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THE ROLE OF MERGERS IN THE GROWTH OF LARGE FIRMS

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J. Fred Weston

**THE ROLE OF
MERGERS
IN THE GROWTH
OF LARGE FIRMS**

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TO MY MOTHER AND FATHER

BUREAU OF BUSINESS AND ECONOMIC RESEARCH
UNIVERSITY OF CALIFORNIA
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The opinions expressed in this study are those of the author. The functions of the Bureau of Business and Economic Research are confined to facilitating the prosecution of independent scholarly research by members of the faculty.

PREFACE

THIS PROJECT was originally suggested to me by Professor Aaron Director, Chairman of the Free Market Study, University of Chicago. He pointed out that not enough reliable information is available on the processes whereby firms in oligopolistic industries have become relatively large in size and relatively few in number. In particular, the role of mergers and acquisitions of other enterprises in the total growth of such firms has been in dispute.

The extent of oligopoly in the American economy, its causes, its economic and social consequences, and the formulation of public policy for dealing with it are subjects of much current interest. This study treats an important aspect of the historical origins of concentration. It seeks to provide additional factual material for appraising alternative public policies toward oligopoly.

Uncovering data on the role of mergers in the growth of 74 companies, especially for the early years of their existence, has been a laborious task of economic detective work. Fortunately, the Free Market Study of the University of Chicago and the Voelker Fund of Kansas City provided financial aid which made possible the help of a large number of research assistants. These graduate students in the School of Business, University of Chicago, participated in the fact-gathering phase of the study: R. Applegate; H. Balthazar;

J. Biancardi; N. Chapin; J. Froomkin; I. Glass; G. Hastings; E. Kanrich; J. Segall; J. Shure; G. Slomer; C. Smith; and I. Stewart. I am further indebted for financial aid to the Bureau of Business and Economic Research of the University of California. The Bureau also provided the assistance of Mr. G. G. de Viet, who originally prepared most of the tables and charts; Mr. David G. Davies and Mr. John W. Ashley, who assisted in the final stages; and Miss Patricia Hay and Mrs. Mary A. Adams, who provided good counsel throughout the writing. Miss Tasile T. Carter helped with editorial changes in the manuscript and checked the accuracy of the tables and charts. I express appreciation also for the coöperation of Mrs. Mary Bogart and her associates at the Central Stenographic Bureau of the University of California, Los Angeles, in facilitating the completion of the study. My wife, June S. Weston, also helped in many ways.

Worksheets containing the basic data on sources of growth were sent to executives of each of the individual companies for review. They provided excellent cooperation. The worksheets are not included in the present volume, but interested persons may procure them from the Bureau of Business and Economic Research, University of California, Los Angeles. Others making intensive studies of individual industries should find these data useful. I shall be surprised if they do not find some acquisitions we failed to discover and hope that any such omissions will be brought to my attention.

The study has benefited from stimulating discussions with many persons, particularly R. Cassady, Jr.; G. H. Evans, Jr.; G. H. Hildebrand; N. H. Jacoby; G. W. Nutter; A. Nicols; F. E. Norton, Jr.; D. F. Pegrum and R. Tannenbaum. These people may not agree with all of the views set forth.

J. FRED WESTON

Los Angeles
June 1952

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The American economy is characterized by large firms and industrial concentration. The sources, extent, and consequences of bigness and concentration have been widely disputed.¹ Many questions remain unsettled. Has the development of concentration in the American economy been inevitable? Is further growth in concentration a natural and unavoidable process which legal prohibitions can no more repel than they could control the tides? Are large firms generally more or less efficient than small firms? What are the effects of monopoly elements upon economic stability and the rate of economic growth?

Although the formation of appropriate public policies awaits further study of these and related issues, our understanding of the nature and appropriate role of large firms may be increased by more complete information concerning the process of their growth. How did the well-known large firms come to their present size? Have they grown in the main by internal expansion, as did the Ford Motor Company? Or have large firms characteristically come into being

¹ Cf. the following judgment of the relatively minor extent of monopoly elements: "It seems conservative to estimate that the competitive industries were producing seven-tenths of the national income in 1939, and utilizing more than four-fifths of the labour force." George J. Stigler, *Five Lectures on Economic Problems* (New York: Macmillan, 1950), p. 50.

as the result of combinations of preëxisting firms, as did the United States Steel Corporation? Are the two processes interdependent?

Mergers are often cited as the major source of economic concentration.² "Probably more important than any other single factor in the trend toward excessive concentration are the mergers, consolidations, and acquisitions that have taken place in recent years."³ It has been suggested that large firms have grown chiefly by absorbing competitors.⁴ On the other hand, the contrary view is also widely held that the growth of firms has come about mainly through internal expansion.⁵

These contrasting generalizations reflect the inadequacy of existing knowledge of the effects of mergers on industrial concentration. In supporting its view that "the role of external expansion has been unduly discounted" and that "a very large part of the rise in economic concentration has been due to consolidations, acquisitions, and mergers," the Federal Trade Commission has cited several types of indirect evidence.⁶ However, the Commission states that "it is impossible to measure the importance of internal versus external growth in industry as a whole," and refers to the paucity of information on the subject.⁷

Objectives of the Study

The present study seeks to narrow this gap in economic knowledge.

(1) It provides data concerning the relative extent of internal expansion and external acquisitions in the development of certain individual corporations. A factual basis is thereby provided for

² For recent statements see George W. Stocking and Myron W. Watkins, *Monopoly and Free Enterprise* (New York: Twentieth Century Fund, 1951), pp. 81-82; Corwin D. Edwards, *Maintaining Competition* (New York: McGraw-Hill, 1949), p. 142; Dudley F. Pegrum, *The Regulation of Industry* (Chicago: R. D. Irwin, 1949); George J. Stigler, "Monopoly and Oligopoly by Merger," *American Economic Review*, Proceedings, XL (May, 1950), 23; *United States Versus Economic Concentration and Monopoly*, Committee on Small Business, U. S. 79th Cong., House of Representatives (Washington, 1946), p. 2.

³ *Study of Monopoly Power*, Hearings before the Subcommittee on Study of Monopoly Power of the Committee on the Judiciary, U. S. 81st Cong., 1st sess., July-August, 1949, Serial No. 14, Part 1, House of Representatives (Washington, 1949), p. 363.

⁴ Federal Trade Commission, *The Merger Movement* (Washington, 1948), pp. 23-24.

⁵ Referred to in *ibid.*, p. 22.

⁶ *Ibid.*, pp. 22-24.

⁷ *Ibid.*, p. 22.

evaluating conflicting assertions regarding the role of mergers and combinations in the growth of large firms. (2) An analysis of the effects of mergers on industrial concentration is made. (3) The economic theory of mergers is reviewed in the light of the empirical findings. (4) Finally, the implications of the results for decisions involving public policy are considered.

Some Definitions

Internal growth.—This study analyzes the relative extent by which firms have grown by internal expansion and through external acquisitions. “Internal growth” includes all growth except that which comes about by absorbing firms or substantial properties from firms with formerly independent existence. Internal growth does not signify growth through retained earnings only, as understood in the literature of business finance. It includes growth by external financing as well as internal financing.

Varieties of external growth.—External growth may take place by the purchase of assets, by consolidation, by merger, by lease, or by the holding company device. Technical differences between these types of external acquisitions are ordinarily observed. In consolidations, all the participating firms lose their identity and a new firm is created. In mergers, the absorbing firm retains its identity. In holding company arrangements, the parent and each subsidiary retain their separate identities, but usually not independence of managerial control. Hence external acquisitions may include a wide variety of forms. In general usage, “merger” covers all these types. This study will therefore use the above terms and the general expressions, “combination,” “amalgamation,” “acquisitions,” to include the complete variety of kinds of growth from external sources.

Absolute size contrasted with relative size.—In decrying industrial concentration, critics often attack bigness *per se* rather than relative size.^a Although the two tend to be associated, they need not be. Since the consequences of bigness and fewness may be different, analysis should clearly distinguish between them.

^a Cf. Edwards, *op. cit.*, pp. 16-26.

The case against bigness, as such, would have to be made on grounds different from the economic issues raised by concentration. Some problems raised by bigness are mainly political and social in nature. Bigness is feared principally because of the power accumulation it represents.⁹

The meaning of oligopoly.—Modern economic analysis centers attention on fewness as a source of market imperfection. To avoid the use of awkward alternative expressions and to be consistent with the terms used to describe other types of market structures, the term “oligopoly” has come into wide usage. Oligopoly refers to a situation in which the market occupancy of a few firms, each of outstanding size in an “industry,” is relatively high. Market occupancy is measured by the proportion of an industry’s total capacity, total sales, total value-added-to-product, or total persons employed, that is accounted for by a specified number of firms. While monopoly refers to one seller, oligopoly refers to a few sellers. Despite the possible novelty of the word, it conveys the idea of a particular type of market structure so conveniently that its present use is justified.

The significance of oligopoly.—Oligopoly has considerable economic significance because of the possibility of overt or tacit collusion between large rivals, leading to noncompetitive pricing and output policies.¹⁰ If three or four large firms account for a high percentage of the total sales of a product, it is likely that awareness of the actions and reactions of rivals will develop. With awareness, it is likely that there will be some tendency among the group to coordinate their activities through some device, e.g., price leadership, for their mutual benefit.

The tendency toward joint monopolistic behavior by oligopolists may be counterbalanced by several forces. There may be uncertainty of the behavior patterns and objectives of rivals. There may be conflict of interest even under conditions where rivals’ reactions are

⁹ Cf. the testimony of Professor Fritz Machlup in *Study of Monopoly Power*, Hearings before the Subcommittee on Study of Monopoly Power of the Committee on the Judiciary, U. S. 81st Cong., 1st sess., October–November, 1949, Serial No. 14, Part 2-A, House of Representatives (Washington, 1949), pp. 505–506.

¹⁰ A detailed technical discussion which elaborates this section is presented in Appendix A.

thought to be known. The dominant personality at the head of an individual firm may behave so individualistically that cooperative policies are impossible to achieve. Differences or changes in cost or demand conditions of the individual firms may make for an unwillingness to be influenced by the policies of rivals. In addition, product variation and advertising may be continuously practiced to initiate advantageous changes that may not be readily matched. Further, unless marked cost or product superiorities of some kind are possessed by the existing dominant firms, the potential entry of new firms into the industry may be a continuing threat which enforces competitive pricing. Finally, fear of government action may inhibit collusive behavior.

Other factors which may influence the market behavior of oligopolists are: durability of product, style influences, time-trend of industry demand, maturity of the industry, phase of the business cycle, number and variety of the channels of supply and of distribution available to the firm.

It is evident that the variables influencing market behavior are too numerous to permit easy generalization regarding the effect of concentration upon market practices. Although the degree of concentration is not an adequate basis for distinguishing markets, it may be a factor of considerable importance. Much additional study of the interrelationship between market structure and market behavior is necessary before conclusions may be drawn with assurance. At a minimum, the price or output policy of an oligopolist is likely to have repercussions on market price and output.

Since fewness has a particularly important influence on market behavior, the firms analyzed in this study were selected from industries in which a high degree of concentration exists.¹¹ The findings that follow have significance for understanding the development of both bigness (absolute size) and concentration (relative size).

¹¹ Problems of constructing, interpreting, and using concentration ratios and the procedures by which the firms were selected for this study are described in Appendix B. Table 2 at the end of Appendix B lists the names of the firms included in this study.

The measurement of the growth of dominant firms in oligopolistic industries should reflect power in the market place. Growth measurement is then best achieved through an analysis of growth in sales. Because sales data are not available for individual firms over the long span of years covered by this study, it has been necessary to adopt a substitute. Growth of total assets is selected as the best available alternative measure.¹

Total growth is separated into two major components, external growth (growth by acquisitions) and internal growth.² The relative extent of growth by each method has been calculated. The analysis in this chapter consists of study of the extent to which oligopolistic firms grew by acquisitions.

Some Measurement Problems and Procedures

Classification of growth subsequent to mergers.—Consideration of dynamic aspects of external growth raised an important problem early in the study. Should the growth of the amalgamated firm following the acquisition of another firm be treated as internal growth,

¹ An appraisal of this measure and alternatives is presented in Appendix C, "Alternative Measures of Growth."

² A detailed discussion of measurement procedures is set forth in Appendix D, "Measurement Procedures."

external growth or some combination of the two? The policy actually adopted was to record all growth of a firm subsequent to a merger as internal growth. Several alternatives were considered, but could not be used for lack of adequate data or because they were without a valid theoretical basis. For example, one possibility was to have assumed the same rate of growth for the acquired unit after merger as it had experienced before. However, usually the necessary antecedent growth data were not available. Further, it would not have been possible to know what changes in the circumstances of either the acquired component or acquiring firm might have taken place as a consequence of the merger.

The methodology of the study was patterned after the techniques used in the work of the Federal Trade Commission and Professor Stigler in their studies of the role of mergers in the steel industry.³ The Federal Trade Commission concluded from its study that mergers since 1915 in the steel industry had accounted for a considerable increase in concentration.⁴ From less systematic analysis the Commission asserted that concentration was increasing in a large number of other industries, due to mergers.⁵ The present study tests these propositions by extending the analysis to other industries, and therefore employs the Commission's techniques of measuring the direct impact of mergers.

It should be clearly perceived that two major issues are involved in this study, but that we have found conclusive evidence on only one. The issue raised by the studies of the Federal Trade Commission and the statements of Professor Stigler is whether the direct effects of increases in assets resulting from mergers have been the major factor causing the development of bigness and concentration in the American economy. The data herein compiled on external and internal growth of individual oligopolists provides a factual answer to this question.

A second issue concerns both the direct and indirect effects of

³ Federal Trade Commission, *The Merger Movement* (Washington, 1948), pp. 70-134; George J. Stigler, "Monopoly and Oligopoly by Merger," *American Economic Review*, Proceedings, XL (May, 1950), 30.

⁴ Federal Trade Commission, *op. cit.*, p. 72.

⁵ *Ibid.*, pp. 1-69.

mergers upon the absolute and relative growth of firms. To the questions raised in this area, the present study can provide only inferential evidence. The direct and immediate effects of mergers on the assets of the acquiring firms may be measured or estimated. However, the effects of a merger on the subsequent growth of a firm may vary widely. Some mergers may enhance a firm's market control through patents, large research or advertising budgets, etc., so that potential entry of rivals is made difficult. Or the merger may so increase the efficiency of a firm's operations that it begins to outstrip its competitors. In such cases virtually all of the subsequent internal growth of a firm may properly be attributable to the merger.

In contrast, much evidence demonstrates that even mergers which have resulted in large immediate increases in market occupancy of the resulting firm have had no assurance of success. Moody and Dewing have provided lists of unsuccessful combinations.⁹ Uneconomical units may have been put together; initiative may have been quelled by overcentralization of management; and so on.

Furthermore, concentration in a large number of industries in which mergers on a large scale had taken place at the turn of the century declined over the subsequent fifty years. This is additional evidence that mergers are no guarantee of superiority over the remainder of the industry and no automatic method of ensuring large internal growth.

Concerning the second issue, therefore—of the indirect as well as the direct effects of mergers on the growth of individual firms—it is difficult to make dependable measurements. In a specific firm or for the economy as a whole, mergers may have had either positive or negative effects on subsequent growth. Consequently, our data on the relative extent of external and internal growth in the development of firms may either understate or overstate the combined direct and indirect effect of mergers. Only with this reservation in mind can our empirical findings be applied to the second issue.

Unequal reliability of the data.—The study covers a long span

⁹ John Moody, *The Truth about the Trusts* (New York: Moody Publishing Co., 1904), pp. 289–369; Arthur S. Dewing, *Corporate Promotions and Reorganizations* (Cambridge: Harvard University Press, 1924), pp. 518–615.

of the existence of diverse companies, and complete information for all years and all firms could not be secured. It was sometimes necessary to develop estimates from fragmentary materials. Our preliminary data sheets were therefore sent to the individual companies for verification. Although these companies provided excellent coöperation, the required information often was unavailable.

Our basic data sheets were accordingly divided into three groups, based upon their degree of reliability. Data for companies in Group I are complete and have been verified by the individual companies. Data for companies in Group II are at least 75 per cent complete, taken from reliable sources, but not entirely corroborated by the individual companies. The individual companies did not take exception to the data, but in most cases simply could not assemble substantiating or correcting information. Data for companies in Group II may be considered to have dependable accuracy. Data for companies in Group III are mainly estimates constructed from fragmentary information. These estimates could not be corroborated by the individual companies and in some cases skepticism and outright objections were expressed. The margin of error of the findings for the companies in Group III possibly exceeds 10 per cent.

The statistical analysis upon which the conclusions of the study are based utilizes data of the three groups individually and combined. Similar results are indicated by the data of each group as well as of successive combinations of the groups.

Time period covered by the data.—A review of the literature and data on mergers suggests that three time spans may be identified as periods of heightened merger activity. The three major merger movements may be dated as (1) 1898–1903, (2) 1926–1929, and (3) 1940–1947. The first merger movement actually began before 1890, but not on a large scale. Some increased merger activity occurred immediately following the passage of the Sherman Act in 1890, but did not attain the scale reached in the late nineties. The merger movement of 1898–1903 will be referred to also as “the merger movement at the turn of the century,” “the first merger movement,” and “the early merger movement.”

The merger movement of 1926–1929 can be identified by the increase in the number of firms absorbed in mergers as illustrated in figure 1, page 78. It will also be called “the merger movement of the ’twenties” and “the second merger movement.”

Some statistical studies have centered on mergers of the period 1940–1947. This period will also be termed “the recent merger movement” and “the third merger movement.”

The present study sought to include the effects of mergers during these major merger movements as well as those occurring before and after the periods of increased merger activity. In view of the extent of the early merger movement, a particularly determined attempt was made to secure information on the antecedents of the combinations which took place at the turn of the century. However, despite considerable effort, the data which could be assembled were relatively meager. The reasons for and consequences of the paucity of data on firms in this early period are briefly indicated.

The first Moody's *Manual of Industrial and Miscellaneous Securities* was published for 1900. Although the first of Poor's *Manuals* was published in 1860, it was devoted exclusively to railroads. The coverage of industrials did not begin until 1890, but the number of industrial firms on which descriptions were provided was not large until after 1900. In 1910 the first Poor's *Manual of Industrials* was published. Conversations and correspondence with the publishers of these manuals suggest that there was very little information on industrials until after the merger activity of the turn of the century. Before the combinations were achieved, the companies were small and their securities were not considered of investment grade. Consequently, only after the consolidations had taken place did periodic financial information on industrial companies become available.

Table 1 indicates the relative paucity of information on firms for years prior to 1900. For only four firms was it possible to secure data for years before 1900. For nearly half of the firms, however, information for years prior to 1910 was secured.

But of greater significance is the fact that lack of early data has little effect on the final percentage calculations since the ratios of

TABLE 1
EARLIEST YEARS FOR WHICH DATA COULD BE SECURED
ON THE INDIVIDUAL FIRMS IN THE STUDY

Year	Number of firms for which data begin within specified time interval	Per cent
1886-1890.....	1	1.4
1891-1895.	1	1.4
1896-1900	2	2.7
1901-1905	12	16.0
1906-1910	14	18.9
1911-1915	12	16.2
1916-1920	12	16.2
1921-1925	9	12.2
1926-1930	7	9.5
1931-1935	2	2.7
1936-1940	1	1.4
1941-1945	0	0
1946-1950	1	1.4
Totals.	74	100 0

SOURCE: Basic data sheets.

total assets for the first data years to total assets in 1948 are consistently low for all of these firms. The ratio of initial total assets of all of the firms for which data were secured for years before 1910 to the increase in total assets of the same firms through 1948 was 1 to 6.14, that is, total assets of these firms increased by over 600 per cent during the period (excluding U. S. Steel, the per cent of increase was 1200). The percentage growth of all of the 74 firms between their various initial years and 1948 was also approximately 600 (excluding U. S. Steel, it was about 950). Data for both comparisons are shown in Appendix E, tables 10 and 11.

Treatment of assets for the initial year.—In many cases, the total asset figures of the initial year for which information was available represented growth, wholly or partially resulting from prior acquisitions or combinations. Often it was not possible to ascertain the relative proportions of internal and external growth in the assets of the initial year. The initial assets of companies such as U. S. Steel or U. S. Rubber, which were formed by combinations, can be regarded as external growth entirely. However, even in these cases it is useful to make calculations which will permit analysis of two important aspects of growth, (1) the role of combinations or acquisitions in the original formation of the company, and (2) the role of acquisitions in subsequent growth.

Accordingly, calculations of the relative extent of external and internal growth in the development of individual firms were performed under three alternative procedures. (A) The initial assets of every firm were assumed to represent acquisitions and were therefore treated as external growth. (B) The initial assets of every firm were taken as a base from which subsequent growth was measured. (C) The initial assets of every firm were treated as a separate item in the growth of the firm. The three alternatives result in calculated percentages of external growth of different amounts, in descending order. The percentages in (A) are largest because external growth is augmented by the amount of the initial assets. The percentages calculated under the method (C) are smaller than under (B) because the initial assets are added to the total growth figures in the former,

resulting in larger denominators from which percentages are computed.

Tables of arrays of growth by acquisitions.—The basis for the statistical analysis which follows in succeeding sections is contained in the first five tables (tables 5–9) of Appendix E, Supplementary Tables and Figure. They present arrays in descending order of the extent of growth of individual firms through external acquisitions. Table 5 presents arrays of per cent of growth from external sources for the firms of Group I, under the three alternative methods (sections A, B, and C) of calculating external growth. Tables 6 and 7 contain the results of corresponding calculations for the firms in Group II and Group III respectively.

It is interesting to observe that the rankings of the firms are not substantially changed by the alternative methods of calculating growth from external sources. Rank correlation indexes were found to be consistently high. In only one case was the rank correlation coefficient less than 0.5; in four of the nine relationships it exceeded 0.9.⁷

Arrays were also constructed by combining Groups I and II and Groups I, II, and III under method (B), in which the initial asset amount for each firm is taken as the base from which subsequent growth is measured. These results are exhibited in Appendix E, tables 8 and 9.

Aggregate Measures of the Role of Acquisitions in the Growth of Large Firms

Table 2 presents an over-all view of the components of growth of the firms studied. The growth in total assets over the period, mainly from 1895–1910 through 1948, was \$28.0 billion. Approximately one-fourth of the growth was achieved by acquisitions.

If the assets of the initial year for firms created by combinations are classified as external growth, total growth becomes \$32.6 billion, approximately one-third of which appears to have come about by

⁷ The correlation of the rankings of the firms in the tables constructed under alternative measurement procedures were as follows: 5A and 5B, 0.94; 5B and 5C, 0.99; 5A and 5C, 0.90; 6A and 6B, 0.52; 6B and 6C, 0.98; 6A and 6C, 0.39; 7A and 7B, 0.63; 7B and 7C, 0.95; 7A and 7C, 0.54.

ROLE OF MERGERS IN THE GROWTH OF LARGE FIRMS

TABLE 2

TOTAL GROWTH, INTERNAL GROWTH, GROWTH BY ACQUISITIONS
IN 74 FIRMS, APPROXIMATELY 1900-1948

	Growth by acquisitions (\$ millions)	Internal growth (\$ millions)	Growth in total assets (\$ millions)	Growth by acquisition as a per cent of total growth	Internal growth as a per cent of total growth
--	--	-------------------------------------	--	--	--

A: Assets of initial years classified as external growth

I.....	3,092 6	8,811 4	11,904 0	26 0	74 0
II.....	5,448 1	9,829 7	15,277 8	35 7	64 3
III.....	2,223 4	3,157 5	5,380 9	41 3	58 7
Totals.....	10,764 1	21,798 6	32,562 7	33 1	66 9
Averages for individual firms.....	.....	.....	.....	36 3	63 7

B: Assets of initial years treated as a base from which subsequent growth is measured

I.....	1,867 3	8,811 4	10,678 7	17 5	82 5
II.....	2,901 8	9,829 7	12,731 5	22 8	77 2
III.....	1,474 4	3,157 5	4,631 9	31 8	68 2
Totals.....	6,243 5	21,798 6	28,042 1	22 3	77 7
Averages for individual firms.....	.....	.....	.....	22 6	77 4

C: Assets of initial years treated as a separate component of growth^a

I.....	1,867 3	8,811 4	11,904 0	15 7	74 0
II.....	2,901 8	9,829 7	15,277 8	19 0	64 3
III.....	1,474 4	3,157 5	5,380 9	27 4	58 7
Totals.....	6,243 5	21,798 6	32,562 7	19 2	66 9
Averages for individual firms.....	.....	.....	.....	18 6	63 7

^a Under method C, dollar amounts of acquisitions plus internal growth do not equal growth of total assets, nor do percentages total 100.0, since initial assets are treated as separate items of growth.
Source: Appendix E, tables 5, 6, 7.

external growth. Thus the early merger movement in the 22 industries included in this study represented combinations consisting of total assets of \$4.6 billion. This amount is approximately 16 per cent of the total subsequent growth. Classification of the early combinations as acquisitions does not significantly alter the indicated proportion of total growth accounted for by external growth.⁹

Under each method of measurement, the percentages of growth by acquisitions were higher for Group III (data for firms in this group are subject to a possible wide margin of error). The differences are not great, however, so that over-all results are not appreciable affected.

The percentages in table 2 are calculated from sums of the absolute amounts of the components of growth and from the arithmetic means of the percentages calculated for individual firms. A comparison between the results by the two methods provides a basis for analyzing the influence of the relatively largest firms on the summary results. If the largest firms grew by external acquisitions to a greater extent than smaller firms, percentages calculated from sums of amounts would exceed percentages representing averages of individual percentages. If the largest firms grew mainly by internal development, the reverse relationship would obtain. The data in table 2 indicate that differences resulting from the use of these alternative methods of calculating percentages of growth by acquisitions are negligible. This demonstrates that among the oligopolistic firms studied, extreme size was associated with neither an unusually high nor an unusually low proportion of external growth.

It appears that as a group, and irrespective of measurement assumptions, the firms studied achieved the major extent of their growth through internal development. The proportion of growth through external acquisitions, however, is appreciable. The data do not support an extreme position as to the nature and source of growth of dominant firms, but the inconclusiveness of the summary data indicates need for a more detailed analysis of the growth patterns of the firms.

⁹ However, the influence of the early merger movement on industrial concentration is highly important, as the material of the following chapter demonstrates.

Variations between Firms in the Extent of Growth by External Acquisitions

Frequency distributions of the percentages of growth by acquisitions are set forth in tables 3, 4, 5, and 6. In the first two tables, assets of the initial year of firms formed by combinations are classified as acquisitions. The first table combines data of Groups I and II, the second combines data of Groups I, II, and III. Tables 5 and 6 similarly combine data of the first two and then all of the groups, but assets of the initial year are treated as a base from which subsequent growth is measured.

The tables exhibit wide variations among individual firms in the extent of growth by acquisitions. More than 65 per cent of the total growth of some firms was directly the result of acquisitions. External growth was negligible in the development of many firms.

In tables 3 and 4, in which assets of the initial year of firms formed by combinations are classified as acquisitions, external growth was less than 50 per cent of the total growth of two-thirds of the firms. Acquisitions accounted for less than 25 per cent of total growth of more than one-third of the firms.

When assets of the initial year are treated as a base from which subsequent growth is measured (tables 5 and 6), the indicated role of acquisitions in the growth of oligopolistic firms is further reduced. In 85 per cent of the firms, acquisitions accounted for less than 50 per cent of total growth. Acquisitions accounted for less than 15 per cent of the total growth of at least one-half of the firms.

These data do not support the extreme positions frequently expressed about the role of acquisitions in the growth of individual firms. Acquisitions have played a relatively negligible role in the growth of most of the oligopolistic firms studied. Yet it cannot be asserted that acquisitions have been an unimportant source of growth for all individual firms, since a number of the firms studied owe the greater portion of their expansion to external growth.⁹

⁹ It must also be borne in mind that the influence of acquisitions may be understated or overstated because it proved impossible to trace the effect of acquisitions on subsequent internal growth.

TABLE 3

FREQUENCY DISTRIBUTION OF PER CENT GROWTH BY ACQUISITIONS,
ASSETS OF INITIAL YEAR OF FIRMS FORMED BY COMBINATIONS
CLASSIFIED AS ACQUISITIONS, GROUPS I AND II COMBINED

Per cent growth by acquisitions	Number of firms	Cumulative number of firms	Cumulative percentage of 53 firms
0- 4 9	1	1	1 9
5- 9.9	8	9	17 0
10-14.9	6	15	28.3
15-19.9	5	20	37.7
20-24 9	4	24	45 3
25-29.9	3	27	50 9
30-34 9	6	33	62.3
35-39 9	1	34	64 2
40-44 9	2	36	67 9
45-49 9	0	36	67 9
50-54 9	8	44	83 0
55-59 9	2	46	86 8
60-64 9	0	46	86 8
65-69 9	6	52	98 1
70-74 9	1	53	100.0
Total	53		

SOURCE: Appendix E, tables 5, 6, section A.

TABLE 4

FREQUENCY DISTRIBUTION OF PER CENT GROWTH BY ACQUISITIONS,
ASSETS OF INITIAL YEAR OF FIRMS FORMED BY COMBINATIONS
CLASSIFIED AS ACQUISITIONS, GROUPS I, II, AND III COMBINED

Per cent growth by acquisitions	Number of firms	Cumulative number of firms	Cumulative percentages of 74 firms
0- 4.9	1	1	1.4
5- 9.9	8	9	12.2
10-14.9	9	18	24.3
15-19.9	6	24	32.4
20-24.9	4	28	37.8
25-29.9	4	32	40.5
30-34.9	10	42	56.8
35-39.9	2	44	59.5
40-44.9	3	47	63.5
45-49.9	1	48	64.9
50-54.9	9	57	77.0
55-59.9	3	60	81.1
60-64.9	0	60	81.1
65-69.9	9	69	93.2
70-74.9	2	71	95.9
75-79.9	0	71	95.9
80-84.9	3	74	100.0
Total	74		

SOURCE: Appendix E, tables 5, 6, 7, section A.

TABLE 5

FREQUENCY DISTRIBUTION OF PER CENT GROWTH BY ACQUISITIONS,
ASSETS OF INITIAL YEAR TREATED AS A BASE FROM WHICH
SUBSEQUENT GROWTH IS MEASURED, GROUPS I AND II COMBINED

Per cent growth by acquisitions	Number of firms	Cumulative number of firms	Cumulative percentage of 53 firms
0- 4.9	13	13	24.5
5- 9.9	11	24	45.3
10-14.9	5	29	54.7
15-19.9	5	34	64.2
20-24.9	2	36	67.9
25-29.9	3	39	73.6
30-34.9	2	41	77.4
35-39.9	1	42	79.2
40-44.9	3	45	84.9
45-49.9	2	47	88.7
50-54.9	2	49	92.5
55-59.9	1	50	94.3
60-64.9	3	53	100.0
Total	53		

SOURCE: Appendix E, tables 5, 6, section B.

TABLE 6

FREQUENCY DISTRIBUTION OF PER CENT GROWTH BY ACQUISITIONS,
ASSETS OF INITIAL YEAR TREATED AS A BASE FROM WHICH
SUBSEQUENT GROWTH IS MEASURED, GROUPS I, II, AND III
COMBINED

Per cent growth by acquisitions	Number of firms	Cumulative number of firms	Cumulative percentage of 74 firms
less than 0 ^a	1	1	1.4
0- 4.9.....	16	17	23.0
5- 9.9.....	13	30	40.5
10-14.9.....	8	38	51.4
15-19.9.....	6	44	59.5
20-24.9.....	3	47	63.5
25-29.9.....	3	50	67.6
30-34.9.....	2	52	70.3
35-39.9.....	3	55	74.3
40-44.9.....	6	61	82.4
45-49.9.....	2	63	85.1
50-54.9.....	2	65	87.8
55-59.9.....	2	67	90.5
60-64.9.....	5	72	97.3
65-69.9.....	0	72	97.3
70-74.9.....	0	72	97.3
75-79.9.....	2	74	100.0
Total.....	74		

^a -11.5.

SOURCE: Appendix E, tables 5, 6, 7, section B.

Industry Differences in the Role of Acquisitions in the Growth of Large Firms

Identification of an industry for empirical study is fraught with unmanageable difficulties. The availability of substitutes with a wide variety of physical characteristics makes it impossible to establish clear boundaries for an industry. Thus Robert Triffin has suggested that the entire concept of industry be discarded and that products be distinguished on the basis of coefficients of substitution.¹⁰

Despite the lack of a rigorous economic basis for determining the dimensions of an industry, however, the notion of an industry has usefulness for some purposes. Thus, it is of interest to use census classifications to examine variations in the extent to which, as a group, the dominant firms of the oligopolistic industries studied grew by acquisitions.

Tables 7 and 8 present arrays of industries by the average per cent by which the largest firms of the industry grew by acquisitions, with assets of the initial year treated respectively as acquisitions and as a base from which subsequent growth is measured. Some of the major industries in which the largest firms grew by acquisitions to a large extent are cement, steel, and compressed and liquefied gases. The last-mentioned industry stands high in the array because its merger movement took place in relatively recent years, leaving comparatively few years for subsequent internal growth by the firms resulting from the combinations.

Industries in which acquisitions accounted for a relatively small percentage of the total growth of the largest firms are aluminum, agricultural implements, and sewing machines. In the agricultural implement industry, the major combination took place at the turn of the century, with no large merger movement among the smaller firms at a later period, as occurred in the steel industry. In the sewing machine and aluminum industries lack of access to the patent advantages of the dominant firm seems to have prevented the development of rivals of significant size.

¹⁰ Robert Triffin, *Monopolistic Competition and General Equilibrium Theory* (Cambridge: Harvard University Press, 1941), pp. 88-89.

TABLE 7

ARRAY OF INDUSTRIES BY THE AVERAGE* PER CENT BY WHICH THE LARGEST FIRMS OF THE INDUSTRY GREW BY ACQUISITIONS, ASSETS OF THE INITIAL YEAR CLASSIFIED AS ACQUISITIONS

Industry	Average per cent
Ammunition.....	69.5
Cement.....	69.4
Steel.....	53.0
Compressed and liquefied gases.....	51.6
Asphalted-felt floor coverings.....	51.3
Typewriters and parts.....	51.3
Photographic apparatus.....	48.6
Dairy products.....	48.5
Corn syrup, sugar, oil.....	43.9
Tin cans.....	40.6
Liquors.....	40.0
Rubber tires.....	37.8
Meat packing.....	29.5
Petroleum refining.....	28.0
Cigarettes.....	24.6
Ink.....	22.4
Rayon and allied products.....	21.8
Electrical machinery.....	20.9
Motor vehicles.....	20.8
Sewing machines.....	16.9
Agricultural implements.....	13.6
Aluminum.....	9.9

* Arithmetic mean of the per cents for the individual firms.
Source: Appendix E, tables 5, 6, 7, section A.

TABLE 8

ARRAY OF INDUSTRIES BY THE AVERAGE PER CENT BY WHICH THE LARGEST FIRMS OF THE INDUSTRY GREW BY ACQUISITIONS, ASSETS OF THE INITIAL YEAR TREATED AS A BASE FROM WHICH SUBSEQUENT GROWTH IS MEASURED

Industry	Growth by acquisitions (\$ millions)	Internal growth (\$ millions)	Growth in total assets (\$ millions)	Growth by acquisitions	
				(per cent) ^a	(per cent) ^b
Steel.....	18,527 6 ^c	27,536 3 ^c	46,063.9	42.1	40.2
Compressed and liquefied gasses.....	231.3	430.8	662.1	41.3	35.0
Dairy products.....	371.4	288 0	659.4	39.9	56.3
Typewriters.....	68.1	97.7	165.8	38.4	41.1
Rubber.....	323 0	923 0	1,246 0	34.1	25.9
Photographic apparatus and materials.....	47.1	377.8	424.9	33.7	11.1
Liquors.....	330.6	642.7	973.3	33.5	34.0
Cement.....	28 0	30.6	58.6	29.0	47.8
Tin cans.....	101.4	299.1	400.5	24.7	25.3
Petroleum refining.....	1,713.1	6,480.3	8,193.4	23.6	20.9
Asphalted-felt floor coverings	28.4	98.8	127.2	19.3	22.3
Electrical machinery and apparatus.....	291.2	1,497.1	1,788.3	17.1	16.3
Motor vehicles.....	769.0	3,895.8	4,664.8	16.4	16.5
Meat packing.....	185.2	824.8	1,010.0	13.1	18.3
Rayon.....	456.2	1,232.3	1,688.5	11.7	27.0
Cigarettes.....	109.5	1,465.2	1,574.7	8.2	7.0
Corn products.....	16.0	124.1	140.1	7.8	11.4
Agricultural implements.....	65.0	810.3	875.3	5.8	7.4
Aluminum products.....	44.1	602.2	646.3	4.7	6.8
Ink.....	1.0	28.8	29.8	3.6	3.4
Sewing machines.....	5.3	173.8	179.1	3.0	3.0
Ammunition and related products.....	0.4	16.8	17.2	2.3	2.3

^a Percentage calculated by averaging per cents of growth by acquisitions for the individual companies.

^b Percentage calculated by dividing aggregate growth by acquisitions of the largest firms in an industry by aggregate total growth.

^c In tons of steel ingots and castings.

Source: Appendix E, tables 5, 6, 7, section B.

In tables 9 and 10 frequency distributions of industries, based on the average per cent by which the largest firms in the industry grew by acquisitions, are presented under the alternative treatments of assets of the initial year. Virtually all of the cases show an average percentage of growth by acquisitions of less than 50 per cent. Indeed, in a very high number of cases, external growth accounts for less than 20 per cent of total growth. The frequency of large percentage growth by acquisitions is much lower for industries than for individual firms. The great variability among individual firms exerts an averaging influence that lowers the indicated percentage of total growth by acquisitions when the firms are grouped by census industries.

Financing Growth in Total Assets

As emphasized earlier, both internal and external growth may be financed from either internal or external sources. Data on financing the growth of 31 of the companies studied were obtained. Financial sources of growth were divided into retained earnings (internal financing) and all other sources (external financing). The measurement procedure understates the role of external financing somewhat, since interim uses of external financing subsequently replaced by internal financing are not reflected in the final results. The method accurately portrays the net role of external financing between two widely separated points in time.

Table 11 presents an array by per cents of the growth from internal sources. Six of the companies, U. S. Steel Corp., Deere & Co., Ford Motor Co., Chrysler Corp., P. Lorillard Co., and B. F. Goodrich Co., financed over 60 per cent of their growth from retained earnings. The firms which occupy the low end of the array financed growth from internal sources by over 25 per cent. All of the firms, as a group, financed nearly 50 per cent of their growth from internal sources. More than one-third of the firms financed over one-half of their growth from retained earnings (table 12). In contrast to the financing policies of this group of 31 firms, business corporations as a whole for the years 1919–1948 financed \$71.3 billion

TABLE 9

FREQUENCY DISTRIBUTION OF INDUSTRIES BASED ON THE AVERAGE*
PER CENT BY WHICH THE LARGEST FIRMS OF THE INDUSTRY GREW
BY ACQUISITIONS, ASSETS OF THE INITIAL YEAR CLASSIFIED AS AC-
QUISITIONS

Average percentage of growth by acquisitions	Number of industries	Cumulative number of industries	Cumulative percentage of 22 industries
0- 9.9	1	1	4.5
10-19.9	2	3	13.6
20-29.9	7	10	45.4
30-39.9	1	11	50.0
40-49.9	5	16	72.7
50-59.9	4	20	90.9
60-69.9	2	22	100.0
70- and over	0	22	100.0
Total	22		

* Arithmetic mean of the per cents for the individual firms.
Source: Table 7.

TABLE 10

FREQUENCY DISTRIBUTION OF INDUSTRIES BASED ON THE AVERAGE*
PER CENT BY WHICH THE LARGEST FIRMS OF THE INDUSTRY GREW
BY ACQUISITIONS, ASSETS OF THE INITIAL YEAR TREATED AS A BASE
FROM WHICH SUBSEQUENT GROWTH IS MEASURED

Average percentage of growth by acquisitions	Number of industries	Cumulative number of industries	Cumulative percentage of 22 industries
0- 9.9	7	7	31.8
10-19.9	5	12	54.5
20-29.9	3	15	68.2
30-39.9	5	20	90.9
40-49.9	2	22	100.0
50- and over	0	22	100.0
Total	22		

* Arithmetic mean of the per cents for the individual firms.
Source: Table 8.

TABLE 11

ARRAY BY PER CENT OF GROWTH OF TOTAL ASSETS OF 31 LARGE FIRMS,
FINANCED FROM INTERNAL SOURCES*

(From indicated initial years through 1948)^b

Name of company	Initial year	Increase in total assets (\$ millions)	Amount of internal financing (\$ millions)	Internal financing (per cent)
U. S. Steel Corp.....	1903	951.3	829.7	87.2
Deere & Co.....	1912	181.6	153.5	84.5
Ford Motor Co.....	1912	1,128.5	816.8	72.4
Chrysler Corp.....	1925	455.8	313.4	68.8
P. Lorillard Co.....	1911	46.7	29.2	62.5
B. F. Goodrich Co.....	1913	167.3	103.3	61.7
Standard Oil Co. (Indiana) . .	1913	1,456.1	867.3	59.6
Swift & Co.	1899	488.7	274.5	56.2
Standard Oil Co. (New Jersey)....	1906	3,154.4	1,699.4	53.9
Socony-Vacuum Oil Co., Inc. . . .	1913	1,339.6	699.7	52.2
Goodyear Tire & Rubber Co..	1909	422.4	210.4	49.8
Jones & Laughlin Steel Corp.. . . .	1922	206.3	98.1	47.6
Firestone Tire & Rubber Co.....	1911	339.8	157.5	46.4
General Motors Corp.	1911	2,877.4	1,287.0	44.7
Standard Oil Co. of California .	1911	1,025.6	457.0	44.6
The Texas Co.....	1908	1,256.5	551.0	43.9
General Electric Co.	1900	1,125.2	481.7	42.8
J. I. Case Co.....	1909	62.5	23.7	38.0
Armour and Co.	1909	322.9	120.7	37.4
Wilson & Co., Inc.	1911	106.4	38.6	36.3
Bethlehem Steel Corp.	1905	985.2	333.0	33.8
Studebaker Corp.....	1911	121.8	41.8	33.7
Cudahy Packing Co.....	1907	79.2	25.6	32.3
U. S. Rubber Co.	1900	300.5	94.6	31.5
International Harvester Co.....	1907	515.5	152.9	29.7
Westinghouse Electric Corp.	1903	652.7	190.2	29.1
Liggett & Myers Tobacco Co.	1911	355.8	94.2	26.5
American Tobacco Co.....	1912	542.0	143.3	26.4
Republic Steel Corp.	1900	437.7	114.0	26.0
Philip Morris & Co., Ltd., Inc.....	1920	112.4	28.8	25.6
R. J. Reynolds Tobacco Co.....	1913	508.2	129.3	25.4
Totals.....		21,674.9	10,560.2	48.7
Arithmetic mean of individual company percentages.....				46.3

* Initial assets treated as base amount.

^b Initial years in this table were determined by the availability of data on internal financing. Hence initial years in this table differ from initial years in the preceding tables and those in Appendix E. Consequently, amounts of "increase in total assets" will likewise differ from amounts found in these other tables.

SOURCE: Moody's *Investment Manuals*.

TABLE 12
FREQUENCY DISTRIBUTION OF PER CENT OF THE TOTAL GROWTH OF
31 FIRMS, FINANCED FROM INTERNAL SOURCES

Per cent of total growth	Number of firms	Per cent of total firms	Cumulative percentage
25-29.9.....	7	22.5	22.5
30-34.9.....	4	12.9	35.4
35-39.9.....	3	9.7	45.1
40-44.9.....	4	12.9	58.0
45-49.9.....	3	9.7	67.7
50-54.9.....	2	6.5	74.2
55-59.9.....	2	6.5	80.7
60-64.9.....	2	6.5	87.2
65-69.9.....	1	3.2	90.4
70-74.9.....	1	3.2	93.6
75-79.9.....	0	0.0	93.6
80-84.9.....	1	3.2	96.8
85-89.9.....	1	3.2	100.0
Totals.....	31	100.0	

SOURCE: Table 11.

of their capital expenditures from internal sources, or 32.8 per cent of a total of \$216.8 billion.¹¹

The average dividend payout of the companies was about 50 per cent (table 13). This compares with an average dividend payout percentage of about 67 per cent for all companies listed on the New York Stock Exchange over a roughly comparable period of time.¹² Less than one-fourth of the companies in the present study paid out as high a percentage of earnings in dividends as did corporations as a whole.

In contrast to financial policies of all corporations, the 31 firms utilized retained earnings to finance asset expansion to an uncommonly high degree. The considerable extent to which large firms have utilized internal financing as a source of growth has given rise to Corwin Edwards' proposal to alter tax policy in order "to force managements to rely for expansion more upon the capital market and less upon earnings."¹³ To the extent that the proposal seeks to limit expansion of large firms, it is not likely to be effective since the size and position of these firms are such that if internal financing, as a source of expansion, were restricted, they would have relatively easy access to the capital markets. Limitations on the extent to which a firm is permitted to utilize internal financing to carry out expansion are likely to handicap smaller firms to a greater degree than larger firms. On the other hand, to exempt firms below "a generous minimum size"¹⁴ would give rise to difficult administrative problems.

The proposal to limit expansion from internal sources is based on the assumption that large firms in the past have expanded through the use of resources which would have yielded higher returns elsewhere. The proposal also rests upon a second assumption—that the capital markets would make a better appraisal of competing uses

¹¹ William F. Butler, *Business Needs for Venture Capital* (New York: McGraw-Hill, 1949), pp. 24-25. If internal sources had been related to *total* asset growth, this reference percentage of financing from internal sources would have been even lower.

¹² Alfred Cowles, 3d, and Associates, *Common-Stock Indexes* (Bloomington, Ind.: Principia Press, 1939), pp. 41-43.

¹³ Corwin D. Edwards, *Maintaining Competition* (New York: McGraw-Hill, 1949), p. 146.

¹⁴ *Loc. cit.*

TABLE 13
 ARRAY BY DIVIDEND PAYOUT PER CENT OF 30 LARGE FIRMS
 (From indicated initial years through 1948)

Name of company	Initial year	Earnings (\$ millions)	Dividends (\$ millions)	Dividend payout (per cent)
American Tobacco Co.	1912	811 7	614.1	75.7
Swift & Co.	1909	474.6	355 8	75.0
General Electric Co.	1909	1,512.0	1,123 3	74.3
R. J. Reynolds Tobacco Co.	1913	771 8	553.3	71.7
General Motors Corp.	1911	4,296 8	3,049.9	71.0
Liggett & Myers Tobacco Co.	1912	550.1	380.4	69.2
P. Lorillard Co.	1912	138 9	92.0	66.2
Standard Oil Co. of California.	1912	1,276 4	747 3	58.5
Westinghouse Electric Corp.	1909	521.3	301 5	57.8
The Texas Co.	1910	1,175 9	674.5	57.4
Philip Morris & Co., Ltd., Inc.	1920	94.8	54.0	57.0
Chrysler Corp.	1925	676 4	374.7	55.4
U. S. Steel Corp.	1902	2,430 4	1,262 9	52.0
Studebaker Corp.	1911	204 3	106 2	52.0
Standard Oil Co. (Indiana).	1913	1,526 2	758 8	49.7
Cudahy Packing Co.	1910	58 9	29.3	49.7
Socony-Vacuum Oil Co., Inc.	1913	1,272.2	618 4	48.6
Standard Oil Co. (New Jersey)	1918	3,107.2	1,531.3	43.5
J. I. Case Co.	1909	67.7	28 3	41.8
International Harvester Co.	1913	625.4	252 1	40.3
Bethlehem Steel Corp.	1909	713 7	271 9	38.1
Republic Steel Corp.	1909	226 5	81 9	36.2
Firestone Tire & Rubber Co.	1911	299 9	101 6	33.8
B. F. Goodrich Co.	1913	205 7	66.3	32.2
Deere & Co.	1912	209 9	62.6	29.8
Armour & Co.	1909	130.7	34.5	26.4
Jones & Laughlin Steel Corp.	1922	190 3	47.3	24.9
Goodyear Tire & Rubber Co.	1910	347 0	84.4	24.3
U. S. Rubber Co.	1910	224 1	46 3	20.7
Wilson & Co., Inc.	1912	81.6	12.0	14.7
Totals.		24,222.4	13,716.9	56.6
Arithmetic mean of individual company percentages.				48.3

SOURCE: Moody's *Investment manuals*.

of assets than corporate managements. Neither hypothesis has been demonstrated.

Proposals to limit the extent to which firms may utilize internal financing to carry out expansion do not rest upon an empirical basis. Without significant changes in financing institutions and markets, large firms will continue to maintain advantages over small firms with respect to access to external financing. Consequently, limits on internal financing are likely to handicap smaller firms to a greater degree than larger firms and to promote concentration rather than to reduce it. An adequate evaluation of public policy proposals in this sphere requires (1) additional factual information on the efficiency of resource allocation by corporate managements, and (2) a judgment of the extent to which financing facilities for small and medium-sized firms would be stimulated if the extent of internal financing available to firms were diminished. In the face of the unknowns, no basis exists for acceptance or rejection of the proposals for limitations on internal financing of asset expansion.

Conclusions on Mergers and Absolute Size

Approximately one-fourth of the growth of the 74 firms studied was directly accounted for by mergers. If assets of the initial year for firms which were formed by combinations are classified as acquisitions, about one-third of the growth then becomes external growth. At least 70 per cent of the firms studied grew by internal expansion to the extent of more than half of their total growth. Acquisitions accounted for less than 25 per cent of the growth of one-half of the firms.

Acquisitions have been a negligible portion of the total growth of most of the firms in census industries now characterized by a high degree of concentration in output. For only a small proportion of the firms does external growth represent a high percentage of total growth. The direct effect of mergers on the absolute size of large firms appears to have been small.

The preceding chapter has presented data concerning the direct effects of mergers on increases in the assets of large firms in oligopolistic industries. Acquisitions were found to be a relatively minor source of the absolute growth of the firms studied. The influence of mergers on the development of the relative position of these firms in their respective industries is now analyzed.

Significance of the Early Merger Movement

The combination movement of 1898–1903 took place in many industries and is said to have given “to American industry its characteristic twentieth-century concentration of control.”¹ Abundant evidence on the high degree of market concentration resulting from mergers in a large number of industries is available. Of 92 large mergers studied by Moody, 78 resulted in control of 50 per cent or more of the output of the industry.² The average of the resulting market occupancy percentages of 21 mergers reported by the Industrial Commission was 71 per cent.³ These and other studies demon-

¹ Paul T. Homan, “Trusts: Early Development,” *Encyclopedia of the Social Sciences*, XV (1935), 114.

² John Moody, *The Truth about the Trusts* (New York: Moody Publishing Co., 1904), pp. 486–487.

³ Cf. George J. Stigler, “Monopoly and Oligopoly by Merger,” *American Economic Review*, Proceedings, XL (May, 1950), 28–29.

strate that mergers were a major means by which a high degree of industrial concentration was fashioned in a large number of industries at the turn of the century.⁴

Although the present study analyzes the development of oligopoly, it should be noted that the typical industrial structure in 1905, after the major combinations had taken place, was not oligopolistic, but one in which a single firm possessed a relatively high percentage of total market occupancy. This may be described as "partial monopoly."⁵ The widespread existence of partial monopoly is corroborated by Stigler's compilation of 20 industries analyzed for trends in concentration.⁶ In Stigler's list, 15 of the industries were partial monopolies, four were oligopolies, and one was an industry in which there was probably a low degree of concentration around 1900. Again, approximately 90 per cent of some 150 "monopolistic" industrial groups listed by G. W. Nutter were characterized by a single dominant firm in the period 1899-1904.⁷

The exceptions are few enough to justify the generalization that the main effect of mergers around 1900 was the emergence of dominance of a single firm. However, Stigler's further generalization that the mergers in this period were "for monopoly"⁸ is incautious. He ascribed a single motivation to a large number of firms and persons in a highly diverse set of circumstances where numerous influences were possible.⁹

⁴ Other studies presenting factual information on this point are: Arthur S. Dewing, *Corporate Promotions and Reorganizations* (Cambridge: Harvard University Press, 1914); Jeremiah W. Jenks, *The Trust Problem* (New York: Doubleday, Page, 1917); Eliot Jones, *The Trust Problem in the United States* (New York: Macmillan, 1921); Charles R. Van Hise, *Concentration and Control* (New York: Macmillan, 1914); Myron W. Watkins, *Industrial Combinations and Public Policy* (Boston: Houghton Mifflin, 1927); Henry R. Seager and Charles A. Gulick, Jr., *Trust and Corporation Problems* (New York: Harper, 1929).

⁵ Since no evaluation of market behavior is intended by the use of this term, a better expression might be "partial dominance" by one firm.

⁶ George J. Stigler, *Five Lectures on Economic Problems* (New York: Macmillan, 1950), p. 53, Appendix, pp. 63-65.

⁷ G. Warren Nutter, *A Quantitative Study of the Extent of Enterprise Monopoly in the United States: 1899-1939* (Chicago: University of Chicago Press, 1951), Appendix B, table 37.

⁸ Stigler, "Monopoly and Oligopoly by Merger," *op. cit.*, pp. 27-31.

⁹ Cf. Joe S. Bain, "Discussion," *American Economic Review*, Proceedings, XL (May, 1950), 64.

Oligopoly prior to 1890.—Regarding the formation of these partial monopolies through combinations, a common misconception exists that the dominant firms emerged from what had been atomistic conditions prior to “the trust movement.” This is not true, for many of the combinations represented the consolidation of a relatively small number of large firms. Table 14 lists seven outstanding examples. Further, the average number of *plants* or firms acquired by the 305 “trusts” studied by Moody was 16.¹⁰ Well over half of the “trusts” (183) were formed from eight or fewer *plants* or firms. One-third of the “trusts” (104) were formed from four or fewer *plants* or firms. In the present study, six of the 13 firms dominant in their respective industries were formed from eight or fewer companies or plants, as indicated in Appendix E, table 12. These data overstate the number of firms merged since they refer to plants in most cases. On the other hand, some of the resulting “trusts” were not dominant firms or even oligopolists.

A further qualification may be noted. The large firms that joined in the major combinations around 1900 were sometimes themselves the product of minor merger activity. This was the case in the steel industry, for example.¹¹ But in most of the other industries, the large units entering into combinations at the turn of the century had not been formed through prior mergers.

The foregoing facts do not permit neat generalization. It cannot be accurately stated, for example, that the American economy in the precombination era was predominantly composed of atomistic industries, followed by the merger movement of 1898–1903, which resulted in partial monopolies or oligopolies. Since many partial monopolies were created by the combination of a small number of firms, considerable industrial concentration must have existed before the combination movement. Atomistic competition in the precombination period was not completely absent, of course, but neither was it as predominant as generally assumed. The stages in

¹⁰ Moody, *op. cit.*, pp. 453–469.

¹¹ Cf. Harry L. Purdy, Martin L. Lindahl, and William A. Carter, *Corporate Concentration and Public Policy* (New York: Prentice-Hall, 1950) p. 521.

the economic history of market structures are more accurately indicated by the following pattern:

Pre-1890 Predominant polypoly,¹² substantial oligopoly.

1890-1905 Some reduction in polypolistic and oligopolistic sectors, increased partial monopoly.

1905-1950 Predominant polypoly, increase in government and public utility sectors, transformation of most of partial monopoly industries into oligopolies.

Significance of the early emergence of partial monopoly for the measurement of growth by acquisitions.—The data present a paradox. We have found that oligopolistic firms have in the main grown from internal sources rather than by acquisitions. Yet it is also clear that the merger movement of 1898-1903 resulted in a high degree of concentration in many industries. In 14 of the 22 industries included in the present study, a high degree of concentration existed by the turn of the century. In 12 of the 14 cases, mergers were an important means by which the concentration was achieved. It is the tremendous growth by internal expansion of the individual companies subsequent to their formation by combination, which accounts for the finding that only a minor portion of their growth was by acquisitions.

From Partial Monopoly to Oligopoly

All of the industries in this study and probably all of the 20 in Stigler's list were oligopolistic in the 1930's. What is the explanation for the transformation from partial monopoly to oligopoly? Stigler suggests that this was achieved by a shift of the motivation for mergers. Since the Northern Securities decision, he declares, "the new goal of mergers is oligopoly."¹³ However, four of the six examples he cites in evidence of change "from near monopoly to oligopoly" by merger are highly questionable. The Cement Trust represented by the American Cement Company was not a near-monopoly, according to one of the major sources of information

¹² Paralleling oligopoly (a few sellers), polypoly signifies many sellers.

¹³ Stigler, "Monopoly and Oligopoly by Merger," *op. cit.*, p. 31.

TABLE 14
NUMBER OF PLANTS OR FIRMS ACQUIRED IN EARLY MAJOR COMBINATIONS

Name of company	Dates of important mergers	Estimated per cent of U. S. production or sales	Firms or plants acquired	Page references in Moody ^a
Amalgamated Copper Co.	1899	15 ^b	11	3
International Mercantile Marine Co.	1902	40	6	107
U. S. Steel Corp.	1901	65	8	136
International Harvester Co.	1902	70	6	252
Union Typewriter Co.	1893	75	5	274
Pullman Co.	1867	85	2	267
U. S. Rubber Co.	1892	50	13	282
Total.			51	
Average number of acquisitions			7 3	

^a J. Moody, *The Truth about the Trusts* (New York: Moody Publishing Company, 1904).

^b Proportion of world's production.

TABLE 15
ROLE OF COMBINATIONS IN THE TRANSFORMATION OF INDUSTRIES FROM PARTIAL MONOPOLY TO OLIGOPOLY

Number of major rivals per industry which grew by acquisition more than the dominant firm	Frequency of occurrence in industries	
	Growth measured after formation of firms	Growth includes initial year's assets as acquisitions
0	6	5
1	3	3
2	2	3
3	0	0
4	0	0
Totals	11	11

SOURCE: Appendix E, table 13.

TABLE 16
CLASSIFICATION OF METHODS BY WHICH OLIGOPOLY DEVELOPED IN 22 INDUSTRIES

Oligopoly by court dissolution or resulting from the pressure of government investigation and the climate of public opinion.	5
Oligopoly by merger.	12 ^a
Oligopoly by internal growth of rivals.	8 ^a
Total.	22 ^b

^a Three industries included in two categories.

^b Duplications counted only once.

SOURCE: Appendix E, table 14.

used by Stigler.¹⁴ The main influence in converting the petroleum industry into smaller units was the dissolution order of 1911. The automobile industry, according to material cited by Stigler, was not a near-monopoly prior to 1904.¹⁵ The dominance of Ford Motor Co. reached its peak in the early 1920's without benefit of merger; the emergence of General Motors Corp. as leader in the industry came many years after the consolidating operations from 1911 to 1920 under W. C. Durant.¹⁶ The major growth of the two largest rivals of International Harvester Co. was not via mergers.¹⁷

Additional evidence also casts doubt on the hypothesis that mergers have been the main instrument by which partial monopolies have been transformed into oligopolies. Table 15 summarizes the detailed analysis by firms of the sources of growth of the large rivals presented in Appendix E, table 13. Calculations have been made under two alternative procedures. The first treats initial acquisitions as a base from which subsequent growth is measured. The second assumes that all of the assets held by emergent major rivals in the first year for which data on each company could be secured represent external acquisition. This assumption overstates growth by merger but little influences the pattern of relationships. In approximately half the industries, no rival grew by combinations to an extent greater than the dominant firm, after the latter had achieved its preëminent position. Typically, at least one firm in each of the industries did not grow by acquisitions as much as the dominant firm during the period when the industry was changing from partial monopoly to oligopoly. On the basis of the facts, it is not correct to say that mergers were the chief instrument by which oligopoly was fashioned.

There is no single explanation of the transformation from par-

¹⁴ Moody, *op. cit.*, pp. 218-219.

¹⁵ Stigler, *Five Lectures on Economic Problems*, Appendix, pp. 63-65.

¹⁶ Lawrence H. Seltzer, *A Financial History of the American Automobile Industry* (Boston: Houghton Mifflin, 1928), pp. 172-177.

¹⁷ Partial monopoly might be transformed into oligopoly by (1) substantial internal growth by one or more small firms, (2) merger of the remaining firms into a very small number, (3) the rise of new firms and their subsequent combination into a very few, or (4) by a combination of these patterns.

tial monopoly to oligopoly, but rather several major influences. These are summarized in table 16, and detailed in Appendix E, table 14. Court dissolutions and antitrust investigations have accounted for the shift from a state of partial monopoly to oligopoly in at least five of the industries. Oligopoly by merger has been a factor, but does not account for as many cases as the other two major influences combined.

Acquisitions and Trends in Industrial Concentration

For a clear demonstration of the effects of mergers on industrial concentration, it would have been illuminating to construct concentration ratios for the "industries" studied, for years immediately prior to and following the years in which major combination activities took place. Unfortunately, industry concentration ratios are not available for a long series of years. Furthermore, construction of industry concentration ratios for years prior to 1929 is not possible because of lack of the necessary data. Total sales figures by industry cannot be secured by census-industry to correspond to sales of individual firms. Wholesale and retail sales data are available, but the data required are manufacturers' sales. The closest approximation to these would be value-of-products-shipped data. However, to measure the percentage market occupancy of the leading four, six, or eight firms would require sales data by product lines for firms. It is impossible to obtain such a breakdown of total sales for individual firms.

Concentration ratios constructed for 1935 by Means and for 1937 by Thorp and Crowder use data from the Census of Manufacturers for the respective years. Value of products by product lines for firms and corresponding industry totals can be secured from this source. However, inquiry revealed that "all Census of Manufactures records prior to 1929, except the published reports, have been destroyed."¹⁸ Hence it is not possible to construct industry concentration ratios with a high degree of reliability for years before 1929.

¹⁸ Information obtained in correspondence with Mr. Maxwell R. Conklin of the Bureau of the Census, letter of September 13, 1949.

Although concentration ratios could not be constructed for specific years, it was possible to present the broad sweep of movements in concentration ratios over the extended periods during which the persistence of merger activity has been noted.¹⁹ The years for which concentration ratios are presented in table 17 are determined mainly by availability of prior calculations or the feasibility of estimates from various sources.

Tables 17 and 18 provide information about two main questions. In view of the persistence of mergers up to the present time: (1) Had the leading firms at the turn of the century increased their percentage market occupancy by 1948? (2) Had the single largest firm in the industry at the turn of the century maintained its position by 1948?

Table 17 shows that General Motors Corp. and Ford Motor Co. increased their market occupancy appreciably to 1921, after which their combined position was constant. This indicates that the great gains of General Motors since 1921 were mainly by inroads into the sales of Ford. The position of the "big three" has declined slightly thus far since the end of World War II, but this may simply reflect the postwar transition.

The combined market occupancy of the four largest ingot steel and steel castings producers declined greatly from 1901 to 1920, then increased to 1930 as a result of the mergers of the 'twenties. Since 1930, however, despite continued merger activities, market occupancy of the largest four has decreased slightly. Similarly, market occupancy of the "big four" cigarette makers and sellers declined considerably during the 'thirties.

Evidently (although the data is highly unreliable), market occupancy by oligopolists in the rubber tire and tin can industries has increased greatly, while the positions of the leading groups in the electrical machinery and in the meat packing industries have remained stable. Table 8 (p. 23) reveals greater merger activity in the first two industries than in the latter two.

Table 18 summarizes the trends in position of the single largest firm in the industries for which concentration ratios over extended

¹⁹ Data concerning total merger activity by quarters since 1919 are presented in Appendix E, table 14.

TABLE 17

TRENDS IN THE POSITION OF LEADING FIRMS IN MAJOR INDUSTRIES

(All data are percentages of total industry output, unless otherwise specified)

1. Motor Vehicle Industry^a

	1904	1909	1911	1921	1937	1941	1948
General Motors Corp.....	28 ^b	22	17.1	11.8	29.9	48.3	43.6
Ford Motor Co..	9	9	19.2	55.4	39.6	18.5	20.4
Chrysler Corp..	°	°	°	°	23.2	23.2	21.9
Studebaker Corp.....	°	11	°	°	°	3.2	4.4
Remainder	63	58	63.7	32.8	7.3	6.8	9.7
Total.....	100	100	100.0	100.0	100.0	100.0	100.0

^a Truck and passenger-car production.^b Oldsmobile, 22; Cadillac, 6; predecessor components of General Motors.^c Data are not available; amounts are included in "Remainder."SOURCE: 1904, 1909, Temporary National Economic Committee, Monograph No. 27, p. 224; 1911, 1921, 1937, Federal Trade Commission, *Report on Motor Vehicle Industry* (Washington, 1939), p. 27; 1941, 1948, *Wall Street Journal*, December 28, 1949, compiled from *Ward's Automotive Reports*.2. Steel Industry^a

	1901	1920	1930	1948
U. S. Steel Corp.....	61.6	39.9	37.2	33.1
Republic Steel Corp..	3.6	2.5	7.1	9.1
Bethlehem Steel Corp..	1.6	5.7	12.8	14.7
Jones & Laughlin Steel Corp..	7.1	3.1	5.0	5.0
Remainder.....	26.1	48.8	37.9	38.1
Total....	100.0	100.0	100.0	100.0

^a Ingot steel and steel castings.SOURCE: American Iron and Steel Institute, *Directories of Iron and Steel Works of the United States and Canada*.

3. Cigarettes

	1891	1912 ^a	1931	1939
American Tobacco Co.....	88.9	36.5	39.5	22.9
R. J. Reynolds Tobacco Co....	....	....	28.4	23.6
Liggett & Myers Tobacco Co....	....	36.9	22.7	21.6
Philip Morris & Co., Ltd., Inc....	....	....	9	7.1
P. Lorillard Co.....	....	17.7	6.5	5.8
Remainder.....	11.1	8.9	2.0	19.0
Total.....	100.0	100.0	100.0	100.0

^a Dissolution of American Tobacco Company by court order in 1911, completed in 1915.SOURCE: 1891, U. S. Bureau of Corporations, *Report of the Commissioner of Corporations on the Tobacco Industry*, 3 vols.; 1912, R. Cox, *Competition in the American Tobacco Industry* (New York: Columbia University Press, 1933), p. 62; 1931, 1939, *American Tobacco Co. vs. U. S.*, 66 U. S. 1132.

TABLE 17—*Continued*

4. Aluminum Industry				
	1891	1912	1916	1948
Electric Smelting Co..	50	.	..	.
Aluminum Co. of America	50	79	100	50
Reynolds Metals Co..	..	..	...	33
Permanente Metals Co....	..	..	..	17
Remainder.....	..	21	..	..
Total..	100	100	100	100

SOURCE: 1891, Donald H. Wallace, *Market Control in the Aluminum Industry*, (Cambridge. Harvard University Press, 1937), estimated from pp. 527-537; 1912, *Commercial and Financial Chronicle*, 94 (1912), 1385; 1916, *Ibid.*, 105:1 (1917), 391; 1948, Standard and Poor, *Industry Surveys*, May 26, 1949.

5. Cement Industry			
	1929	1937	1945
Universal Atlas Cement Co.	13	14	15
Lone Star Cement Corp.	7	7	7
Lehigh Portland Cement Co....	11	9	12
Ideal Cement Co.....	3	4	3
Alpha Portland Cement Co. ..	5	5	5
Penn-Dixie Cement Corp...	5	5	5
Remainder	56	56	53
Total..	100	100	100

SOURCE: Federal Trade Commission, *The Merger Movement* (Washington, 1948), pp. 8-10.

6. Electrical Machinery, Apparatus, and Supplies

	1904	1909	1919	1927	1937	1947
General Electric Co.	28	23	23	17	22	25
Westinghouse Electric Corp. ..	12	13	14	9	13	15
Remainder.....	60	64	63	74	65	60
Total.....	100	100	100	100	100	100

SOURCE: Data for individual firms are sales from annual volumes of Moody's. Industry totals are total value of product shipped, taken from *Biennial Censuses of Manufactures* for a series of years. Data for the individual firms and industry totals are not strictly comparable, since (1) data from *Census of Manufactures* are value of product shipped from factory, whereas sales data are sales prices to final consumers; (2) product components for the firm's sales differ from products included in the industry classifications of the *Census of Manufactures*. Consequently the percentages in the table are not an accurate measure of occupancy of the market. However, the percentages through time indicate very roughly trends in occupancy of the market.

TABLE 17—*Concluded*

7. Meat Packing (Wholesale)

	1904	1909	1929	1939
Swift & Co....	19.0	9.5	10.2	12.9
Armour & Co.....	11.8	10.3	13.2	12.4
Wilson & Co., Inc..	....	....	2.9	3.6
Cudahy Packing Co....	4.3	2.1	2.3	2.8
Remainder....	64.9	78.1	71.4	68.3
Total ..	100.0	100.0	100.0	100.0

SOURCE: See section 6 above.

8. Rubber Tires and Inner Tubes

	1904	1909	1919	1929	1939	1947
U. S. Rubber Co.	22.2	19.6	19.8	17.3	21.6	21.4
B. F. Goodrich Co. ....	....	....	12.4	14.7	15.7	14.4
Goodyear Tire & Rubber Co.	..	2.2	14.9	22.9	22.2	24.7
Firestone Tire & Rubber Co. ....	..	....	8.0	13.0	17.7	23.5
Remainder	77.8	78.2	44.9	32.1	22.8	16.0
Total ..	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: See section 6 above.

9. Tin Cans and Other Tinware

	1901	1904	1914	1923	1929	1939
American Can Co..	85	60	52	52	53	51
Continental Can Co., Inc..	..	..	17	17	33	25
National Can Corp.....	..	5	..	..	5	4
Owens-Illinois Glass Co.....	..	..	..	..	..	3
Remainder.....	15	35	31	31	9	17
Total.....	100	100	100	100	100	100

SOURCE: See section 6 above.

time periods could be assembled. Typically, after establishment by combination shortly after 1900, the leading firm's percentage of market occupancy declined.²⁰ In the automobile industry, Ford Motor Co., which grew mainly without mergers, was the leader up to the early 'twenties when it alone accounted for over 50 per cent of industry truck and passenger car production. The subsequent gains of General Motors Corp. were not to any significant degree achieved through new mergers.

Stigler compares concentration in twenty industries at the end of the early combination movement at the turn of the century with concentration in the 1930's.²¹ He shows that concentration declined in fourteen, increased in two, and did not change appreciably in four.

The foregoing data suggest that concentration in industries has not generally been increased by mergers since 1904. In the majority of industries for which information is available, decreases in concentration have actually occurred since 1904 despite merger activity.

This conclusion is subject to three qualifications and is partially reversed by other findings. *First*, the decreases in concentration took place in industries in which mergers had already been an important early influence in increasing concentration. Thus the selection of industries is somewhat "biased" by the availability of early information mainly on firms which had already achieved large size and investment interest by 1900 (typically via early combinations).

Second, the decreases in concentration which occurred were relatively small. Monopolistic industrial structures were not transformed into industries of atomistic competition. In a large number of cases the degree of concentration was associated with a shift from partial monopoly to oligopoly. However, the consequences of oligopoly may be more serious than those of monopoly. While oligopoly may result in price and output policies similar to those which would

²⁰ These declines have been cited as evidence of lethargic response by the monopolist to his dynamic environment. Under this or more favorable interpretations of the data, it would appear that time at least in part provides correcting "natural" forces to limit, restrain, and diminish industry dominance by a single seller. As a corrective for oligopoly, time appears to be a less dependable prescription.

²¹ Stigler, *loc. cit.*

TABLE 18
TRENDS IN POSITION OF LARGEST FIRMS IN SOME MAJOR INDUSTRIES

Motor Vehicle Industry

General Motors Corp.—decline to 1921, rise to 1941. Ford Motor Co.—over one-half industry output by 1921, yet decline to 18.5 percent by 1941.

Steel Industry

U. S. Steel Corp.—steady decline from 1901.

Electrical Machinery, Apparatus, and Supplies

No appreciable change 1904–1947.

Meat Packing

Relative decline of Swift & Co., leading firm in 1904, during 1904–1939.

Cigarettes

Substantial decline of American Tobacco Co., 1931–1939.

Rubber Tires

U. S. Rubber Co.—largest in 1904, dropped to third largest by 1947. Rise of Goodyear Tire & Rubber Co., Firestone Tire & Rubber Co.

Tin Cans

Decline of American Can Co., 1901–1939.

Aluminum

Decline of Aluminum Co. of America, but this is a special case (because of new capacity sold by the government to other firms during and after World War II).

SOURCE: Table 17.

TABLE 19
FREQUENCY DISTRIBUTION OF THE NUMBER OF FIRMS IN WHICH
INTERNAL GROWTH RESULTED IN SPECIFIED CHANGES IN MARKET
OCCUPANCY BY 1948^a

Per cent of market occupancy in 1948 accounted for by internal growth	Number of firms	Per cent of total	Cumulative per cent
Negative.	11	44.0	44.0
0-4 9.	6	24.0	68.0
5-9.9.	5	20.0	88.0
10-14.9.	3	12.0	100.0
Totals.	25	100.0	

^a In some cases the terminal year is 1947.
SOURCE: Table 17 and basic data sheets.

prevail under partial monopoly, it is less likely to be subject to public regulation than overt monopoly.

Third, decreases in concentration might have been even larger in the absence of mergers. Factual material on this possibility is presented in the following two sections.

Internal Expansion and Industrial Concentration

This section points out the role of acquisitions by showing the extent to which current concentration in selected industries has resulted from the internal growth of the largest firms. The influence of external growth varies inversely with the extent to which present concentration is a result of internal growth.

Of the several possible techniques for measuring the influence of internal expansion on existing levels of concentration, the following appeared to be most useful. First, the market occupancy percentage of the leading firms in an industry for the earliest year for which data are available was calculated. Second, data on external growth were deducted from absolute amounts of output or total assets of individual firms, but not for the industry as a whole. Third, the adjusted data of output or total assets for the firms were used to calculate market occupancy percentages of individual firms which would have obtained if the growth of the firms had occurred entirely by internal expansion. Fourth, the adjusted concentration ratios were compared with the concentration ratios of the earliest period to measure the extent of present concentration due to internal growth. Fifth, these results were expressed in relative terms by dividing by the adjusted percentages of market occupancy.

The data required for the analysis were available for 25 firms. Table 19 shows that in 44 per cent of the firms studied, internal expansion accounted for none of the concentration existing in 1947 or 1948. In 24 per cent of the cases, internal expansion accounted for some positive but small amounts of market occupancy.

A clearer picture of the influence of internal expansion upon market concentration is achieved by expressing the results in relatives. Table 20 exhibits a frequency distribution of the number of firms

TABLE 20

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIRMS IN WHICH INTERNAL GROWTH RESULTED IN SPECIFIED PER CENT INCREASES IN MARKET OCCUPANCY PERCENTAGES BY 1948^a

Per cent of market occupancy percentage in 1948 accounted for by internal growth	Number of firms	Per cent of total	Cumulative per cent
Negative	11	44.0	44 0
0- 9 9	2	8.0	52.0
10-19 9	2	8.0	60.0
20-29 9	3	12.0	72 0
30-39 9	2	8 0	80 0
40-49 9	2	8.0	88 0
50-59 9	0	0.0	88.0
60-69 9	2	8 0	96 0
70-79 9	1	4.0	100.0
Total	25		

^a In some cases the terminal year is 1947.
Source: Table 17 and basic data sheets.

TABLE 21

INDUSTRIES CLASSIFIED BY THE NUMBER OF FIRMS IN WHICH INTERNAL GROWTH, FROM THE EARLIEST YEAR FOR WHICH DATA COULD BE SECURED, RESULTED IN AN INCREASE OF 50 PER CENT OR MORE IN MARKET OCCUPANCY PERCENTAGES BY 1948^a

Zero firms	One firm	Two firms	Three firms
Steel	Cigarettes	None	None
Electrical machinery	Motor vehicles		
Tin cans	Rubber tires		
Meat packing			

^a In some cases the terminal year is 1947.
Source: Table 17 and basic data sheets.

whose internal growth resulted in specified increases in their market occupancy percentage by 1947 or 1948. The 44 per cent whose internal expansion accounted for none of the currently existing concentration would score similarly in the relative measures. As a consequence of internal expansion, the percentage of market occupancy of an additional 44 per cent of the firms was increased by 50 per cent. The findings confirm the impression conveyed by the previous table.

A final method of exhibiting the role of internal growth in the development of industrial concentration is utilized in table 21. This table groups oligopolistic industries by the number of firms whose internal growth resulted in an increase of 50 per cent or more in their market occupancy percentage. In four of the industries there were no firms whose present dominance was achieved to an appreciable degree by internal growth. In three of the industries, only one of four or five leading firms reached its present level of market occupancy mainly through internal growth. In none of the industries did more than one of the dominant firms attain a high percentage of its present market occupancy through internal growth.

Later Acquisitions and Industrial Concentration

It is generally acknowledged that the mergers and combinations at the turn of the century increased concentration considerably. But what of the effects of acquisitions subsequent to the early merger movement? To develop some factual evidence on this point, calculations were made of the extent to which present levels of concentration are accounted for by later acquisitions.

In the preceding section, computations were made of concentration ratios which would have existed in the absence of external growth subsequent to the initial year for which data could be secured for individual firms. These figures are now deducted from concentration ratios existing in 1947, to provide measures of the extent to which present concentration is accounted for by acquisitions which took place after the early merger movement.

Table 22 expresses the results in absolute amounts by which present concentration ratios reflect the influence of the later mergers.

TABLE 22

FREQUENCY DISTRIBUTION OF EXTENT TO WHICH PRESENT MARKET OCCUPANCY PERCENTAGES ARE DUE TO ACQUISITIONS SUBSEQUENT TO INITIAL YEAR^a

Per cent extent	Number of firms	Cumulative number of firms	Cumulative per cent of firms
Negative.....	4	4	16
0-2.49.....	6	10	40
2 5-4.99.....	7	17	68
5 0-7 49. . .	3	20	80
7 5-9.99.....	4	24	96
10 or more. . .	1 ^b	25	100
Total.	25		

^a Initial year refers to the earliest year for which data could be secured and is usually subsequent to the early acquisition activity.

^b 15.94 per cent.

Source: Table 17 and basic data sheets.

TABLE 23

FREQUENCY DISTRIBUTION OF PERCENTAGES OF PRESENT CONCENTRATION INDEXES ACCOUNTED FOR BY ACQUISITIONS SUBSEQUENT TO INITIAL YEAR^a

Per cent of present concentration index	Number of firms	Cumulative number of firms	Cumulative per cent of firms
10 0 or less...	8	8	32
10 01-20 0.....	8	16	64
20 01-30 0	1	17	68
30 01-40 0	3	20	80
40.01-50 0	4	24	96
50 01-60 0	1	25	100
Total.	25		

^a Initial year refers to the earliest year for which data could be secured, and is usually subsequent to the early acquisition activity.

Source: Table 17 and basic data sheets.

Only one case exists in which present market occupancy percentages in the industries of the highest degree of concentration were increased by over ten percentage points due to acquisitions subsequent to the early combination movement. The market occupancy of two-thirds of the firms was affected by less than five percentage points due to later mergers.

The significance of the data is enhanced by expressing these results as per cents of the concentration ratios existing in 1947, as set forth in table 23. Only one firm shows more than one-half of the present market occupancy as due to mergers subsequent to 1901, and in this instance the present market occupancy of the firm (Republic Steel Corp.) is slightly under 10 per cent. Acquisitions subsequent to the initial formation of the firms account for less than 20 per cent of the present concentration ratios of approximately two-thirds of the firms. It is likely, therefore, that if there had been no mergers after 1905, the present degree of industrial concentration would not have been greatly altered.

Conclusions on Mergers and Concentration

The alternative presentations of the role of internal growth in the development of oligopoly confirm the conclusion that internal expansion accounts for a relatively small degree of present industrial concentration for most firms and most industries. Since concentration has not resulted from internal expansion, it must represent the effect of external expansion. However, acquisitions subsequent to the early merger movement have had relatively small effects on concentration.

The historical time-pattern of the development of oligopoly is re-emphasized. The present absolute size of most of the oligopolistic firms is due mainly to internal growth, not acquisitions. Yet internal growth has not been a major cause of the existing concentration in industries. This is another aspect of the paradox referred to on page 34. The merger movement at the turn of the century resulted in a high degree of concentration in a large number of industries. Subsequently, great growth took place in these industries, but the domi-

nant firms of 1900–1905 did not grow relatively faster than the rest of the industry. Hence the present levels of industrial concentration reflect to a considerable extent the high degree of concentration resulting from the early merger movements. Although the *absolute* size of present day oligopolists is due only in small part to either earlier or later acquisitions, the *relative* position of these firms is accounted for mainly by the merger movement at the turn of the century.

A balanced appraisal of the current significance of mergers should rest more on recent and prospective tendencies than on the consequences of the merger movement of the 1920's or the era of combinations at the turn of the century.¹ Two detailed studies of mergers since 1940 have been made.² Although the recency of the period and the availability of more complete data made possible detailed analyses, the conclusions of the two studies are in disagreement on some major issues. A review of the studies will increase understanding of the effects of mergers on industrial concentration.

¹ This chapter reproduces, with the permission of the University of Chicago Press, much of the material presented by the author in an article, "The Recent Merger Movement," *Journal of Business*, XXV (January, 1952), 30-38.

² The first is, Federal Trade Commission, *The Merger Movement* (Washington, 1948). An earlier publication presents data compiled by Federal Trade Commission members concerning the role of acquisitions in numerous industries. However, quantitative measures of the effects of these acquisitions on absolute or relative size of firms are not developed in these materials. Cf. *To Amend Sections 7 and 11 of the Clayton Act*, Hearing before Subcommittee No. 3 of the Committee on the Judiciary, U. S. 79th Cong., 1st sess., May, September, 1945, H. R. 2357, Serial No. 8, House of Representatives (Washington, 1947). The second is an outgrowth of a study in the Tax Research Program conducted through the Harvard Graduate School of Business Administration, by J. Keith Butters, John Lintner, and William L. Cary, *Effects of Taxation: Corporate Mergers* (Cambridge: Harvard University Press, 1951). Most of the material on statistical characteristics of the recent merger movement is also set forth in an article by John Lintner and J. Keith Butters, "Effects of Mergers on Industrial Concentration, 1940-1947," *Review of Economics and Statistics*, XXXII, (February, 1950), 30-48. Disagreements

The Federal Trade Commission Study

The Federal Trade Commission Study can be conveniently summarized under five items.³ *One*, during the period 1940–1947 mergers resulted in the disappearance of some 2,500 firms with total assets aggregating about \$5 billion, representing 5.5 per cent of the total assets of all manufacturing corporations in the United States in 1943.⁴

Two, the role of acquisitions in the growth of the eight largest steel corporations from 1915–1945 is presented. The Commission's tabulations indicate that during the period specified, nearly one-fourth of the growth of the eight companies was by means of external acquisitions.⁵ The percentages were highest for Republic Steel and Bethlehem Steel Corps., 63.8 and 33.4 respectively. Of the more than \$1.5 billion total additions to net assets by the U. S. Steel Corp. during 1915–1945, only 6.9 per cent was accounted for by external acquisitions. Since the data include only two-thirds of the known 153 acquisitions, their influence is understated. However, since the acquisitions for which data are unavailable typically involve very small companies, the understatement is likely to be less than 10 per cent.

Although the report cites the steel industry study as an item of evidence that "a very large part of the rise in economic concentration has been due to consolidations, acquisitions, and mergers," the conclusion appears to carry an unjustified emphasis. Internal growth was three times external growth. If external growth were very large, internal growth must be said to have been much larger.

Three, examples are presented of resort to mergers through asset

with Federal Trade Commission officials and with the present writer are discussed in the same journal of February, 1951. Considerable benefit from a critical evaluation by Drs. Butters and Lintner of earlier drafts of this chapter is acknowledged.

³ The first two points are evaluated immediately; the remaining three are analyzed in connection with the presentation of the findings of the second study.

⁴ Federal Trade Commission. *op. cit.*, p. 17. The Butters, Lintner, and Cary data are in substantial agreement (*Effects of Taxation: Corporate Mergers*, pp. 242–243.)

⁵ The findings are summarized in Federal Trade Commission, *op. cit.*, p. 72.

acquisitions shortly after Federal Trade Commission orders to cease and desist from conspiring to fix prices. Companies in six different industries are cited.⁶

Four, numerous examples of different types of acquisitions are presented.⁷ The inference drawn is that concentration has been significantly increased by the merger movement of 1940–1947. “No great stretch of the imagination is required to foresee that if nothing is done to check the growth in concentration, either the giant corporations will ultimately take over the country, or the Government will be impelled to step in and impose some form of direct regulation in the public interest.”⁸

Five, it is suggested that certain special characteristics of the recent merger movement have aggravated concentration. “The importance of external expansion in promoting concentration has never been more clearly revealed than in the acquisition movement that is taking place at the present time. . . .”⁹ The current merger movement is said to be “strengthening the position of big business” in that (a) several traditionally “small-business” industries have been affected, (b) in some product lines most of the output has come under the control of large firms, and (c) the mergers have consisted mainly of acquisitions of small companies by larger firms.

Preponderance of Small Firms in Acquisitions

The Butters, Lintner, and Cary study is in agreement with the Federal Trade Commission’s generalization that the recent merger movement was characterized by large firms acquiring small firms. The authors observe, however, that “the numerical preponderance of small firms losing their independence through reported sales or mergers simply reflects the preponderance of small firms in the economy.”¹⁰ The data their study develops put in proper perspective the role of small firms as objects of acquisitions.

⁶ *Ibid.*, pp. 8–14.

⁷ *Ibid.*, pp. 29–66.

⁸ *Ibid.*, p. 68.

⁹ *Ibid.*, p. 25.

¹⁰ Butters, Lintner and Cary, *op. cit.*, p. 254. Italicized in the original.

Effects of the Recent Merger Movement on Concentration

The sharpest point of disagreement between the two studies centers on the effect of the recent merger movement on industrial concentration. The *Review of Economics and Statistics* article by Drs. Lintner and Butters takes direct exception to the Commission conclusion that the current merger movement was substantially increasing the already high prewar levels of industrial concentration.¹¹ Officials of the Commission have replied that this was not meant to be their position. They observe that if the Commission had made any statement on the point "it would probably have concluded, based on its own data, that the recent mergers have *not* 'substantially' increased concentration in manufacturing as a whole," but that concentration increased in 15 individual industries.¹² A review of the evidence will provide a basis for evaluating these positions. Three aspects of changes in concentration due to mergers are considered.

General indicators of changes in concentration.—The first aspect "reflects, in the most general way, the concentration of previously existing assets in the smaller remaining total number of firms resulting from mergers."¹³ In presenting information on concentration from this view, Lintner and Butters discuss the following topics: reduction in number of firms, size distribution and total assets of acquired companies, proportion of all companies in each size sold or merged, proportion of all companies in each size class acquiring other companies, and relative contributions of acquired companies to the assets of acquiring concerns of different sizes.¹⁴ These data are presented to provide background on significant aspects of the merger movement and to "add to the understanding of what was going on 'behind the scenes' and within the measures of concentration."¹⁵

Measures of changes in absolute concentration.—Second, changes

¹¹ Lintner and Butters, *op. cit.*, pp. 30–31.

¹² John M. Blair and Harrison F. Houghton, "A Reply," *Review of Economics and Statistics*, XXXIII (February, 1951) 64; 66–67.

¹³ Lintner and Butters, *op. cit.*, p. 45.

¹⁴ *Ibid.*, pp. 37 ff.

¹⁵ John Lintner and J. Keith Butters, "Rejoinder," *Review of Economics and Statistics*, XXXIII (February, 1951), 75.

in absolute concentration are calculated at three levels: (1) for all manufacturing and mining firms, (2) for major industry groups, and (3) for narrowly defined industry groups. The last category is represented by the largest firms in 26 industries for which the Federal Trade Commission presented concentration indexes in their report, *The Concentration of Productive Facilities, 1947*. "With few exceptions, all minor in extent," merger activity during 1940-1947 affected absolute concentration by less than two percentage points at all three levels.¹⁶

In their reply to the Lintner and Butters analysis of the effect of mergers, Blair and Houghton state that the "Lintner-Butters findings are not in conflict with those parts of the FTC's conclusions pertaining to specific industries or products."¹⁷ But the FTC presents data on the effects of mergers on concentration for only three of the 15 industries cited in their reply. For the other 12 industries, the Commission only "discussed" recent mergers in selected fields. With reference to the three industries for which the Commission presented material on changes in concentration, the data show small changes in the steel and cement industries during the period covered. In the third, the distilling industry, absolute concentration in production and total stocks increased from 1934 to 1941, but decreased during 1941 through 1946. Concentration in holdings by the "big four" of stocks four years old and over increased by 18 percentage points between 1941 through 1946.¹⁸

With regard to the merger activity in other areas, Butters, Lintner, and Cary make the following observations. Although a large number of acquisitions took place in the textile industry, a low degree of concentration still existed in that industry at the end of 1947. The acquisitions in the steel-drums, tight-cooperage, and wines industries may have resulted in increases in concentration, but these product lines are so narrow as to make construction of concentration ratios for them of little significance for assessing changes in the general level

¹⁶ Butters, Lintner, and Cary, *op. cit.*, pp. 300-302.

¹⁷ Blair and Houghton, *op. cit.*, point (4) on page 64 and the associated footnote 7.

¹⁸ From 57 per cent of total holdings to 75 per cent. Federal Trade Commission, *op. cit.*, pp. 63-66.

of industrial concentration, or for determining effects on competition.¹⁹

Analysis of acquisitions in the 22 industries studied by the present writer confirms the foregoing observations. Since 1940, acquisitions of more than negligible magnitude were made only by four distillers, two steel companies, the U. S. Rubber Co., and the Continental Can Co. Inc.

Further evidence is provided by the Department of Commerce study of changes in concentration (measured by value added by manufacture) between 1935 and 1947.²⁰ Concentration ratios for the first four companies increased in 58 industries and decreased in 72 industries.²¹ Approximately 85 per cent of increases in concentration ratios were by less than 10 per cent. Over 35 per cent of the decreases in concentration were by more than 10 per cent.²² Only moderate changes (equally balanced between increases and decreases) took place among industries with market concentration ratios between 75 and 100 per cent during the period 1935-1947.²³

Despite these several measurements of changes in concentration, the coverage is incomplete. Effects on concentration at the more detailed level of individual plants, at the broader level of financial interest groups,²⁴ or in regional and local markets are not shown. Important cases may exist in which such tests may be the most relevant.

However, on balance, the data on changes in absolute concentration afford a basis for general agreement that the merger movement of 1940-1947 did not substantially increase industrial concentration, either over-all or in more than two or three product lines. The Commission explained this fact by pointing to the high degree of concentration already existing in major industries, which meant that there remained only a relatively few small competitors still avail-

¹⁹ Butters, Lintner, and Cary, *op. cit.*, pp. 301-303; 313.

²⁰ U. S. Department of Commerce, *Concentration of Industry Report* (Washington: Department of Commerce, 1949).

²¹ *Ibid.*, p. 26, table 5.

²² *Loc. cit.*

²³ *Ibid.*, p. 13, table 2.

²⁴ Butters, Lintner, and Cary, *op. cit.*, pp. 272-273.

able for purchase.²⁵ But Butters, Lintner, and Cary observe that during the recent merger movement the largest firms (assets over \$50 million) acquired only a small fraction (about one-fortieth) of the total assets of all smaller firms.²⁶ The fact that large firms acquired only a relatively small percentage of the available assets of small firms provides at least a partial explanation for the small increases in absolute concentration caused by the merger movement of 1940–1947. The levels of absolute concentration existing in 1940 were such that increases of 10 to 15 percentage points, for example, might easily have taken place. That such increases did not take place provides a striking contrast to the effects of earlier merger movements.

Measurement of changes in relative concentration.—Butters, Lintner, and Cary use the “Gini concentration ratio” to measure relative concentration or inequality.²⁷ The ratio is a measure of “the different percentages of all assets held by various *proportions* of all companies.”²⁸ Using this measure, the authors found that “some increases in relative concentration due to mergers occurred between 1940 and 1947, but, with only one or two exceptions in individual industries, the increases were relatively small.”²⁹ They found also that relative concentration for the 500 and 1,000 largest manufacturing companies as of the end of 1946 had actually decreased.³⁰

The use of the Gini ratio to measure changes in concentration may in some circumstances be misleading. If 10 firms each hold exactly 10 per cent of total industry assets, the Gini ratio would indicate zero relative concentration. Yet absolute concentration, however measured, would be very high. Thus measures of absolute concentration might be increasing while measures of relative concentration were decreasing. It should be observed, however, that the example here presented is extreme. Indeed, the limitations of any single measure of changes in concentration make it advisable to utilize several meas-

²⁵ Federal Trade Commission, *op. cit.*, pp. 21–22.

²⁶ Butters, Lintner, and Cary, *op. cit.*, pp. 300–301.

²⁷ For an explanation, *ibid.*, p. 277 and references there cited.

²⁸ *Ibid.*, p. 277. Italics in the original.

²⁹ *Loc. cit.*

³⁰ *Ibid.*, pp. 277–278.

ures, as Butters, Lintner, and Cary do. Their several results are corroborative of one another.

However, the purpose of their calculation of changes in relative concentration among the 500 and 1,000 largest manufacturing companies is not clear. As they recognize, the observed decrease in relative concentration simply indicates that among the largest firms, the less large grew to a greater extent by mergers than the largest.³¹ This may imply that oligopoly was strengthened relative to partial monopoly, but one cannot be certain.

The conclusiveness of the data on changes in absolute concentration provides ample basis for assurance that the merger movement since 1940 has not resulted in significant increases in concentration. This characteristic of recent merger activity invites comparison with earlier merger movements.

Comparisons Among Major Merger Movements

Butters, Lintner, and Cary feel that the mergers of the 1940–1947 period sharply differ from the earlier large-scale merger movements. They cite the data from Moody's *The Truth about the Trusts* indicating that at the end of the merger movement of 1898–1903, some 300 industrial combinations had been formed, with 78 of these firms controlling one-half or more of the total production in their respective fields. They also refer to the Seager and Gulick estimate that the 300 combinations controlled fully two-fifths of the manufacturing capital of the country.³²

The authors draw a contrast between the recent merger movement and that of the late 1920's, using data from Gardner Means' article in 1931 on "The Large Corporation in American Economic Life." During the 'twenties there were eight amalgamations between companies with assets of over \$100 million and at least 14 mergers in which companies with assets of more than \$50 million were acquired. During 1940–1947 there were no mergers between companies with assets of more than \$100 million and only one between companies with assets of more than \$50 million.³³

³¹ *Ibid.*, p. 278.

³² *Loc. cit.*

³³ *Ibid.*, p. 294.

Comparisons at the industry level reveal similar contrasts among the merger movements. Although most major industries experienced substantial increases in concentration during the two earlier merger movements, foods and textiles were the only broad industry groups in which marked increases in concentration took place during the merger movement of 1940–1947. The increase in the foods group is accounted for mainly by the acquisitions of the large distillers. The concentration in the textile industry was relatively low in 1947 even after the increases in concentration had taken place. These data are also corroborated by the present writer's study of mergers in 22 oligopolistic industries. Only 10 per cent of the mergers (in dollar amounts) took place after 1940. In contrast, nearly 40 per cent took place during 1921–1929.

The evidence is consistent and persuasive. The merger movement of 1898–1903 resulted in a major increase in concentration; that of the 1920's represented acquisitions of somewhat intermediate magnitude. The recent merger movement appears not to have accentuated the level of industrial concentration significantly.

Relative Significance of Acquisitions for Large versus Small Acquiring Companies

In analyzing the role of mergers, Butters, Lintner, and Cary present material on the "importance of acquisitions to the acquiring companies."³⁴ They emphasize that the "average percentage growth in the assets of the acquiring company for all its acquisitions taken together was regularly and substantially less for larger acquirers than for smaller acquirers."³⁵

They recognize that an existing high level of concentration may affect this finding in two ways. First, concentration may be so high that it is mathematically impossible for the numerator, in the calculation of percentage increase in the assets of acquirers, to be large. This actually was not a major factor since, as the authors point out,

³⁴ *Ibid.*, p. 267. The general context of their discussion and specific usage in most places suggest that in this section they use the word "importance" in the sense of *importance in the growth* of acquirers of different sizes.

³⁵ *Ibid.*, p. 264, chart IX-4 and table IX-12.

only about one-fortieth of the assets potentially available for acquisition was acquired.

Second, a high level of concentration enters into the denominator of the calculations so that an equal absolute increase in the assets of large and small acquirers appears as a smaller percentage increase in the assets of the larger firms.

The authors do indeed recognize that the existing level of concentration needs to be taken "fully into account."³⁶ To do so, however, makes untenable what they call "the highly significant further conclusion," that "*mergers of all manufacturing and mining companies, 1940-1947, were a much less important source of growth for large companies than for small companies.*"³⁷ In absolute terms, the growth in assets of the \$50-\$100 million asset class was \$7.6 million, and \$1.6 million for the \$1-\$5 million asset class. In relative terms these represent an increase of less than one-sixth of total assets of the larger acquiring firms and an increase of more than two-thirds of total assets of the smaller acquiring firms.³⁸ No basis for regarding either the absolute or relative measurements as the more relevant is discernible.

From the data it does not seem possible to determine whether growth by acquisitions was more important to small firms than to large firms, in either an ordinal or cardinal sense. In a purely quantitative analysis, the comparative importance depends upon which type of measurement is emphasized. A dependable conclusion would require a qualitative data analysis, as the authors recognized, although they failed to perform it. Without the qualitative analysis, the conclusion that acquisitions were a much less important source of growth for large companies than for small companies cannot be established. Nor, on the basis of the data, is the conclusion established that acquisitions, in a purely quantitative sense, were a much less important source of growth for large companies than for small companies.

³⁶ *Ibid.*, p. 270.

³⁷ *Ibid.*, p. 263. Italics in original.

³⁸ Lintner and Butters, "Rejoinder," *op. cit.*, p. 74.

Effects of the Recent Merger Movement on Competitive Behavior

Butters, Lintner, and Cary conclude that "such adverse effects on competitive behavior as have occurred because of recent merger activity have been relatively minor in their general significance."³⁰ Three considerations are presented in support of this view. First, to the extent that competitive behavior is influenced by the degree of concentration, the small changes in concentration would indicate correspondingly small changes in the nature of competitive behavior. Second, it is not likely that most of the other structural influences upon competitive behavior—for example, character of the product, ease of entry, character of distributive organization of the market—were influenced to any marked extent by the number and nature of the mergers which took place. Third, in only 14 of 80 cases did the buyer take the initiative in approaching sellers not previously known to have been available for sale.

The authors very carefully guard their conclusion, however, by indicating the possibility that recent mergers may have had substantially adverse effects on competitive behavior despite the relatively small changes in concentration in most industries. The present writer would emphasize this latter possibility even more strongly. The relative size of the buyers and sellers may not provide a good index to the importance of acquisitions for the market position of the buyers. The product, operating methods, or personnel of the acquired firm might have represented a potential threat of substantial future inroads on the position of the acquirer. It must be conceded, however, that the author's findings on motivations for mergers, taken with corroborative evidence, indicate a relatively low probability that market control motivations were a dominant factor in any appreciable number of recent acquisitions.

Conclusions on the Significance of the Recent Merger Movement

Some 2,500 firms were absorbed in mergers during 1940–1947. Although in numbers of disappearances this period is comparable

³⁰ Butters, Lintner, and Cary, *op. cit.*, p. 306.

to earlier periods of merger activity, the acquired firms in the recent merger movement were typically of small size. The outstanding characteristic of the recent merger movement was the acquisition by large firms of relatively small firms. Nevertheless, acquisitions resulted in greater percentage increases in the assets of smaller firms than of larger firms. However, it cannot be concluded without additional quantitative analysis, that mergers had a more significant influence on the market positions of small firms than of larger firms.

Absolute concentration was not appreciably increased by the recent merger movement. This holds with only minor exceptions whether the measurements are made on the aggregate level, broad industry level, or narrow industry level. Relative concentration likewise appears to have increased only slightly as a consequence of mergers.

The recent merger movement is in striking contrast to earlier merger movements. The effect on market concentration was much smaller. The motivations of buyers seem to have been much altered. The main influence appears to have been business advantages obtained by owners of the firms *sold*. Adverse effects on competitive behavior have not been demonstrated.⁴⁰

⁴⁰ Related issues have also been argued at length in a series of articles initiated by M. A. Adelman, "The Measurement of Industrial Concentration," *Review of Economics and Statistics*, XXXIII (November, 1951), 269-296. See also the extended discussions in *ibid.*, May and November, 1952. It seems that three main questions are at issue. (1) Did over-all concentration in the United States increase between 1901 and 1947? (2) Did over-all concentration increase between 1940 and 1947? (3) Was concentration in the American economy undesirably large in 1947? The discussions conveyed to the present writer the following impressions: (1) Concentration (using eclectic concepts and measures) in the private sector of the economy probably decreased somewhat between 1901 and 1947. (2) Over-all concentration probably increased due to mergers very slightly in the 1940-1947 period. (3) We need more study to establish whether concentration in specific areas or overall was undesirably large in 1947. Further spadework has been accomplished by the National Bureau of Economic Research Conference on Business Concentration and Price Policy, June 17-19, 1952, whose proceedings will be available in a published volume late in 1953.

An empirical study of the role of acquisitions in the growth of firms should add to an understanding of the economic theory of mergers. By examining a large number of mergers and observing the broad sweep of merger movements, it was hoped that a basis could be provided for testing the existing theory of mergers and contributing additional elements to it.

Beginning in the early 1900's, a considerable amount of literature interpreting the economic significance of mergers developed. Although a vast body of writing in this area has accumulated, it is in the main descriptive, having achieved little progress toward finding answers to the basic theoretical issues raised by merger activity.

A recent paper by Professor Stigler develops the analytical apparatus and extends the economic theory of mergers.¹ A review and appraisal of his contribution will serve to summarize the state of the theory and to indicate the nature of the unsettled questions.

Introduction to the Theory

Professor Stigler begins with an analysis of the possible reasons for mergers under a set of four rigid assumptions. (1) Long-run

¹ George J. Stigler, "Monopoly and Oligopoly by Merger," *American Economic Review*, Proceedings, XL (May, 1950), 23-34.

cost conditions are the same for all firms of relevant sizes. (2) Entry of firms is relatively easy, but not necessarily inexpensive. (3) The demand for the output of the industry is stable. (4) The specialized resources in the industry are indestructible. He posits an industry in which these conditions exist and which consists of numerous identical firms which are in long-run competitive equilibrium. With the use of diagrammatic analysis he indicates that, although under the assumptions monopoly gains cannot exist in the long run, merger for monopoly may occur. Monopoly gains will be achieved as a result of the merger until they are wiped out by the appearance of new entrants into the industry. Thereafter, losses will be incurred permanently (under the fourth assumption), but it is possible that the discounted value of the early gains will exceed the discounted value of the later losses.

Some of the assumptions are then relaxed. Assumptions (3) and (4) are obviously not realistic. A secular expansion in demand has been experienced in many industries and periodic replacement of fixed factors has taken place. In such circumstances the likelihood of achieving net gains from mergers for monopoly is greatly increased.

Ease of entry is discussed. The two main factors affecting ease of entry are (1) ability to secure the requisite initial capital and (2) the existence of economies of scale. Stigler summarizes the argument that because of the large capital requirements necessary to establish a new company of minimum efficient size, free entry is often difficult. However, he expresses skepticism of the general importance or validity of the financial barrier to entry. In fact, he defines free entry as an extension of the first assumption—"the condition that long-run costs of new firms if they enter the industry will be equal to those of firms already in the industry."² The major issue, therefore, in connection with both the first and second assumptions is the degree to which economies or diseconomies of plant-size versus multiplant operations exist.

Professor Stigler presents a unique test of relative efficiency

² *Ibid.*, p. 27.

among firms of different sizes. He holds that since cost comparisons *cannot be conclusive*, survival is the only test of a firm's effectiveness. He reasons, "if a firm of a given size survives, we may infer that its costs are equal to those of other sizes of firm [*sic*], being neither less (or firms of this size would grow in number relative to the industry) nor more (or firms of this size would decline in number relative to the industry)." He concludes that "economies of scale are unimportant over a wide range of sizes in most American industries, for we commonly find both small and large firms persisting."

Several considerations cast doubt upon the validity of Stigler's test of relative efficiency of small and large firms. *First*, as Professor Joe S. Bain has suggested, "the survival of some small firms in a group which the census calls an industry is not conclusive evidence that there are negligible advantages to large scale and that there are no significant artificial barriers to entry."³ The small firms may be producing different products than the major firms, even though both are included in the same census classification. Large firms are typically multiproduct firms with different varieties, ranges, and mixes of products. Small firms tend to specialize in a particular aspect of final fabrication of the product, or they may provide special types of the products produced large-scale by the larger firms. Geographical or other market imperfections may enable the small firm to supply limited segments of the market. Further, the small firm may provide special extras in the form of more speedy delivery, alterations of basic designs, personal services—any of which represents some differentiation of the product or differential pricing.

Second, small firms may persist along with large firms in an oligopolistic industry only because of "umbrella" pricing policies by the dominant firms. In the familiar price leadership model, the smaller firms are typically assumed to have higher long-run cost functions than the price leaders, but to take the price set by the leaders as a competitive horizontal demand curve, equating marginal

³ *Ibid.*, p. 26.

⁴ *Loc. cit.*

⁵ Joe S. Bain, "Discussion," *American Economic Review*, Proceedings, XL (May, 1950), 65.

cost to price. The prevailing price in the kinky demand-curve formulation of oligopoly pricing may represent a price which yields large gains to oligopolists, but barely survival returns to the smaller firms in the industry.

Third, wide variations in rates of return on resources in firms of different sizes may persist, reflecting economies or diseconomies of scale. Further, while in small firms owner-managers may gain smaller returns than they could earn if they sold their services on a hired basis, many may prefer the nonpecuniary advantages of "being their own boss."

Fourth, variations in rates of return on resources in firms of different sizes may have been substantially reduced through the capitalization process. As a consequence of bankruptcy, reorganization, or revaluation, assets may be carried on balance sheets at less than their original values. Also, the contributions of high-quality factors may result in upward recapitalization. Hence, not only current rates of returns, but also gains and losses in revaluations, should be taken into account in comparing the returns on investments.

For these reasons, Stigler's survival test of economies or diseconomies of scale must be rejected. Hence the possibility of economies of plant-size or multiplant operations as a motivation for mergers cannot be ruled out.

Professor Stigler has indicated that he feels his position is strengthened by the fact that most of the mergers result in multiplant operations, and that one firm with several plants is not likely to be more efficient than several separate single-plant firms. He has expressed his skepticism of multiplant economies in the following statement.

I prefer to approach this question from the other side and ask myself: What possible efficiency comes from having a steel plant in Pennsylvania and one in Alabama and several out west? The only answers I can get are unsatisfying. Of course, you need only one legal counsel instead of several, and you can perhaps have one central research agency instead of several, but the functions of this type are not quantitatively important.

On the other hand, you have all the problems of coordinating a wide-flung empire.⁶

A study of the geographical distribution of plants operated by 74 large firms included in the present study confirms the view that large size typically is associated with multiplant operations. Table 24 summarizes an analysis of plant locations by states and census regions for 74 firms in this study. It shows that more than 75 per cent of the firms have plants in five or more states; approximately 50 per cent have plants in 10 or more states. Similarly 85 per cent have plants in three or more census regions; with 75 per cent having plants in four or more census regions.

While it is true that mergers typically resulted in multiplant operations, Stigler's assertion that possible multiplant economies are not likely to be large may be questioned. Avoidance of duplicate selling and distributing organizations may result in appreciable savings. Although expenditures on research and development projects are a relatively small fraction of the total operating costs of a firm, the significance of such outlays may be tremendous. As Professor Joseph Schumpeter has indicated, technological advance may be more important for the cost position of the firm than the shape of the long-run average cost curve under static assumptions.⁷

While empirical demonstrations of multiplant economies have not been developed, the *a priori* basis for believing that such economies may be large is as strong as any basis for skepticism. Indirect evidence for the existence of such economies is provided by studies of the performance of mergers.

Have Mergers Been Successful?

Dewing's study.—The best known and most widely quoted study of the performance of mergers is the analysis of A. S. Dewing.⁸ He

⁶ *Study of Monopoly Power, Steel*, Hearings before the Subcommittee on Study of Monopoly Power of the Committee on the Judiciary, U. S. 81st Cong., 2d Sess., April–May 1950, Serial No. 14, Part 4A, House of Representatives (Washington, 1950), p. 123.

⁷ Joseph A. Schumpeter, *Capitalism, Socialism, and Democracy* (2d ed.; New York: Harper, 1947), pp. 87–105.

⁸ Arthur S. Dewing, "A Statistical Test of the Success of Consolidations," *Quarterly Journal of Economics*, XXXVI (November, 1921), 84–101.

TABLE 24
GEOGRAPHICAL DISTRIBUTION OF PLANTS OPERATED BY 74 LARGE FIRMS

States in which plants are operated	Firms operating plants in indicated number of states	Per cent	Census regions in which plants are operated	Firms operating plants in indicated number of regions	Per cent
0- 4 . . .	17	22.9	less than 3	11	14.8
5- 9 . . .	22	29.7	3	9	12.2
10-14	14	18.9	4	6	8.1
15-19	7	9.5	5	9	12.2
20-24	7	9.5	6	9	12.2
25-29	3	4.1	7	5	6.7
30-34	1	1.3	8	7	9.4
35-39	3	4.1	9	9	12.2
40-48	0	.0	10	9	12.2
Totals	74	100.0		74	100.0

SOURCE: Moody's *Investment Manuals*, and company annual reports to stockholders.

TABLE 25
TIMING OF CYCLES IN NUMBER OF MERGERS^a

Dates of specific cycles			Lead (-) or lag (+) at reference			
			Peak		Trough	
			Number of months	Reference date	Number of months	Reference date
1 {	1Q 1920		0	1Q 1920		3Q 1921
		3Q 1923		2Q 1923	+4Q	3Q 1924
2 3Q 1923	1Q 1926	4Q 1926	+2Q	3Q 1926	+4Q	4Q 1927
3 4Q 1926	2Q 1929	1Q 1932	0	2Q 1929	+4Q	1Q 1933
.....	.....	.....	..	2Q 1937		2Q 1938
1Q 1932	4Q 1945					
Average, 3 cycles 1920-1938			+2/3 Q		+4Q	
Average deviation			8/9 Q		0	

^a Net number of firms disappearing.

SOURCE: Data for specific cycles, fig. 1; reference cycles from Arthur F. Burns and Wesley C. Mitchell, *Measuring Business Cycles* (New York: National Bureau of Economics Research, 1946), p. 78.

selected 35 consolidations organized between 1893 and 1902, that met reasonable criteria for statistical dependability of results.⁹ His findings were: (1) Earnings of the constituent companies before consolidation were nearly a fifth greater than the earnings of the consolidated company for the first year after consolidation, and between a fifth and a sixth greater than the average earnings of the ten years following consolidation. (2) Promoters' estimates of probable earnings were 150 per cent of the actual earnings of the first year and 200 per cent of the actual average earnings during the ten-year period after consolidation. (3) After sufficient time had elapsed to permit the consolidation to perfect its organization and to effect all its anticipated economies (including new investments), earnings gradually diminished, for earnings of the first year were 7 per cent greater than the earnings of the tenth year after consolidation.

Although the clear inference from Dewing's findings is that mergers on the whole were unsuccessful, some qualifying factors deserve consideration. Of the 35 consolidations, the formation of 25, or 71 per cent, happened immediately before a business recession (according to National Bureau of Economic Research reference cycles). However, Dewing's inclusion of comparisons with earnings of a full subsequent ten-year period greatly reduces the effect of cyclical influences upon the dependability of his results.

The selection of industries in Dewing's sample appears to be heavily weighted with industries for which the long-term influence had not been favorable.¹⁰ Of the 22 industries included in the present study, only two are represented in Dewing's list. Furthermore, as Dewing himself has emphasized, the human factors are of considerable importance.¹¹ Errors of promotion or errors of management may undo the advantages offered by large-scale operations. The six fundamental causes for the failure of industrial combinations, listed by Dewing, do not reflect inherent weaknesses of large size or of multiplant operations.¹²

⁹ *Ibid.*, p. 86.

¹⁰ Cf. Edward S. Mead, *Corporation Finance* (New York: D. Appleton, 1930), p. 477.

¹¹ Arthur S. Dewing, *Corporate Promotions and Reorganizations* (Cambridge: Harvard University Press, 1914).

¹² *Ibid.*, pp. 557-566.

Mead's study.—Professor Edward Mead studied the subsequent histories of the combinations whose operations for the first ten years had been summarized in Dewing's statistical analysis.¹³ Mead observed that most of the companies had been formed in anticipation of securing a high degree of market control, and that although these hopes of monopoly were not in fact realized, a majority of the combinations achieved "conspicuous success," reflecting the advantages of large-scale operations.¹⁴

But the facts compiled by Professor Mead do not permit this sweeping generalization of the inherent advantages of large size. Six of the companies subsequently went through reorganization, while two of these achieved a "fair measure of success" after reorganization. Eleven others, while remaining solvent, showed poor results, but as a consequence of various special "external" causes. Fourteen companies were "conspicuously successful."¹⁵

Thus the evidence presented by Professor Mead does not appear to support his conclusions. Mead did not define "success." Some combinations achieved high earnings, others did not. The data do not permit generalization on the advantages or disadvantages of large-scale operations. Management and environmental factors also appeared to be important variables.

Livermore's study.—The most extensive study of the success of mergers was made by Professor Shaw Livermore.¹⁶ His very broad sample of 328 companies sought to include all companies which had engaged in mergers during 1890–1904 and for which adequate data could be secured. His study differed from previous investigations in that mergers which did not achieve a high degree of "monopoly power" in an industry were also included. Further, he did not exclude companies that lacked a long period of continued existence, on the grounds that such a procedure excludes the early failures.

Of the 156 companies classified in his primary group (com-

¹³ Mead, *op. cit.*, pp. 473–478.

¹⁴ *Ibid.*, p. 478. The remaining combinations were presumably moderately successful.

¹⁵ *Loc. cit.*

¹⁶ Shaw Livermore, "The Success of Industrial Mergers," *Quarterly Journal of Economics*, L (November, 1935), 68–96.

panies that obtained a high degree of market control through mergers), Professor Livermore judged 40.4 per cent failures, 10.9 per cent marginal, and 48.7 per cent successes.¹⁷ In his secondary group (172 companies that did not obtain a high degree of market control through mergers), 45.3 per cent were classified as failures, 6.4 per cent as marginal, and 48.3 per cent as successes. Professor Livermore concluded that the general impression created by the Dewing study, that mergers were typically unsuccessful, needed reappraisal. He suggested that the number of mergers to achieve success had been higher than was generally supposed.

Livermore's conclusions appear reasonable on the basis of his empirical data. In both his primary and secondary groups of mergers, successes and failures were about evenly divided. It is remarkable that the mergers in the first group (represented by firms that had achieved a high degree of market control through mergers) were not more successful on the average than those of the second group. What is even more significant for the point here at issue, size was definitely not a unique variable determining the probable success or failure of a firm. Whether important economies or diseconomies of size exist, therefore, cannot be determined from the above studies of the success of industrial mergers.

Another approach to the question of whether economies of scale were achieved by the combinations is to analyze motivations for mergers. This is done in the following section.

Motivations for Mergers

Evidence on early mergers.—The present survey has examined a wide body of literature and historical materials on amalgamations. Unfortunately, any hope of unearthing a rich body of materials explaining the motivations of these actions has not been fulfilled. If the financial facts surrounding early amalgamations are fragmentary, stated reasons for the activities are even less informative. In setting forth the advantages of a proposed merger or in justifying

¹⁷ Although Livermore discusses the problem of defining "success," he does not formulate a clear test. He mentions that he considered earnings, "dividend records and company histories," but he does not specify boundaries for the classifications adopted. *Ibid.*, p. 74.

one already consummated, managements would typically give some very general reason, such as "to expand operations," or "to achieve economies of larger size," or "to meet competition more effectively." Obviously, such reasons conceal as much as they reveal. Rarely were alleged economies of scale explained in terms of specific economies, although distribution economies and purchasing economies were frequently mentioned.

Sometimes special factors were cited. Examples are purchase of a bankrupt company on favorable terms, purchase of a company to secure the services of able executives, desire to sell a small company to settle an estate, etc. Some writers have suggested that promoters' profits were frequently a motivating influence.¹⁸ The latter reason, or a desire to achieve market control, would not, of course, be stated publicly.

Unfortunately, the information we have does not enable us to add to the classification of reasons for mergers set forth in standard corporation-finance textbooks.¹⁹

Evidence on motivations for recent mergers.—A more detailed analysis of the forces operative in the recent merger movement is available. In their study of the mergers that took place between 1940–1947, Professors Butters, Lintner, and Cary, with the aid of Powell Niland, were able to make field surveys of 104 mergers. Intensive case interviewing enabled them to inquire more deeply into motivations for mergers than is ordinarily possible with the use of published materials only.

The authors express agreement with the recurrent view that a major objective of earlier combinations was market control. Upon the basis of their case studies, they register "serious doubt on the strength and pervasiveness of a comparable motivation for recent merger activity."²⁰

¹⁸ Willard L. Thorp, "The Persistence of the Merger Movement," *American Economic Review*, Proceedings, XXI (March, 1931), 85–86; Stigler, *op. cit.*, XL (May, 1950), 29–30; Charles S. Tippetts and Shaw Livermore, *Business Organization and Public Control* (New York: Van Nostrand, 1941), pp. 377–379.

¹⁹ See, e.g., Arthur S. Dewing, *Financial Policy of Corporations* (4th ed.; New York: Ronald Press, 1941), II, chaps. 2 and 3.

²⁰ J. Keith Butters, John Lintner, and William L. Cary, *Effects of Taxation: Corporate Mergers* (Cambridge: Harvard University Press, 1951), pp. 308–310.

1) *Motivations of sellers.*—The motivations involved in recent mergers are catalogued. Since a major purpose of the study was to ascertain the influence of taxes in bringing about mergers, motives were broadly classed into tax and nontax groups.

The authors estimate that taxes were an important factor in the sale of about one-tenth of the total *number* of selling companies, and of one-fourth for selling companies with total assets of over \$1 million. Taxes appear to have been a major reason for sale of about one-fourth of the *assets* of all companies sold, and of one-third of the total assets of all companies sold with assets of over \$1 million.²¹ Taxes are thus seen to have exerted a major influence in a large percentage of mergers.

Nontax motives are divided into management and investment considerations. Management considerations are found to have been a major reason for the sale of about one-half of the companies with total assets of less than \$15 million. In the sales of companies with assets exceeding \$15 million, management considerations dominated in about one-quarter of the cases.²² Among the frequent management motivations mentioned are: (1) desire to retire, (2) loss of key management personnel by death, (3) desire to reduce the management load borne by the key executives, (4) inability of top management to keep up with its competition, (5) desire to become connected with larger companies, and (6) dissension among the owner-managers.²³

The desire to improve the investment position of owners was of little importance in the sale of small companies, but of dominating significance in the sale of about two-thirds of the companies with assets exceeding \$1 million.²⁴ The most common investment considerations were: (1) anticipation by the owners of a highly probable decline in value of their holdings, (2) desire to capitalize the value of owner-contributions in companies in which this value was highly dependent upon active owner-participation in management,

²¹ *Ibid.*, pp. 205–208; 232.

²² *Ibid.*, p. 214.

²³ *Ibid.*, pp. 214–218.

²⁴ *Ibid.*, p. 218.

and (3) desire for greater diversification and to improve the quality and marketability of investment holdings.²⁵

2) *Motivations of buyers.*—In the motivations of the purchasers of firms, tax considerations were of little consequence.²⁶ Although the nontax motivations were typically combined in an overlapping complex, the following objectives could be separated. (1) In about half of the cases, the purchaser sought to acquire a new product, new plant capacity, or a new production organization. (2) About one-third of the acquisitions were for the purpose of achieving a greater degree of vertical integration. (3) The opportunity to gain financial advantages also constituted an important motivation for acquisitions. Among the financial considerations were (a) desire to improve the marketability of stock or to increase the availability of outside capital, and (b) desire to obtain the working capital of the seller.

It is interesting that nowhere in the above discussion by Butters, Lintner, and Cary, is reference made to the cases emphasized by the Federal Trade Commission, in which acquisitions were made shortly after the participating firms had been cited for collusive price-fixing activity.²⁷ The omission may be accounted for alternatively by (1) the relative infrequency of the cases, (2) the limited size of the Butters, Lintner, and Cary sample, or (3) the obvious tendency for respondents not to disclose motives widely regarded as antisocial. Such cases are known to exist, however, and we underscore the author's recognition of the "possibility, or even the probability" of the promise of market control among the complex of motivations for recent mergers.²⁸

Comparison of the Results of Internal and External Growth

One method of studying motivations in mergers is to compare the results of internal and external growth. Either form of expansion may achieve economies of scale (of plant-size or of multiplant operations) and increased market control.

²⁵ *Ibid.*, pp. 218–221.

²⁶ *Ibid.*, pp. 212–213.

²⁷ Federal Trade Commission, *The Merger Movement* (Washington, 1948), pp. 8–14.

²⁸ *Ibid.*, p. 308.

The results of internal and external growth may be identical, yet there are a number of reasons why a firm may prefer external expansion to internal expansion.²⁹ *One*, new facilities may be acquired more quickly through mergers. New products, new processes, new plants, and new productive organizations can be developed either by the firm itself or purchased. A possible advantage of purchase is that the addition may be achieved with little delay.

Two, the desired facilities may be secured more cheaply by purchasing the stock of an existing company. For a host of possible reasons (some may be found in special circumstances of sellers), the securities of a company may be selling below replacement cost of the firm's assets. Arrangements may be made whereby the stock of such a company may be acquired without causing a precipitous rise in price.

Similarly, the services of desired personnel may be obtained by buying outright the company employing them. The inducement of higher compensation might be either unduly expensive or useless.

Three, the desired new product, new process, or new organization may be developed with less uncertainty of investment loss. The purchased facility may have already demonstrated its revenue-yielding capacity. Innovation usually involves great uncertainty, imitation is less difficult, but to acquire facilities involves the least uncertainty of all. Acquisition activity, however, is not completely free from uncertainty—an estimate of the future yield of the asset acquired must be made in order to determine an appropriate purchase price.

Four, it may be more feasible to finance an acquisition than to finance internal growth. The sellers may be more willing to accept the stock of the acquirer in payment for the facilities sold than would investors in a public distribution. Further, the size thereby more quickly attained may permit additional financing through use of the capital markets under more favorable conditions.

Five, the development of new products and marketing areas may be accomplished through external expansion without the necessity

²⁹ See in this connection the excellent discussion by Butters, Lintner, and Cary, *op. cit.*, p. 224.

of combating difficult competition in the early stages of development. This consideration is distinct from the effort to avoid competition through permanent market control, for the objective at hand may be solely that of getting established. Further, the maintenance of favorable public relations may require purchase of an existing firm. In the case of Borden's many acquisitions, for example, it might have been entirely feasible through more efficient operations to have driven into insolvency the existing dairy or ice-cream company in whatever small city Borden may have desired to establish an outlet. In a community of small size, it may be that only one dairy can be supported by the market. To drive out the existing firm and to inflict financial hardships upon local residents might cause considerable ill-will toward the large outside firm. Hence, to preserve the goodwill of the local community, entry by acquisition may be a superior policy to the erection of new duplicate facilities.

Six, rationalization of industries may take place through mergers. Mergers may represent the most effective method of achieving stability and progress at certain stages of industrial development, as in railroad transport, air transport, banking, and possibly agricultural implements and steel.

Seven, it must be recognized, finally, that market control may be secured more rapidly and with less effort through acquisitions than by internal expansion. The merger of two large firms may result in market dominance by the resulting firm. Coördinated price and output policies that might be illegal by separate firms would be entirely respectable for a single consolidated enterprise.

Business advantages secured through expansion by external acquisitions are, then, not limited to market control. It is entirely possible that in a given acquisition both market control *and* other advantages may result.

Significance of the Timing of Mergers

How does the timing of mergers compare with the timing of internal expansion? Does the frequency of mergers follow a cyclical pattern? What are the major influences on the timing of mergers?

These questions may be explored by examining data on the occurrence of mergers.

Internal expansion is reflected in capital formation. External expansion, however, does not represent investment, but only a change in ownership. The timing of internal expansion may be indicated by reference to the timing of aggregate investment and its components.³⁰ Variations in total capital formation are closely related to variations in general business activity. The amplitude of the cyclical fluctuations in investment is, of course, greater than the amplitude of fluctuations in general business activity. Apparently, there is a slight tendency for a lag in investment behind general business activity at the upper and lower turning points. Industrial building, one of the components of total capital formation, shows a slight lead at the lower turning points. New orders for producers' durable goods demonstrate appreciable leads over movements in general business activity. Actual expenditures on producers' durable goods show a slight lead at the trough, but none at the peak. Investment in aggregate inventories coincides roughly with movements in a general cycle of business activity.

Aggregate internal expansion exhibits strong cyclical characteristics. Although knowledge of factors determining investment decisions is still quite limited, existing empirical data indicate that the timing of internal expansion is closely related to fluctuations in the level of general business activity.

Data on the net number of firms disappearing through mergers have been developed on a quarterly basis for the period 1919 through 1947 in Appendix E, table 15. These data suffer from two deficiencies. The time span covered is relatively limited. Numbers of disappearances alone do not provide conclusive evidence on the importance of the mergers. From materials developed in the present study, an annual series beginning in 1891, for both numbers and amounts of acquisitions, was constructed. It is presented in Appendix E, table 16.

³⁰ The following discussion is based on Robert A. Gordon, *The Dynamics of Economic Activity (Selected Chapters)* (Berkeley: California Book Co., 1948), pp. 24-31.

A close relationship between the number of acquisitions per year for the sample of 74 firms in the present study and for the total number of disappearances was found for the years of common coverage, as shown in Appendix E, figure 2. This finding suggested the possibility of achieving a wide time-span coverage by splicing the data of our sample for the years 1891 through 1919 with the total number of mergers for subsequent years. Two difficulties militated against the adoption of this procedure. First, the sample data were on an annual basis, the universe data on a quarterly basis. While the quarterly data could, of course, have been placed on an annual basis, valuable detail for analysis of timing relationships would thereby have been lost. Second, the sample data became increasingly fragmentary and of diminishing reliability from 1919 backwards. Hence it was concluded that the most useful analysis of timing relationships should utilize the universe quarterly data, granted its weaknesses of limited time coverage and lack of information on dollar amounts involved in the mergers.

An analysis of timing relationships is made in figure 1 by relating the data on number of disappearances quarterly to the National Bureau of Economic Research reference cycles. Table 25 (p. 67) summarizes the relationship between cycles in mergers and reference cycles. The results obviously suffer from the brevity of the period covered and the paucity of cycles. In the period 1920–1938 there were five reference cycles, but only three merger cycles. The first merger cycle encompasses two reference cycles.

Counting three merger cycles between 1920 and 1938, we find that the average lag of the peaks of mergers behind the peaks of the reference cycles was two-thirds of a quarter, with an average deviation of eight-ninths of a quarter. The average lag of the troughs of mergers behind the troughs of the reference cycles was four quarters, with zero average deviation. To the extent that any cyclical pattern in the timing of mergers exists, mergers tend to lag behind both peaks and troughs of business activity.

However, much evidence suggests that it is inappropriate to consider that a cyclical pattern exists in the timing of mergers. As figure

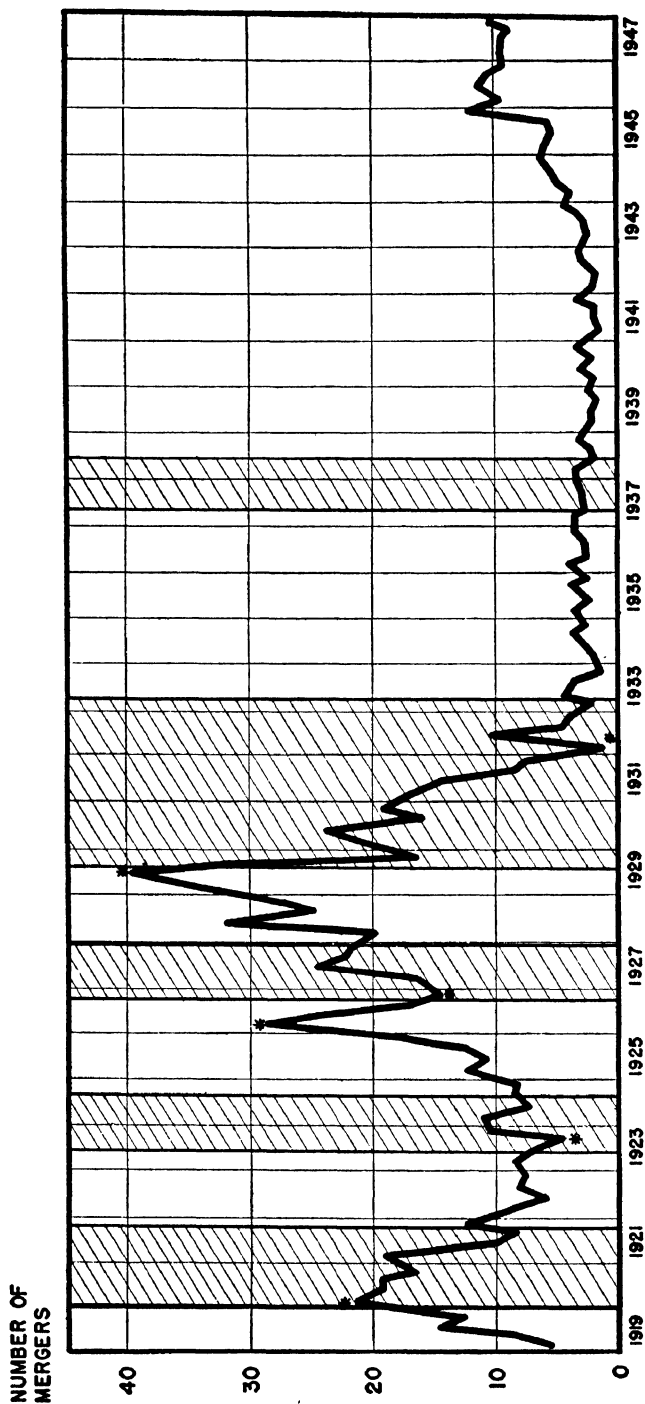


Fig. 1. Number of firms absorbed in mergers, per quarter, United States 1919-1947.

* Turning points. Shaded areas represent reference cycle contractions.

Sources: (1) Number of disappearances, Appendix E, table 15. (2) Reference cycles, A. F. Burns and W. C. Mitchell, *Measuring Business Cycles* (New York: National Bureau of Economic Research, 1946) p. 78.

l demonstrates, the level of merger activity was quite low from 1932 to 1945. No cyclical movements are exhibited during these 14 years. Even the second merger movement cycle may be regarded as a secondary movement on a primary movement whose trough occurred in the third quarter of 1923 and whose peak was reached in the second quarter of 1929.

If mergers occur in cycles, it is necessary to discover the rationale for the periodicity. On logical grounds, it might be inferred that if the dominant reason for mergers was the achievement of economies of operation, the greatest pressure for securing cost reductions would have taken place during cyclical contractions. Hence we would expect the mergers to exhibit a pattern inverse to that of general business activity.

In view of the frequent statements that mergers were greatly stimulated by the gains resulting from the promotion of mergers during a period of high security prices, a strong positive relationship between the timing of mergers and the levels of stock prices would be expected. A third variable taken into account is the level of wholesale prices. One of the purposes of considering the influence of the general price level upon merger activity was to ascertain whether our measures of the extent of growth through acquisitions might be overstated to the extent that mergers characteristically had taken place at times of high prices.

The relationship between merger activity and the three factors cited was analyzed for the interwar period by correlation studies. The Federal Reserve Board Index of Industrial Production was taken as the measure of business activity. National income data were not utilized because we wanted to use a series in physical rather than dollar terms, since the third independent variable was the price level. The Dow-Jones Industrial Averages were used as an index of stock prices. The Bureau of Labor Statistics Index of Wholesale Prices was used to indicate the movements in the general price level. Tests of the data indicated that the influence of trend was moderate in all three cases, but largest in the industrial production index. The

production index series was adjusted by dividing each observation by the trend value for the year.

Both simple and multiple regression relationships were investigated, but since the multiple regression analysis is more meaningful, only those results are presented. In the multiple regression equations, the variables are: X_1 —the number of mergers per year; X_2 —the industrial production index; X_3 —stock prices; and X_4 —wholesale commodity prices. The multiple regression equation is

$$X_1 = -446.15 - 440.39X_2 + 3.74X_3 + 8.45X_4$$

The multiple correlation coefficient is .82. The multiple correlation coefficient is statistically significant at the 1 per cent probability level. (The “t” test was employed with 13 degrees of freedom; “t” is 5.2). The high value of the multiple correlation coefficient also indicates that the equation embodies the major influences explaining the timing of mergers.

The standard errors of the partial regression coefficients (the coefficients of the X 's) are respectively: 461.60; 0.98; and 2.87. Applying a test of three standard errors, only the relationship between the number of mergers and stock prices is clearly significant (i.e., the true partial regression coefficient is probably not zero). The relationship between mergers and commodity prices is of borderline significance, but the relationship between mergers and the level of business activity is not significant.

To indicate the relative influence of the three variables upon mergers, the “betas” were calculated. The “betas” are the partial regression coefficients multiplied by the ratio of the standard deviation of the independent variable to the standard deviation of the dependent variable. The resulting “pure” numbers permit direct comparison of the influence of each variable. The betas are respectively: -0.209; 0.799; and 0.509. The “betas” indicate that stock prices exerted about $1\frac{1}{2}$ times greater influence on merger activity than the level of commodity prices and about four times as much influence as the level of industrial production.

The relationship between the level of business activity and the

number of mergers per year is not statistically significant. Since mergers do not in fact occur with greatest frequency during business contractions when the pressure for more efficient operations is greatest, the hypothesis that the achievement of economies is a strong motive for mergers remains unsupported.

Changes in the general price level have some influence on merger activity. A rise in the wholesale commodity index by one standard deviation would result in an average increase of 175 mergers. Thus our data on mergers are likely to overstate the relative importance of mergers in the growth of the assets of a firm, since a larger number of mergers occur during periods when the general price level is high.

But changes in the level of stock prices represented the greatest influence upon mergers during the interwar period. An increase or decrease of one standard deviation in the Dow-Jones Industrial Stock Price averages was associated with a change in the same direction of about 275 in the number of mergers. Of the variables studied, therefore, the level of stock prices has the greatest effect upon merger activity. The common observation that high security prices stimulated mergers by providing gains to the stockholders of constituent companies and large gains to promoters is corroborated by this study.

On the other hand, an interesting reversal has taken place since 1940, when price-earnings ratios were unusually low and stock prices were not as high as those which obtained in 1929 or 1937. In this situation, *depressed* stock prices tended to stimulate mergers because buyers could acquire assets at a lower cost by purchasing another company, than by building the facilities themselves.³¹ The level of stock prices is not therefore an influence which has operated in the same direction at all times.

Unique Forces in Different Merger Movements

The timing of mergers does not appear to exhibit cyclical characteristics. Certainly the periodicity of the movements does not bear similarity to the widely familiar reference cycles. The changed

³¹ Butters, Lintner, and Cary, *op. cit.*, p. 312.

relationship between mergers and stock prices and the (statistically) tenuous relationship between mergers and the other variables indicate the absence of a mechanism producing cyclical patterns in merger activity. The possibility of long waves in mergers also seems controverted by the absence of systematic forces operating to produce the variations in merger activity which did take place. The three major merger movements which have been described seem to be accounted for in each case by a special combination of factors. Any factors common to the different periods have operated with considerably different force and effect at the different times.

Special forces operating in the merger movement of 1898–1903.—No merger movement before or after the period 1898–1903 attained the dimensions of this wave of combinations which had profound effects upon the structure of American industry. A conjunction of several strong influences accounts for the magnitude of the first major merger movement. The period coincided with considerable relaxation of incorporation laws. Especially important was the privilege granted (in 1889) to corporations to hold stock in other corporations. The development of transportation and national markets increased the possibility of achieving economies of size. Progress in the development of management techniques also contributed to economies of large-scale and multiunit operations. The development of financial markets increased the marketability of the securities of corporations. This made possible large gains to promoters and stockholders from capitalizing prospective economies of consolidation. The Sherman Act outlawed collusive activity. This encouraged combinations (given the climate of the time as reflected in court decisions), since what the firms could not engage in as separate entities they could, of course, practice as one firm, provided that the resulting market occupancy did not raise the issue of monopoly. It appears also that oligopolistic industries (e.g., the steel and agricultural implement industries) had not reached the period of stability characteristic of a state of workable competition. It was the joint effect of all of these factors which accounts for the great wave of combinations at the turn of the century.

Dominant influences in the mergers of the 1920's.—The factor of overwhelming significance in the merger movement of the 1920's was the great bull market in security prices. Combinations took place to create new securities. Mergers made possible great gains to participating stockholders and promoters. Outside financing required in connection with some mergers was readily obtainable on very favorable terms in the buoyant capital markets. In these ways the extremely high stock-market prices stimulated the mergers of the late 1920's.

Two other major forces appeared as factors in the merger movement of this period, during which many integrated organizations were established through vertical mergers. Apparently, one motive was to achieve technical gains from integration, but more important, to free the expanding firm from dependence on other firms for raw materials. Mergers also took place at this time in order to consolidate sales and distributing organizations. The second objective was to make advertising expenditures more effective. It is said that large size permitted larger expenditures for advertising, which in turn increased sales and economies of large-scale operations.³²

However, it is not readily apparent why the last two forces should have been concentrated in this decade. It appears that while these influences were present at other periods, they were particularly stimulated by the favorable state of the financial markets in the late 1920's.

Strategic factors in recent mergers.—Figure 1 (p. 78) indicates that merger activity sharply increased at the end of World War II. The relatively small dollar magnitudes involved in the mergers and the relatively small effects on concentration cast some doubt on the appropriateness of terming this a merger movement. Nevertheless, the causes of the heightened activity which took place may be explored.

In their detailed study of mergers for the period 1940–1947, Professors Butters, Linter, and Cary indicate several dominant influences. The tax effect is found appreciable, but they caution against

³² George W. Stocking and Myron W. Watkins, *Monopoly and Free Enterprise* (New York: Twentieth Century Fund, 1951), p. 498.

exaggeration of this factor. They refer also to management and investment reasons of sellers and expansion motives of buyers.

However, many of the factors on which they center attention were present to the same degree before as well as during the increased merger activity. It is only the variables that emerged after World War II, or operated with increased force after World War II, that can be said to have been dominant forces in the postwar merger activity. One of these certainly was the high level of taxation, which was unique for a peacetime period. A second special situation was the low market values of common stocks in relation to earnings levels. Thus there was greater likelihood of arriving at merger terms attractive to both seller and buyer.³³ Third, the postwar shortages produced preference for asset expansion through mergers because the output of individual firms could thereby be increased much more quickly than by building new plants. The firms that expanded through mergers were thereby enabled to gain the advantages of a sellers' market of unpredictable duration. The desire to achieve market control does not seem to have been an important influence during this period.³⁴

Hypotheses to Account for the Changing Role of Mergers

The recent merger movement appears not to have caused appreciable increases in over-all concentration, whereas earlier merger activity is generally regarded to have been a source of considerable concentration. To provide an explanation for this changed role of mergers would require another extensive investigation. However, some hypotheses may be offered.³⁵

³³ Discussed by Butters, Lintner, and Cary, *op. cit.*, p. 224.

³⁴ Another writer has mentioned a different set of factors as dominant in postwar mergers. He states that recent merger activity "seems encouraged by the accumulation of large wartime working capital, by the unbalanced activities of many companies, and by the desire to achieve a strong strategic position before the return to a buyer's market." Unsigned, "Corporate Consolidation and the Concentration of Economic Power: Proposals for Revitalization of Section 7 of the Clayton Act," *Yale Law Journal*, 57 (February, 1948), p. 614. This explanation does not appear to be valid. The strong working capital position could have financed internal expansion as well as external expansion. Also, the activities of the companies had been unbalanced and they had lacked strong market positions during the 'thirties when merger activity was quiescent.

³⁵ Butters, Lintner, and Cary, *op. cit.*, p. 314.

Mature oligopoly has achieved a state of more workable competition, which lessens the pressure for further horizontal mergers between the large firms. This development is coupled with increased public awareness of the economic problems of bigness and fewness as well as more vigorous enforcement of antitrust laws. With regard to vertical mergers,⁸⁶ it is likely that increasing recognition of exhaustion of potential economies in this direction and of the problem of coordinating far-flung operations has been a deterrent. Further, vertical integration and circular mergers are less fully reflected in ordinary measures of concentration in particular industries. Lessened incentives to mergers may have resulted from increased recognition that efficiency and management considerations may be more important for earning power than size alone or temporary market control. Some may regard the decline in the power and influence of the investment banking industry as a factor removing a strong force for mergers. Still another possibility is that the nature of technological developments has undergone a major change in which the tendency toward large-scale operations has lost momentum. The relative weighting to be given to each of these possible factors, and the possible relationship between them, are matters for further study.

Conclusions on Motives for and Effects of Mergers

The foregoing discussion shows that mergers are motivated in many ways. The leading ones are:⁸⁷ (1) desire to achieve production economies of large-scale and multiunit operations; (2) possibility of achieving distribution and advertising economies; (3) financial

⁸⁶ Terminology for distinguishing between different types of mergers is not fully standardized, but the following brief definitions provide some guidance. Vertical mergers consist of combinations of firms producing components at different stages of the production of a product. (An automobile manufacturer combines with a steel company.) Horizontal mergers consist of combinations of firms producing the same product or close substitutes. (Two can-producing firms combine, or a can-producing firm joins with a paper-container company.) Circular mergers consist of combinations of firms producing items which may be sold by a single sales force. (A company producing nails combines with a firm producing hammers; both sell their wares to hardware wholesalers.) Conglomerate or heterogeneous mergers consist of combinations of firms with no apparent similarities in producing or sales activities.

⁸⁷ Cf. Joe S. Bain, "Discussion," *op. cit.*, p. 64.

advantages of large size; (4) strategic control of patents; (5) acquisition of financial resources; (6) response to antitrust laws; (7) tax advantages; (8) gains from sales of securities; (9) gains of promoters; (10) desire to limit competition.

Very often, situations have existed where merger activity has resulted in socially desirable combinations. On the other hand, we may presume that some mergers have indeed increased market control either in the short run or long run. It should be the object of public policy to encourage the socially desirable and to discourage the socially undesirable merger. We then have the problem of implementing such a program.

The combination movement of the 1890's produced a widely held opinion that acquisitions were a major cause of monopoly. The size and dramatic quality of the early combinations brought them considerable public attention. Combinations were very early an issue of public policy programs. The Sherman Act of 1890 was directed at monopoly and monopoly practices. Sections 7 and 11 of the Clayton Act of 1914 were specifically directed against nascent monopoly through absorption of one company by another through acquisitions of its stock. The empirical material of this study provides background for this issue of public policy and furnishes a basis for evaluation of some related proposals.

Two main issues of public policy are suggested by our study of the role of mergers in the development of oligopolistic firms. First, should the degree of industrial concentration be reduced through dissolutions? Second, should future mergers be subject to effective government review and control?

Dissolution as a Method of Reducing Concentration

Dissolution of large firms has been suggested as a method of remedying the consequences of past mergers.¹ The relevant finding

¹ Cf. *Study of Monopoly Power, Steel*, Hearings before the Subcommittee on Study of Monopoly Power of the Committee on the Judiciary, U. S. 81st Cong., 2d sess., April-May 1950, Serial No. 14, Part 4A, House of Representatives (Washington, 1950), 26.

of the present study is that the major merger activity of the large firms in the industries with the highest current levels of absolute concentration took place very early in the existence of the companies. Moreover, while in many instances the firms came into existence through the combination of several other firms, the present absolute size of the firms was achieved mainly by internal growth rather than by acquisitions.

One possible conclusion to come out of this finding—that the industrial omelet was formed many years ago and hence may present insuperable difficulties for unscrambling—does not, of course, constitute grounds against dissolution proceedings. The existence of multiplant operations in many firms provides a technological basis for separation into individual units, without the likelihood of efficiency losses. The techniques of modern corporate finance are adequately developed to provide arrangements for achieving fair and feasible distributions of claims on dissolution.

On the other hand, the considerable development of the large firms following their formation through combinations and mergers argues against dissolution, since the subsequent growth may be said to constitute a strong argument of efficiency of operations, including multiplant economies. Against this, the decline in concentration that has taken place in an appreciable number of industries may be urged as evidence that the smaller-firm segment of the industry has been relatively efficient. However, this is not conclusive proof. The decline in the position of the larger firms has been relatively minor; the small firms may have benefited from umbrella pricing.

The argument that the existence of small firms in an industry demonstrates that economies of scale do not exist, or are not appreciable,² has been shown to be debatable at best. But even if the proposition that coexistence demonstrates equal efficiency is granted, the case for dissolution gains no further ground. If the smaller firms are equally efficient, they are thereby enabled by effective competition to prevent the larger firms from behaving monopolistically. Joint

² George J. Stigler, "Monopoly and Oligopoly by Merger," *American Economic Review*, Proceedings, XL (May, 1950), 26.

maximization policies by the larger firms will result in rapid and extensive inroads by smaller firms on their market occupancy. This reasoning, however, ignores the possibility (difficult to prove, however) that the larger firms by price leadership and other tactics effectively include the smaller firms in the joint maximization policies of the industry.

The converse proposition does not present a happy set of alternatives. If there are important economies of size, either of large-scale or multiplant operations, dissolution might involve significant social losses. This proposition does not specify whether such economies are achieved only in an industry of three or four large firms or also in an industry of twenty to thirty large firms. If economies of scale are achieved only by large firms, the coexistence of small firms *producing identical products* is not likely. Hence economies of size will be passed on to the public only in part or not at all. Faced with the dilemma posed by this reasoning, many writers have chosen, as the only path of desirable economic policy under the circumstances, regulation of oligopolies as public utilities. Misgivings have been expressed at this prospect on grounds that the performance of government as regulator has not been satisfactory and may be inherently ineffective.

Consequently, others have taken the position that the losses resulting from dissolutions should willingly be accepted as the price for automaticity and impersonality in our economic system. If automaticity can in fact be secured by any feasible or conceivable program, it will be worth a considerable price in efficiency losses. However, the evidence that concentration prior to the merger movements was not negligible casts doubt on the likelihood that any plausible dissolution program can result in atomistic industrial structures.

A further question concerns the extent to which competition might be increased by dissolutions. If each large firm were broken into six or eight small firms, would an industry of 30 or 40 relatively large firms exhibit more competitive behavior (assuming that such can be usefully defined) than an industry in which four firms account

for 60 to 80 per cent of the industry output? Economic theory has not provided an answer to this question either on *a priori* grounds or by factual data.

The soundness of a general program to reduce oligopoly by dissolution cannot be determined by available knowledge. The data of the present study suggest some economies of scale in large firms in which mergers and combinations were important in their early formation or subsequent growth. The attainment of atomistic competition through dissolutions moreover appears improbable. In any event, the burden of proof that must be borne by proponents of dissolution requires evidence that to date has not been assembled.

Some Major Issues of Control of Future Mergers

A full evaluation of the desirability of granting broad authority to an administrative body to control future combinations requires consideration of the economic goals which might thereby be achieved.

Would prevention of future combinations achieve atomistic competition?—We have no grounds for thinking that atomistic competition would be secured by control of future mergers. *First*, there is considerable evidence that the major industries were not populated by atomistic units before the combination movement of the 1890's. Most early mergers represented the combination of relatively large firms. In many cases an oligopolistic industrial structure already had developed but was unstable and "excessively competitive." Frequently the combinations which took place sought to stabilize highly volatile oligopolistic market situations.

Second, the major expansion of most oligopolistic firms, following their early formation through combination, was by internal growth rather than by external growth. Even when the total assets of all companies involved in the original formation of a combination, and representing a high percentage of market occupancy at its inception, are counted as external acquisition, the percentage of growth from external sources is still relatively small.

Third, with absolute prohibition of absorption, there would still remain the possibility that the number of firms in a given industry

will continue to decrease. If the relatively large firms possess real economies of size, smaller firms might fail and disappear as separate entities.

Fourth, the prevention of future corporate combinations might fail to transform the economy to atomistic competition, because such prevention would not affect existing and future labor, agricultural, and other possible combinations. In 1914, when the Clayton Act was passed, these new and possible combinations did not at the time appear to be a major public concern. There is now, of course, increased apprehension about the growing power of these noncorporate groups, while thoroughgoing control of them, in the nature of the prohibitions contained in Section 7 of the Clayton Act, has not been adopted.

Would the prevention of future combinations reduce the rate of increase in economic concentration?—It may be urged that it is extreme to evaluate proposals to control future combinations solely on their capacity to transform the economy to atomistic competition. The objective of such proposals may be the more modest one of simply curbing the tendency toward increased concentration through merger. A complete anti-concentration program would have many facets and restraint of mergers would simply be one of them.

Unfortunately, prevention of future corporate amalgamation cannot prevent the increase in economic concentration that develops through the growth of individual firms; and we have already seen that much of the growth of large firms in the past forty years has been through internal development. Furthermore, some mergers take place because "centers of initiative" have already dried up.³ Many firms acquired in the past would probably have disappeared even without merger. Moreover, the extent to which concentration pressure develops in an industry is greatly influenced by the financial and technological characteristics of the industry.

In some fifty industries where style and consumer taste played a more important role, where capital requirements were relatively small, and where patents were unimportant, the four

³ Cf. John Lintner and J. Keith Butters, "Effect of Mergers on Industrial Concentration, 1940-47," *Review of Economics and Statistics*, XXXII (February, 1950), 33.

largest concerns produced less than a fourth and the eight largest concerns less than a third of the total output.⁴

It follows that mergers are less likely to take place in some types of industries than in others.

Available evidence does not make it possible to determine by what extent the present degree of concentration might have been different if there had been control of early mergers. The factual data of this and other studies on mergers suggest that present concentration would be smaller if many early mergers had been prevented. On the other hand, recent mergers have either only retarded somewhat the rate of decrease in concentration or increased concentration slightly.

Would restraint of acquisitions increase competition?—Granted that the control of acquisitions *might* forestall potential increases in concentration, what are the possible effects of such control on competitive behavior?

It seems self-evident that the acquisition of formerly independent firms will result in a lessening of competition, since the number of sellers is thereby reduced. However, whether this conclusion is valid or not depends upon one's concept of competition. In the purely formal sense, where mere number of competitors is decisive, the conclusion, of course, follows without question. But there are other considerations.⁵ Suppose, for example, the industry is originally in a state of what John M. Clark would call excessive competition, cut-throat competition, or unworkable competition: then, perhaps, the reduction in the number of firms—the further development toward an oligopolistic situation—would in fact bring the industry closer to a state of “workable” competition.⁶

There must also be analysis of the conditions under which acquisitions have taken place. If the acquired firms, for example, have been inefficiently operated, insolvency or dissolution will sooner or

⁴ George W. Stocking and Myron W. Watkins, *Monopoly and Free Enterprise* (New York: Twentieth Century Fund, 1951), p. 494.

⁵ Cf. Joe S. Bain, “Workable Competition in Oligopoly,” *American Economic Review*, Proceedings, XL (May, 1950), 35–47.

⁶ John M. Clark, “Toward a Concept of Workable Competition,” *American Economic Review*, XXX (June, 1940), 241–256.

later result. Acquisitions by other firms of such inefficient operations will not necessarily decrease competition, since the acquired firms will have disappeared anyhow. It may be argued that persons outside the industry should preferably acquire the assets of such firms. This is reasonable, but typically there is no market for a firm approaching dissolution except to buyers who are already operating in the industry and who, therefore, have knowledge and experience in the line of operation.

Section 7 of the Clayton Act refers to the undesirability of acquisitions that result in, among other things, a "substantial lessening of competition." Congressional debate at the time of formulation of the Clayton Act indicates that the framers of the Act did not intend to prohibit all acquisitions.⁷ It was also recognized at that time that any acquisitions would result in some possible lessening of competition, but the Act placed an injunction only against "*substantial* lessening of competition." In the leading court decision on this part of Section 7 of the Clayton Act, the *International Shoe Company vs. Federal Trade Commission*, 1930, Justice Sutherland, speaking for the majority opinion, implied that substantial lessening of competition could be determined only by a demonstration that there had been public injury resulting from the acquisition.⁸

Furthermore, it is possible that some mergers may have beneficial effects. If, as a consequence of acquisitions and large multi-unit operations, innovations are accelerated with increased research, if stability of the industry is increased (admittedly a debatable proposition), if a larger portion of the industry's operations is conducted more effectively, it is possible that the public has been benefited rather than injured.⁹

Formulation of legislation for maintaining competition is made no easier by the fact that available economic tests of changes in the degree of competition or monopoly cannot be applied mechanically. Lerner's test, price minus marginal cost divided by price, suffers

⁷ *Congressional Record*, U. S. 63rd Cong., 2d sess., 51:14 (August 27, 1914), 14316.

⁸ 280 U. S. 291.

⁹ Joseph A. Schumpeter, *Capitalism, Socialism and Democracy* (New York: Harper, 1947), pp. 100-101.

from lack of adequate data for marginal costs.¹⁰ Rothschild's measure, the ratio of the elasticity of the industry demand curve to the elasticity of the firm demand curve at the prevailing price, cannot be used directly with available empirical data.¹¹ Bain's test, profitability, is difficult to apply, because of the vagaries of asset valuation and accounting measures of net income, because monopoly power may exist without monopoly gains, and since high rates of return may result from efficiency, temporary gains of innovation, windfalls, etc., in addition to monopoly power.¹²

While these measures, as well as others not herein described, cannot be used in mechanical ways and hence are not suitable for incorporation into laws, they are useful along with other elements of theory in enabling economists in individual situations to make judgments of the effects on competition of proposed mergers.

Another aspect of the question of increasing competition through restraint of mergers is the fact that market control may be achieved by methods other than external growth via mergers, consolidations, and holding company arrangements. Some devices are (1) trade association activity, (2) sharing information through letters, dinners, informal contacts, (3) price leadership and sharing of market arrangements, (4) interlocking officers, (5) indirect interlocking directorates, (6) influence through ownership of small percentages of the voting stock, and (7) influence attained through creditor-debtor relationships. When restraints are imposed in some areas, resort to alternative techniques is often stimulated. It appears, however, that the effectiveness of most of these other methods of achieving monopoly power presupposes an already high degree of concentration in the industry.

Hence the net effect of mergers on competition is at present uncertain. This is not to imply the conclusion that mergers do not or are not likely to decrease competition. The early combinations seem

¹⁰ Abba P. Lerner, "The Concept of Monopoly and the Measurement of Monopoly Power," *Review of Economic Studies*, I (June, 1934), 169.

¹¹ K. W. Rothschild, "The Degree of Monopoly," *Economica*, IX (February, 1942), 24-29.

¹² Joe S. Bain, "The Profit Rate as a Measure of Monopoly Power," *Quarterly Journal of Economics*, LV (February, 1941), 272-273; 291-293.

to have decreased competition; evidence about the later merger movements is not certain. The pragmatic question of the public welfare, however, indicates a need for the development of usable norms for measuring the extent and effectiveness of competition.

Would the existence of a larger number of firms have desirable economic effects?—The questions raised in the preceding section implicitly assume that the achievement of industrial structures characterized by more smaller firms is a desirable economic goal.

This assumption requires some examination. At the outset it may be noted that the goal is ambiguously stated. Whether it is a desirable goal would certainly depend upon how much more numerous and how much smaller firms are to be. If the goal is atomistic competition, it is not likely to be achieved merely through prohibition of acquisitions. If prohibition of combinations is joined with a dissolution program, the latter would necessarily have to be more relentless than any yet decreed or proposed, to achieve atomistically competitive market structures. Dissolution to this degree would undoubtedly involve serious losses of economies of scale.

The losses involved in atomizing an industry might be even more serious. Innovation and economic progress require at least temporary suspensions of pure competition.¹³ The implications are clear. Furthermore, industries exposed to high cyclical instability or suffering from secular decline have in the past appealed with considerable success for government intervention to maintain prices and restrict output. The practice of appealing for government intervention to achieve monopolistic output and price policies for atomistic industries is well established.¹⁴ Confronted with this pattern, some may prefer unregulated or regulated oligopolies to government-sponsored cartel arrangements.

¹³ Schumpeter, *op. cit.*, pp. 104–105.

¹⁴ Observe the following statement by Professor J. M. Clark: "... it is probably lucky that there is no prospect of industry being atomized into really small fragments such as are required for 'pure' competition, because then they would become politically popular instead of unpopular and their efforts to shelter themselves from the more extreme rigors of competition would have public support instead of meeting public resistance. Then the antitrust laws might really be emasculated and the principle of the fair-trade laws might spread to business in general." "The Orientation of Antitrust Policy," *American Economic Review*, Proceedings, XL (May, 1950), 97.

It may be argued that cartel arrangements conducted by government in agriculture, labor, bituminous coal, fluid milk, and other markets have developed as defensive responses to existing oligopolies in other areas. This may be an appropriate view about some activities. However, now that the pattern has been established, it is likely that the major determinants of future application of the technique will be (1) the degree of cyclical instability or secular decline in an industry, and (2) the extent of direct and indirect political influence of the industry. Hence the establishment of atomistic industries may have the practical effect of developing legalized and publicly supported monopolistic patterns in the industry.

Such a development need not be inevitable. To the extent that measures to reduce over-all cyclical instability are successful, a major source of pressure for government cartelization will be diminished. It is conceivable that government action on secular decline in some industries will some day take the direction of financial responsibility for shifting resources to improved uses, rather than subsidization which spreads the economic penalty of resource misallocation.

Formulating a Rule to Control Future Mergers

Although it is not likely that control of future mergers, alone, will substantially reduce concentration, supervision of mergers may be a desirable part of a broad program to encourage workable competition. Combinations with potentially undesirable consequences could be prevented by effective power over merger activity. Wide agreement exists among economists that future combinations should be subject to control.¹⁵ However, their recommendations specify that some but not all acquisitions be prohibited. The problem is to evaluate what is permissible and what is not.

One proposal seeks to prohibit mergers making for an increase in industrial concentration beyond a prescribed level. Some, to protect such a proposed law against too much reliance on administrative discretion (on grounds that "government by laws" is preferred to

¹⁵ The principle has been supported by many economists: see, for example, statements by the following in the *American Economic Review*, Proceedings, XL (May, 1950): W. J. Fellner, pp. 61-62; J. M. Clark, p. 97; C. Wilcox, p. 100.

“government by men”), have sought to lay down a fixed rule. In seeking to prevent absolute concentration beyond a defined level, the rule is applied to growth by internal expansion as well as by external expansion.

One rule would limit the size of firms in absolute terms, such as a maximum amount of total assets or a maximum number of employees.¹⁶ This is clearly not feasible. The appropriate maxima would vary with industries, and would present a tremendously complex problem in devising practical limitations for each industry. Considerable difficulty would be encountered in defining and identifying industries. It would not be a simple rule, nor would it eliminate the necessity for the exercise of considerable administrative decision-making.

Some of these difficulties are overcome by a rule of the type proposed by Henry Simons. He suggested that a positive program for liberal economic policy should include “limitations designed to preclude the existence in any industry of a single company large enough to dominate that industry.”¹⁷ Simons recommended that a rule be stated in legislation to apply to major industries. He proposed that no ownership unit be permitted to “produce or control more than 5 per cent of the total output.”¹⁸

This rule has serious drawbacks. The percentage ceiling would be impractical in that (a) the boundaries of an industry are too difficult to define to apply a rigid percentage, (b) early pioneers would require special treatment, and (c) the economic effect of a stated percentage would vary with the technology of the industry, the nature of demand and cost functions, and the relative ease of entry into the industry.¹⁹ Furthermore, a ceiling on size, even measured as a percentage of industry output, would have unfortunate results in that, as the maximum percentage is approached, the incentive to charge lower prices and to increase sales would be considerably reduced.

¹⁶ Cf. Fred I. Raymond, *The Limitist* (New York: Norton, 1947), pp. 110–130.

¹⁷ Henry C. Simons, *A Positive Program for Laissez Faire* (Chicago: University of Chicago Press, 1934), p. 20.

¹⁸ *Ibid.*, pp. 19–21; p. 38, n. 5.

¹⁹ Cf. Corwin D. Edwards, *Maintaining Competition* (New York: McGraw-Hill, 1949), pp. 120–121.

Simons also proposed a rule to prohibit holding companies. He suggested the enactment of federal incorporation laws including the provision, "that no corporation which engages in the manufacture or merchandising of commodities or services shall own any securities of any other corporation."²⁰ Although the enactment of such a law might eliminate holding company relationships, it would probably result in the increased use of other forms of corporate coalitions—mergers, consolidations, and lease arrangements. It might suppress control through fractional ownership, but probably would not completely eliminate subtle forms of control exercised without apparent direct ownership or creditor relationships.

We judge the foregoing rules inadequate, not because they lack standards and principles, for these are embodied in the rules; nor are they rejected because they eliminate both administrative and judicial discretion in their application. The rules are undesirable because of their disruptive and undesirable effects upon the functioning of the economic system.

The 1950 Amendment to the Clayton Act

Since we have not found it possible to formulate a rule to regulate merger activity, we turn to the proposal for an administrative body with power to exercise discretion in passing upon proposed mergers. This power apparently was granted to the Federal Trade Commission by Sections 7 and 11 of the Clayton Act, which prohibited acquisition by one company of the stock of another if adverse effects on competition were foreseeable. However, Section 7 could be effectively avoided by purchasing the assets of a company directly or by first purchasing the stock and then the assets of the acquired company. Although control of a company through stock acquisitions might be illegal, the courts held that if the acquired stock were used to absorb the assets of the company before the Commission could file a complaint or complete proceedings under a complaint, the acquisition was not subject to Section 7 of the Clayton Act.²¹ This

²⁰ Simons, *op. cit.*, p. 19.

²¹ *Thatcher Mfg. Co. v. Federal Trade Commission* and *Swift & Co. v. Federal Trade Commission* (1926), 272 U. S. 554; *Arrow-Hart and Hegeman Electric Co. v. Federal Trade Commission* (1934), 291 U. S. 587.

loophole represented virtual emasculation of any commission control over mergers.

After some 25 years of effort to change Sections 7 and 11 of the Clayton Act,²² a law amending the sections was approved December 29, 1950.²³ Under the present law, the Commission now has equal power over both kinds of acquisitions. The language of the sections is somewhat altered, so that the Act now in addition prohibits mergers with given effects upon competition which the courts had ruled were not covered prior to the amendment. For the first time, therefore, it is said, a government commission has received effective power to regulate mergers.

On the theoretical level two arguments may be advanced in support of the recent amendment. The first is an untenable argument, the second is valid. (1) Since the original intention of the Clayton Act was to give the Federal Trade Commission control over mergers, the amendment simply restored a power voided by judicial interpretation. This is inadequate justification, since the basis for the original law may have been unsound. (2) This study has indicated that there are good mergers and bad mergers. It is therefore useful to have administrative regulation (subject to judicial review) of mergers.

The difficulty of establishing legal proof of public injury or tendency to create a monopoly, even with a broadened Section 7, suggests that, if supervision of acquisitions is considered appropriate public policy, still more control over prospective mergers should be given to the Federal Trade Commission. In this connection, the *Final Report* of the Temporary National Economic Committee recommends that acquisitions involving amounts exceeding a specified level meet the prior approval of the Federal Trade Commission.²⁴ In addition,

²² This was proposed as early as the 1920's. It was also a recommendation in the *Final Report and Recommendations of the Temporary National Economic Committee* (Washington, 1941), pp. 38-40. See also U. S. 80th Cong., 1st sess., Report No. 596, "To Accompany H. R. 3736," June 17, 1947, and 81st Cong., 1st sess., Hearings on H. R. 988, H. R. 1240, H. R. 2006, H. R. 2734, "Amending Sections 7 and 11 of the Clayton Act" (Washington, 1949).

²³ *Public Law No. 899*, U. S. 81st Cong., 2nd sess., December 29, 1950 (Washington). I am indebted to Dr. Corwin D. Edwards for aid in interpreting the new law.

²⁴ *Final Report and Recommendations of the Temporary National Economic Committee*, *op. cit.*, pp. 38-40.

standards for the evaluation of proposed mergers are suggested. The burden of proof is assigned to the proponents of the mergers who must demonstrate that: (a) the acquisition is in the public interest; (b) the acquisition will not substantially lessen competition, restrain trade, or tend to create a monopoly either nationally or regionally; (c) the corporations do not exceed specified levels of market occupancy; (d) the size of the resulting firm will not be incompatible with effective competition in the line of business; (e) the acquisition will not lead to effective oligopoly; and (f) the acquiring company has not violated other provisions of the Federal Trade Commission Act.²⁵

On the basis of existing knowledge it is difficult to evaluate the foregoing proposals of the Temporary National Economic Committee. The economic tests embodied in the criteria for judging mergers are vague. Only the recommendation with reference to specifying maximum permissible levels of market occupancy is susceptible of quantification, but even it presents difficulties in determining appropriate percentage limits and undoubtedly involves some inherent arbitrariness.

We have pointed out how the sections of the Clayton Act providing the Federal Trade Commission with powers to regulate mergers were emasculated by court decisions in the early 1930's. The power which the Federal Trade Commission was intended to have by the original Clayton Act has now been reestablished by the amendment of December 29, 1950. We therefore now have the opportunity to develop a body of experience with the exercise by the Federal Trade Commission of its original authority over mergers. This experience will provide a basis for better judging the advisability of increased powers of the type suggested in the report of the Temporary National Economic Committee.

The great present need is for additional guidance from economists on criteria of effective competition and for operational concepts for measuring increases or decreases in competition, substantial or otherwise.

²⁵ *Ibid.*, p. 39.

The statement frequently is made that the major cause of concentration in the United States is the growth of large firms through corporate mergers. Although this view has been expressed often, it has not been documented. The purpose of this study has been to provide an empirical measure of the direct influence of mergers on the growth of firms.

Mergers and Absolute Size

The 74 firms studied grew in the aggregate by \$28.0 billion during the period extending from roughly the turn of the century through 1948. Of this growth, about one-fourth represents growth through mergers. When assets of the initial year for which data could be secured for each of the firms are arbitrarily classified as acquisitions, total growth is \$32.6 billion, about one-third of which is external growth.

The extent to which individual firms have grown by acquisitions varies greatly, but external growth is a relatively minor fraction of the total growth of most of the firms, according to the findings of this study. External growth was smaller than internal growth for about two-thirds of the firms studied. External growth was less than 25 per cent of the total growth of more than one-third of the firms.

The present size of large firms was attained, then, mainly by internal expansion. Exceptions exist, but in the aggregate and for a sizeable majority of individual firms, the conclusion holds.

Mergers and Industrial Concentration

The role of acquisitions in the development of existing levels of industrial concentration has been found to be as follows. Data required for the analysis were available for 25 firms. In the case of most of these, internal expansion had a negligible influence on concentration in the early period. Later concentration, however, seems to have been largely due to internal expansion. Acquisitions subsequent to the early merger movement accounted for only small proportions of the market occupancy percentages of firms in 1947: less than five percentage points for two-thirds of the firms studied.

Two conclusions may be drawn from these findings. On the one hand, almost no growth in the *relative* size of large firms was achieved through internal expansion. Existing levels of industrial concentration are due almost entirely to external growth. On the other hand, external growth subsequent to the early merger movement exerted only negligible effects on concentration. If all firms had been established at some arbitrary starting point, say 1903, and internal growth of the amounts which they actually experienced had been their only method of growth, present concentration levels would be virtually unchanged.

These somewhat paradoxical conclusions are reconciled by a look at the historical pattern. The combination movement at the turn of the century resulted in a high degree of concentration in a large number of industries. The subsequent growth of assets and sales in these industries was extremely great. This explains why external growth represents only a small fraction of the present absolute size of the dominant firms in oligopolistic industries. But the total growth of dominant firms after 1903, the end of the first major merger movement, was relatively smaller than that of the remainder of the industry. Hence present levels of industrial concentration are ac-

counted for, almost entirely, by the high degree of concentration resulting from the early merger movements.

Two points about the foregoing relationships should be stressed. First, care should be exercised to avoid exaggerating the effects of the early merger movements on industrial concentration. It is generally assumed that the dominant firms of 1890–1903 emerged from atomistic conditions. Since many of the combinations represented the consolidation of a relatively small number of firms, and represented a high percentage of market occupancy, the components must have been large in both an absolute and relative sense. While concentration was increased by the early combinations, the levels of concentration existing before their formation must have been more than negligible.

Second, although it has been demonstrated that present levels of concentration are the result of combinations, it is a fact that these combinations took place before 1903. Mergers during the last two decades have not had appreciable effects on industrial concentration.

Concluding Observations on Public Policy Issues

There is no assurance that if the early combinations had not taken place, industrial structures would be substantially different from what they are today. Appreciable concentration had developed before 1898 before the early merger movement took place. Further, it is possible that some, many, or most of the unmerged firms might have failed in the subsequent “competitive” struggle, at the price of dissolution and disappearance. Admittedly, this conjecture is undemonstrable.

Since the major extent of growth in many firms was internal, it may be argued that oligopoly would have developed without major combinations. This view is, however, subject to some doubt, since the early mergers did greatly increase industrial concentration. If firms had not joined in the early combinations, perhaps their separate growth would not have resulted in bigness and fewness in American industry. A greater number of “medium-size” firms and

industrial structures, with 15 to 20 dominant firms instead of two, three, or four, might have developed. However, the differences in price and production policies that would have resulted if "fewness" were increased to 15 or 20 firms are still unsettled problems of oligopoly theory.

The economic consequences of the substantial concentration which had developed by the turn of the century are likewise uncertain. It may be argued, on the one hand, that autonomous secular forces accounted for vigorous general growth in the economy and that the industrial giants used their dominant positions to secure a major share of basic growth developments. On the other hand, it may be urged that it was the high concentration in major industries which made possible or stimulated the favorable secular growth which took place. The data assembled in this study do not provide evidence for either contention. It is possible only to observe that the concentration in industry which existed in 1900 was not incompatible with a remarkably favorable three-decade secular growth in the economy with relatively mild cyclical contractions, followed by one decade when secular growth trends were weaker and depressions were of greater gravity.

The special influences accounting for the heightened postwar merger activity have been shown to be (1) an unprecedentedly high peacetime tax structure, (2) low price-earnings ratios of common stocks, and (3) a desire to achieve rapid expansion in order to increase sales in a strong sellers' market. To the extent that market control motivations appear to have been relatively minor, the need for increased government supervision of mergers is hard to prove. Decreasing the rate of merger activity, if this goal be judged a sound one, could better be achieved by directing attention to the important forces which gave rise to the heightened merger activity of the postwar period. The third influence may be presumed to be a temporary one. The second is a matter primarily of the operation of general market forces. The first influence is in the area of fiscal management, where some feasible alterations in the tax structure may better miti-

gate undesirable tendencies. The changes in the Revenue Act of 1950 indicate what might be done in this direction.

Major changes in industrial structures are not likely to result from the recent amendment to the Clayton Act, but this is not a weakness of the law, since it may be regarded as an element of a broad program for promoting desirable market practices. Since mergers may have socially beneficial effects as well as undesirable consequences, the net result of the restoration of Federal Trade Commission authority over mergers will depend upon how it is exercised. If the motives and results of future mergers prove to be similar to those of most of the mergers which took place after the late 'twenties, few will be prevented if the power is wisely exercised.

But the economic case for still further increases in administrative power over mergers remains incomplete. Recent merger activity has had little effect upon concentration and probably minor effects upon competition. It is therefore desirable to accumulate more experience with the recent amendment to the Clayton Act before attempting to judge the advisability of further legislative changes. At this stage the need is for more understanding rather than more laws.

Market Structures

Market structures may be initially distinguished according to two major criteria: (1) numbers and (2) differentiation of product.¹ As a limiting concept, pure competition is defined in terms of large numbers and a homogeneous product. Similarly, pure monopoly can be defined as one seller of a "completely" differentiated product.² Oligopoly is defined as a small number of sellers with or without the presence of product differentiation. The usual discussion of monopolistic competition presents the concept in contrast to oligopoly, and defines it as large numbers selling differentiated products. Product differentiation or heterogeneity is a necessary condition to distinguish this case from pure competition.

However, there is lack of symmetry in this definition of monopolistic competition. Since oligopoly is used to refer to a few sellers, the corresponding term for many sellers should be polypoly.³ Chamberlin himself has pointed out that he intended a generic use of the term, monopolistic competition, to mean the presence of both monopolistic and competitive elements in a market,⁴ that is, all forms of imperfect competition. Hence oligopoly

¹ For brevity of exposition, the concepts are framed with reference to sellers. Extension to buyers' markets may readily be performed by the reader.

² As Chamberlin has pointed out, the existence of substitutes makes pure monopoly impossible unless there is "control of the supply of all economic goods by the same person or agency." Edward H. Chamberlin, *The Theory of Monopolistic Competition* (3d ed.; Cambridge: Harvard University Press, 1938), p. 64.

³ Fritz Machlup, "Competition, Plipoly and Profit," *Economica*, IX (February, 1942), 1.

⁴ Edward H. Chamberlin, "Various Views on the Monopoly Problem, Some Final Comments," *Review of Economics and Statistics*, XXXI (May, 1949), 124.

is a type of monopolistic competition whether it is homogeneous oligopoly or heterogeneous oligopoly, since both "competitive" and "monopolistic" elements are present.

Fewness in oligopoly may reflect absence of practical possibility of entry. The many in polypoly presumes ease of entry. Machlup, however, has suggested that entry is not a distinguishing difference between oligopoly and polypoly, and that the condition of the possibility of entry be indicated by the term, pliopoly, that is, *more* firms may come into the industry.⁵ Relative ease of entry is likely, of course, to have an important influence upon the price and output policies emerging in given market structures.

Economic Behavior Aspects of Market Structures

The foregoing distinctions have significant implications for economic behavior. Fewness in oligopoly is said to lead to awareness of the reactions of rivals and hence to "spontaneous coordination" of price and output policies, approaching results indicated by the pure monopoly model. As E. S. Mason has stated, "Both as an analytical problem and as a problem in public policy, monopoly means typically oligopoly with or without product differentiation."⁶

Polypolistic conditions, on the other hand, are presumed to approach the results indicated by the purely competitive model. However, spatial factors may cause the polypolistic market to be oligopolistic in relevant actual market situations.⁷

Opposing views of the economic significance of fewness have been expressed. "In my opinion the number of producers of any article, or defined group of articles, has very little bearing on the question of effective competition. A prize fight, with only two participants, is every bit as competitive as a track meet with forty or fifty."⁸

This analogy ignores the fundamental economic processes involved. While some uncertainty of the outcome is a basic condition of a game of sports, uncertainty arising from inability to conjecture rivals' actions and reactions is an obstacle to effective planning by the firm. Even in sports, moreover, considerable vigilance is often required to prevent "collusive" activities. The incentive to achieve "understandings" among firms is much greater.

However, there is basis for considerable qualification of the generalization that oligopolists typically work towards a joint maximization solution. In

⁵ Machlup, *op. cit.*, pp. 1-2.

⁶ Edward S. Mason, "Various Views on the Monopoly Problem, Introduction," *Review of Economics and Statistics*, XXXI (May, 1949), 104.

⁷ *Loc. cit.*

⁸ Rufus S. Tucker, "Discussion," *American Economic Review*, Proceedings, XXXVIII (May, 1948), 109.

addition to the circumstances which may prevent a monopolist from maximizing net receipts,⁹ several influences may cause oligopoly market behavior to depart widely from monopoly price and output policy. These are: (1) lack of knowledge of the behavior patterns and objectives of rivals, (2) individualistic behavior, (3) differences in, or changes in, demand functions, (4) differences in, or changes in, cost functions, (5) product differentiation, (6) advertising, and (7) potential entry.

Lack of knowledge:—Although fewness leads to awareness, the operations of rivals may be complex and decision-making a highly involved procedure. It may be difficult to ascertain the strategy and tactics of rivals.

Individualistic behavior:—A related obstacle to spontaneous understandings among oligopolists is the possible individualistic behavior of one or more firms. "The capricious and irrational or mistaken judgement of one member of a market may be far more important than all the theoretical generalizations there are."¹⁰ If the judgment of the decision-makers in a firm differs from the views of the decision-makers in other firms, coordinated action may not be possible.

Differences in, or changes in, demand functions:—The market segments which are served by rivals producing similar products may have quite distinctive characteristics. Price elasticities of demand may differ, as well as income elasticities of demand. The response of each firm to price or output changes of rivals or changes in the level of general economic activity may therefore be widely disparate.

Differences in, or changes in, cost functions:—Markedly different cost conditions may lead to individualistic behavior. Cost advantages could be used to achieve price reductions that could not be matched by rivals. Such a condition would, of course, lead to sole survival by the firm with the cost advantage, unless in multiproduct operations the cost advantages are not all held by one firm and product mixes are sold. Further, improvements in processes and other innovations achieving cost reductions may make the situation so dynamic that stable understandings are not achievable. Firms may prefer independent action if they expect to achieve cost advantages unlikely to be matched in a short time, if at all.¹¹

Product differentiation and advertising:—Product variation can be a

⁹ These have been effectively described by Fellner as (1) divergence of ownership and control interests, (2) long-run maximization objectives, and (3) safety-margin considerations. William J. Fellner, *Competition Among the Few* (New York: Knopf, 1949), pp. 146-174.

¹⁰ William H. Nicholls, "Social Biases and Recent Theories of Competition," *Quarterly Journal of Economics*, LVIII (November, 1943), 11.

¹¹ Cf. William J. Fellner, "Collusion and Its Limits under Oligopoly," *American Economic Review*, Proceedings, XL (May, 1950), 56-58.

continuing activity which provides a firm with the ability to initiate advantageous changes that may not readily be achieved by rivals. As with cost reductions, some lag in response is likely to be involved. Rivals may be slow to imitate. By the time a given product improvement has been copied, still new ones may have been fashioned. The general uncertainty of the ability to match product innovations provides a basis for independent noncoordinated actions. Further, even the desirability of variations may be questionable until experience has been gained.

Professor William Fellner has suggested that oligopolists would benefit as a group by noncompetitive coordination of product improvements.¹² This is especially applicable to variations that increase one firm's sales at the expense of another's and bring about effective retaliation. However, to the extent that the product variation (including advertising) increases industry sales, each firm may have benefited, even if the relative position of each firm is unchanged after retaliation. The question still remains whether such efforts might not result in greater increases for each if they were coordinated. Fellner's observations assume that innovation is not stimulated by rivalry. But if rivalrous actions result in greater technical progress, both the firm and society thereby benefit. It cannot be demonstrated that oligopolists as a group will or will not benefit from suppression of non-price rivalry. There is abundant evidence, however, that oligopolists do not completely achieve spontaneous coordination in cost-saving innovations, product variation, and advertising.

Potential entry:—If economic superiorities of some kind are not possessed by the existing few, entry of new rivals is a continuing threat, likely to enforce behavior approaching the competitive norm.¹³ If fewness exists because of the economic superiorities possessed by the existing firms, entry may be prohibited by lack of ability to duplicate the advantages. In this case competitive price policy is not likely to be practiced. The ineffectiveness of potential competition under such conditions was set forth clearly by Professor Charles J. Bullock:

The advocates of combination consider that it is proved that a single company can produce and market commodities at a much lower cost than independent concerns. If this be true, we may assume that, if the lowest price at which an independent company can afford to sell a commodity be one dollar, a combination can afford to sell for still less,

¹² Fellner, *Competition Among the Few*, pp. 186–191.

¹³ Bain has suggested that too easy entry would result in instability in the industry and “unworkable” competition. Joe S. Bain, “Workable Competition in Oligopoly,” *American Economic Review*, Proceedings, XL (May, 1950), 42–43. This seems to imply also that the traditional purely competitive model represents an “unworkably competitive” situation.

say eighty cents, and that the difference of twenty cents represents the savings effected by monopoly. Now it is evident that competition can never, except for relatively short periods when the market is overstocked, reduce the price below one dollar, and that producers will never enter the field unless they hope to be able to secure at least these figures. A monopoly, therefore, can maintain the price at ninety-nine and nine-tenths cents without inviting competition.¹⁴

If the oligopolists possess economic advantages, the threat of entry is less pressing, especially if each firm produces a high percentage of industry output and if such high percentage is necessary to achieve the scale of operations which yield the economies possessed. If the threat of new entrants does not exist, competitive behavior may not exist. If economies of size limit entry, competitive practices are not a norm since bigness is required to achieve the economies.

On the other hand, of what value to society are the economies if they are not "passed on?" Schumpeter has suggested that even with economies of the type under consideration, competitive practices may be stimulated by threat of new commodities and new methods of production.¹⁵ Oligopolists, even when they have achieved industry-wide understandings, may thus be compelled to behave as competitors under the threat of potential invasion of their sphere by new products emanating from their dynamic environment.

Rationale for the Present Study

Other characteristics in addition to (1) number of sellers, (2) product differentiation, and (3) relative ease of entry will influence price policies. Some of these factors are: durability of product, style influences, whether a producer or consumer good, time-trend of industry demand, maturity of the industry, phase of the cycle, number and variety of channels of supply and distribution available to firms.¹⁶

The forces influencing market behavior are too numerous to permit easy generalization from consideration of only a few of the variables. *First*, the joint influence of the given variables is different in different combinations. *Second*, allowance must be made for the influence of the complete set of factors at work even though a limited number of strategic characteristics is

¹⁴ Charles J. Bullock, "Trust Literature," in *Trusts, Pools, and Corporations*, ed. by W. Z. Ripley (Boston: Ginn, 1905), p. 468.

¹⁵ Joseph A. Schumpeter, *Capitalism, Socialism and Democracy* (2d ed.; New York: Harper, 1947) pp. 100-103.

¹⁶ Mason, *op. cit.*, p. 104; Joe S. Bain, "Market Classifications in Modern Price Theory," *Quarterly Journal of Economics*, LVI (August, 1942), 560-574; John M. Clark, "Toward a Concept of Workable Competition," *American Economic Review*, XXX (June, 1940), 241-256.

under consideration. *Third*, the multiplicity of influences and the possibility of actions and reactions by the individual firms make extremely complex the pattern by which a *modus vivendi* may be reached. It is generally agreed that continued detailed study of individual markets will be necessary to provide a basis for increased knowledge of the relationship between market characteristics and the behavior of individual firms. In addition to exhaustive, intimate studies of individual market structures, it will be necessary to conduct broad studies of the development of specific strategic factors influencing market behavior. Such is the objective of this study of the origins and growth of the "fewness" element in market structures.

Although "numbers" is not a complete basis for distinguishing markets, it may be a factor of considerable importance. In this connection, Professor William H. Nicholls has observed that in oligopoly the significant thing is the supreme importance of the individual decision upon market price and output.¹⁷ Further, fewness is likely to result in awareness. With awareness, there is likely to be at least some tendency to coordinated activities. Since fewness has a peculiarly important influence on market behavior, it is appropriate to analyze the nature and circumstances of some aspects of its development in the American economy.

¹⁷ Nicholls, *op. cit.*, p. 11.

Since the objective of the inquiry is an analysis of the origins and development of "fewness," identification of oligopolistic industries is required. One basis for selection might have been to take the judgment of competent specialists on whether or not an industry is oligopolistic. The weakness in this procedure is that authorities may disagree (though one might depend on limited consensus). It is, therefore, useful to resort to some quantitative measurements. Accordingly, the widely known data of Gardner C. Means were used as a basis for selecting the industries to be studied.¹ The Means calculations of industry concentration ratios were used in preference to those made by Crowder.² Crowder's data, in the main, relate to census-products, which is a narrower classification than Means' census-industries. By narrowing product lines sufficiently fine, any desired degree of concentration might be demonstrated. However, examples can be found where a census-product group might in one year be a broader category than a census-industry group in another year due to reclassification.³

The use of concentration ratios provides quantitative measures of the portion of total industry sales (or whatever other measure might be desired) by the leading four firms in the industry. Admittedly, there are some arbitrary elements in making such calculations. For example, one is immediately confronted with the slippery and never settled problem of how

¹ National Resources Committee, *The Structure of the American Economy* (Washington, 1939) pp. 239-262.

² Willard L. Thorp and Walter F. Crowder, *The Structure of Industry*, T.N.E.C. Monograph, no. 27 (Washington, 1941), pp. 420-481.

³ Cf. G. Warren Nutter, *A Quantitative Study of the Extent of Enterprise Monopoly in the United States: 1899-1939* (Chicago: University of Chicago Press, 1951), pp. 12-15.

to define properly industry or commodity, and to select appropriate empirical counterparts of the distinctions made. The Bureau of Census determines classifications on five bases: product; industry; industry subgroup; industry group; major industry group.

The groupings of products in Census data lack close correspondence with industries that economic criteria would identify.⁴ However, the attempt to apply economic criteria to classify industries would involve tremendously difficult practical problems. With the choice narrowed by the availability of present compilations, the census-industries grouping selected by Means for measuring concentration ratios is a defensible one. While his grouping is so broad as to include wide heterogeneity, it avoids in great measure undue narrowness of classification, which would make extremely serious the problem of having separate concentration ratios for close substitutes.

The next question which may be raised concerns the selection of four rather than some other number of firms as the crucial number for measuring dominance in an industry. Again the facts of industry structure provide sensible guidance to the selection. In many industries, the breakoff point in studying the role of fewness would be four firms. In some industries, the number of dominant firms may be more or less than four. However, no heavy reliance need be placed on the number "4." Concentration ratios might very well have been constructed to vary with the number of dominant firms in the industry, from two to ten, 15 or 40, whatever might be appropriate. However, there is some usefulness to the construction of concentration ratios for a constant number of firms.

Another element which might be subject to dispute is the critical concentration level for designating an industry as oligopolistic. Is a market occupancy by four firms of 40 per cent, 60 per cent, 80 per cent, etc., the critical level? Again no answer can be defended as completely free from arbitrary elements. But pin-point accuracy is not required. There are likely to be strong oligopolistic characteristics when the percentage of market occupancy by four firms is 35 (or 25 to 45) per cent or more.

Even more basic criticisms of concentration ratios as measures of economic concentration have been made. "They minimize the extent of monopoly control in many cases: all markets are treated as national; collusion between firms is not considered; and physically similar commodities are treated as identical. But, on the other hand, intercommodity competition is ignored, and this is an equally fatal defect."⁵ Since these comments relate to monopoly

⁴ Cf. Clair Wilcox, "On the Alleged Ubiquity of Oligopoly," *American Economic Review*, Proceedings, XL (May, 1950), 68-69.

⁵ George J. Stigler, "The Extent and Bases of Monopoly," *American Economic Review*, XXXII, Supplement (June, 1942), 7.

control, they are not relevant to the use of concentration ratios as a guide to the determination of industries with oligopoly characteristics. However, it may be noted that the first three criticisms relate to understatement of the degree of monopoly control. Hence concentration-ratio measures tend to state the case conservatively (admittedly the ideal is not conservatism, but accuracy). Intercommodity competition operates as a restraint on monopolistic practices in oligopolistic industries, but is no fatal defect in the construction of data on the structure of oligopolistic industries.

This study is not concerned with identifying monopolistic industries. Concentration represents only one aspect of market structure that might result in monopolistic behavior. Concentration ratios are utilized here merely as a guide to industries in which fewness is likely to exist and strongly influence market behavior of constituent firms.

A criticism that Stigler presents with even greater emphasis is the failure of the statistical procedures in developing the concentration ratios to take into account the influence of imports. He states that the "bias is very large," and concludes that "the omission of imports is therefore sufficient, I believe, to vitiate the conclusion of the monograph."⁶ He states that the same criticism is applicable to the concentration ratios in Means' *The Structure of the American Economy*.⁷ His conclusions are based on nine products contained in Crowder's list of 1,807 in which inclusion of imports by Stigler resulted in considerable reductions in concentration ratios.

In the present study, therefore, this writer resolved to select industries by first making corrections for the role of imports, using the method indicated by Stigler in calculating the corrections that he made.⁸ Accordingly, Stigler's method was applied to the nine industries with the highest concentration ratios in Means' list of 21 large industries, 26 industries with the highest concentration ratios in Means' list of 44 medium industries, and 27 industries with highest concentration ratios in Means' list of 210 small industries.⁹ Added to the latter group were three industries in which, in Federal Trade Commission studies, merger activity has been cited as significant. However, it was found, after making the adjustments used in Stigler's procedure, that the effect of imports on concentration ratios was less than 1 per cent in each of the nine large industries, was negligible in all of the 26 medium industries except one where the adjustment was only 6.78 per cent, and was appreciable in only four of the 30 small industries, as shown in Appendix B, table 1. Four of the five industries in which adjustments were required in the concentration ratios, as a consequence of including the effect of imports, are

⁶ *Loc. cit.*

⁷ *Loc. cit.*

⁸ *Ibid.*, n. 17.

⁹ National Resources Committee, *op. cit.*, table II, pp. 248-259.

industries that include the products contained in Stigler's list of nine.¹⁰ These findings demonstrate that the omission of imports does not vitiate the findings in Means' study.

Adjustments for imports were also made for a random sample of census-products in Crowder's study. The proportion of concentration ratios by product lines requiring more than negligible adjustment for the influence of imports was even lower than the small proportion of cases requiring adjustment in the Means study.

The above findings raise the question whether Stigler's list represents a sample of Crowder's list of 1,807 products, or whether it represents the total number of products in which the effect of imports resulted in lower concentration ratios. If the latter is true, the conclusions to be drawn from Stigler's list of nine products are precisely the opposite of those he suggests. His data would then indicate that the effect of imports was important in only nine out of the 1,807 products. If this be the case, the findings of the Crowder study are not appreciably affected by the omission of imports. While this omission, if not previously tested, may have been an ill-advised statistical procedure, it did not seriously impair the results.

Accordingly, the industries in the Means' study selected after adjustment for imports would appear to be virtually the same as the industries selected without adjustment for imports, either because the industries with the highest concentration ratios were on an export basis or because the influence of imports in the industries on an import basis was relatively small.¹¹ The industries selected for study were those that, based on number of persons employed,¹² had concentration ratios of 40 per cent or more.

In the case of industries that were so related that the same individual firms were leading producers in both, only one of the industries was examined.

¹⁰ Stigler has suggested to the writer that in making adjustments, the procedure should be applied only to commodities on an export basis. "It is illogical to allow for imports of commodities (such as automobiles) that are on an export basis." Letter of October 18, 1949. This is a valid observation, but it is irrelevant to the issue. The sole question is: Will imports cause reduction in concentration ratios for an appreciably large number of industries? The data demonstrate that they do not. Hence it is unnecessary to "allow for imports" of commodities on an export basis.

¹¹ Stigler observed that 1935 was not a year of high imports and that, for industries on an export basis, the value of product of the major producers should be related to total world output. Letter of October 18, 1949. The influence on concentration ratios would not be great unless a major proportion of industry output was exported and output of the United States was a small proportion of world output. These circumstances did not obtain in any of the industries analyzed in this study.

¹² The rationale for using concentration ratios based on number of persons employed as the criterion is indicated in Edward S. Mason, "Monopoly in Law and Economics," reprinted in *Readings in the Social Control of Industry* (Philadelphia: Blakiston, 1942), p. 46. However, the industries selected would not have differed appreciably if concentration ratios based on value of product produced or value added had been used.

TABLE 1

EFFECT OF IMPORTS ON INDUSTRY CONCENTRATION RATIOS, 1935

Industries	Concentration ratio (based on value of product) (per cent)	Total value of product—4 lead- ing companies (in 000 dollars)	Total value of products (in dollars)*	Imports (in 000 dollars)	U. S. production and U. S. imports (in dollars)	Adjusted concentration ratio (2)-(5) (per cent)	Effects of imports on concentration ratios (1)-(6) (per cent)
<i>9 Large industries</i>							
Motor vehicles, not including cycles. . . .	87.0	2,080,334	2,391,089,954	281	2,391,370,954	86.99	.01
Motor vehicles, bodies, and parts. . . .	69.4	1,076,150	1,550,924,169	229	1,551,153,169	69.38	.02
Steel-works and rolling mill products . . .	49.3	951,819	1,931,318,220	5,741	1,937,059,220	49.14	.16
Electrical machinery, etc.	44.4	426,276	960,430,400	2,108	962,538,400	44.29	.11
Meat packing, wholesale	55.6	1,313,029	2,362,369,081	19,178	2,381,547,081	55.13	.47
Railroad repair shops, steam.	36.0	133,989	371,699,435	.....	.....	.....	.00
Wool and hair mfgs.	23.1	164,186	710,740,376	18,821	729,561,376	22.50	.60
Boots and shoes, non-rubber.	24.7	158,822	643,872,470	1,882	645,754,470	24.59	.11
Canned and dried fruits, etc.	22.7	144,587	649,644,032	10,328	659,972,000	21.91	.79
<i>26 medium industries</i>							
Cigarettes.	89.7	723,262	806,690,052	53	806,743,052	89.65	.05
Rubber tires and inner tubes.	80.9	361,202	446,091,602	76	446,167,602	80.96	-.06
Rayon and allied products.	74.3	137,520	185,159,534	2,844	188,003,534	73.15	1.15
Tin cans, etc.	80.1	234,086	292,388,012	.....	.....	.....	.00
Agricultural implements.	72.4	210,972	291,254,064	4,597	295,851,064	71.31	1.09
Carpets and rugs.	51.1	65,185	127,587,761	5,096	132,683,761	49.13	1.97
Ship and boat building.	44.8	69,392	154,899,887	.....	.....	.....	.00
Refrigerators, etc.	46.1	103,318	224,113,941	.....	.....	.....	.00
Steam and hot water apparatus.	38.7	43,206	111,749,501	.....	.....	.....	.00
Petroleum refining.	38.2	701,298	1,838,621,913	13,450	1,852,071,913	37.87	.33

Radios and phonographs.....	27.0	54,349	200,972,523	122	201,094,523	27.03	-.03
Nonferrous metal alloys.....	36.2	142,358	393,226,934	.....	.....	.....	.00
Glass.....	44.9	127,435	283,925,061	5,058	288,983,061	44.10	.80
Chemicals, n.e.c.....	35.9	240,293	668,697,448	.....	.....	.....	.00
Hardware, n.e.c.....	36.3	53,689	147,677,006	.....	.....	.....	.00
Cigars.....	38.5	58,225	151,264,707	3,705	154,969,707	37.57	.93
Paints, pigments, etc.....	32.2	134,129	416,999,566	2,109	419,108,566	32.00	.20
Gas mfg., illum., and htg.....	31.2	107,776	345,967,324	.....	.....	.....	.00
Wirework, n.e.c.....	21.7	25,485	117,569,335	529	118,098,335	21.58	.12
Engines, turbines, etc.....	28.9	28,899	99,996,336	319	100,315,336	28.81	.09
Structural metal work.....	24.3	39,000	160,762,487	1,208	161,970,487	24.08	.22
Pulp.....	22.7	37,875	167,208,261	70,735	237,943,261	15.92	6.78 ^d
Foundries.....	24.1	60,223	250,460,230	.....	.....	.....	.00
Machine tools, etc.....	20.9	20,196	96,837,534	.....	.....	.....	.00
Flour, etc.....	29.1	248,250	853,219,061	54	853,273,061	29.09	.01
Leather, etc.....	21.8	67,071	308,344,763	8,186	316,530,763	21.19	.61
<i>30 small industries</i>							
Typewriters and parts.....	99.3 ^b	33,609 ^b	33,858,443	.....	.....	.....	.00
Graphite.....	86.4	1,834	2,122,271	526	2,648,271	69.25	17.15 ^d
Oils, essential.....	98.0 ^b	3,472 ^b	3,541,983	4,414	7,955,983	43.64	54.36 ^d
Ammunition, etc.....	91.7	24,136	26,307,507	30	26,337,507	91.64	.06
Combs and hairpins.....	88.1	622	705,692	302	1,007,692	61.73	26.37 ^d
Oil, cake and meal—linseed.....	87.9	52,978	60,264,331	207	60,471,331	87.61	.29
China firing and decorating.....	89.3 ^b	1,132 ^b	1,267,029	.....	.....	.....	.00
Asphalted-felt base floor.....	81.6	42,752	52,397,513	.....	.....	.....	.00
Safes and vaults.....	84.8	2,808	3,313,065	.....	.....	.....	.00
Ink, writing.....	83.0	2,808	3,381,907	.....	.....	.....	.00
Files.....	85.8	7,879	9,179,227	.....	.....	.....	.00
Drug grinding.....	87.8	5,195	5,915,760	.....	.....	.....	.00

TABLE 1—*Concluded*

Industries	Concentration ratio (based on value of product) (per cent)	Total value of product—4 leading companies (in 000 dollars)	Total value of products (in dollars)*	Imports (in 000 dollars)	U. S. production and U. S. imports (in dollars)	Adjusted concentration ratio (2)-(5) (per cent)	Effects of imports on concentration ratios (1)-(6) (per cent)
<i>30 small industries, concluded</i>							
Oleomargarine.....	79.1	25,615	32,402,226	..	..	..	.00
Sewing machines, etc.....	78.9	17,857	22,635,452	206	22,841,452	78.18	.72
Explosives.....	82.0	33,351	40,667,200	827	41,494,200	80.38	1.62
Photographic apparatus.....	77.6	57,395	73,966,259	1,344	75,310,259	76.21	1.39
Firearms.....	81.9	10,670	13,026,978	169	13,195,978	80.86	1.04
Boots and shoes, rubber.....	81.3	43,243	53,162,121	..	..	..	.00
Fire extinguishers, chem.....	77.2	4,121	5,342,793	..	..	..	.00
Bone carbon and lampblack.....	81.0	12,000	14,811,298	..	..	..	.00
Compressed and liquefied gases.....	79.1	33,244	42,018,950	..	..	..	.00
Aluminum products.....	76.0	79,036	104,067,370	633	104,700,370	75.49	.51
Cork products.....	76.7	10,729	13,986,608	639	14,625,608	73.36	3.34
Gold leaf and foil.....	63.6	1,135	1,782,599	..	..	..	.00
Corn syrup, etc.....	77.2°	80,058	98,963,756	1,571	100,534,756	79.63	-2.43
Chewing gum.....	91.0	43,450	47,766,180	..	..	..	.00
Soda fountains and acc.....	73.5	6,039	8,214,090	..	..	..	.00
Cement.....	29.2	35,179	120,417,129	669	121,086,129	29.05	.15
Liquors, distilled.....	51.0	77,937	152,874,908	26,498	179,372,908	43.45	7.55 ^d
Condensed and evaporated milk.....	42.7	73,218	171,489,341	40	171,529,341	42.69	.01

* No final digits dropped when given in original sources since the effects of imports on concentration ratios are small.

^b Data are for 8 largest producers in order to avoid disclosure of original data.

^c Correct ratio appears to be 80.90 per cent using Means' own figures. There is either a miscalculation or a typographical error in Means' work; or Means included certain products in this group which the Census of Manufacturers does not include.

^d Major differences

SOURCES: Cols. (1), (2), National Resources Committee, *Structure of the American Economy*, Col. (3), *Census of Manufactures*, 1935; Col. (4), *Statistical Abstract*, 1936.

TABLE 2
ALPHABETICAL LISTING OF FIRMS STUDIED

Name of firm	Group number ^a
Air Reduction Co., Inc.....	I
Aluminum Co. of America.....	II
American Can Co.....	I
American Enka Corp.....	II
American Tobacco Co.....	I
American Viscose Corp.....	II
Armour and Co.....	III
Armstrong Cork Co.....	III
Beatrice Foods Co.....	I
Bethlehem Steel Corp.....	I, II ^b
The Borden Co.....	III
Carnation Co.....	III
J. I. Case Co.....	I
Celanese Corp. of America.....	II
Chrysler Corp.....	I
Clinton Industries, Inc.....	II
Congoleum-Nairn, Inc.....	III
Continental Can Co., Inc.....	III
Corn Products Refining Co.....	II
Cudahy Packing Co.....	III
Deere & Co.....	I
Distillers Corp., Ltd.....	III
E. I. duPont de Nemours & Co.....	III
Eastman Kodak Co.....	III
Fairmont Foods Co.....	I
Firestone Tire & Rubber Co.....	I
Ford Motor Co.....	II
General Aniline & Film Corp.....	III
General Electric Co.....	II
General Motors Corp.....	II
B. F. Goodrich Co.....	III
Goodyear Tire & Rubber Co.....	I
Hiram Walker-Gooderham & Worts, Ltd.....	III
Ideal Cement Co.....	III
Industrial Rayon Corp.....	II
International Harvester Co.....	II
Jones & Laughlin Steel Corp.....	I, II ^b
Liggett & Myers Tobacco Co.....	II
Liquid Carbonic Corp.....	I
Lone Star Cement Corp.....	III
P. Lorillard Co.....	II
National Cylinder Gas Co.....	II
National Dairy Products Corp.....	III
National Distillers Products Corp.....	II

TABLE 2—Continued

Name of firm	Group number ^a
Parker Pen Co.....	II
Penick & Ford, Ltd., Inc.....	II
Pet Milk Co.....	I
Permanente Metals Co.....	II
Philip Morris & Co., Ltd., Inc.....	I
Remington Arms Co., Inc.....	II
Remington Rand, Inc.....	I
Republic Steel Corp.....	I, II ^b
Reynolds Metals Co.....	II
R. J. Reynolds Tobacco Co.....	I
Royal Typewriter Co., Inc.....	I
Schenley Industries, Inc.....	III
W. A. Sheaffer Pen Co.....	II
Singer Manufacturing Co.....	III
Sloane-Blabon Corp.....	III
L. C. Smith & Corona Typewriters, Inc.....	I
Socony-Vacuum Oil Co., Inc.....	I
A. E. Staley Manufacturing Co.....	II
Standard Oil Co. of California.....	I
Standard Oil Co. (Indiana).....	II
Standard Oil Co. (New Jersey).....	I
Studebaker Corp.....	I
Swift & Co.....	III
The Texas Co.....	I
Underwood Corp.....	I
Union Carbide and Carbon Corp.....	I
United States Rubber Co.....	II
United States Steel Corp.....	I, II ^b
Westinghouse Electric Corp.....	II
Wilson & Co., Inc.....	III

^a Data for companies in Group I are complete, taken from reliable sources and verified through correspondence with company officials. Data for companies in Group II are relatively complete and reliable, but could not be completely corroborated. Data for companies in Group III are based on estimates subject to a wide margin of error.

^b Data in Group I refer to net tons of steel ingots; data in Group II refer to dollar amounts of total assets.

The Means' classification of small industries contained a considerable number of industries with concentration ratios exceeding 40 per cent. To avoid unduly extending the list, a cutoff point of 70 per cent was selected and within this group only those were studied in which the number of persons employed and value of product produced were relatively large. In addition, there were added to the list those industries that the Federal Trade Commission had cited in recent studies as active in acquiring formerly independent firms. Twenty-two industries in total were analyzed. Since in some of the industries there were less than four dominant firms, the total number of firms studied was 74. The firms studied are listed in Appendix B, table 2.

In analyzing the growth of the dominant companies in oligopolistic industries, one of the basic questions concerns measurement of growth. To appraise the influence of dominant firms, the element to be measured is power in the market place. This is best approached through an analysis of sales. Accordingly, sales figures would have been used if available. Sales data, however, for the long span of years during which growth of firms is studied were not obtainable. Therefore, it was necessary to find a substitute which best approximated what is conveyed by sales figures. Criteria frequently suggested by analysts were evaluated: (1) net worth, (2) physical assets only, (3) tangible assets (total assets less goodwill and other intangibles), (4) net assets (tangible assets less current liabilities), and (5) total assets (including intangibles).

Net Worth

Net worth is a defective measure of productive facilities acquired because it is subject to variations in financial policies. Within the boundaries defined by standards of prudent financial management, considerable discretion is possible in choosing what the composition of claims on assets shall be. Table 3 of Appendix C illustrates this principle.

The composition and total of the assets of the two firms are the same. However, Firm A is financed almost entirely by equity capital, whereas Firm B has a considerable amount of long-term debt outstanding. If net worth were used as a criterion of facilities acquired in a merger, the purchase of Firm A would be represented as the acquisition of double the quantity of facilities as

TABLE 3
VARIATIONS IN FINANCIAL PLANS

Balance sheet—Firm A			
Current assets.....	\$ 50 M	Current liabilities.....	\$ 25 M
Fixed assets.....	450 M	Long-term debt.....	25 M
Intangibles.....	50 M	Common stock.....	500 M
Total assets.....	<u>\$550 M</u>	Total liabilities and net worth.....	<u>\$550 M</u>

Balance sheet—Firm B			
Current assets.....	\$ 50 M	Current liabilities.....	\$ 25 M
Fixed assets.....	450 M	Long-term debt.....	275 M
Intangibles.....	50 M	Common stock.....	250 M
Total assets.....	<u>\$550 M</u>	Total liabilities and net worth.....	<u>\$550 M</u>

TABLE 4
SOURCES OF FINANCING ACQUISITIONS

	Group I	Group II	Group III	Total	Per cent
Acquisitions over \$5 million, decrease in internal growth less than $\frac{1}{2}$ the amount of the acquisition	32	64	55	151	75
Acquisitions over \$5 million, decrease in internal growth more than $\frac{1}{2}$ the amount of the acquisition	8	25	16	49	25

SOURCE: Basic data sheets.

would be secured in the acquisition of Firm B. But Firm A could be purchased with the same outlay as Firm B, if the acquiring company issued its own long-term debt in the amount of \$250 million simultaneously with the acquisition of Firm A, pledging the fixed assets of A as security for the mortgage. To use net worth as a measure of facilities acquired would be misleading, since the assets acquired are exactly the same in each case. Therefore, net worth was rejected as a measure of growth of the firms studied.

Physical Assets

For similar reasons physical assets are an inadequate measure of facilities acquired, since current assets are as indispensable to the operation of a firm as fixed assets. Some portion of current assets are permanent assets. The crucial role of current assets is reflected by the fact that many firms fail because of unsound inventory or receivable policies. Since current assets are an essential part of the necessary facilities for operating a business, analysis of growth should not be limited to growth of physical or fixed assets alone.

Total Assets less Intangibles

The treatment of intangibles always presents perplexing problems. In its most general sense goodwill is, as described by Canning, a master valuation account.¹ The presence of a goodwill account on the balance sheet is notice that some assets are worth more than the book figures presented. Because of the inability to assign the differential value to specific assets, it is lumped into the one account. Whenever a firm is purchased at a price exceeding the book value of net worth, balance in the resulting accounts is achieved through the creation of a goodwill account.

In economic terms, goodwill represents superior earning power of some or all of the assets. In many cases superior earning power is real and important. The goodwill account may represent assets that are a greater source of revenue for the firm than the tangible assets.

On the other hand, numerous historical examples of assets written up on a purely fictional basis may be found. The abuse of the goodwill account explains the accountant's predilection for acknowledging goodwill only when it has actually been paid for and then writing it off "as soon as possible." However, it is equally true that physical assets might be either overstated or understated. Since there is no basis in a broad study of this kind for testing the validity of accounting valuations of physical assets, inevitably values of physical assets will be included that have no foundation in reality. There is

¹ John B. Canning, *The Economics of Accountancy* (New York: Ronald Press, 1929), pp. 42-43; 156-157.

no general basis for testing overstatement of either tangibles or intangibles. Hence both types of assets should be accorded the same treatment.

Net Assets

A fourth possible measure is net assets, defined as tangible assets less current liabilities.² This is the measure used by the Federal Trade Commission in its study of growth through mergers in the steel industry. The Commission justified the selection of this criterion on the grounds that "it reflects as nearly as possible the actual investment in the business."³ Another basis for use of net assets rests upon the assumption that temporary fluctuations of current assets are financed mainly by current liabilities. Hence fixed assets plus net working capital would, if the assumption is valid, represent the permanent assets in the firm.

On the other hand, temporary assets are as vital to operations as permanent assets. Further, to some extent long-term debt and short-term debt are interchangeable sources of funds. This is especially true with the increased use of continuing financing arrangements provided by inventory and receivables financing. It is difficult to establish a basis for deducting one form of debt to measure "investment" in a firm, but not other closely related forms of debt.

Total Assets

Total assets, which provide a measure of all resources used by the firm, were therefore used as a basis for analyzing growth of the individual firms. Intangibles were included as well as tangibles for the reasons indicated above. In view of the differences in sales-asset ratios for different companies in the same industry and for different industries, this is not a completely satisfactory measure of influence in the market place. However, it is the best available substitute for sales data.

It is probable that the results would be relatively insensitive to a shift from total assets to net assets as a criterion of growth. Drs. Lintner and Butters found, in constructing a concentration frequency distribution by size-class of firms, that the percentage distributions, when based on total assets, differed from a distribution based on net assets by less than 0.4 per cent in each size-class.⁴

² Federal Trade Commission, *The Merger Movement* (Washington, 1948), p. 70.

³ *Loc. cit.*

⁴ John Lintner and J. Keith Butters, "Effect of Mergers on Industrial Concentration, 1940-1947," *Review of Economics and Statistics*, XXXII (February, 1950), 30, n. 3.

The findings of this study are little influenced by some methodological decisions, but are highly sensitive to others. For example, the extent of the growth of the U. S. Steel Corporation through acquisitions of properties from other firms ranges from 87.5 per cent to a negative 33.02 per cent depending upon the measurement procedures adopted. On the other hand, the shifting of definitions and criteria of measurement has little effect upon results obtained for many other individual firms.

Nature of the Information Used

Sources of Information.—The major sources of information were Moody's and Poor's investment manuals. Frequently, these manuals contained references to acquisitions, but provided no further information. In such cases the *Commercial and Financial Chronicle* was consulted for the period during which the acquisitions took place. Usually the *Chronicle* provided sufficient information to make possible some estimate of the quantitative dimensions of the acquisitions. Special studies of individual firms and industries, by government agencies—Federal Trade Commission and Tariff Commission studies—and private studies by the National Industrial Conference Board and academic scholars were the other main sources of information.

Procedure for estimating total assets from amount of net worth.—Frequently, incomplete information was available for precise calculation of total assets. In many cases in which acquisitions took place, only the net worth of the acquired company was known. It was necessary to transform the net worth figure into the total asset figure. This was performed by multi-

plying the net worth figure by the ratio of total assets to net worth of the acquiring company for the year in which acquisition took place. If the ratio of total assets to net worth of the acquiring company was greatly different from the ratio of the industry as a whole, the industry ratio was used rather than the individual firm ratio. If the ratio fluctuated greatly from year to year for either company or the industry, ratios for several years were averaged to eliminate erratic influences.

Procedure for estimating total assets when only the names of firms acquired were given.—In some cases, only the names of the acquired firms were available. Hence, the net change in the investment account of the acquiring firm was taken as a measure of the market value of the securities of the firm acquired. This figure was multiplied by the ratio of total assets to the market value of the securities of the acquiring firm for the year in which acquisition took place. Market value of securities was estimated by calculating the mean of the high and low of security prices for the year. This results in an admittedly rough estimate of total assets of the acquired firms; however, no better procedure was possible and the results from this method were superior, certainly, to no estimate at all.

When acquisitions were reflected in consolidated statements, attention was focused on changes in the net property account of the acquiring firm. If the available sources of information made no mention of improvements or additions to the firm's own property, the total change in the net property account, after allowance for the depreciation charge on its assets before additions, was attributed to the acquisitions reported. This may represent an overstatement to the extent that there may have been unannounced internal development of the company's own property. A representative total-asset/fixed-asset ratio was used to estimate total assets from the net property figure.

When the cost of internal improvements was reported, these could be removed from the change in the net property account to indicate the increase due to acquisitions. However, where information on the amount of internal additions was not provided, estimates were required. These estimates were made, however, only after communicating with the individual companies concerned, requesting the information necessary for a breakdown. If the companies replied that this information was not available, estimates were made on the basis of fragmentary information available. In most cases, the ratio of increases in floor space of owned properties to total increases in floor space was used as a basis for estimating the increase in the gross property account attributable to internal development.

To the extent that sales of property are not specifically mentioned in the

sources of information used, there may be an overstatement of acquisitions in that disposals are not completely recorded. The magnitude of such possible omissions is doubtless minor.

Some Basic Theoretical Problems in Measuring External Growth

In measuring the external growth of the dominant firms in oligopolistic industries, judgments and estimates had to be made which inevitably influenced the reliability of our findings. While aware of the difficulties involved in the choice between available alternatives, we sought to select the procedure that minimized inaccuracy and avoided bias in any direction. To interpret properly the nature of the findings, it is necessary to have an understanding of the treatment of some of the problems which arose.

Treatment of goodwill purchased, but subsequently written off.—In some acquisitions goodwill was part of the assets purchased. Our treatment of goodwill, existing when a specific company was acquired, was based on practical realities. If a company acquired assets including goodwill and paid a specified amount for the goodwill, the amount of goodwill was included in the total of acquired assets. The amount appeared in the column, "growth in total assets by acquisitions," in our basic tables. If goodwill were subsequently written off against net income and the goodwill account thereby decreased, the effect of amortizing goodwill was to decrease earnings. Even though the goodwill account declined, presumably the total assets remained about the same as they would have if goodwill had not been written down since the writing off of goodwill would result in holding additional assets in the company. If goodwill is written off by a charge to surplus, internal growth increases as surplus is built up, and is reduced when surplus is reduced, the net effect on net internal growth being the same as that resulting from the write-off against current earnings.

Thus the write-off of goodwill offsets an increase in internal growth. This accurately conveys what has happened. If a company has acquired assets including goodwill and paid for both tangible and intangible assets, there can be no valid reason for excluding one type of assets. If, however, because of the nature of the acquiring company's management of those assets, the goodwill disappears, this signifies that real assets acquired by the company have been used up. This disappearance should be recorded. The treatment will have been no different in the case of real physical assets that have become obsolete. In both cases, assets are acquired and subsequently a portion of their value has expired.

Similarly, a recapitalization or reorganization that records a scaling-down

of asset values represents negative internal growth. This obtains whether the total assets affected were originally classed as external or internal growth.

Alternative sources of financing external growth.—A problem with which we wrestled at the outset of the study relates to alternative sources of financing an external growth. If acquisitions are financed by increasing debt obligations or ownership accounts, total assets of the acquiring firm increase correspondingly. However, if acquisitions are financed by payment of cash or some other existing assets of the acquiring firm, total assets remain unaffected. In the extreme, the total assets of a firm at any point in time might entirely represent properties acquired from other firms, yet have shown no increase in total assets while the acquisitions took place. To illustrate, a firm might reinvest an amount equal to depreciation charges, over a period, in properties acquired by purchasing formerly independent firms; total assets would remain unchanged, but the percentage of total assets represented by acquisitions of other firms would have been substantially increased. In some cases, total assets of the acquiring firm might actually decrease with an acquisition purchased for cash, since goodwill acquired might be immediately written off by a debit to its earned surplus account. Some comparative balance sheets demonstrate these points.

H. Company—Consolidated Balance Sheet I

Cash..	\$ 400	Borrowings..	\$ 300
Other current assets..	300	Capital stock...	500
Net property.	500	Surplus	400
	<u>\$1,200</u>		<u>\$1,200</u>

A. Company—Balance Sheet

Current assets.	\$ 100	Capital stock....	\$ 200
Net property.	100		
	<u>\$ 200</u>		<u>\$ 200</u>

When H. Company purchases A. Company with “free” cash, the consolidated total assets of H. Company would remain unchanged as shown in Balance Sheet I—A below.

H. Company—Balance sheet I—A

Cash.	\$ 200	Borrowings.. . . .	\$ 300
Other current assets....	400	Capital stock.	500
Net property.	600	Surplus.	400
	<u>\$1,200</u>		<u>\$1,200</u>

B. Company—Balance sheet

Current assets.....	\$200	Borrowings.....	\$200
Net property.....	300	Capital stock.....	300
	<u>\$500</u>		<u>\$500</u>

H. Company may buy B. Company for \$300, utilizing "free" cash. The consolidated balance sheet would appear as follows:

H. Company—Consolidated balance sheet I-B

Cash.....	\$ 100	Borrowings...	\$ 500
Other current assets....	500	Capital stock.....	500
Net property.....	800	Surplus.....	400
	<u>\$1,400</u>		<u>\$1,400</u>

These cases illustrate the following points. To the extent that purchases are made with assets of the H. Company, the consolidated total assets of H. Company would not increase. If the acquiring company assumes any debt of the acquired company, the total assets of the acquiring company will be increased to that extent. This is equivalent to purchase by means of increasing the borrowings of the H. Company.

The limit to the volume of acquisitions that could be achieved without a resultant increase in consolidated total assets would be the "free" cash or other assets of the acquiring company. Since the amount of such assets is likely to be limited, a substantial volume of acquisitions is, in actuality, likely to be associated with a substantial increase in total assets. An analysis of acquisitions by companies in our study revealed that of 200 acquisitions of over \$5 million, only 49, or slightly less than 25 per cent, were associated with a decrease in internal growth (i.e., reflecting the use of existing assets to accomplish the acquisition) of one-half or more of the amount of the acquisition (Appendix C, table 4, p. 123). The facts show that while external growth may have been financed from internal sources to a considerable degree in individual cases, it does not represent the characteristic method of financing acquisitions.

But further, even if the dominant pattern of financing acquisitions should have resulted in no increase in consolidated total assets in the year of the acquisition, to record the acquisitions as external growth would still be conceptually correct. This can readily be perceived if the time span of the analysis is elongated. During the time that a firm is building up free cash

or other assets to purchase additional plant and equipment, its total assets appear to increase by internal growth. However, its "operating" facilities have not increased since it is building up liquid assets which are not used in productive operations. Hence when the acquisition of facilities takes place by utilizing nonoperating assets, it is proper to record this amount as external growth and to reduce internal growth by the same amount, since total assets have remained unchanged.

Similar reasoning is applicable to cases where depreciation charges are associated with acquisitions. If the source of "funds" (properly interpreted) for acquisitions is depreciation, no net increase in total assets results. If the facilities purchased to replace those used up are secured by acquisitions, external growth will be recorded in the same amount as the decline in internal growth, total assets remaining unchanged.

Distinguishing between external growth and internal growth when external growth may be in part internally financed and in part externally financed does not, therefore, pose insuperable measurement problems. The apparent difficulties seem to exist only if a static view of acquisitions is taken. If the time reference is extended, the transactions are placed in proper perspective. The source of financing acquisitions may affect the economic interpretation of the consequences of the acquisitions, but it does not influence the factual measurement of the extent of external growth of firms.

Abandonment or replacement of physical units added through external growth.—It was pointed out by representatives of some of the companies that their total assets at the end of 1948 may no longer have included the facilities secured through acquisitions. The individual physical units may have been abandoned, rebuilt, or so altered that they would no longer be identical with the items acquired.

This is doubtless true, especially for acquisitions before 1930. However, the economic significance of the acquisitions is not altered by the wearing out and replacement of specific physical units. The component originally absorbed lost its independent existence at the time of the combination. The increased power, if any, in the market place secured by the acquiring firm would simply be maintained by replacement of facilities. If, however, facilities were acquired and then later sold to another firm, this should be and is treated as negative external growth of the seller at the time of disposition.

Inevitably, the formulation of procedures in dealing with the many measurement problems discussed above involved some subjective judgments. In addition, the incompleteness of the data required the use of estimates at some points. However, the absence of preconceptions led to the adoption of measurement methods which avoid bias and make the probable magnitude of error in the findings relatively minor.

*Appendix E***SUPPLEMENTARY TABLES AND FIGURE**

TABLE 5

GROWTH OF TOTAL ASSETS, AMOUNTS AND PER CENTS OF INTERNAL AND
EXTERNAL GROWTH OF INDIVIDUAL FIRMS IN GROUP I^a

A. Array by per cent of external growth through 1948, ^b initial assets of firms
formed by combination treated as external growth

Firm	Per cent acqui- sitions	Per cent internal growth	Acquisitions (\$ millions)	Internal growth (\$ millions)	Growth of total assets (\$ millions)
Underwood Corp.....	74 0	26.0	30 8	10 8	41.6
L. C. Smith & Corona Type- writers, Inc.....	68.8	31 2	12.8	5.8	18.6
Beatrice Foods Co....	67.2	32 8	24.0	11 7	35.7
Republic Steel Corp....	66.2	33 8	5,690.4°	2,909 6°	8,600 0°
Remington Rand, Inc.	54.9	45 1	70.3	57 7	128 0
Bethlehem Steel Corp....	52.1	47.9	7,184 9°	6,615.1°	13,800 0°
Union Carbide and Carbon Corp.	51.9	48 1	374 8	347 9	722.7
Air Reduction Co., Inc.....	51.5	48.5	48.7	45.8	94.5
Liquid Carbonic Corp....	51 5	48.5	25 4	23 9	49 3
U. S. Steel Corp....	51.3	48 7	16,047.0°	15,230 0°	31,277.0°
Socony-Vacuum Oil Co., Inc....	43.6	56.4	629.4	813.6	1,443.0
Jones & Laughlin Steel Corp....	42 2	57.8	2,034 9°	2,781.6°	4,816.5°
Chrysler Corp.....	35 4	64 6	191 5	349 9	541.4
American Can Co....	34 1	65 9	94.1	181.7	275.8
American Tobacco Co....	34.0	66.0	233.7	453 0	686.7
Pet Milk Co....	30.9	69.1	15.5	34.6	50.1
Standard Oil Co. of Calif.....	30.8	69 2	330 9	743 6	1,074.5
Studebaker Corp.	22 0	78.0	28.4	100 8	129 2
Standard Oil Co. (New Jersey) ..	20 8	79 2	733 5	2,792 5	3,526 0
Fairmont Foods Co....	13.7	86 3	5.0	31.5	36.5
Philip Morris & Co., Ltd., Inc.	12 3	87.7	14.0	99.7	113.7
The Texas Co.....	11.4	88 6	145.1	1,132.0	1,277.1
J. I. Case Co.....	8.1	91.9	6 2	70.4	76.6
Deere & Co.....	7 5	92.5	19.4	238.2	257.6
Royal Typewriter Co., Inc.	7.5	92.5	1.9	23.4	25.3
Goodyear Tire & Rubber Co. .	5.8	94 2	24.6	400 4	425 0
Firestone Tire & Rubber Co....	5.4	94 6	18.5	325.9	344.4
R. J. Reynolds Tobacco Co..	2 7	97.3	14.1	516.6	530.7
Totals.....	....	....	3,092.6	8,811 4	11,904.0
Per cent ..	34.2	65.8	26.0	74.0	100.0

TABLE 5—Continued

B. Array by per cent of external growth through 1948, ^b initial assets treated as a base amount

Firm	Per cent acqui- sitions	Per cent internal growth	Acquisitions (\$ millions)	Internal growth (\$ millions)	Growth of total assets (\$ millions)
Republic Steel Corp.....	64.1	35.9	5,206.0 ^c	2,909.6 ^c	8,115.6 ^c
Beatrice Foods Co.....	62.6	37.4	19.6	11.7	31.3
Underwood Corp.....	60.0	40.0	16.2	10.8	27.0
Bethlehem Steel Corp.....	50.7	49.3	6,809.7 ^c	6,615.1 ^c	13,424.8 ^c
L. C. Smith & Corona Type- writers, Inc.....	49.1	50.9	5.6	5.8	11.4
Air Reduction Co., Inc.....	46.6	53.4	40.0	45.8	85.8
Remington Rand, Inc.....	44.5	55.5	46.3	57.7	104.0
Liquid Carbonic Corp.....	44.0	56.0	18.8	23.9	42.7
Socony-Vacuum Oil Co., Inc.....	37.5	62.5	487.2	813.6	1,300.8
Union Carbide and Carbon Corp.	31.9	68.1	162.8	347.9	510.7
Standard Oil Co. of Calif....	27.5	72.5	282.0	743.6	1,025.6
Jones & Laughlin Steel Corp..	27.0	73.0	1,026.9 ^c	2,781.6 ^c	3,808.5
U. S. Steel Corp.....	26.5	73.5	5,485.0 ^c	15,230.0 ^c	20,715.0
Chrysler Corp.....	23.2	76.8	105.9	349.9	455.8
Studebaker Corp.....	17.2	82.8	21.0	100.8	121.8
American Tobacco Co.....	16.5	83.5	89.8	453.0	542.8
Pet Milk Co.....	15.4	84.6	6.3	34.6	40.9
Standard Oil Co. (New Jersey)	11.5	88.5	361.9	2,792.5	3,154.4
Philip Morris & Co., Ltd., Inc.	11.3	88.7	12.7	99.7	112.4
The Texas Co.....	9.9	90.1	124.5	1,132.0	1,256.5
Fairmont Foods Co.....	7.9	92.1	2.7	31.5	34.2
American Can Co.....	6.0	94.0	11.6	181.7	193.3
Goodyear Tire & Rubber Co....	5.5	94.5	23.2	400.4	423.6
Deere & Co.....	4.9	95.1	12.4	238.2	250.6
Firestone Tire & Rubber Co....	4.1	95.9	13.9	325.9	339.8
J. I. Case Co.....	3.4	96.6	2.5	70.4	72.9
R. J. Reynolds Tobacco Co....	0.1	99.9	0.4	516.6	517.0
Royal Typewriter Co., Inc....	.....	100.0	.....	23.4	23.4
Totals.....	.....	.....	1,867.3	8,811.4	10,678.7
Per cent.....	25.3	74.7	17.5	82.5	100.0

TABLE 5--*Concluded*

C. Array by per cent of external growth through 1948,^b initial assets treated as a separate component of growth^d

Firm	Per cent acquisitions	Per cent internal growth	Acquisitions (\$ millions)	Internal growth (\$ millions)	Growth of total assets (\$ millions)
Republic Steel Corp.	60.5	33.8	5,206.0 ^c	2,909.6 ^c	8,600.0 ^c
Beatrice Foods Co.	54.9	32.8	19.6	11.7	35.7
Bethlehem Steel Corp.	49.4	47.9	6,809.7 ^c	6,615.1 ^c	13,800.0 ^c
Air Reduction Co., Inc.	42.3	48.5	40.0	45.8	94.5
Underwood Corp.	38.9	26.0	16.2	10.8	41.6
Liquid Carbonic Corp.	38.1	48.5	18.8	23.9	49.3
Remington Rand, Inc.	36.2	45.1	46.3	57.7	128.0
Socony-Vacuum Oil Co., Inc.	33.8	56.4	487.2	813.6	1,443.0
L. C. Smith & Corona Type-writers, Inc.	30.1	31.2	5.6	5.8	18.6
Standard Oil Co. of Calif.	26.2	69.2	282.0	743.6	1,074.5
Union Carbide and Carbon Corp.	22.5	48.1	162.8	347.9	722.7
Jones & Laughlin Steel Corp.	21.3	57.8	1,026.9 ^c	2,781.6 ^c	4,816.5 ^c
Chrysler Corp.	19.6	64.6	105.9	349.9	541.4
U. S. Steel Corp.	17.5	48.7	5,485.0 ^c	15,230.0 ^c	31,277.0 ^c
Studebaker Corp.	16.3	78.0	21.0	100.8	129.2
American Tobacco Co.	13.1	66.0	89.8	453.0	686.7
Pet Milk Co.	12.6	69.1	6.3	34.6	50.1
Philip Morris & Co., Ltd., Inc.	11.2	87.7	12.7	99.7	113.7
Standard Oil Co. (New Jersey).	10.3	79.2	361.9	2,792.5	3,526.0
The Texas Co.	9.7	88.6	124.5	1,132.0	1,277.1
Fairmont Foods Co.	7.4	86.3	2.7	31.5	36.5
Goodyear Tire & Rubber Co.	5.5	94.2	23.2	400.4	425.0
Deere & Co.	4.8	92.5	12.4	238.2	257.6
American Can Co.	4.2	65.9	11.6	181.7	275.8
Firestone Tire & Rubber Co.	4.0	94.6	13.9	325.9	344.4
J. I. Case Co.	3.3	91.9	2.5	70.4	76.6
R. J. Reynolds Tobacco Co.	0.1	97.3	0.4	516.6	530.7
Royal Typewriter Co., Inc. . . . .	....	92.5	....	23.4	25.3
Totals. . . . .	....	....	1,867.3	8,811.4	11,904.0 ^d
Per cent.	21.2 ^d	65.8 ^d	15.7	74.0	100.0 ^d

^a Data for companies in Group I are complete and have been verified by the individual companies.

^b The beginning dates from which growth is measured vary, since the earliest years for which data can be secured for the individual companies vary.

^c Amounts in thousands of net tons of steel ingots and castings and not included in column totals.

^d Under Method C, dollar amounts of acquisitions plus internal growth do not equal growth of total assets, nor do percentages total 100, since initial assets are treated as separate items of growth. Total initial assets are \$1,225.3 millions which represent 10.3 per cent of total growth; the arithmetic mean of per cents of initial assets to total growth is 13.0.

SOURCE: Basic data sheets.

TABLE 6

GROWTH OF TOTAL ASSETS, AMOUNTS AND PER CENTS OF INTERNAL AND EXTERNAL
GROWTH OF INDIVIDUAL FIRMS IN GROUP II^a

A. Array by per cent of external growth through 1948,^b initial assets treated
as external growth

Firm	Per cent acqui- sitions	Per cent internal growth	Acquisitions (\$ millions)	Internal growth (\$ millions)	Growth of Total assets (\$ millions)
Republic Steel Corp.....	76.7	23.3	375 1	114.0	489 1
U. S. Steel Corp..	74 9	25 1	1,898 9	636 1	2,535.0
Remington Arms Co., Inc..	69.5	30 5	38.3	16 8	55 1
Penick & Ford Ltd., Inc.....	65.7	34.3	11.1	5 8	16.9
Corn Products Refining Co.	65.6	34.4	91 2	47 9	139.1
National Distillers Products Corp.	58 9	41.1	126 3	88.3	214 6
P. Lorillard Co.	57 8	42 2	55 7	40 7	96 4
Jones & Laughlin Steel Corp.....	56.3	43 7	213.4	165.7	379.1
U. S. Rubber Co.....	54 9	45.1	191.2	157.3	348.5
National Cylinder Gas Co....	51 3	48.7	13.9	13.2	27.1
Bethlehem Steel Corp.....	47.2	52.8	486.2	542.8	1,029.0
American Enka Corp....	33.7	66 3	16.4	32.2	48.6
Standard Oil Co. (Indiana).	33 4	66 6	501 4	998 6	1,500 0
Clinton Industries, Inc....	29.1	70.9	8 8	21 4	30 2
W. A. Sheaffer Pen Co.	26.3	73 7	4.6	12 9	17.5
International Harvester Co.	25 3	74 7	170 1	501 7	671 8
Westinghouse Electric Corp..	24 6	75.4	170 8	522 8	693.6
General Motors Corp..	20 3	79.7	599.1	2,358.7	2,957.8
Parker Pen Co....	18 5	81 5	3 6	15 9	19 5
General Electric Co..	17 2	82 8	203.1	974 3	1,177.4
Celanese Corp. of America	16 6	83 4	42 5	214 2	256.7
Liggett & Myers Tobacco Co.	16 4	83 6	69 8	355 2	425 0
A. E. Staley Mfg. Co....	15 2	84 8	8 8	49 0	57.8
Reynolds Metals Co..	13 5	86 5	16.4	104 9	121.3
American Viscose Corp....	10 2	89 8	23.2	203.7	226.9
Industrial Rayon Corp.	10 1	89 9	5.8	51.9	57.7
Permanente Metals Co.	9.0	91.0	3 0	30 3	33.3
Aluminum Co. of America.....	7 3	92.7	36 6	467.0	503 6
Ford Motor Co....	5 5	94.5	62.8	1,086.4	1,149.2
Totals.....	..	..	5,448.1	9,829 7	15,277.8
Per cent.	34.9	65.1	35.7	64 3	100.0

TABLE 6--Continued

B. Array by per cent of external growth through 1948,^b initial assets treated as a base amount

Firm	Per cent acqui- sitions	Per cent internal growth	Acquisitions (\$ millions)	Internal growth (\$ millions)	Growth of Total assets (\$ millions)
Republic Steel Corp.....	74.0	26.0	323.7	114.0	437.7
National Distillers Products Corp.....	55.0	45.0	108.1	88.3	196.4
U. S. Rubber Co.....	50.8	49.2	162.4	157.3	319.7
Bethlehem Steel Corp...	44.9	55.1	442.4	542.8	985.2
National Cylinder Gas Co...	42.4	57.6	9.7	13.2	22.9
Standard Oil Co. (Indiana)...	31.4	68.6	457.5	998.6	1,456.1
U. S. Steel Corp...	28.3	71.7	251.5	636.1	887.6
Corn Products Refining Co...	24.6	75.4	15.6	47.9	63.5
Westinghouse Electric Corp...	19.9	80.1	130.0	522.8	652.8
General Motors Corp...	19.8	80.2	580.7	2,358.7	2,939.4
Jones & Laughlin Steel Corp...	19.7	80.3	40.6	165.7	206.3
General Electric Co....	14.2	85.8	161.2	974.3	1,135.5
Celanese Corp. of America	13.3	86.7	32.9	214.2	247.1
P. Lorillard Co.	12.8	87.2	6.0	40.7	46.7
American Viscose Corp.	9.5	90.5	21.5	203.7	225.2
International Harvester Co.	9.1	90.9	50.1	501.7	551.8
Aluminum Co. of America..	7.3	92.7	36.6	467.0	503.6
W. A. Sheaffer Pen Co.	7.2	92.8	1.0	12.9	13.9
Reynolds Metals Co.	6.7	93.3	7.5	104.9	112.4
Penick & Ford, Ltd., Inc...	6.5	93.5	0.4	5.8	6.2
Ford Motor Co.	5.3	94.7	61.4	1,086.4	1,147.8
Remington Arms Co., Inc.	2.3	97.7	0.4	16.8	17.2
Liggett & Myers Tobacco Co.	0.2	99.8	0.6	355.2	355.8
Industrial Rayon Corp.	.	100.0	....	51.9	51.9
A. E. Staley Mfg. Co. ...	.	100.0	.	49.0	49.0
American Enka Corp..	.	100.0	.	32.2	32.2
Permanente Metals Co.	.	100.0	..	30.3	30.3
Clinton Industries, Inc..	.	100.0	....	21.4	21.4
Parker Pen Co....	.	100.0	.	15.9	15.9
Totals.....	....	....	2,901.8	9,829.7	12,731.5
Per cent.....	17.4	82.6	22.8	77.2	100.0

TABLE 6—*Concluded*

C. Array by per cent of external growth through 1948,^b initial assets treated as a separate component of growth

Firm	Per cent acquisitions	Per cent internal growth	Acquisitions (\$ millions)	Internal growth (\$ millions)	Growth of Total assets (\$ millions)
Republic Steel Corp.....	66.2	23.3	323.7	114.0	489.1
National Distillers Products Corp.....	50.4	41.1	108.1	88.3	214.6
U. S. Rubber Co.....	46.6	45.1	162.4	157.3	348.5
Behlthelhem Steel Corp.....	43.0	52.8	442.4	542.8	1,029.0
National Cylinder Gas Co....	35.8	48.7	9.7	13.2	27.1
Standard Oil Co. (Indiana)....	30.5	66.6	457.5	998.6	1,500.0
General Motors Corp.....	19.6	79.7	580.7	2,358.7	2,957.8
Westinghouse Electric Corp....	18.7	75.4	130.0	522.8	693.6
General Electric Co.....	13.7	82.8	161.2	974.3	1,177.4
Celanese Corp. of America	12.8	83.4	32.9	214.2	256.7
Corn Products Refining Co..	11.2	34.4	15.6	47.9	139.1
Jones & Laughlin Steel Corp....	10.7	43.7	40.6	165.7	379.1
U. S. Steel Corp..	9.9	25.1	251.5	636.1	2,535.0
American Viscose Corp..	9.5	89.8	21.5	203.7	226.9
International Harvester Co....	7.5	74.7	50.1	501.7	671.8
Aluminum Co. of America....	7.3	92.7	36.6	467.0	503.6
Reynolds Metals Co....	6.2	86.5	7.5	104.9	121.3
P. Lorillard Co....	6.2	42.2	6.0	40.7	96.4
W. A. Sheaffer Pen Co..	5.7	73.7	1.0	12.9	17.5
Ford Motor Co....	5.3	94.5	61.4	1,086.4	1,149.2
Penick & Ford, Ltd., Inc..	2.4	34.3	0.4	5.8	16.9
Remington Arms Co., Inc.	0.7	30.5	0.4	16.8	55.1
Liggett & Myers Tobacco Co..	0.1	83.6	0.6	355.2	425.0
A. E. Staley Mfg. Co....		84.8		49.0	57.8
Industrial Rayon Corp.		89.9		51.9	57.7
American Enka Corp....		66.3		32.2	48.6
Permanente Metals Co..		91.0		30.3	33.3
Clinton Industries, Inc..		70.9		21.4	30.2
Parker Pen Co....		81.5		15.9	19.5
Totals..	.....	.....	2,901.8	9,829.7	15,277.8°
Per cent.....	14.5°	65.1°	19.0	64.3	100.0°

* Data for companies in Group II are relatively complete, taken from reliable sources, but not entirely corroborated by the individual companies.

^b The beginning dates from which growth is measured vary, since the earliest years for which data can be secured for the individual companies vary.

^c Under Method C, dollar amounts of acquisitions plus internal growth do not equal growth of total assets nor do percentages total 100.0, since initial assets are treated as separate items of growth. Total initial assets are \$2,546.3 millions, which represent 16.7 per cent of total growth; the arithmetic mean of per cents of initial assets to total growth is 20.4.

SOURCE: Basic data sheets.

TABLE 7

GROWTH IN TOTAL ASSETS, AMOUNTS AND PER CENTS OF INTERNAL AND EXTERNAL GROWTH OF INDIVIDUAL FIRMS IN GROUP III^a

A. Array by per cent of external growth through 1948,^b initial assets treated as external growth

Firm	Per cent acqui- sitions	Per cent internal growth	Acquisitions (\$ millions)	Internal growth (\$ millions)	Growth of total assets (\$ millions)
B. F. Goodrich Co....	84.9	15.1	222.3	39.4	261.7
General Aniline & Film Corp.	84.8	15.2	93.8	16.8	110.6
The Borden Co....	81.5	18.5	197.5	44.7	242.2
Ideal Cement Co.....	72.1	27.9	26.6	10.3	36.9
Sloane-Blabon Corp....	68.1	31.9	12.4	5.8	18.2
Lone Star Cement Corp.....	66.6	33.4	40.4	20.3	60.7
National Dairy Products Corp...	65.7	34.3	208.6	109.0	317.6
Armour and Co..	59.8	40.2	267.9	179.8	447.7
Congoleum-Nairn, Inc..	51.6	48.4	22.5	21.1	43.6
Continental Can Co., Inc....	47.0	53.0	104.3	117.4	221.7
Schenley Industries, Inc.....	43.2	56.8	147.7	194.3	342.0
E. I. du Pont de Nemours & Co...	38.6	61.4	459.0	730.3	1,189.3
Wilson & Co., Inc.....	34.9	65.1	53.8	100.2	154.0
Armstrong Cork Co....	34.1	65.9	37.2	71.9	109.1
Carnation Co..	31.7	68.3	26.2	56.5	82.7
Hiram Walker-Gooderham & Worts, Ltd....	31.0	69.0	47.9	106.6	154.5
Distillers Corp., Ltd..	26.8	73.2	92.7	253.5	346.2
Singer Mfg. Co.....	16.9	83.1	35.3	173.8	209.1
Swift & Co.....	12.6	87.4	66.0	456.5	522.5
Eastman Kodak Co..	12.3	87.7	50.6	361.0	411.6
Cudahy Packing Co.....	10.8	89.2	10.7	88.3	99.0
Totals.....	....	....	2,223.4	3,157.5	5,380.9
Per cent.....	46.4	53.6	41.3	58.7	100.0

TABLE 7—*Continued*

B. Array by per cent of external growth through 1948,^b initial assets treated as a base amount

Firm	Per cent acquisitions	Per cent internal growth	Acquisitions (\$ millions)	Internal growth (\$ millions)	Growth of total assets (\$ millions)
B. F. Goodrich Co....	75 8	24 2	123.5	39.4	162 9
The Borden Co.	75 4	24.6	136 9	44 7	181.6
National Dairy Products Corp...	64.4	35.6	197.0	109 0	306.0
General Aniline & Film Corp.	62 3	37.7	27 8	16.8	44 6
Lone Star Cement Corp....	58.0	42 0	28.0	20 3	48.3
Armour and Co.	44 3	55.7	143 1	179 8	322 9
Congoleum-Nairn, Inc.....	43.7	56 3	16 4	21.1	37 5
Continental Can Co., Inc....	43 3	56.7	89 8	117.4	207 2
Schenley Industries, Inc.....	39.9	60.1	129.2	194 3	323.5
E. I. du Pont de Nemours & Co..	35 5	64 5	401.8	730.3	1,132 1
Distillers Corp.....	21 9	78.1	71 2	253.5	324.7
Hiram Walker-Gooderham & Worts, Ltd..	17.2	82.8	22 1	106.6	128.7
Armstrong Cork Co....	14 3	85.7	12 0	71.9	83.9
Carnation Co.	13 6	86.4	8 9	56.5	65 4
Wilson & Co., Inc.....	11.8	88.2	13.4	100.2	113.6
Swift & Co.....	7 6	92.4	37.8	456.5	494 3
Eastman Kodak Co..	5 1	94.9	19 3	361.0	380 3
Singer Mfg. Co....	3 0	97.0	5 3	173.8	179.1
Ideal Cement Co.....	....	100.0	....	10.3	10.3
Sloane-Blabon Corp...	...	100 0	....	5.8	5 8
Cudahy Packing Co.	-11.5	111 5	-9.1	88.3	79.2
Totals.....	....	....	1,474.4	3,157.5	4,631 9
Per cent	29.8	70.2	31.8	68 2	100.0

TABLE 7—*Concluded*

C. Array by per cent of external growth through 1948,^b initial assets treated as a separate component of growth^c

Firm	Per cent acquisitions	Per cent internal growth	Acquisitions (\$ millions)	Internal growth (\$ millions)	Growth of total assets (\$ millions)
National Dairy Products Corp...	62 0	34.3	197.0	109.0	317.6
The Borden Co.....	56 5	18.5	136.9	44.7	242.2
B. F. Goodrich Co..	47 2	15 1	123.5	39.4	261.7
Lone Star Cement Corp....	46.1	33 4	28.0	20.3	60.7
Continental Can Co., Inc....	40 5	53.0	89.8	117.4	221.7
Schenley Industries, Inc.	37.8	56 8	129 2	194.3	342 0
Congoleum-Nairn, Inc.....	37 6	48 4	16 4	21.1	43.6
E. I. du Pont de Nemours & Co..	33 8	61.4	401.8	730 3	1,189.3
Armour and Co.	31 9	40 2	143.1	179 8	447.7
General Aniline & Film Corp.	25.1	15.2	27 8	16 8	110.6
Distillers Corp., Ltd....	20.6	73 2	71.2	253.5	346 2
Hiram Walker-Gooderham & Worts, Ltd....	14 3	69 0	22.1	106 6	154 5
Armstrong Cork Co...	11 0	65 9	12 0	71.9	109 1
Carnation Co....	10 8	68 3	8 9	56 5	82.7
Wilson & Co., Inc.	8.7	65 1	13.4	100.2	154.0
Swift & Co.....	7 2	87.4	37 8	456.5	522 5
Eastman Kodak Co..	4.7	87 7	19 3	361.0	411 6
Singer Mfg. Co.....	2 5	83 1	5.3	173 8	209.1
Ideal Cement Co.....	....	27.9	....	10 3	36 9
Sloane-Blabon Corp...	....	31.9	....	5 8	18.2
Cudahy Packing Co. .	-9.2	89 2	-9.1	88.3	99 0
Totals. ....	....	...	1,474.4	3,157.5	5,380 9°
Per cent.	23.3°	53 6°	27.4	58.7	100.0°

* Data for companies in Group III were estimates constructed from fragmentary information subject to considerable margin of error.

^b The beginning dates from which growth is measured vary, since the earliest years for which data can be secured for the individual companies vary.

^c Under Method C, dollar amounts of acquisitions plus internal growth do not equal growth of total assets, nor do percentages total 100.0, since initial assets are treated as separate items of growth. Total initial assets are \$749.0 millions, which represent 13.9 per cent of total growth; the arithmetic mean of per cents of initial assets to total growth is 23.1.

SOURCE: Basic data sheets.

TABLE 8
 ARRAY BY PER CENT OF EXTERNAL GROWTH^a OF INDIVIDUAL FIRMS
 THROUGH 1948,^b GROUPS I AND II COMBINED

Firm	Per cent acqui- sitions	Per cent internal growth	Acquisitions (\$ millions)	Internal growth (\$ millions)	Growth of Total assets (\$ millions)
Republic Steel Corp.....	64.1	35.9	5,206.0 ^c	2,909.6 ^c	8,115.6 ^c
Beatrice Foods Co..	62.6	37.4	19.6	11.7	31.3
Underwood Corp.....	60.0	40.0	16.2	10.8	27.0
National Distillers Products Corp..	55.0	45.0	108.1	88.3	196.4
U. S. Rubber Co.....	50.8	49.2	162.4	157.3	319.7
Bethlehem Steel Corp. . .	50.7	49.3	6,809.7 ^c	6,615.1 ^c	13,424.8 ^c
L. C. Smith & Corona Type- writers, Inc..	49.1	50.9	5.6	5.8	11.4
Air Reduction Co., Inc.. . . .	46.6	53.4	40.0	45.8	85.8
Remington Rand, Inc.. . . .	44.5	55.5	46.3	57.7	104.0
Liquid Carbonic Corp.. . . .	44.0	56.0	18.8	23.9	42.7
National Cylinder Gas Co. . .	42.4	57.6	9.7	13.2	22.9
Socony-Vacuum Oil Co., Inc. .	37.5	62.5	487.2	813.6	1,300.8
Union Carbide and Carbon Corp.	31.9	68.1	162.8	347.9	510.7
Standard Oil Co. (Indiana)	31.4	68.6	457.5	998.6	1,456.1
Standard Oil Co. of Calif.	27.5	72.5	282.0	743.6	1,025.6
Jones & Laughlin Steel Corp.. .	27.0	73.0	1,026.9 ^c	2,781.6 ^c	3,808.5 ^c
U. S. Steel Corp.	26.5	73.5	5,485.0 ^c	15,230.0 ^c	20,715.0 ^c
Corn Products Refining Co..	24.6	75.4	15.6	47.9	63.5
Chrysler Corp..	23.2	76.8	105.9	349.9	455.8
Westinghouse Electric Corp.	19.9	80.1	130.0	522.8	652.8
General Motors Corp.	19.8	80.2	580.7	2,358.7	2,939.4
Studebaker Corp..	17.2	82.8	21.0	100.8	121.8
American Tobacco Co.	16.5	83.5	89.8	453.0	542.8
Pet Milk Co..	15.4	84.6	6.3	34.6	40.9
General Electric Co..	14.2	85.8	161.2	974.3	1,135.5
Celanese Corp. of America.	13.3	86.7	32.9	214.2	247.1
P. Lorillard Co.	12.8	87.2	6.0	40.7	46.7
Standard Oil Co. (New Jersey).	11.5	88.5	361.9	2,792.5	3,154.4
Philip Morris & Co., Ltd., Inc....	11.3	88.7	12.7	99.7	112.4
The Texas Co.....	9.9	90.1	124.5	1,132.0	1,256.5
American Viscose Corp.....	9.5	90.5	21.5	203.7	225.2
International Harvester Co.....	9.1	90.9	50.1	501.7	551.8
Fairmont Foods Co..	7.9	92.1	2.7	31.5	34.2
Aluminum Co. of America.....	7.3	92.7	36.6	467.0	503.6
W. A. Sheaffer Pen Co.. . . .	7.2	92.8	1.0	12.9	13.9
Reynolds Metals Co.....	6.7	93.3	7.5	104.9	112.4
Penick & Ford, Ltd., Inc....	6.5	93.5	0.4	5.8	6.2
American Can Co..	6.0	94.0	11.6	181.7	193.3
Goodyear Tire & Rubber Co....	5.5	94.5	23.2	400.4	423.6
Ford Motor Co.....	5.3	94.7	61.4	1,086.4	1,147.8

TABLE 8—*Continued*

Firm	Per cent acquisitions	Per cent internal growth	Acquisitions (\$ millions)	Internal growth (\$ millions)	Growth of Total assets (\$ millions)
Deere & Co.....	4.9	95.1	12.4	238.2	250.6
Firestone Tire & Rubber Co....	4.1	95.9	13.9	325.9	339.8
J. I. Case Co.....	3.4	96.6	2.5	70.4	72.9
Remington Arms Co., Inc....	2.3	97.7	0.4	16.8	17.2
Liggett & Myers Tobacco Co....	0.2	99.8	0.6	355.2	355.8
R. J. Reynolds Tobacco Co....	0.1	99.9	0.4	516.6	517.0
Industrial Rayon Corp....	.	100.0	...	51.9	51.9
A. E. Staley Mfg. Co....	.	100.0	.	49.0	49.0
American Enka Corp....	.	100.0	...	32.2	32.2
Permanente Metals Co..	.	100.0	..	30.3	30.3
Royal Typewriter Co., Inc..	.	100.0	..	23.4	23.4
Clinton Industries, Inc..	.	100.0	..	21.4	21.4
Parker Pen Co.....	..	100.0	.	15.9	15.9
Totals...	..	..	3,710.9	17,182.5	20,893.4
Per cent.....	19.8	80.2	17.8	82.2	100.0

* Although the initial assets of some of the firms appeared to represent, in the main, prior amalgamations, the initial asset figure for each firm is here treated as a base amount from which subsequent growth is measured, to avoid possible overstatement of acquisitions.

^b The beginning dates from which growth is measured vary, since the earliest years for which data can be obtained for the individual companies vary.

^c Amounts in thousands of net tons of steel ingots and castings.

SOURCE: Basic data sheets.

TABLE 9
 ARRAY BY PER CENT OF EXTERNAL GROWTH* OF INDIVIDUAL FIRMS
 THROUGH 1948, ^b GROUPS I, II, AND III COMBINED

Firm	Per cent acqui- sitions	Per cent internal growth	Acquisitions (\$ millions)	Internal growth (\$ millions)	Growth of Total assets (\$ millions)
B. F. Goodrich Co.....	75.8	24.2	123 5	39.4	162.9
The Borden Co.....	75.4	24.6	136 9	44.7	181.6
National Dairy Products Corp....	64.4	35.6	197.0	109 0	306.0
Republic Steel Corp.....	64.1	35 9	5,206 0°	2,909.6°	8,115.6°
Beatrice Foods Co.....	62.6	37.4	19.6	11.7	31.3
General Aniline & Film Corp....	62.3	37 7	27 8	16.8	44 6
Underwood Corp.....	60.0	40 0	16 2	10 8	27.0
Lone Star Cement Corp.....	58 0	42 0	28.0	20.3	48.3
National Distillers Products Corp..	55 0	45 0	108 1	88 3	196.4
U. S. Rubber Co.....	50 8	49 2	162.4	157.3	319.7
Bethlehem Steel Corp....	50 7	49.3	6,809.7°	6,615.1°	13,424.8°
L. C. Smith & Corona Type- writers, Inc.....	49 1	50.9	5.6	5 8	11.4
Air Reduction Co., Inc....	46 6	53 4	40.0	45.8	85.8
Remington Rand, Inc....	44 5	55 5	46.3	57.7	104 0
Armour and Co.....	44.3	55 7	143 1	179.8	322 9
Liquid Carbonic Corp....	44.0	56 0	18.8	23 9	42 7
Congoleum-Nairn, Inc.....	43 7	56 3	16.4	21.1	37.5
Continental Can Co., Inc.	43 3	56 7	89 8	117 4	207.2
National Cylinder Gas Co.	42 4	57.6	9 7	13.2	22 9
Schenley Industries, Inc.	39 9	60 1	129.2	194 3	323.5
Socony-Vacuum Co., Inc....	37 5	62.5	487.2	813.6	1,300 8
E. I. du Pont de Nemours & Co..	35 5	64 5	401 8	730 3	1,132.1
Union Carbide and Carbon Corp.	31 9	68.1	162 8	347 9	510.7
Standard Oil Co. (Indiana) ...	31.4	68 6	457.5	998 6	1,456.1
Standard Oil Co. of Calif.....	27.5	72.5	282 0	743.6	1,025.6
Jones & Laughlin Steel Corp....	27.0	73.0	1,026.9°	2,781.6°	3,808.5°
U. S. Steel Corp.....	26 5	73.5	5,485.0°	15,230 0°	20,715.0°
Corn Products Refining Co.	24.6	75.4	15.6	47.9	63.5
Chrysler Corp.....	23.2	76.8	105 9	349 9	455.8
Distillers Corp., Ltd.....	21.9	78.1	71.2	253.5	324.7
Westinghouse Electric Corp....	19.9	80 1	130.0	522.8	652.8
General Motors Corp.....	19 8	80.2	580.7	2,358 7	2,939.4
Hiram Walker-Gooderham & Worts, Ltd.....	17.2	82.8	22 1	106.6	128.7
Studebaker Corp.....	17.2	82.8	21.0	100 8	121 8
American Tobacco Co.....	16 5	83.5	89.8	453 0	542.8
Pet Milk Co.....	15 4	84.6	6.3	34 6	40.9
Armstrong Cork Co.....	14 3	85 7	12 0	71.9	83.9
General Electric Co.....	14.2	85.8	161 2	974 3	1,135.5
Carnation Co.....	13.6	86.4	8.9	56.5	65.4
Celanese Corp. of America....	13.3	86.7	32 9	214.2	247.1

TABLE 9—Continued

Firm	Per cent acqui- sitions	Per cent internal growth	Acquisitions (\$ millions)	Internal growth (\$ millions)	Growth of Total assets (\$ millions)
P. Lorillard Co.....	12.8	87.2	6.0	40.7	46.7
Wilson & Co., Inc.....	11.8	88.2	13.4	100.2	113.6
Standard Oil Co. (New Jersey) .	11.5	88.5	361.9	2,792.5	3,154.4
Philip Morris & Co., Ltd., Inc...	11.3	88.7	12.7	99.7	112.4
The Texas Co.....	9.9	90.1	124.5	1,132.0	1,256.5
American Viscose Corp.....	9.5	90.5	21.5	203.7	225.2
International Harvester Co. . .	9.1	90.9	50.1	501.7	551.8
Fairmont Foods Co.....	7.9	92.1	2.7	31.5	34.2
Swift & Co.....	7.6	92.4	37.8	456.5	494.3
Aluminum Co. of America.....	7.3	92.7	36.6	467.0	503.6
W. A. Sheaffer Pen Co.	7.2	92.8	1.0	12.9	13.9
Reynolds Metals Co.....	6.7	93.3	7.5	104.9	112.4
Penick & Ford, Ltd., Inc....	6.5	93.5	0.4	5.8	6.2
American Can Co.	6.0	94.0	11.6	181.7	193.3
Goodyear Tire & Rubber Co. .	5.5	94.5	23.2	400.4	423.6
Ford Motor Co.....	5.3	94.7	61.4	1,086.4	1,147.8
Eastman Kodak Co.	5.1	94.9	19.3	361.0	380.3
Deere & Co.....	4.9	95.1	12.4	238.2	250.6
Firestone Tire & Rubber Co...	4.1	95.9	13.9	325.9	339.8
J. I. Case Co.	3.4	96.6	2.5	70.4	72.9
Singer Mfg. Co.	3.0	97.0	5.3	173.8	179.1
Remington Arms Co., Inc..	2.3	97.7	0.4	16.8	17.2
Liggett & Myers Tobacco Co....	0.2	99.8	0.6	355.2	355.8
R. J. Reynolds Tobacco Co..	0.1	99.9	0.4	516.6	517.0
Industrial Rayon Corp..		100.0		51.9	51.9
A. E. Staley Mfg. Co.....		100.0		49.0	49.0
American Enka Corp.....		100.0		32.2	32.2
Permanente Metals Co.		100.0		30.3	30.3
Royal Typewriter Co., Inc. . .		100.0		23.4	23.4
Clinton Industries, Inc.....		100.0		21.4	21.4
Parker Pen Co.		100.0		15.9	15.9
Ideal Cement Co.....		100.0		10.3	10.3
Sloane-Blabon Corp... . .		100.0		5.8	5.8
Cudahy Packing Co.....	-11.5	111.5	-9.1	88.3	79.2
Totals.....			5,185.3	20,340.0	25,525.3
Per cent.....	22.6	77.4	20.3	79.7	100.0

* Although the initial assets of some of the firms appeared to represent, in the main, prior amalgamations, the initial asset figure for each firm is here treated as a base amount, from which subsequent growth is measured, to avoid possible overstatement of acquisitions.

^b The beginning dates from which growth is measured vary, since the earliest years for which data can be obtained for the individual companies vary.

^c Amounts in thousands of net tons of steel ingots and castings.

Source: Basic data sheets.

TABLE 10

GROWTH IN TOTAL ASSETS THROUGH 1948 OF COMPANIES FOR WHICH DATA
FOR YEARS PRIOR TO 1910 COULD BE SECURED, BY INDUSTRY ^a

Name of company	Initial year	Total assets initial year (\$ millions)	Total assets 1948 (\$ millions)
<i>Motor Vehicles</i>			
General Motors Corp.	1909	18.4	2,957.8
Ford Motor Co.	1907	1.4	1,149.2
<i>Meat Packing</i>			
Swift & Co.	1897	28.2	522.5
Armour and Co.	1909	124.8	447.7
Cudahy Packing Co.	1907	19.8	99.0
<i>Steel</i>			
U. S. Steel Corp.	1901	1,647.4	2,535.0
Bethlehem Steel Corp.	1905	43.8	1,029.0
Republic Steel Corp.	1900	51.4	489.1
<i>Electrical Machinery and Apparatus</i>			
General Electric Co.	1901	41.9	1,177.4
Westinghouse Electric Corp.	1902	40.8	693.6
<i>Rubber</i>			
Goodyear Tire & Rubber Co.	1908	1.4	425.0
U. S. Rubber Co.	1893	28.8	348.5
<i>Tin Cans</i>			
American Can Co.	1901	82.5	275.8
<i>Rayon</i>			
E. I. du Pont de Nemours & Co.	1902	57.2	1,189.3
<i>Agricultural Implements</i>			
International Harvester Co.	1902	120.0	671.8
Deere & Co.	1905	7.0	257.6
J. I. Case Co.	1908	3.7	76.6
<i>Petroleum Refining</i>			
Standard Oil Co. (New Jersey)	1906	371.6	3,526.0
The Texas Co.	1908	20.6	1,277.1
<i>Typewriters</i>			
Royal Typewriter Co., Inc.	1907	1.9	25.3
Remington Rand, Inc.	1908	24.0	128.0

TABLE 10—*Continued*

Name of company	Initial year	Total assets initial year (\$ millions)	Total assets 1948 (\$ millions)
<i>Corn Products</i>			
Corn Products Refining Co.....	1903	75.6	139.1
Clinton Industries, Inc.....	1905	8.8	30.2
<i>Sewing Machines</i>			
Singer Mfg. Co.....	1905	30.0	209.1
<i>Photographic Apparatus and Materials</i>			
Eastman Kodak Co....	1905	31.3	411.6
<i>Aluminum Products</i>			
Aluminum Co. of America.....	1888	.02	503.6
<i>Dairy Products</i>			
Beatrice Foods Co.....	1907	4.4	35.7
Totals.....	....	2,886.7	20,630.6
Increase in assets.....	....	.....	17,743.9
Per cent increase in assets.....	....	.....	614.5
Totals, excluding U. S. Steel.....	..	1,239.3	18,095.6
Increase in assets, excluding U. S. Steel....	..	.....	16,856.3
Per cent increase in assets, excluding U. S. Steel....	..	.....	1,204.9

* Industries are listed in the order in which they appeared in the original source, National Resources Committee, *The Structure of the American Economy* (Washington, 1939), pp. 239-262.
 SOURCE: Basic data sheets.

TABLE 11
GROWTH IN TOTAL ASSETS THROUGH 1948 OF ALL COMPANIES, BY INDUSTRY^a

Name of company	Initial year	Total assets initial year (\$ millions)	Total assets 1948 (\$ millions)
<i>Motor Vehicles</i>			
General Motors Corp.....	1909	18.4	2,957.8
Chrysler Corp.....	1925	85.6	541.4
Ford Motor Co.....	1907	1.4	1,149.2
Studebaker Corp.....	1911	7.4	129.2
<i>Meat Packing</i>			
Swift & Co.....	1897	28.2	522.5
Armour and Co.....	1909	124.8	447.7
Cudahy Packing Co.....	1907	19.8	99.0
Wilson & Co., Inc.....	1910	40.4	154.0
<i>Steel</i>			
U. S. Steel Corp.....	1901	1,647.4	2,535.0
Bethlehem Steel Corp.....	1905	43.8	1,029.0
Republic Steel Corp.....	1900	51.4	489.1
Jones & Laughlin Steel Corp.....	1922	172.8	379.1
<i>Electrical Machinery and Apparatus</i>			
General Electric Co.....	1901	41.9	1,177.4
Westinghouse Electric Corp.....	1902	40.8	693.6
<i>Cigarettes</i>			
American Tobacco Co.....	1913	143.9	686.7
R. J. Reynolds Tobacco Co.....	1911	13.7	530.7
Liggett & Myers Tobacco Co.....	1911	69.2	425.0
Philip Morris & Co., Ltd., Inc.....	1920	1.3	113.7
P. Lorillard Co.....	1911	49.7	96.4
<i>Rubber</i>			
Goodyear Tire & Rubber Co.....	1908	1.4	425.0
Firestone Tire & Rubber Co.....	1911	4.6	344.4
U. S. Rubber Co.....	1893	28.8	348.5
B. F. Goodrich Co.....	1912	98.8	261.7
<i>Tin Cans</i>			
American Can Co.....	1901	82.5	275.8
Continental Can Co., Inc.....	1912	14.5	221.7
<i>Rayon</i>			
American Enka Corp.....	1928	16.4	48.6
American Viscose Corp.....	1910	1.7	226.9
Celanese Corp. of America.....	1925	9.6	256.7
Industrial Rayon Co.....	1923	5.8	57.7
E. I. du Pont de Nemours & Co.....	1902	57.2	1,189.3

TABLE 11—Continued

Name of company	Initial year	Total assets initial year (\$ millions)	Total assets 1948 (\$ millions)
<i>Agricultural Implements</i>			
International Harvester Co.....	1902	120.0	671.8
Deere & Co.....	1905	7.0	257.6
J. I. Case Co.....	1908	3.7	76.6
<i>Petroleum Refining</i>			
Standard Oil of California.....	1911	48.9	1,074.5
Standard Oil (Indiana).....	1912	43.9	1,500.0
Standard Oil (New Jersey).....	1906	371.6	3,526.0
Socony-Vacuum Oil Co., Inc.....	1911	142.2	1,443.0
The Texas Co.....	1908	20.6	1,277.1
<i>Typewriters</i>			
Royal Typewriter Co., Inc.....	1907	1.9	25.3
L. C. Smith & Corona Typewriters, Inc...	1924	7.2	18.6
Remington Rand, Inc.....	1908	24.0	128.0
Underwood Corp.....	1910	14.6	41.6
<i>Ammunition and Related Products</i>			
Remington Arms Co., Inc.....	1920	37.9	55.1
<i>Ink</i>			
Parker Pen Co.....	1924	3.6	19.5
W. A. Sheaffer Pen Co.....	1927	3.6	17.5
<i>Asphalted-Felt-Base Floor Coverings</i>			
Armstrong Cork Co.....	1920	25.2	109.1
Congoleum-Nairn, Inc.....	1919	6.1	43.6
Sloane-Blabon Corp.....	1931	12.4	18.2
<i>Corn Products</i>			
Corn Products Refining Co.....	1903	75.6	139.1
Clinton Industries, Inc.....	1905	8.8	30.2
A. E. Staley Mfg. Co.....	1920	8.8	57.8
Penick & Ford, Ltd., Inc.....	1919	10.7	16.9
<i>Compressed and Liquefied Gases</i>			
Union Carbide and Carbon Corp.....	1920	212.0	722.7
Air Reduction Co., Inc.....	1919	8.7	94.5
Liquid Carbonic Corp.....	1916	6.6	49.3
National Cylinder Gas Co.....	1936	4.2	27.1
<i>Sewing Machines</i>			
Singer Mfg. Co.....	1905	30.0	209.1

TABLE 11—*Concluded*

Name of company	Initial year	Total assets initial year (\$ millions)	Total assets 1948 (\$ millions)
<i>Photographic Apparatus and Materials</i>			
Eastman Kodak Co.....	1905	31 3	411.6
General Aniline & Film Corp.....	1929	66 0	110 6
<i>Aluminum Products</i>			
Aluminum Co. of America.....	1888	.02	503.6
Reynolds Metals Co.....	1928	8.9	121.3
Permanente Metals Co.....	1947	3 0	33 3
<i>Liquors</i>			
Hiram Walker-Gooderham & Worts, Ltd.	1928	25 8	154.5
Schenley Industries, Inc.....	1933	18 5	342 0
Distillers Corp., Ltd.....	1929	21 5	346.2
National Distillers Products Corp.	1924	18 2	214 6
<i>Dairy Products</i>			
The Borden Co.	1919	60 6	242.2
National Dairy Products Corp..	1923	11 6	317 6
Beatrice Foods Co..	1907	4 4	35.7
Fairmont Foods Co.	1914	2.3	36.5
Carnation Co.....	1919	17 3	82.7
Pet Milk Co..	1924	9 2	50 1
<i>Cement</i>			
Lone Star Cement Co..	1919	12 4	60.7
Ideal Cement Co.....	1927	26.6	36.9
Totals..	...	4,520.6	32,562.7
Increase in assets....	...	.....	28,042.1
Per cent increase in assets	...	.....	620.3
Totals, excluding U. S. Steel	...	2,873.2	30,027.7
Increase in assets, excluding U. S. Steel...	...	.....	27,154 5
Per cent increase in assets, excluding U. S. Steel.	...	.	945.1

* Industries are listed in the order in which they appeared in the original source, National Resources Committee, *The Structure of the American Economy* (Washington, 1939), pp. 239-262.
SOURCE: Basic data sheets.

TABLE 12
DATES AND NUMBER OF COMPANIES OR PLANTS ABSORBED IN THE FORMATION OF THE DOMINANT FIRMS
IN 20 INDUSTRIES AROUND 1900

Industry	Dominant firms	Dates of large acquisitions	Number of companies absorbed	Per cent of U. S. production or sales	Sources
Motor vehicles.....	General Motors Corp.	1908-1910	25	.....	E 154
Meat packing.....	n.d.f. ^a	.....	..	.....	.....
Steel.....	U. S. Steel Corp.....	1901	8	60 6	C 119
Electrical machinery and apparatus.....	General Electric Co.....	1900-1903	8	90 (with Westinghouse)	A 249
Cigarettes.....	American Tobacco Co.....	1890-1904	150	90	A 96
Rubber.....	U. S. Rubber Co.....	1892	13	50	A 281-282
Tin cans.....	American Can Co.....	1901	123	65-75	A 216
Rayon.....	n.d.f.	.....	..	.....	.....
Agricultural implements.....	International Harvester Co.....	1902	6	about 70	A 252
Petroleum refining.....	Standard Oil Co.....	1882	400	84	A 132
Typewriters.....	Union Typewriter Co.....	1893	5	75	A 274
Ink.....	n.d.f.	.....	..	.....	.....
Asphalted-felt-base floor covering.....	n.d.f.	.....	..	.....	.....
Corn products.....	American Sugar Refining Co.....	1891	55	70-90	A 64, 69
Compressed and liquefied gases.....	n.d.f.	.....	..	.....	.....
Sewing machines.....	Singer Mfg. Co.....	.....	..	100	B 193
Aluminum products.....	Aluminum Co. of America.....	.....	..	90	D 536
Liquors.....	Distillers Security Corp.....	1902	93	60	A 246
Dairy products.....	The Borden Co.....	.....	7	large	A 239
Cement.....	American Cement Co.....	1899	6	small	A 218-219

^a n.d.f. No dominant firm around 1900.

SOURCES cited are the following:

A—John Moody, *The Truth About the Trusts* (New York: Moody Publishing Co., 1904). B—U. S. Industrial Commission, *Report of the Industrial Commission, Vol. XIII* (Washington: 1901). C—Charles R. Van Hise, *Concentration and Control, A Solution of the Trust Problem in the United States* (New York, Macmillan Co., 1914). D—Don H. Wallace, *Market Control in the Aluminum Industry* (Cambridge: Harvard University Press, 1938). E—Lawrence H. Seltzer, *A Financial History of the American Automobile Industry* (Boston: Houghton Mifflin, 1928).

TABLE 13

ROLE OF ACQUISITIONS IN THE DEVELOPMENT OF OLIGOPOLY IN 12 MAJOR INDUSTRIES

(1) Firms grouped by industry	(2) Initial dates	(3) Total assets 1948	(4) Growth by acquisitions, assets in initial year treated as base amount		(5) Growth by acquisitions, initial year assets of dominant firms treated as in Col. (4); initial year assets of other firms treated as acquisitions	
			(\$ millions)	(per cent)	(\$ millions)	(per cent)
U. S. Steel Corp. ^a	1901	31,277.0	5,485.0	26.5	5,485.0	26.5
Bethlehem Steel Corp. ^a	1905	13,800.0	6,809.7	50.7	7,184.9	52.1
Republic Steel Corp. ^a	1900	8,600.0	5,206.0	64.1	5,690.4	66.2
Jones & Laughlin Steel Corp. ^a	1922	4,816.5	1,026.9	27.0	2,034.9	42.2
American Tobacco Co.	1913	686.7	89.8	16.5	89.8	16.5
R. J. Reynolds Tobacco Co.	1911	530.7	0.4	0.1	14.1	2.7
Liggett & Myers Tobacco Co.	1911	425.0	0.6	0.2	69.8	16.4
Philip Morris & Co., Ltd., Inc.	1920	113.7	12.7	11.3	14.0	12.3
P. Lorillard Co.	1911	96.4	6.0	12.8	55.7	57.8
U. S. Rubber Co.	1893	348.5	162.4	50.8	162.4	50.8
Goodyear Tire & Rubber Co.	1908	425.0	23.2	5.5	24.6	5.8
B. F. Goodrich Co.	1912	261.7	123.5	75.8	222.3	84.9
Firestone Tire & Rubber Co.	1911	344.4	13.9	4.1	18.5	5.4
American Can Co.	1901	275.8	11.6	6.0	11.6	6.0
Continental Can Co., Inc.	1912	221.7	89.8	43.3	104.3	47.0
International Harvester Co.	1902	671.8	50.1	9.1	50.1	9.1
Deere & Co.	1905	257.6	12.4	4.9	19.4	7.5
J. I. Case Co.	1908	76.6	2.5	3.4	6.2	8.1
Standard Oil Co. (New Jersey)	1906	3,526.0	361.9	11.5	361.9	11.5
Standard Oil Co. of Calif.	1911	1,074.5	282.0	27.5	330.9	30.8
Standard Oil Co. (Indiana)	1912	1,500.0	457.5	31.4	501.4	33.4
Socony-Vacuum Oil Co., Inc.	1911	1,443.0	487.2	37.5	629.4	43.6
The Texas Co.	1908	1,277.1	124.5	9.9	145.1	11.4

TABLE 13—Continued

(1) Firms grouped by industry	(2) Initial dates	(3) Total assets 1948 (\$ millions)	(4) Growth by acquisitions, assets in initial year treated as base amount		(5) Growth by acquisitions initial year assets of dominant firms treated as in Col. (4); initial year assets of other firms treated as acquisitions	
			(\$ millions)	(per cent)	(\$ millions)	(per cent)
Corn Products Refining Co....	1903	139.1	15.6	24.6	15.6	24.6
Clinton Industries, Inc....	1905	30.2	0.0	0.0	8.8	29.1
A. E. Staley Mfg. Co....	1920	57.8	0.0	0.0	8.8	15.2
Penick & Ford, Ltd., Inc..	1919	16.9	0.4	6.5	11.1	65.7
Eastman Kodak Co.	1905	411.6	19.3	5.1	19.3	5.1
General Aniline & Film Corp.....	1929	110.6	27.8	62.3	93.8	84.8
Aluminum Co. of America	1888	503.6	36.6	7.3	36.6	7.3
Reynolds Metals Co.	1928	121.3	7.5	6.7	16.4	13.5
Permanente Metals Co..	1947	33.3	0.0	0.0	3.0	9.0
Remington Rand, Inc....	1908	128.0	46.3	44.5	46.3	44.5
Royal Typewriter Co., Inc....	1907	25.3	0.0	0.0	1.9	7.5
L. C. Smith & Corona Typewriters, Inc.....	1924	18.6	5.6	49.1	12.8	68.8
Underwood Corp..	1910	41.6	16.2	60.0	30.8	74.0
Distillers Corp....	1929	346.2	71.2	21.9	71.2	21.9
Schenley Industries, Inc..	1933	342.0	129.2	39.9	147.7	43.2
Nat'l Distillers Products Corp....	1924	214.6	108.1	55.0	126.3	58.9
Hiram Walker-Gooderham & Worts, Ltd.....	1928	154.5	22.1	17.2	47.9	31.0
Singer Mfg. Co.....	1905	209.1	5.3	3.0	5.3	3.0

^a Data are in thousands of net tons of steel ingots and castings.
SOURCE: Basic data sheets.

TABLE 14
MAJOR INFLUENCES IN THE DEVELOPMENT OF OLIGOPOLY
IN 22 IMPORTANT INDUSTRIES

I. Oligopoly by court dissolution or government investigation and the pressure of public opinion
Tobacco
Agricultural implements
Petroleum
Corn products refining
Aluminum
II. Oligopoly by merger
Automobile ^a
Steel
Rubber ^a
Can
Ammunition
Floor-covering
Compressed and liquefied gases
Photographic supplies ^a
Whiskey distilleries
Dairy products
Cement
Typewriters
III. Oligopoly resulting from extensive internal development of a few firms
Automobile ^b
Meat packing
Electrical equipment
Rubber ^b
Rayon
Ink
Photographic supplies ^b
Sewing machines

^a Also included in group III.

^b Also included in group II.

SOURCE: Basic data sheets.

TABLE 15
MERGERS AND ACQUISITIONS IN MANUFACTURING AND MINING
BY QUARTERS, 1919-1947

Year	Net number of firms disappearing ^a				Total ^b
	1st quarter	2d quarter	3d quarter	4th quarter	
1919.....	57	82	147	125	438
1920.....	209	186	188	166	760
1921.....	184 ^c	99	80	122	487
1922.....	86	53	82	76	309
1923.....	84	67	44	105	311
1924.....	110	71	87	85	368
1925.....	124	104	127	175	554
1926.....	286	236	171	146	856
1927.....	161	247	220	213	870
1928.....	197	315	242	274	1,058
1929.....	349	395	312	160	1,245
1930.....	204	237	156	189	799
1931.....	163	142	87	71	464
1932.....	7	102	46	40	203
1933.....	19	43	33	12	120
1934.....	19	25	34	23	101
1935.....	36	27	38	24	130
1936.....	39	25	27	32	126
1937.....	32	27	29	31	124
1938.....	32	20	22	33	110
1939.....	24	22	16	25	87
1940.....	17	32	19	32	100
1941.....	13	18	17	33	81
1942.....	14	13	29	37	93
1943.....	26	29	36	43	134
1944.....	38	50	57	62	207
1945.....	59	54	61	121	295
1946.....	96	114	107	91	408
1947.....	99	98	92	111	400

^a Number of concerns merged less number of mergers plus concerns acquired.

^b Annual totals are larger than the sum of quarterly figures, because they include a small number of cases where exact dates were not available.

^c Includes one merger of 60 concerns.

SOURCE: 1919-1939, Willard L. Thorp, "The Merger Movement," in *The Structure of Industry*, Temporary National Economic Committee, No. 27, table 1, p. 233; 1940-1945, Smaller War Plants Corporation, *Economic Concentration and World War II* (Washington, 1946) p. 350; 1946-1947, Federal Trade Commission, *The Merger Movement* (Washington, 1948), interpolated from chart 2 facing p. 18.

TABLE 16
TIME DISTRIBUTION OF ACQUISITIONS OF 74 FIRMS, 1891-1948

Year	Number of acquisitions by 74 firms	Total amount of acquisitions by 74 firms (\$ millions)	Per cent of total amount of acquisitions, 1891-1948
1891.....	1	7.2	0.1
1892.....	..	...	...
1893.....	..	...	...
1894.....	2	12.8	0.2
1895.....	1	1.3	0.01
1896.....	..	...	...
1897.....	1	0.1	0.001
1898.....	1	5.5	0.1
1899.....	2	29.2	0.5
1900.....	2	1.3	0.01
1901.....	1	1.5	0.01
1902.....	5	63.7	1.0
1903.....	3	8.5	0.1
1904.....	4	204.3	3.2
1905.....	4	38.3	0.6
1906.....	5	35.2	0.5
1907.....	5	70.0	1.1
1908.....	3	17.4	0.3
1909.....	..	...	...
1910.....	5	29.3	0.4
1911.....	4	21.6	0.3
1912.....	4	30.9	0.5
1913.....	4	30.4	0.5
1914.....	2	11.8	0.2
1915.....	3	96.4	1.4
1916.....	3	24.1	0.4
1917.....	11	100.9	1.7
1918.....	10	201.3	3.2
1919.....	11	175.2	2.7
1920.....	16	137.1	2.1
1921.....	9	69.1	1.1
1922.....	10	139.5	2.2
1923.....	10	325.7	5.1
1924.....	11	58.1	0.9
1925.....	19	494.7	7.8
1926.....	20	356.1	5.5
1927.....	15	61.2	0.9
1928.....	27	429.1	6.7
1929.....	26	616.2	9.6
1930.....	32	622.0	9.7
1931.....	18	508.6	8.0
1932.....	11	234.5	3.6
1933.....	12	45.1	0.7
1934.....	13	56.0	0.9

TABLE 16—*Continued*

Year	Number of acquisitions by 74 firms	Total amount of acquisitions by 74 firms (\$ millions)	Per cent of total amount of acquisitions, 1891-1948
1935	20	208.6	3.2
1936	17	24.0	0.4
1937	16	40.6	0.6
1938	10	33.2	0.5
1939	8	49.5	0.7
1940	13	-24.6	-0.5
1941	12	37.9	0.6
1942	12	93.7	1.4
1943	10	84.6	1.3
1944	15	93.9	1.4
1945	19	102.3	1.6
1946	20	174.6	2.7
1947	18	116.8	1.9
1948	6	36.0	0.5
Totals	542	6,442.3	100.0

Source: Basic data sheets.

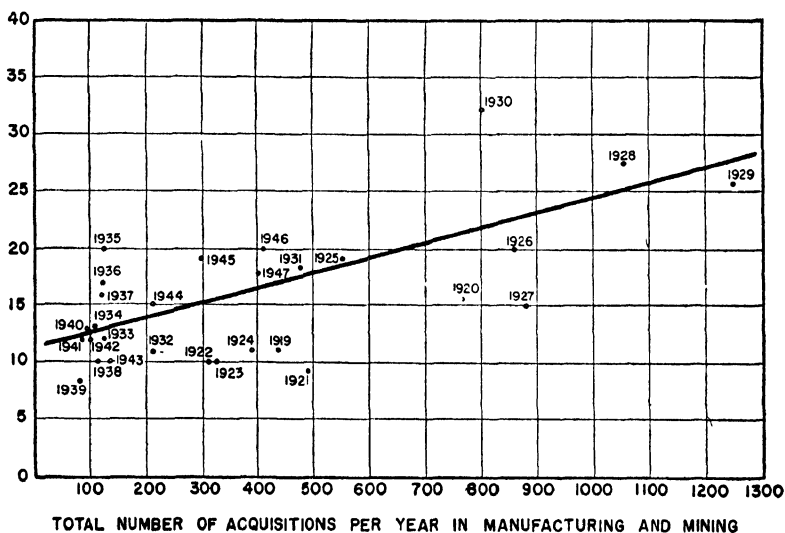
NUMBER OF ACQUISITIONS
FOR 74 FIRMS IN THIS STUDY

Fig. 2. Relationship between number of acquisitions of firms studied and total number of disappearances, 1919-1947.

Source: Appendix E, tables 15, 16.

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