.8	9 6	52.2
12 9	1.5	11.4	6.2	.....	6.2	5.1	.....	5.1
9,933.9	2,142 7	7,791 2	9,991 6	1,877 4	8,114.2	11,604 1	1,409.3	10,194.8

[a] Vol. 130, p. 366.

VII. Character and Grouping of New Corporate

(In millions

Year Ended December 31	1925 Total	1925 Refunding	1925 Net New Financing	1926 Total	1926 Refunding	1926 Net New Financing
LONG-TERM BONDS AND NOTES:						
Railroads	473.6	134.0	339 6	351 7	54 6	297.1
Public utilities	1,024.1	169 3	854 8	1,373.8	333 1	1,040.7
Iron, steel, coal, etc	113 7	18 3	95 4	219 6	78 5	141 1
Equipment manufacturers	11 3	.....	11 3	25 2	13 0	12 2
Motors and accessories	78 4	0 4	78 0	67 8	.....	67 8
Other industrial and mfg	276 7	43 0	233 7	352 8	77 8	275 0
Oil	108 4	21 5	86 9	260 0	140 6	119 4
Land, buildings, etc	695 8	37 1	658 7	647 3	25 8	621 5
Rubber	34 6	.....	34.6	6 8	.....	6 8
Shipping	14 5	4 3	10 2	26.0	5 0	21 0
Investment trusts, etc	3 0	.....	3 0	11.5	.....	11 5
Miscellaneous	206 3	20 2	186.1	305 5	25 6	279 9
Total	3,040 4	448 1	2,592 3	3,648.0	754 0	2,894.0
SHORT-TERM BONDS AND NOTES:						
Railroads	24 9	0 4	24 5	30 0	22 0	8 0
Public utilities	148 8	31 3	117 5	106 0	13 7	92 3
Iron, steel, coal, etc	24 0	2 5	21 5	6 2	.....	6 2
Equipment manufacturers	1 2	.....	1 2	.....	.....	.....
Motors and accessories	1 0	.....	1 0	16 3	0 2	16 1
Other industrial and mfg	28.4	0 8	27 6	55 7	6 6	49 1
Oil	76 2	52 2	24 0	23 4	7.4	16 0
Land, buildings, etc	26 6	.....	26 6	27.7	0 9	26 8
Rubber	15 0	.....	15 0	32 2	.....	32 2
Shipping	12 5	.....	12 5	0 5	.....	0 5
Investment trusts, etc	.....	.....	.....	4 0	.....	4 0
Miscellaneous	28 4	2 7	25 7	31 7	0 6	31 1
Total	387.0	89 9	297.1	333 7	51.4	282 3
STOCKS:						
Railroads	16.2	.....	16 2	40 8	.....	40.8
Public utilities	537.1	28 4	508.7	488.2	23 3	464.9
Iron, steel, coal, etc	16 3	.....	16 3	54 5	8 6	45 9
Equipment manufacturers	1 4	.....	1 4	5 6	.....	5 6
Motors and accessories	110 7	3 6	107.1	47 5	.....	47 5
Other industrial and mfg	259 3	19 2	240 1	215 9	13 1	202 8
Oil	97.9	40 5	57 4	216 3	89.0	127.3
Land, buildings, etc	30 3	0 1	30.2	61.1	.....	61 1
Rubber	16.0	0 8	15.2	4.2	.....	4.2
Shipping	7 4	.....	7.4	.....	.....	.....
Investment trusts, etc	12 1	.....	12.1	55 6	.....	55.6
Miscellaneous	206 3	7.0	199 3	127 9	3 0	124 9
Total	1,311.0	99 6	1,211.4	1,317.6	137 0	1,180.6
SUMMARY:						
Railroads	514.7	134.4	380.3	422.5	76.6	345.9
Public utilities	1,710.0	229.0	1,481.0	1,968.0	370 1	1,597.9
Iron, steel, coal, etc	154.0	20.8	133.2	280 3	87.1	193.2
Equipment manufacturers	13 9	.....	13.9	30 8	13 0	17.8
Motors and accessories	190.1	4 0	186.1	131.6	0.2	131.4
Other industrial and mfg	564.4	63 0	501.4	624.4	97.5	526.9
Oil	282.5	114.2	168.3	499.7	237.0	262.7
Land, buildings, etc	752.7	37.2	715.5	736.1	26 7	709.4
Rubber	65.6	0.8	64.8	43.2	.....	43.2
Shipping	34.4	4.3	30.1	26.5	5.0	21.5
Investment trusts, etc	15.1	.....	15 1	71.1	.....	71.1
Miscellaneous	441.0	29.9	411 1	465.1	29.2	435.9
Total	4,738.4	637.6	4,100.8	5,299.3	942.4	4,356.9

[a] Twelve months ended December 31. *Commercial and Financial Chronicle,*

ISSUES IN THE UNITED STATES, 1925-29 [a]

of dollars)

1927			1928			1929		
Total	Refunding	Net New Financing	Total	Refunding	Net New Financing	Total	Refunding	Net New Financing
767 6	372 5	395 1	505 7	206 7	299 0	581 1	189 4	391 7
1,996 0	786.5	1,209 5	1,508 6	568 7	939 9	918 1	263 8	654 3
172 2	80 6	91 6	186 5	70 7	115 8	128 2	3 2	125 0
22 6	.....	22 6	7 2	.....	7 2	1 8	.....	1 8
52 3	0 1	52 2	5 8	0 8	5 0	0 2	.....	0 2
547 0	92 9	454 1	381.2	112 2	269 0	265 8	2 1	263 7
354 4	94 0	260 4	75 0	31 7	43 3	186 9	15 4	171 5
573 3	36 5	536 8	683 7	90.3	593 4	333 8	5 1	328 7
70.0	60 0	10 0	1 3	.....	1 3	1 0	.....	1 0
25 6	0 4	25 2	0 8	.....	0 8	14 1	6 0	8 1
81 0	.....	81.0	99 4	1.0	98 4	116 2	.....	116 2
528 5	54 3	474 2	461 4	45 2	416 2	295 0	12 9	282 1
5,190 5	1,577 8	3,612.7	3,916 6	1,127.3	2,789 3	2,842 2	497 9	2,344 3
20 1	0 6	19 5	29 5	17 0	12 5	26 9	5 4	21 5
139 6	57 2	82 4	135 7	21 6	114 1	99 2	41 7	48 5
2 3	.....	2 3	0 5	.....	0 5	6 5	5 8	0 7
1 2	.....	1 2	.....	.....	.....	.....	.....	.....
4 9	.....	4 9	5 5	1.2	4 3	0 5	.....	0 5
21 8	5 0	16 8	7 8	2 5	5 3	22 0	.....	22 0
50 2	12 4	37 8	18 2	10 7	7 5	2 4	.....	2.4
40 3	1 7	38 6	38 9	1 4	37.5	74 3	1 2	73.1
.....	.....	.....	.....	.....	.....	.....	.....	.....
8 6	7 5	1.1	.....	.....	.....	.....	.....	.....
4 5	.....	4 5	1 6	.....	1 6	1 0	.....	1 0
61 9	2 0	59 9	36 4	.....	36 4	38 9	2 3	36 6
355 4	86.4	269.0	274.1	54 4	219.7	262 7	56 4	206 3
175.1	84 0	91.1	192 6	140 0	52 6	209 2	75 9	133.3
841 7	68 3	773 4	918 0	160 5	757 5	1,434 4	205 3	1,229 1
12 6	6 0	6 6	126 6	34.7	91 9	499 7	351 0	148.7
.....	.....	.....	1 9	.....	1 9	0 6	.....	0 6
37 5	.....	37 5	95 9	38 9	57 0	87 0	5 5	81 5
301 1	66.6	234 5	693 0	114 8	578 2	992 5	90 9	901.6
21.0	2 0	19 0	147.4	4 5	142.9	160 6	63 5	97.1
55 1	0 1	55 0	86 7	1 3	85 4	119 0	0 4	118 6
2.7	.....	2 7	63 1	8.5	54 6	114.3	25 3	89 0
.....	.....	.....	20 4	.....	20 4	23 2	.....	23 2
89.4	.....	89.4	689 7	3.0	686 7	2,106 5	1 5	2,105 0
237 0	37 1	199 9	591 9	50 3	541 6	1,184 5	13 3	1,171 2
1,773.2	264 1	1,509.1	3,627.2	556 5	3,070 7	6,931.5	832 6	6,098.9
962.8	457 1	505 7	727 8	363 7	364.1	817 2	270 7	546.5
2,977.3	912 0	2,065 3	2,562 3	750.8	1,811 5	2,442 7	510 8	1,931.9
187.1	86.6	100 5	313 6	105 4	208 2	634 4	360 0	274.4
23.8	.....	23 8	9 1	.....	9 1	2 4	.....	2 4
94 7	0 1	94 6	107.2	40 9	66 3	87 7	5 5	82.2
869 9	164 5	705 4	1,082 0	229.5	852 5	1,280 3	93.0	1,187.3
425.6	108.4	317 2	240 6	46 9	193 7	349 9	78 9	271.0
668.7	38 3	630 4	809 3	93 0	716.3	527.1	6 7	540.4
72.7	60.0	12 7	64.4	8.5	55.9	115 3	25 3	90.0
34 2	7.9	26.3	21.2	.....	21.2	37.3	6 0	31.3
174 9	.....	174 9	790 7	4 0	786.7	2,223 7	1.5	2,222.2
827.4	93 4	734 0	1,089 7	95 5	994 2	1,518 4	28 5	1,489.9
7,319.1	1,928.3	5,390.8	7,817.9	1,738.2	6,079.7	10,036 4	1,386.9	8,649.5

[a] Vol. 130, p. 366.

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