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THE 1919 - 1930 MERGER MOVEMENT IN AMERICAN INDUSTRY

by

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CHAPTER 1

INTRODUCTION

Mergers are the combination of two or more companies into one. As such, all mergers have the immediate effect of reducing the number of independent decision-making units in the economy. Whether this reduction has a significant effect on the structure of the economy and the degree of concentration depends on the size and composition of merger activity. The divergence of views on merger effects found among both economists[1] and legislators reflects, in part, the lack of reliable and comprehensive merger data.

Students of industrial organization[2] generally agree that there have been three distinct merger movements in America's industrial period. The first took place around the turn of the century, its peak years being 1898 through 1902. The second merger movement began after World War I and reached its peak in the late 1920's. The third has been underway at least since the end of World War II and possibly since 1940.

The three merger waves have been the subject of a number of statistical studies of varying scope. The most comprehensive analysis of the first movement is presented by Ralph Nelson in Merger Movements in American Industry 1895-1956. This study measured merger activity in the manufacturing and mining sectors by the number of firm

disappearances through consolidation and acquisition, and the capitalization of firms entering into merger. Merger activity was further classified according to its industrial composition, time pattern, size distribution and merger process, and the results used to test some of the leading explanations for this merger wave.

Since 1940, the primary source of merger data has been the Federal Trade Commission. Its detailed studies[3] provide a comprehensive record of merger activity classified by size of acquiring firm, size of acquired firm, and by industry. Large mergers are further classified by type of integration achieved, enabling an estimate of the effects of mergers on levels of concentration.

For the 1920's, the only comprehensive statistical examination of mergers was made by Willard Thorp.[4] While comprehensive, Thorp's series dealt primarily with the number of mergers. He also classified mergers by broad industrial groupings through 1928. However the merger data are otherwise unclassified,[5] and the 1920's are the least well documented of the three waves.

The need for additional data for the 1920's is reflected in the wide divergence of opinion over the direction and significance of this merger movement. Markham contends that their monopoly effects may have been small: "Mergers of all kinds in the 1920's typically embraced a relatively small proportion of the total firms in their respective industries and for one reason or another firms that had not

previously competed with each other."[6] He presents some examples of chain and conglomerate mergers and concludes that,

> While such illustrative cases permit no sweeping generalizations, they suggest that a large portion of the mergers formed in the 1920's brought together firms producing totally different lines of products, the same products in noncompeting territories, or firms engaged in different stages of fabrication. They contributed to a concomitant increase in concentration of control of assets, but it is much less certain that, on balance, they measurably affected monopoly power in specific market areas.[7]

This differs sharply from the views of Butters, Lintner and Cary:

> The movement of the 1920's was comparably broad in the number of industries covered - indeed the breadth and magnitude of the movement have caused the entire period to be referred to as the 'era of consolidations.' Oil, steel and copper were outstanding in terms of mergers between the already largest companies in the basic industries. Merger activity in these years was most active in the iron, steel and machinery group which accounted for about one-fifth of the mergers and acquisitions in manufacturing and mining. Without doubt the merger movement of the 1920's not only significantly increased overall levels of concentration but did so to a substantial extent in the important heavy industry group, as well as in less primary industries.[8]

Economists also differed in their views as to the extent to which the movement resembled that of the turn of the century. Stocking and Watkins maintain that:

> In the twenties the climate of opinion had become favorable once more to the onward march of big business. The combination of a business boom characterized by headlong speculation, the friendly attitude of the Coolidge administration toward industrial concentration, . . . practically duplicated the situation at the turn of the century under the McKinley administration.[9]

Arthur Stone Dewing came to a different conclusion.

Referring to the period of the twenties, he writes

> These later consolidations differed in many important respects from the consolidations of twenty or more years before. In the first place, no attempt was made to secure all the plants of a given industry - good, bad and indifferent - in the confident hope that thereby competition could be suppressed. . . . The consolidation of separate and independent plants was a mere incident to expansion. . . . Altogether, however, industrial consolidation was not the outstanding feature of the rising tide of business that culminated in 1929.[10]

These differences of opinion arise mainly from the lack of a comprehensive, multi-dimensional empirical study of this period in merger history. According to Markham, " . . . until both disappearances and census data have been broken down into much finer classifications, quantitative measurement of the effect of the 1919-1930 merger movement on the structure of all industries can proceed no farther."[11] The lack of comprehensive, classified data led him to conclude that, "No one has yet written the 'Truth about Mergers' for the 1920's."[12]

In addition to providing answers to questions about merger effects in the 1920's, a set of comprehensive data can be used to examine more general questions about the causes and consequences of mergers viewed historically, and their implications for public policy.

One important issue is whether merger activity is more directly associated with periods of prosperity or with periods of depression. It can be argued that the primary motivational force underlying merger activity is the drive to achieve greater efficiency and reduce costs. If this is

true, one might expect to find mergers occurring in periods of declining demand, since the need for increased efficiency becomes greater in periods of industry depression.

On the other hand mergers may be considered to be a form of investment and expansion - external expansion as an alternative to the growth of the firm through internal expansion. Using this approach to mergers, one would expect to find merger time patterns similar to those of investment series. According to this view mergers are more directly associated with periods of prosperity and should exhibit pro-cyclical patterns.

Detailed merger data for the 1920's, by completing an important section in the recorded time series, permit a more definitive test of the relationship of mergers to the business cycle. Such data also permit a related examination of the association between mergers within an industry and the industry's pattern of acceleration and retardation in growth rates.

Another important use of such data would be to measure the effects of anti-trust legislation on patterns of merger activity. Does the mere existence of anti-trust laws provide an effective barrier to widespread merger activity? If not, can vigorous enforcement yield satisfactory economic results? The experience of the first large merger wave to follow the passage of the Clayton Act can yield important information concerning these questions.

On a related issue, Prof. Stigler has compared[13] mer-

ger patterns before and after 1950 as a method of testing the effectiveness of the 1950 anti-merger amendment to the Clayton Act. His conclusions are qualified because he had no relevant data for the period before 1948. This led him to remark, "Unfortunately the extent of horizontal mergers in earlier times has not been measured - it seems incredible but it is true that all forms of merger are combined in the standard merger series. . . . The deficiency in the statistical history of mergers is of course remediable."[14] A comprehensive set of data for the period of the 1920's providing this type of classification can be used to further illuminate this important question.

CHAPTER 1 - NOTES

1. For example, see J. Fred Weston, The Role of Mergers in the Growth of Large Firms (Berkeley: University of California Press, 1953), and George Stigler, "The Statistics of Monopoly and Merger," Journal of Political Economy, LXIV, (February, 1956).
2. Jesse Markham, "Survey of the Evidence and Findings on Mergers," Business Concentration and Price Policy, A Conference of the Universities - National Bureau Committee for Economic Research (Princeton: Princeton University Press, 1955); Ralph Nelson, Merger Movements in American Industry 1895-1956 (Princeton: Princeton University Press for National Bureau of Economic Research, 1959); J. F. Butters, J. Lintner and W. L. Cary, Effects of Taxation: Corporate Mergers (Boston: Harvard University Graduate School of Business Administration, 1951).
3. U. S., Federal Trade Commission, The Merger Movement, A Summary Report (Washington: U. S. Government Printing Office, 1948); U. S., Federal Trade Commission, Report on Corporate Mergers and Acquisitions (Washington: U. S. Government Printing Office, 1955). The results of later studies have been presented before Congressional Committees.
4. Merger data for 1919-1928 are presented in "The Changing

Structure of Industry," Recent Economic Changes in the United States, Report of the President's Conference on Unemployment (2 Vols.; New York: McGraw-Hill Book Co., 1929), Vol. I, pp. 167-218. The series is extended by Thorp in "The Merger Movement," Monograph No. 27 The Structure of Industry, Temporary National Economic Committee (Washington: U. S. Government Printing Office, 1941), pp. 231-234.

5. A more detailed discussion of these two studies and their limitations will be presented in Chapter 2.
6. Jesse Markham, "Survey of the Evidence and Findings on Mergers," Business Concentration and Price Policy, p. 170.
7. Ibid., p. 171.
8. Effects of Taxation: Corporate Mergers, pp. 297-299.
9. G. W. Stocking and M. Watkins, Cartels or Competition (New York: Twentieth Century Fund, 1948), p. 16n.
10. Arthur Stone Dewing, The Financial Policy of Corporations (2 Vols.; 4th ed.; New York: The Ronald Press Co., 1941), Vol. II, pp. 928-929.
11. "Survey of the Evidence and Findings on Mergers," Business Concentration and Price Policy, p. 171.
12. Ibid., p. 167.
13. "The Economic Effects of the Anti-trust Laws," Journal of Law and Economics, IX, (October, 1966).
14. Ibid., p. 234.

CHAPTER 2

SCOPE AND METHOD OF RESEARCH

Introduction

This chapter describes the procedures and methods used in assembling, verifying and organizing the data that are the bases for this study. A principal purpose of the study is to describe, for the first time and in precise terms a number of important dimensions of the merger activity that took place in the period 1919-1930. The chapter thus provides an assessment of the reliability and scope of the study, and its limitations.

Existing Studies of This Merger Movement

The only comprehensive existing studies of merger activity for the years 1919-1930, are two made by Willard Thorp. The first appeared in Recent Economic Changes[1] and covered the period through 1928. The second represents an extension of time series through the 1930's and appeared in T.N.E.C. Monograph 27, The Structure of Industry.[2]

Thorp's data were derived primarily from the Standard Daily Trade Service and are limited to manufacturing and mining. The measures of merger activity used are the number of concerns disappearing through mergers and acquisition, and the number of mergers. There are no size data nor are there classifications by

geographical location or type of integration achieved. Several broad industrial groupings are used to classify the mergers, but only for the period 1919-1928, and with none for the high merger years 1929 and 1930. The data are presented as a time series of firm disappearances, both annually and quarterly.

Thorp's method of compilation and his description suffer from two important shortcomings, which he himself acknowledges.

> The record is neither complete nor accurate . . . The record has been compiled on a quarterly basis, although it was often difficult to allocate exactly by time. The original reports often failed to distinguish between agreement, ratification or actual merging.[3]

This meant that 1) mergers may have been included on the basis of 'merger talk' or tentative agreement, without actually having taken place; 2) the reported timing of actual mergers may have been distorted, with biases toward both early and late reporting. The time of announcement of a completed merger is often several months after the event, and more time may elapse before it is reported in the press. On the other hand, many mergers were reported completed even before the stockholders had voted their approval.

Another serious shortcoming is the absence of any data on size, so that the disappearances of small and large firms are treated equally. Thorp recognized this when he wrote:

> It is unfortunate that no measure of mergers and acquisitions can be obtained other than the number of concerns involved. Certain of the instances involve the largest

industrial enterprises in the country, while others refer to small and local manufacturing establishments. In at least three months . . ., the figures, on the basis given are distorted because mergers were consummated involving a large number of small concerns.[4]

This study attempts to overcome these difficulties and so present a more comprehensive and accurate picture of this important period in merger history. Although the firm-by-firm record on which Thorp's series are based were not available for comparison, this study's coverage and conclusions are compared to Thorp's, later in this chapter, using whatever detail the Thorp study contains in making comparisons.

Scope of the Study

The study is limited to merger activity in the manufacturing and mining sectors of the economy. These are sectors characterized by the operation of free markets as contrasted to transportation, finance and public utilities, where direct public regulation is an important influence. A study of mergers as a form of business decision making and growth policy has greatest relevance in the free market sector. Moreover, since competitive markets are a primary goal of public policy in these sectors, the concern about the effects of mergers on industry structure and performance requires an examination of such effects.

The study does not deal with all the free market sectors of the economy however, and an important reason for confining it to manufacturing and mining is the availability of data. Much more information is available for

these sectors than for agriculture, trade, and services the principal other areas in which firms operate in a free market setting. Moreover these are the only sectors for which historical and cross sectional comparisons are possible, since other studies covering the same, preceding and succeeding periods examine only manufacturing and mining mergers.

The study covers the period 1919-1930. It begins with mergers consummated after January 1, 1919, as does Thorp's series, and so covers the post-World War I peak in merger activity. This also provides a two year overlap with the Nelson series of 1895-1920. The terminal year is 1930, the first year in the decline following the 1929 peak, and a year of significant merger activity.

As mentioned above, a principal purpose of the study was to measure and describe the merger movement in a number of ways, and thereby lay a foundation for a variety of analyses. The study thus presents data on the following dimensions:

1. Time Pattern
2. Industrial Composition
3. Merger Process (Consolidation or Acquisition)
4. State of Incorporation
5. Type of Integration (Horizontal, Vertical, etc.)

Compilation and Verification

Drawing from information in the financial press, a

basic card file on mergers was assembled. The main source of data was the weekly Commercial and Financial Chronicle. The Investment News Pages were read covering the years 1919-1930, and all items relating to mergers were recorded, with as much detail as given. Earlier and later news about the companies involved were checked, to provide more information about the firms' activities and size.

Every merger news item recorded was then checked in Moody's Manual for the year of and the four years following the merger. This procedure provided more specific information about whether the merger had been consummated and whether it was a true merger of independent companies. It was not uncommon to find evidence that the apparently merging firms had been under the same control even though not formally merged, or evidence that the merger had not been consummated or evidence that the firm was not in manufacturing or mining. The criterion for including a merger was that it represented the disappearance of a separate decision making entity engaged in manufacturing or mining. Thus mergers of subsidiaries or the sale of a subsidiary to another firm were not included.[5]

In general the rule adopted in this compilation was that any multifirm consolidation not verified in Moody, or in subsequent editions of the Chronicle, was not included in the list. Acquisitions not later verified in Moody or the Chronicle nevertheless were counted if the original statement in the Chronicle was a definitive one. The reason for the difference is that acquisitions were

less likely to have been promoter's dreams, and it was felt that a definitive statement (as contrasted to 'merger under way,' 'merger negotiations') was likely to be true.

The verification procedure was also valuable in providing additional information about the size and activities of the acquiring and the acquired firms and the date of the merger. The information gained from the Chronicle and from Moody's Manual often complemented one another and enabled the writer to gain a comprehensive picture of the sequence of events that led up to the merger.

Cut-Off Limit

Using the financial reporting services as the primary source of data undoubtedly causes certain sampling biases. The financial news reporters were probably more interested in and able to get a more complete coverage of larger mergers than of smaller ones. The result is that the list here compiled probably contains a relatively more complete record of larger than of smaller mergers.

The device of the lower cut-off limit, excluding all mergers below a given size, can be used to handle this type of sampling bias. This provides some assurance that the sample represents a fairly complete list of large mergers and permits a reliable description to be made of various dimensions of the merger movement, at least for mergers above the given size level. A cut-off limit was not applied to the data assembled in this study, for two reasons. First, a cut-off limit which attempted to exclude

mergers below a given size would be applied to a list for which size data were not available for all mergers. This would result in omitting many firms above the given size level, and so could introduce probably more serious biases. Furthermore, when considering multifirm consolidations, the use of any cut-off limit, would inevitably have ambiguous results. For example, assuming a cut-off limit for merged firm size of $1 million, the acquisition of a $350,000 firm by a $640,000 firm would be excluded, while the simultaneous consolidation of three $340,000 would be included. If, however, a cut-off limit for acquiring firm size of $600,000 were used, the three firm merger would be excluded, and the two firm merger would be included. In neither case does it seem consistent to include one of the mergers and not the other.

The data as compiled seem to have a "built in" cut-off limit (Table 2-1). This suggests that consolidations smaller than $1 million were not nearly as fully reported as larger ones. Only 16, or 4.3% of the total reported were smaller than $1 million. Column 3 shows that starting from the largest size, the number of consolidations per $500,000 interval increased as asset size falls until $1 million, after which it fell sharply. It thus appears that the number of reported consolidations drops off sharply below the $1 million level, even though the number of firms of these smaller sizes is relatively large.

Because several alternate measures were used to determine the size of acquisitions, a frequency distribution of

TABLE 2-1

Frequency Distribution of the Asset Size of Consolidations 1919-1930

Asset Size Millions of Dollars	Number of Consolidations	Number of Consolidations Per $500,000 Class Interval
0 - .499	2	2
.5 - .999	14	14
1.0 - 1.499	31	31
1.5 - 3.499	84	21
3.5 - 6.499	84	14
6.5 - 11.499	78	7.8
11.5 - 26.499	50	1.6
26.5 - 56.499	18	0.3
56.5 - 99.499	6	0.07
99.5 - --	5	--

their size was not constructed. However, it seems fairly clear that the sample of acquisitions "cuts itself off" quite abruptly at the acquisition of firms whose pre merger size was below $100,000.

There may have been a change in the pattern of coverage over the period, reflecting in part changes in the price level of business capital. If, for example, the price level of business capital for 1919 was considerably below that for 1930, the $1 million lower cut-off limit apparently imposed by the financial press, other things equal, would produce a larger sample of mergers for the later year than for the earlier year. The merger activity of 1930 would consequently be overstated relative to that of 1919. A substantial change in the price of business capital therefore could distort inter-temporal comparisons.

Although data concerning changes in the level of capital prices are fragmentary, two sources are useful. A

comparison of 1919 total capital in manufacturing expressed in both current prices and in 1929 prices, based on data from Creamer, Dobrovolsky and Borenstein[6] indicates that, with 1929=100, the implicit price index of total capital in 1919 is 87.4. Lowell J. Chawner[7] estimated manufacturing investment in plant and equipment for 1915-1939 on an annual basis, both in current and in 1939 prices. The implicit price index derived from his data with 1939=100 indicates that for the twelve year period 1919-1930, the index for seven of the twelve years fell between 99.0 and 102.1. For four other years the index ranged between 94.1 and 106.2, and one year it stood at 115.3. The maximum price variation was thus approximately 25%.

Applying this to the $1 million consolidation cut-off point in the lowest price year, would make $1.25 million the equivalent in physical size for the highest price year. Only 17 of the 372 consolidations over the twelve year period were between $1.0 million and $1.25 million. Since in most of the years the price variation was much smaller, it appears that price level changes in business capital within this twelve year period were not of sufficient magnitude to seriously reduce the inter-year comparability of the time series.

Merger Process

For a number of purposes it is instructive to distinguish between consolidations and acquisitions. A consolidation is defined in this study, as a more-or-less

simultaneous combination of three or more firms into one new corporate entity. On the other hand, an acquisition is the purchase by an operating company of the assets of another operating company or of enough stock to give it control. The economic motives and behavior leading to a consolidation may differ from those leading to an acquisition, and so it may be important to examine the relative importance of each form, as this has varied over time and among industries.

In this context, there was a question about classifying a two-firm consolidation, i. e., the merging of two firms into a new corporate entity. In many respects this type of transaction is the equivalent of an acquisition. There is only one less decision making firm in existence, and it was often difficult to distinguish between a two-firm consolidation and a reincorporation subsequent to an acquisition of another firm, an action essentially incidental to the acquisition. For these and other reasons, two-firm consolidations are considered as acquisitions wherever this distinction is made in the descriptive and analytical section to follow. However, tables are also presented using the alternative method of considering two-firm consolidations as consolidations. This was done to permit comparisons with other studies using the latter definition. It might be noted that the use of the alternative method did not significantly modify any of the conclusions reached in the next chapter.

To make the number of disappearances by acquisition

and consolidation more comparable, consolidation disappearances always refer to net disappearances. For example, if four independent firms merge and form a new consolidated corporation, there are three less independent firms in existence, making only three net disappearances.

The Assignment of Dates

The following conventions for dating the merger were used. Consolidations were dated from the date the new firm was incorporated. Any additional firms entering the consolidation within four months of the date of incorporation were considered to be part of the original consolidation. An attempt was made to date acquisitions from the time that control of the firm actually changed hands. For the larger and more important acquisitions this date (by month) was usually given in the short history of the company sketched in Moody's Manual.

Wherever such a date was given in Moody, it was accepted, even if it differed from the date given in the Chronicle. If no date of the merger was given in Moody's the date used was taken from the Chronicle. Often the Chronicle would have several subsequent entries telling of negotiations, director approval, stockholder approval and change of control. Where possible an attempt was made to determine the date that control passed. If this was not possible, the date used was that of stockholder approval, if available. Otherwise the rule was to use the month that the news item appeared in the Chronicle if

the item appeared on the tenth of the month or later. If the news item appeared before the tenth of the month, the preceeding month was used. Although the writer has not prepared a detailed comparison, it seems that in most cases where a specific date was given in Moody's it coincided with the date that would have been used had the author relied only on the Chronicle, using the conventions described.

Industrial Classification

An important part of any detailed description is a classification of mergers by industries. Data on the industrial focus of merger activity are not only of descriptive interest, but also have many important analytical uses. Industry comparisons may help to determine whether for example, mergers are related to technological change, or to the rate of growth of a market, or to the industry firm size structure. An industrial classification is also necessary in any attempt to classify the type of integration, whether horizontal, vertical or diversified.

The classification used in this study is based on the 1957 Standard Industrial Classification published by the Bureau of the Budget. The descriptions of the firm in the Chronicle and in Moody's Manual usually provided the information for classifying the firm. Where sufficient information was available a four-digit classification was assigned. If this was not possible, the firm was assigned a 3-digit classification. In 94% of the mergers, it was possible to assign a 3- or 4-digit classification. In

the remainder either a 2-digit classification or no classification was assigned. If a firm had operations in 2 or more categories, it was classified according to its major activity. In several mixed areas it was not possible to determine whether the mining or manufacturing component of the firm was predominant and the procedure adopted is shown in Table 2-2.

TABLE 2-2

Classifications Adopted in Assigning Industry Classes to Mixed Manufacturing and Mining Companies

Manufacturing Category	S.I.C. Number	Mining Category	S.I.C. Number	Class. Adopted
Iron & Steel	331	Iron Ore	101	331
Copper Smelting & Refining	3331	Copper Ore	1021	3331
Petroleum Refining	291	Crude Petroleum	131	291
Cement	324	Cement Qry'g	142	324
Structural Clay Prod.	325	Clay, Ceramic & Refractory Mineral	145	325

For acquisitions, the Industrial Classification of the acquired firm was used. For consolidations, it was often not possible to get detailed information on the firms going into the merger. The procedure adopted for all consolidations was to classify it by the major activity of the consolidated firm. Since the study is confined to the manufacturing and mining sectors, certain procedures were adopted to make the study as consistent as possible. A few relatively large mergers, (notably airlines with airplane manufacturers and moving picture producers with moving picture equipment manufacturers) combined manufacturing and non-manufacturing firms. This study counts only the manufacturing

firms in the number of firm disappearances and measures only their size. In a few cases, firms that were primarily in transportation sold all their manufacturing or mining divisions. Although the firm remained in existence, it ceased to exist as a mining or manufacturing operation and was therefore counted as a disappearance. Conversely, if a transportation or service firm acquired a manufacturing or mining firm there are no fewer decision-making firms within the manufacturing or mining sectors, even though, for the economy, a firm had disappeared.

Size

Perhaps the most important deficiency of the existing studies is the lack of data on merger size. This study has attempted to make an estimate of the size of all firms that disappeared into consolidations and acquisitions. Probably the best measure of size, given the availability of data, is gross assets. Gross assets are preferred to net assets since the latter would differentiate between firms on the basis of their capital structure rather than on the size of their productive resources. Gross assets were available for 89% of the consolidations, and this figure was used as a measure of the combined size of the disappearing firms. This involves an overstatement relative to measures of acquisition activity. If five independent firms merge into a new firm, the number of net disappearances is only four, and consistency would require that only the size of the four smallest disappearing firms be

included. However, it was usually not possible to get the pre-merger size of many of the firms going into consolidations, and so it was felt that it would be better to count the assets size of the new consolidations recognizing that this involved some degree of overstatement. For those consolidations where no asset size was available, outstanding capitalization was used, or if this was not known, authorized capitalization was used. Those having only capitalization data, were all relatively small consolidations. No size data were available for only 2% of the recorded consolidations.

An attempt was made to obtain asset size data for firms disappearing by acquisition. Often this information was given in the Chronicle article or in Moody as part of the merger report. If not, the issue of Moody's Manual prior to the acquisition was checked and in many cases the balance sheet of the subsequently acquired firm was given, and this source was used. In certain cases the acquiring firm continued to operate the acquired firm as a separate subsidiary and its balance sheet was separately presented. In many cases no balance sheet was given, but the news item of the acquisition in the Chronicle or Moody's Manual would give the purchase price; this was accepted as an equally valid measure of size. Where the purchase price was given in shares of stock, the value of each share was computed as an average of its yearly high and low quotations on the stock exchange. This procedure had to be used in relatively few cases

(primarily in acquisitions by the large dairy and baking firms) in estimating the purchase price.[8]

The proportion of acquisitions for which no size data were available was not uniform either over time or between industries. To have excluded them in all probability would have led to sharply reduced comparability in both time series and cross-sectional examinations. Therefore, an attempt was made to estimate the sizes of these acquisitions, and to use these estimates in arriving at total merger values.

It was initially thought sufficient to use the following estimation procedure. First the average size for those acquisitions with known size data would be determined. Second, this average would be applied to the acquisitions having no direct size data. This approach was not adopted, however. Size data were probably more readily available for larger firms and so it was more likely that firms with no size data were smaller firms. Also it seemed likely that the average size of firms going into consolidations would differ significantly from the size of firms that were acquired.

To take account of these biases it was decided to take the average size of the smaller 50% of the disappearances-by-acquisition for every 3-digit industry. This average size was assigned to each acquisition within the 3-digit industry for which no size data was available. This procedure was followed if there were at least ten size observations, so that the average was taken from a

group of at least five. If there were less than ten observations, the average was taken of all the acquisitions but eliminating those that were clearly much larger than all the others. If there still were an insufficient number of observations the size of firms going into consolidations were included in computing the average.[9] If there still were an insufficient number of observations, the firms were assigned the average size of the most closely related 3-digit industry or of the entire 2-digit group in which it was located. In almost all cases the average was derived from within the same 3-digit group.[10] Acquisitions without size data accounted for 37% of all disappearances and the estimated value of these acquisitions amounted to 16% of total merger values.

Type of Integration

Another objective of the study was to develop data on the number and value of mergers representing the horizontal, vertical and diversified expansion of enterprises. Mergers of competing firms at the same stage of production (horizontal) are probably undertaken for different reasons and result in different economic effects than mergers of firms engaged in successive states of production (vertical) and mergers of firms selling non-competing products (diversified).

The classification of mergers by type of integration is limited to the years 1926-1930. These later five years of the period saw improvements in the financial reporting

services, with better information available on the activities and products of firms. Moody's Manual in particular provided more detailed and comprehensive coverage. In addition these five years accounted for the preponderance of merger activity over the whole period 1919-1930.

Because data were more readily available and accurate for larger firms, this classification was limited to consolidations whose assets were at least $9 million and acquisitions in which the size of the acquired firm was at least $3 million. This sample included 25% of all disappearances and 73% of total merger values for the period 1926-1930.

There are few objective guides to classifications of this type, and conventions used in other studies provide little help. Under the conventions used in the 1948 F.T.C.[11] study, mergers between two firms in the same 2-digit industry were classified as being horizontal. Clair Wilcox[12] and others have argued that mergers between firms in the same, more narrowly defined, 4-digit industry need not be horizontal. For example, a firm manufacturing pig iron and another operating a steel rolling mill are both classified in 3312. If one acquired the other it would clearly be vertical. If a firm manufacturing tractors acquires a company producing harvesters, it would be diversified, although both are in classification 3522. On the other hand, the merger may be horizontal even though the firms are classified differently. A steel rolling mill also producing fabricated

metal products is in major industry group 33 while a firm fabricating metal products from purchased steel is in major industry group 34, even though both compete directly.

In assigning categories of integration, each case was decided individually, to some degree subjectively. The emphasis was on similarity of physical characteristics and closeness of substitution in the product markets. This led to some divergence from the S.I.C., especially in those categories where similarity of technology was the basis for classification.

There was also a considerable problem in handling mergers that combined elements of horizontal, vertical and/or diversified expansion. For example, if an integrated steel firm buys another firm in the same category there may be significant elements of both horizontality and verticality. It is horizontal since both firms produce rolled steel, but it is also vertical if firm A needs and uses the pig iron or coke production of firm B. A combination of horizontal and vertical integration also occurs if A, an integrated firm, buys B, whose product corresponds to only one stage of A's production; or if A, a non-integrated firm, buys B, which is integrated. Rather than forcing mergers of this type into either a horizontal or vertical category, they were placed in a separate category, Horizontal-Vertical. This category was especially important in the petroleum industry where many of the large firms were vertically integrated in varying degrees,

so that many of their acquisitions fell into this grouping.

Similar problems arose if a firm producing product A (or Products A & C) acquired a firm producing products A and B. These mergers, being both horizontal and diversified, were placed in a separate category -- Horizontal-Diversified. These mixed categories were used only if the author had no evidence that one effect was strongly predominant. If such data were available the merger was classified according to the more important effect.

The classification was further complicated by gradients in the degree of substitutability among the products involved. In order to be truly horizontal, the two firms must be selling similar products in the same geographical market. To handle this problem a market extension category was also included. It was limited however, to the merger of firms whose market is local in nature such as newspapers, ice, and milk, and where it was determined that the merging firms were located relatively far apart geographically. Where this was not possible, the transaction was classified as horizontal based only on the similarity of the product. To the extent that market extension mergers were counted as horizontal, the latter category is overstated. The maximum amount of this overstatement is discussed in the following chapter, and an attempt is made to eliminate this bias.

Completeness of Coverage

Comparisons With Other Studies

As previously mentioned, the only comprehensive studies on mergers for this period are by Willard Thorp in Recent Economic Changes and in T. N. E. C. Monograph 27, The Structure of Industry. Thorp presents quarterly and annual series on firm disappearances and a broad industrial classification through 1928. Table 2-3 provides a comparison of the number of disappearances in the Thorp and Eis studies, classified according to Thorp's industrial groupings.[13] The Eis-to-Thorp percentage runs from a low of 26.5 in Oil to a high of 51.1 in Foodstuffs, with an aggregate percentage of 35.0. To determine whether the two studies show significant differences in the relative number of mergers in the several industry groups, a rank correlation for eight groups was computed. The rank correlation coefficient (Spearman) was +.86; the main difference being Chemicals, which was fourth in the Eis series and seventh in the Thorp series. Excluding Chemicals the rank correlation (Spearman) is +1.00.

Table 2-4 provides a year by year comparison of the two series. It shows that the degree of coverage from year to year is much the same except for 1920 and 1921. From 1922 through 1929 with the exception of 1926, the percentage coverage ranged between 35.2 and 48.8. In discussing his tables, Thorp writes that the years 1921 and 1926 included several mergers of more than sixty concerns each, and he comments that "the figures are distorted

TABLE 2-3

Comparison of Eis and Thorp Lists by Industry Groupings 1919-1928

Industry[a] Group.	Number of Disappearances Thorp Col. 1	Number of Disappearances Eis Col. 2	Col. 2 as Per Cent of Co. 1
Oil	641	170	26.5
Coal	238	76	31.9
Primary Metal[b] & Metal Prod.	1770	532	30.1
Textiles	401	107	26.7
Motor Vehicles	300	89	29.7
Chemicals	296	136	45.9
Foodstuffs	835	427	51.1
Lumber & Paper	419	125	29.8
Other	1091	432	39.6
Totals	5991	2094	35.0

[a]Thorp's groupings are very comprehensive. "Oil includes both petroleum mining and refining. Textiles includes rugs and felt hats as well as dyeing and finishing textile products. Motor vehicles includes the manufacture of automobile parts, except tires. Chemicals include paint and varnish, perfume, etc."

[b]Although Thorp has one category for iron and steel and their products and another for non-ferrous metals and their products, they were combined, because the author was unable to satisfactorily distinguish between them when considering fabricated metal products.

because mergers were consummated involving a large number of small concerns."[14] Eliminating these mergers from the Thorp series gives the Eis series an annual percentage coverage of at least 35% in every year except 1920 and 1921.

The abnormally low coverage for 1920 and 1921, for which the author has no explanation, applies to all the industry groups, although it is especially low for Motor Vehicles in 1920, and for Foodstuffs and Lumber and Paper

in 1921.[15] The highest percentage coverage was for the important merger years 1928 and 1929.

TABLE 2-4

Comparison of Eis and Thorp Series by Year 1919-1930

	Number of Disappearances Thorp Col. 1	Number of Disappearances Eis Col. 2	Col. 2 as a Percent of Col. 1
1919	438	159	36.3
1920	760	163	21.5
1921	487	70	14.4
1922	309	122	39.5
1923	311	143	46.0
1924	368	149	40.5
1925	554	257	46.4
1926	856	265	31.0
1927	870	306	35.2
1928	1038	507	48.8
1929	1245	587	47.3
1930	709	281	39.6
Totals	7945	3009	37.9

Comparison of the two studies thus indicates that despite the fact that the Eis series contains only between 35% to 40% of the firm disappearances identified by Thorp, both reveal the same essential patterns regarding industrial groupings and annual time series. It is likely that the main reason for the disparity is a more complete coverage by Thorp of small mergers, presumably those not covered by the Commercial and Financial Chronicle. The two series are probably much more comparable in their coverage of larger mergers. However, since the Thorp series contains no record of firm disappearances by size or by firm name, a more detailed direct analysis along these lines is impossible.[16]

The only independent and tolerably comprehensive compilation of mergers by company name and size for the 1919-1930 period is found in Weston's study, The Role of Merger in the Growth of Large Firms.[17] The Weston study examined 74 large firms who were leaders (in 1948) in their respective industries, chosen for their size and degree of oligopoly position. Twenty-two industries were analyzed. Weston's basic data sheets were examined and all merger activity by the 74 firms[18] for the period 1919-1930 was recorded. The list of acquisitions derived from Weston's data sheets was then compared to this author's record of merger activity by the same firms. The purpose was to determine, 1) the difference in total number of firm disappearances, and 2) the difference in the value of these mergers that might result from alternate methods of estimating the size of acquired firms.

To make the two lists comparable, certain adjustments were made to Weston's list. For one thing, his original list includes acquisitions of foreign companies, of subsidiaries of other firms, and of firms outside manufacturing or mining. Since these types of mergers were not included in this study, they were also excluded from the Weston list to enable a more direct comparison of the two.

The number of firm disappearances contained in the revised Weston list for 1919-1930 is 795. This study shows 416 or 52.3% of Weston's. However, some qualifications are in order. Of the 795 disappearances according to Weston, 495 are accounted for by Bordens and National

Dairy Products. In both these cases, Weston does not provide any detailed list, but reports the totals as found in the F.T.C. Report on the Dairy Industry. The present study recorded 180 acquisitions for these two companies. If we exclude these two firms from both lists, this study shows 236 acquisitions of 78.7% of the adjusted Weston total of 300.

Concerning the great difference in coverage of the two giant dairy firms, the Weston total (taken from the F.T.C. Report) includes the acquisition of Canadian firms and U. S. firms engaged only in the distribution of dairy products, having no manufacturing facilities. The author does not have exact numbers on this, but based on the reports in the Chronicle, this study excluded a substantial number of acquisitions by these two firms for these reasons.

In any event, almost all the dairy firms acquired were very small in size. The average size of these acquisitions, derived by dividing the number of disappearances recorded by the F.T.C. into Weston's estimate of the increase in Borden's and National Dairy Products' assets, was $650,000. It is likely that the unrecorded acquisitions were even smaller, since several relatively large acquisitions were recorded, such as the acquisition by National Dairy Products of the Kraft-Phenix Cheese Corp. with assets of approximately $50 million. The other firms for which this study showed significant undercoverage were Pet Milk Co. and Swift & Co. The Eis list contained only two of the twenty-six acquisitions recorded by Weston for these firms.

However, the average size of the twenty-four acquisitions not on the Eis list, is only $290,000. If these two firms are also eliminated, this study contains 85.5% of the number of acquisitions on the Weston list. These findings indicate that the major portion of the disparity is caused by undercoverage of relatively small firms; the coverage improves substantially as the comparison is based only on larger mergers.

The two studies use different methods and criteria in determining the size of the acquired firm. Weston's purpose is to determine the proportion of growth of the acquiring firm, that is accounted for by acquisition. He handles this problem of size estimation by several different procedures, depending upon the available information.[19] For many individual transactions, our criteria and methods placed a different value on the acquisition than did Weston. In some cases the Eis estimate was higher and in some cases it was lower. To determine whether the two methods and sets of criteria led to significantly different aggregate results, the total merger values of the two lists were compared. The total value computed in this study accounts fo 89% of the total value as computed by Weston.

The 416 disappearances on the Eis list had an average asset size of $6.29 million. The average size of Weston acquisitions unreported by Eis was estimated by dividing the number of unreported acquisitions into the excess of Weston's estimate of total value over that of Eis. Thus calculated the Weston disappearances that were not reported

by Eis had an average asset size of approximately $850,000. This of course is a crude measure of the average size of unreported acquisitions. However, it does suggest that the average size of reported acquisitions is much larger than those that were omitted. In another way it indicates that the Eis series contains a more complete coverage of large mergers and a much less complete coverage of smaller ones.

CHAPTER 2 - NOTES

1. "The Changing Structure of Industry," Recent Economic Changes, I, pp. 167-218.
2. "The Merger Movement", Monograph No. 27 The Structure of Industry, pp. 231-234.
3. Ibid., p. 232.
4. Recent Economic Changes, I, p. 183.
5. Although the sale of a subsidiary may approximate the economic effects of a firm disappearance, they are omitted in the Nelson and Thorp studies and are therefore also omitted here. In any event, their importance is negligible.
6. Capital in Manufacturing and Mining: Its Formation and Financing (Princeton: Princeton University Press, for National Bureau of Economic Research, 1960), p. 241.
7. "Capital Expenditures for Manufacturing Plant and Equipment - 1915 to 1940", Survey of Current Business, (March, 1941), pp. 10-11.
8. It is interesting to note that in those instances in the dairy industry where data on total assets of the acquired firm were available, the computed purchase price based on the market value of the stock exchanged was invariably about double the assets listed in the balance sheet.
9. It was felt that it was better to have a larger number of observations, recognizing the possible biases, but still eliminating those consolidations that clearly

were of a much greater size.

10. There were three acquisitions in the ordnance industry and forty one others which were not allocable to any 2-digit industry group. These amounted to 1.5% of all firm disappearances. Since nonehad size data, it was felt that any estimate of size would be very tenuous. Therefore, they were not included in any totals for merger value or industry classification.

11. U. S., Federal Trade Commission, The Merger Movement, A Summary Report (Washington: U. S. Government Printing Office, 1948). The classification of horizontal mergers is discussed in Butters, Lintner and Cary, Effects of Taxation - Corporate Mergers, p. 308n.

12. "On the Alleged Ubiquity of Oligopoly," American Economic Review Papers and Proceedings, Vol. XL, No. 2, (May, 1950), pp. 67-77.

13. The S.I.C. system used in this study was modified to make the industry groupings more comparable to Thorp's system of classification. The changes are explained in the footnotes for Table 2-3.

14. Thorp, "The Changing Structure of Industry," Recent Economic Changes, I, p. 184.

15. The 1921 merger of a large number of small concerns, referred to above, was in the Lumber and Paper group.

16. Thorp's worksheets are not available, nor are early editions of the Standard Daily Trade Service, access

to which might have enabled a reconstruction of his data.

17. Merger data for individual firms are presented in supplementary data sheets (mimeographed).

18. Several of the companies first came into existence after 1931.

19. A detailed discussion of his measurement procedures is presented in his Appendix D.

CHAPTER 3

DETAILED DESCRIPTION OF MERGER ACTIVITY FOR THE YEARS 1919 - 1930

Introduction

This chapter presents detailed quantitative data describing several aspects of merger activity for the years 1919-1930. It focuses on the following dimensions of the merger activity of this period.

1. Time Pattern
2. Industrial Composition
3. Process of Merger
4. State of Incorporation
5. Type of Integration

The Time Pattern

One of the most striking features of the 1919-1930 period was a pattern of extreme short run changes in merger activity. The purpose of this section is to examine these fluctuations over time and identify the cyclical patterns they reveal. The time pattern of merger activity is described in two series, (1) number of firms disappearing into mergers and, (2) the total value of the firms disappearing through mergers. The data are presented both as annual and quarterly time series. [1]

Annual Series[2]

In certain respects the annual series for the two measures of merger activity show the same time pattern (Table 3-1 and Chart 3-1).

TABLE 3-1

Yearly Time Series of Merger Activity in Manufacturing and Mining 1919-1930

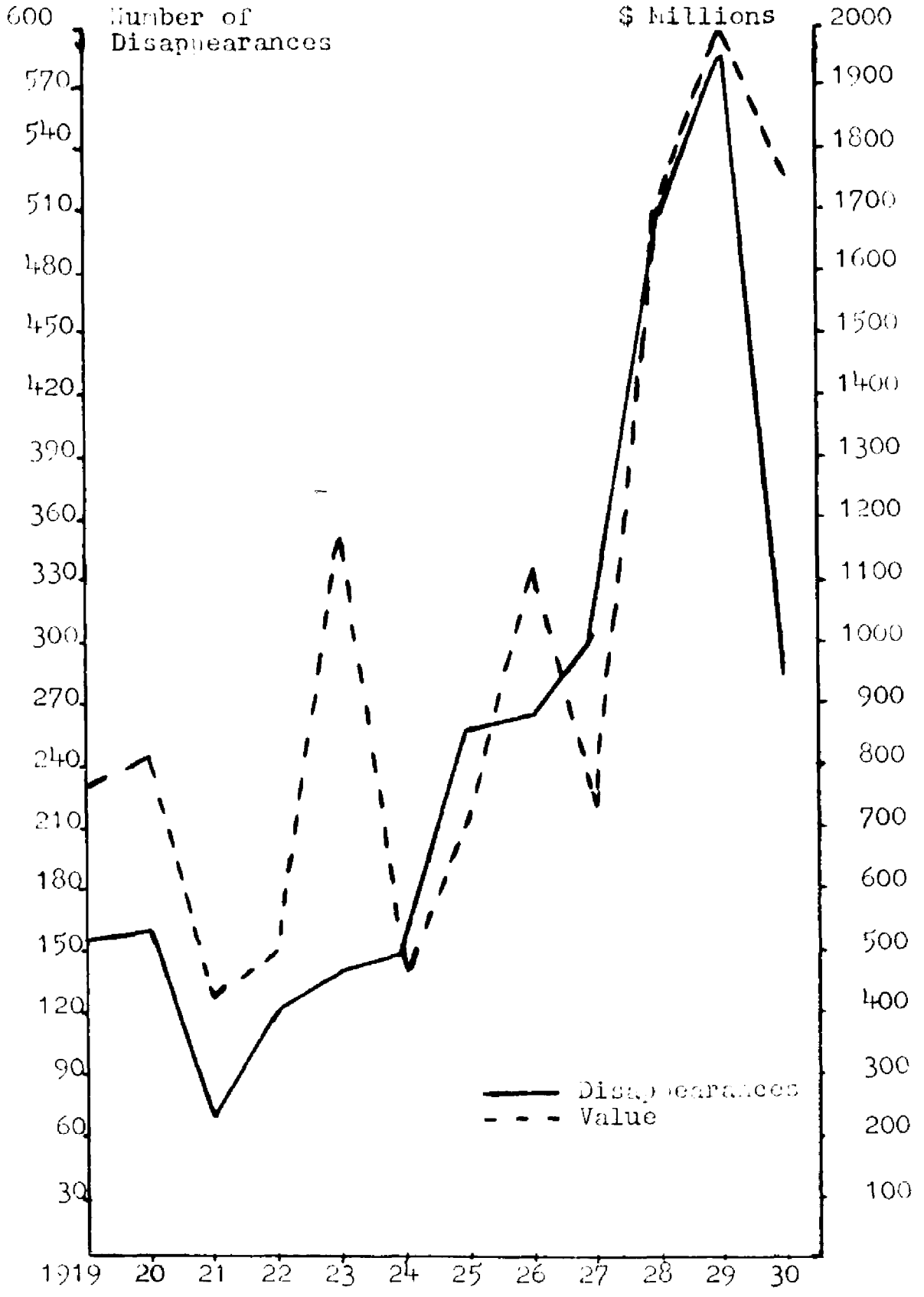
Year	Measure of Merger Activity: Number of Disappearances	Measure of Merger Activity: Merger Values Million of Dollars
1919	159	777.4
1920	163	809.4
1921	70	430.0
1922	122	501.8
1923	143	1171.1
1924	149	466.0
1925	257	720.7
1926	265	1135.0
1927	306	727.4
1928	507	1653.2
1929	587	1993.3
1930	281	1756.8
Total	3009	12142.1

Both series indicate a high degree of merger activity in the two post-war boom years, 1919 and 1920, with 1920 showing a moderate increase over 1919. Both drop off sharply in the post-war depression of 1921, as the price level and industrial production fell drastically. Merger activity increased in 1922 as the recovery from the post-war depression began, and continued into 1923.

For the rest of the decade, the two series followed somewhat different patterns. Between 1923 and 1929 the

CHART 3-1

1919-1930 Annual Merger Series
For Number of Disappearances and Merger Value



disappearance series shows a persistently increasing pattern. The small increase between 1923 and 1924 was followed by a large increase in 1925. The modest increase between 1925 and 1926 was followed by a sharply rising pattern, culminating in the 1929 peak.

In contrast, the series on merger value saw a number of reversals. Between 1922 and 1923, the series on value shows a much greater increase than the disappearance series, primarily because of several very large acquisitions in the steel, copper and meat packing industries.[3] A moderate recession occurred in 1924, accompanied by a sharp decline in merger values. The sharpness of the decline reflected the aforementioned several large acquisitions of 1923. In 1925 the rapid advance in physical production was resumed again and continued into 1926. This was accompanied by large increases in merger values in both years, increases much larger than those of the disappearance series. The 1927 recession saw a fall in merger values but an increase in the number of disappearances. Both series show very large increases in 1928 and continued their rise to a peak in 1929. The two series declined in 1930. The decline in merger value was not very great, however, so that 1930 was the second largest year of the 1919-1930 period in terms of merger value.

Quarterly Series

As reported in Chapter 2, it was often difficult to pinpoint precisely the date of a merger and so the present-

ation of a monthly series would imply a degree of precision not supported by the data. However, for purposes of examining cyclical patterns, the quarterly series can serve quite adequately.

The two quarterly series on merger activity are presented in Table 3-2 and Chart 3-2. The two series show a pattern of extreme quarter-to-quarter variation, the variation being much more pronounced in the value series. However, the quarterly disappearance series also shows a pattern of fluctuation that was absent from the annual disappearance series. The extreme fluctuations in the two series made it difficult to identify cyclical turning points. Some of the peaks and troughs were clearly identifiable, but in some instances the turning points were uncertain. To assist in identifying the turning points, 3-quarter centered moving averages were computed for several sub-periods.

There was closer agreement in turning points between the quarterly disappearance and value series than between the two annual merger series (Table 3-3, Columns 1 & 2). The quarterly disappearance series peaked in the first quarter of 1920. The Value series had twin peaks in the third quarter of 1919, and the fourth quarter of 1920; but the moving averages placed the peak in the third quarter of 1919. Both series showed troughs in the latter half of 1921, and rose to new peaks in the first quarter of 1923. The disappearance series reached its next trough in the

third quarter of 1923, while the trough in the Value series occurred in the second quarter of 1924.

TABLE 3-2

Quarterly Time Series of Merger Activity in Manufacturing and Mining 1919-1930

Year and Quarter		Number of Disappearances	Merger Values ($ Million)	Year and Quarter		Number of Disappearances	Merger Values ($ Million)
1919	1	34	65.4	1925	1	41	67.4
	2	40	204.9		2	76	302.6
	3	46	357.5		3	76	100.5
	4	26	104.4		4	45	191.2
1920	1	50	159.8	1926	1	102	409.2
	2	28	69.4		2	58	368.1
	3	30	173.1		3	58	252.6
	4	38	388.0		4	37	94.6
1921	1	11	61.4	1927	1	47	142.5
	2	23	215.4		2	106	194.8
	3	13	93.8		3	57	158.1
	4	17	52.7		4	80	200.4
1922	1	20	175.2	1928	1	140	384.9
	2	28	72.0		2	119	496.7
	3	34	85.3		3	88	352.0
	4	21	155.3		4	137	400.7
1923	1	46	574.1	1929	1	180	669.2
	2	32	345.6		2	171	596.6
	3	23	104.5		3	142	302.9
	4	25	128.4		4	81	308.6
1924	1	32	108.4	1930	1	90	469.8
	2	23	72.2		2	80	629.6
	3	39	80.0		3	59	254.8
	4	46	186.5		4	33	187.0

Both series showed the quarterly turning points for the peaks in the first quarters of 1926 and 1929, and for the intervening trough in the fourth quarter of 1926. Of the four peaks and three troughs that occurred through the period, the two series showed coincident timing on three peaks and one trough. The average difference for the seven turning

CHART 3-2

1919-1930 Quarterly Merger Series,
Disappearances and Merger Value

TABLE 3-3

Cyclical Turning Points For Several Merger and Related Series 1919-1930

	Eis Firm Disappearances Cycle	Eis Merger Value Cycle	Reference Cycle	Thorp - N.B.E.R. Merger Cycle[b]
	Quarterly	Quarterly	Quarterly	Monthly
Peak	I/20 (2/20)[a]	III/19 (8/19)[a]	I/20	2/20
Trough	III/21 (8/21)	IV/21 (11/21)	III/21	--
Peak	I/23 (2/23)	I/23 (2/23)	II/23	--
Trough	III/23 (8/23)	II/24 (5/24)	III/24	8/23
Peak	I/26 (2/26)	I/26 (2/26)	III/26	2/26
Trough	IV/26 (11/26)	IV/26 (11/26)	IV/27	2/27
Peak	I/29 (2/29)	I/29 (2/29)	III/29	2/29

[a]The center month of the quarterly turning point was taken as the monthly turning point to facilitate comparison with the turning points of the Thorp Merger Series.

[b]Dated by the N.B.E.R. from Thorp's Series on Mergers.

points was 2.6 months.

In several quarters large differences in the relative magnitudes of the two series were observed. These were caused primarily by several mergers that involved the disappearance of relatively few, but very large firms. Transcontinental Oil was formed in July, 1919, with total assets of $198 million, but accounted for only four disappearances. Allied Chemical & Dye was formed in December, 1920, with assets of $283 million, but also involved only four disappearances. In the first six months in 1923, there were six acquisitions whose total value was $638.2 million. Republic Steel Corp. was formed in April, 1930, with assets of $331 million, but accounted for only three disappearances.

For purposes of comparison, the reference cycle and

the specific cycle for merger activity based on the Thorp Series are presented in Table 3-3, Columns 3 and 4.[4] The Thorp-based merger chronology shows one less cycle than does that of Eis, having five turning points over the period. The dates of the five turning points correspond very closely to the turning points identified in this study (Columns 1 and 2). The average difference for the five turning points between the Thorp and the Eis disappearance series is only .6 months, and they agree on four of the turning points. The average difference between the Thorp Series on disappearances and the Eis Value Series is 3.6 months.

In the Nelson study the Thorp Chronology was compared to turning points in the reference cycle.[5] The Business Cycle Unit of the National Bureau did not identify any merger expansion corresponding to the 1921-1923 reference expansion. Prof. Nelson, commenting on this, writes, "The expansion of 1921-1923 was vigorous, however, and it is not clear why merger activity did not respond."[6]

Both merger series developed in this study show the 1921-1923 trough-peak-trough cycle that was absent from the Thorp series. The cyclical pattern in the disappearance series for this period is not very pronounced and may result in part from the sharp drop in the Eis disappearance coverage for 1920 and 1921. But the series on merger value shows a very definite and distinct cycle during this period which parallels the reference cycle and reinforces the pattern

of relationship between the other merger and reference cycles during this decade.

Industrial Classification

This section examines the industrial pattern of merger activity of 1919-1930. Practically all manufacturing and mining industries experienced some merger activity during this period. However, some industries experienced a very large amount of merger activity, while others had very little. Moreover, the industrial pattern shifted between the earlier and later parts of the period.

Absolute Merger Activity: Manufacturing and Mining

Some merger activity was recorded in each of the twenty-five major industry groups in manufacturing and mining (Table 3-4).[7] But although widespread, it was not equally important in every industry. As shown in Tables 3-5 and 3-6 a high proportion of merger activity was focussed in several industries. Five industries -- Primary Metals (33), Petroleum Refining and Related Products (29), Food and Kindred Products (20), Chemicals and Allied Products (28), and Transportation Equipment (37) -- accounted for 67.5% of total merger value in manufacturing and mining, and for 72.7% of total merger value for manufacturing alone. Four of these industries plus Non-Electrical Machinery (35) accounted for 51.3% of total disappearances in manufacturing and mining, and 56.4% of total disappearances for manufacturing

TABLE 3-4

Distribution of 1919-1930 Merger Activity in Manufacturing and Mining By Two-Digit Industry Classes

S.I.C.[a]	Industry	Merger Activity: Firm Disappearances	Merger Activity: Value $ Millions	Rank: Disappearances	Rank: Value
20	Food and Kindred Products	739	1520.3	1	3
21	Tobacco Products	22	77.0	23	21
22	Textiles	127	316.2	9	10
23	Apparel	12	20.2	25	25
24	Lumber, Wood Products (except 25)	30	76.0	19	22
25	Furniture and Fixtures	23	103.8	22	18
26	Paper and Allied Products	71	243.4	16	12
27	Printing, Publishing & Allied Ind.	73	89.9	15	19
28	Chemicals and Allied Products	220	1075.5	2	4
29	Petroleum Refining & Products	104	2211.8	11	2
30	Rubber Products	17	119.8	24	16
31	Leather and Products	33	77.2	18	20
32	Stone, Clay, Glass Products	163	374.1	7	9
33	Primary Metal Industries	201	2598.9	3	1
34	Fabricated Metal Products	138	446.4	8	7
35	Machinery (except Electrical)	192	552.0	4	6
36	Electrical Machinery and Equip.	110	278.8	10	11
37	Transportation Equipment	170	806.6	6	5
38	Scientific Instruments, Etc.	39	106.1	17	17
39	Miscellaneous Manufacturing	28	57.7	20	24
	Ice, Natural and Manufactured	173	147.4	5	15
10	Metal Mining	26	69.3	21	23
11,12	Coal Mining	76	246.8	14	13
13	Petroleum and Gas Extraction	98	390.7	12	8
14	Non-Metallic Minerals Mining	80	167.5	13	14

[a]For a more detailed description of each industry group, see Standard Industrial Classification Manual, Bureau of the Budget, Washington, D. C., 1957.

TABLE 3-5

Percentage of Merger Values Occurring in Five Industries of Highest Merger Activity

	Industry	Per Cent of Total Merger Value-Manufacturing Only		Per Cent of Total Merger Value, Manufacturing and Mining	
		Individual	Cumulative	Individual	Cumulative
33	Primary Metals	23.0	23.0	21.4	21.4
29	Petroleum Products	19.6	42.6	18.1	39.5
20	Food Products	13.4	56.0	12.5	52.0
28	Chemicals	9.5	65.5	8.8	60.8
37	Transportation Equipment	7.2	72.7	6.7	67.5

TABLE 3-6

Percentage of Firm Disappearances Occurring in Five Industries of Highest Merger Activity

	Industry	Per Cent of Total Firm Disappearances, Manufacturing Only		Per Cent of Total Firm Disappearances, Manufacturing & Mining	
		Individual	Cumulative	Individual	Cumulative
20	Food Products	27.2	27.2	24.9	24.9
28	Chemicals	8.2	35.4	7.4	32.3
33	Primary Metals	7.5	42.9	6.8	39.1
35	Non-Electrical Machinery	7.2	50.1	6.5	45.6
37	Transportation Equipment	6.3	56.4	5.7	51.3

alone. The fifth, Petroleum Refining and Products, though second in merger value in manufacturing with 19.6% of the total, accounted for only 3.9% of manufacturing disappearances. This disparity reflects the fact that the average size of disappearances in this industry was $21.27 million, as compared to $4.21 million for all manufacturing. On the other hand, Food Products was by far the most important in number of disappearances, accounting for 27.2% of all disappearances in manufacturing. However, the average disappearance size in this industry was $2.06 million, and so it accounted for only 13.4% of total merger value for manufacturing. Of the other important industries, the average disappearance sizes were: Transportation Equipment, $4.74 million; Chemicals, $4.89 million; and Primary Metals, $12.92 million.

Taking Manufacturing separately, and excluding the ice industry, the same ten industries occupy the highest rank in both merger value and in number of disappearances. Although the rank correlation coefficient (Spearman) is only +.48, it can be seen from Table 3-7 that this low figure is due mainly to Petroleum Refining (29), which is second in merger value and tenth in disappearances. Eliminating this industry, the rank correlation coefficient for the other nine industries is +.92.

It was next our purpose to determine whether any significant changes in industrial composition had taken place over the period. Accordingly the twelve year period

was divided into two sub-periods, 1919-1925 and 1926-1930. Comparison of the ranks of the twenty-five industries for the two sub-periods suggests that relatively little change in industrial composition had in fact taken place (Table 3-8). The rank correlations (Spearman) between the two sub-periods are +.61 for number of disappearances, and +.63 for merger value. The major shifts were within the mining sector, with substantial declines in coal mining (12) and oil extraction (13) and increases in the mining of non-metallic minerals (14).

TABLE 3-7

Ranks of Ten Largest[a] Two-Digit Manufacturing Industries for Number of Disappearances and Merger Value

	Industry	Disappearance Rank	Value Rank
20	Food Products	1	3
28	Chemicals	2	4
33	Primary Metals	3	1
35	Non-Electrical Machinery	4	6
37	Transportation Equipment	5	5
32	Stone, Clay, Glass Products	6	8
34	Fabric. Metal Products	7	7
22	Textiles	8	9
36	Electrical Equipment	9	10
29	Petroleum Products	10	2

[a]Excluding the Ice Industry.

Taking the manufacturing industries separately, we find an even smaller change in composition. The rank correlation was +.74 for number of disappearances and +.82 for merger value. Within manufacturing the top five

TABLE 3-8

Ranking of Merger Activity in Twenty-Five
Two-Digit Industries 1919-1925 and 1926-1930

	Industry	Rank by Firm Disappearances 1919-1925	Rank by Firm Disappearances 1926-1930	Rank by Merger Value 1919-1925	Rank by Merger Value 1926-1930
20	Food Products	1	1	3	3
33	Primary Metals	2	5	1	1
13	Petroleum Extraction	3	17	5	17
37	Transportation Equipment	4	6	6	5
32	Stone, Clay, Glass	5	7	9	8
22	Textiles	6	12	8	11
35	Non-Electrical Machinery	7	4	10	6
12	Coal Mining	8	16	7	22
28	Chemicals	9	2	4	4
29	Petroleum Products	10	13	2	2
34	Fabricated Metal Products	11	8	11	7
36	Electrical Equipment	12	9	16	9
	Manufactured Ice	13	3	19	13
26	Paper Products	14	14	12	10
31	Leather Products	15	20	13	23
10	Metal Mining	16	24	15	25
39	Miscellaneous	17	23	17	21
25	Furniture and Fixtures	18	25	14	19
21	Tobacco	19	21	18	20
14	Non-Metallic Mineral Mining	20	11	22	12
24	Wood Products	21	18	21	18
38	Scientific Instruments	22	15	23	15
30	Rubber Products	23	19	20	14
27	Printing and Publishing	24	10	24	16
23	Apparel	25	22	25	24

in value remained in the same order for both periods. One important change was a significant increase in the frequency of mergers in the Chemicals Industry.

Measured by numbers of disappearances it moved from ninth position in 1919-1925 with 53 recorded disappearances to second position in 1926-1930 with 167 recorded disappearances. Although it was fourth in merger value for both sub-periods, 68% of the value for 1919-1925 was accounted for by the very large Allied Chemical and Dye consolidation. Eliminating this consolidation would put Chemicals in ninth place in terms of merger value for the period 1919-1925. The average size of disappearances for 1926-1930 was $4.0 million while for 1919-1925 it was $7.8 million with the Allied Chemical consolidation and $2.6 million without it.

Relative Merger Activity: Manufacturing Only

For many purposes a more meaningful measure of merger activity is that which expresses the magnitude of an industry's mergers in relation to the size and firm population of the industry. A very large industry may experience large absolute merger activity. This, however, may be insignificant in relation to total industry size. Conversely, small absolute merger activity, in a small industry, may nevertheless be significant in relation to its overall size. For many analytical purposes -- for example, the extent to which mergers increased the concentration of control within an industry -- it is important to examine mergers in relation

to the size of the industry.

As the measure of relative merger activity we have expressed the merger activity of an industry as a percentage of industry size. The measure of industry size used is the 1929[8] value of total industry capital, presented in Column 1, Table 3-9. The data on capital size are classified into categories which differ slightly from the industrial classification used in this study, and several minor adjustments were made to make the two classifications comparable.[9] Column 3 expresses the value of mergers from 1919-1930 as a percentage of total 1929 capital for sixteen major industry groups. Comparison of the rankings in Columns 2 and 3 indicates a close relationship between absolute and relative merger activity. The highest five ranks in Columns 2 and 3 are occupied by the same industries. The rank correlation (Spearman) for all sixteen industry groups is +.88. The finding suggests that, on this broad basis at least, analyses made using absolute measures might yield results reasonably near those found using relative measures.

Detailed Description For Selected Industries

The 2-digit industry categories used in the above comparisons may conceal important patterns within these broad industry categories. Many 2-digit categories contain a heterogeneous collection of industries. In such cases an examination of patterns within a 2-digit group could yield important information. One might learn which

TABLE 3-9

Relationship of Merger Values to Total
1929 Capital by Industry

Industry Group[a]		1929 Capital Millions of Dollars (1)	1919-1930 Merger Value $ Millions (2)	Col. 2 As Per Cent of Col. 1 (3)	Rank of Absolute Merger Value Col. 2	Rank of Relative Merger Value Col. 3
33,34	Iron, Steel, Non-Ferrous Metals & their Products	8420	3045.3	36.2	1	2
29	Petroleum Refining	5745	2211.8	38.5	2	1
20	Food & Kindred Products	7731	1520.3	19.4	3	5
28	Chemicals & Allied Products	3942	1075.5	27.3	4	3
37	Transportation Equipment	3264	806.6	24.7	5	4
35	Nonelectrical Machinery	4319	552.0	12.8	6	8
32	Stone, Clay & Glass Products	2351	374.1	15.9	7	7
22	Textiles (except Clothing)	5929	316.2	5.3	8	13
36	Electrical Machinery	1514	278.8	18.4	9	6
26	Paper, Pulp & Products	2060	243.4	11.8	10	9
24,25	Forest Products	3842	179.8	4.7	11	14
30	Rubber Products	1088	119.8	11.2	12	10
27	Printing & Publishing	2622	89.9	3.4	13	15
31	Leather Products	1167	77.2	6.6	14	12
21	Tobacco Products	1150	77.0	6.7	15	11
23	Clothing	1758	20.2	1.1	16	16

Data on Industry Capital from D. Creamer, S. Dobrovolsky, and I. Borenstein, Capital in Manufacturing and Mining: Its Formation and Financing (Princeton: Princeton University Press, 1960) Appendix Table A-8.

[a]Industry groupings differ slightly from S.I.C. to enable comparison with the figures on capital size. See Note 9.

groups were predominant and whether there were shifts over time within the 2-digit industry; patterns concealed by examining the industry as a whole.

Food Products

The distribution of merger activity among product groups in the Food and Kindred Products category is given in Table 3-10. Although all of the 3-digit product groups recorded some merger activity, more than 90% of the merger activity is concentrated in the meat, dairy, grain mill, bakery and miscellaneous groups.

TABLE 3-10

Distribution of 1919-1930 Merger Activity In The Food and Kindred Products Industry

S.I.C.	Product Group	Firm Disappearances		Merger Values	
		Number	Per Cent	Amount ($ Millions)	Per Cent
201	Meat Products	42	5.7	204.0	13.4
202	Dairy Products	429	58.0	541.6	35.6
203	Canning and Preserving Fruits, Veg. & Sea Foods	45	6.1	88.2	5.8
204	Grain Mill Products	30	4.1	186.5	12.3
205	Bakery Products	123	16.7	219.2	14.4
206	Sugar	7	.9	24.6	1.6
207	Confectionery & Rel. Prod.	7	.9	27.3	1.8
208	Beverage Industries	6	.8	10.4	.7
209	Miscellaneous	50	6.8	218.5	14.4

The Dairy Industry (202) was by far the most important 3-digit group. In 1919-1925 it accounted for 20% of the value and 33% of the number and in 1926-1930 it accounted for 44% of the value and 67% of the number of

Food Product disappearances. The later period was notable for the very large number of acquisitions by the largest dairy firms, Bordens and National Dairy Products, and to a smaller degree Beatrice Creamery Co. In addition, there were many local mergers of relatively small producers of milk and ice cream. This study recorded over 200 acquisitions [10] by the three large firms, with acquisitions ranging in size from Kraft-Phenix Cheese with assets of over $50 million to the more usual local dairy firm.

The second largest volume of merger activity occurred in Bakery Products (205). It was most important in the early half of the period, declining from 26% of merger value and 33% of disappearances for 1919-1925, to 9% and 10% respectively for 1926-1930. The 1919-1925 period was characterized by widespread inter-city consolidations of baking firms (2051), especially during 1924 and 1925. Mergers in baking were highlighted by the formation, in 1924, of the $67 million Continental Baking Corporation. The later period not only showed much less merger activity, but the emphasis was shifted to the biscuit and cracker industry (2052) with the dominant firm, National Biscuit Company, being very active.

Grain Mill Products (204) accounted for only 3% of merger activity in the early half of the period, but jumped to 17% of the merger value and 5% of number of disappearances in the later half. The later half was highlighted by the organization, in 1928, of General Mills. This consolidation

together with subsequent acquisitions made it the leading firm in its field.

Of the total $204 million of merger values in meat products (201), the acquisition by Armour and Company of Morris and Company in 1923 accounted for almost half, $91.4 million. Other mergers in this industry were of secondary importance and involved relatively small firms.

Miscellaneous products (209) accounted for 11% of both merger value and number of disappearances in the first period, and 16% of the value and 5% of the disappearances in the second period. The latter period was highlighted by the organization of Standard Brands in 1929 and by numerous acquisitions by General Foods. Both companies produced a widely diversified group of products, and placed stress on centralized advertising and distribution.

Primary Metals Industries

The distribution of merger activity in the Primary Metals Industries is presented in Table 3-11, which shows the predominance of group 331, Blast Furnaces, Steel Works and Rolling Mills. Iron and Steel Foundries (332), Primary non-Ferrous Smelting and Refining (333) and non-Ferrous Metals Rolling and Drawing (335), occupied the secondary positions in merger activity. The pattern was similar over the entire period. In terms of ferrous vs. non-ferrous categories, Iron and Steel (331 and 332) accounted for between 70% and 75% in both sub-periods, while non-ferrous metals (333-336) accounted for between 24% and 28%.

TABLE 3-11

Distribution of 1919-1930 Merger Activity in the Primary Metals Industries

S.I.C.	Industry Group	Firm Disappearances Number	Per Cent	Merger Values Amount ($ Millions)	Per Cent
331	Blast Furnaces, Steel Works, Rolling and Finishing Mills	102	50.7	1742.1	67.0
332	Iron and Steel Foundries	37	18.4	143.8	5.5
333	Primary Non-Ferrous Smelting and Refining	10	5.0	369.5	14.2
334	Secondary Non-Ferrous Smelting and Refining	3	1.5	16.8	.7
335	Rolling, Drawing Non-Ferrous Metals	29	14.4	245.7	9.5
336	Non-Ferrous Foundries	10	5.0	33.9	1.3
339	Misc. Primary Metals Ind.	10	5.0	47.1	1.8

Merger activity in Blast Furnaces, Steel Works, and Rolling Mills (331) was highlighted by several very large consolidations. These were Wheeling Steel in 1920 ($116.8 million), National Steel in 1929 ($120.9 million), Republic Steel in 1930 ($331.8 million), and Interlake Iron in 1930 ($72.8 million). Major acquisitions include those by Bethlehem Steel of Lackawanna Steel ($89.6 million) in 1922 and Midvale Steel and Ordnance in 1923 ($270.8 million). Youngstown Sheet and Tube acquired Brier Hill Steel ($50.0 million) and Steel and Tube Company of America ($108.5 million), both in 1923.

There were several large acquisitions in the Copper Industry. Anaconda Copper Mining, Kennecott Copper and Phelps Dodge, three of the four largest firms in this

industry before 1923 and the three largest since, undertook both horizontal mergers and mergers for forward and backward integration. Anaconda acquired Chile Copper ($151.4 million) in 1923, American Brass ($47 million) in 1922, and Greene-Cananea Copper ($57.6 million) in 1929. Kennecott acquired Utah Copper ($66 million) in 1923 and Ray Consolidated Copper ($55.2 million) in 1926. General Cable Corporation was a 1927 consolidation of five wire and cable firms with assets of $56 million.

The Merger Process

This section examines the relative roles of mergers-by-consolidation and mergers-by-acquisition. The distinction is in part that between single and multiple mergers and in part that between all-at-once and one-at-a-time mergers. A consolidation is defined as the simultaneous or nearly-simultaneous union of three or more independent firms into a new consolidated company. Acquisitions represent the taking-over of one firm by another, either as a single action, or as part of a series of acquisitions over a period of time.

The economic motives and behavior leading to an acquisition may differ from those leading to a consolidation. One motive for consolidation may be the desire to secure a dominant market position directly, without a lengthy and uncertain competitive war. Acquisitions, on the other hand, might not as often have market dominance as their

objective. However, the distinction is not clearcut. A consolidation might gain only a small percentage of its industry. On the other hand, a single acquisition of a large competitor can have large competition-reducing effects. Similarly, an existing large firm wishing to increase its share of the market might prefer to use the acquisition form of merger, especially if the industry is characterized by many small firms. In this event, a program of acquisitions might be planned over a period of as long as five to ten years. Mergers in the Dairy Industry are a prime example of this method.

As was mentioned in Chapter 2, there was a question about classifying a two-firm consolidation, i. e., the combination of two independent firms into a new corporate entity. In many respects this transaction is the equivalent of an acquisition, while in others it approximates a consolidation. Therefore, the tables presenting the distribution between consolidations and acquisitions are presented in two parts -- one treating two-firm consolidations as consolidations, the other treating them as acquisitions. The two alternative definitions can be considered to set a range, if the reader wishes to use them in this manner. The author feels that the economic effects of a two-firm consolidation more closely approximate those of an acquisition. For this and other reasons presented in Chapter 2, the textual comment is based on the definition of a two-firm consolidation as an acquisition.

TABLE 3-12

Distribution of Merger Activity By
Consolidation and Acquisition 1919-1930
(Two-Firm Consolidations Counted as Acquisitions)

Year	Merger Values			Firm Disappearances		
	Total $ Millions	Per Cent By Consolidation	Per Cent By Acquisition	Total	Per Cent By Consolidation	Per Cent By Acquisition
1919	777.4	64.9	35.1	159	53.5	46.5
1920	809.4	63.3	36.7	163	35.1	64.9
1921	430.0	.5	99.5	70	2.9	97.1
1922	501.8	15.3	84.7	122	27.6	72.4
1923	1171.1	6.3	93.7	143	25.5	74.5
1924	466.0	36.5	63.5	149	35.6	64.4
1925	720.7	17.6	82.4	257	43.9	56.1
1926	1135.0	23.8	76.2	265	47.7	52.3
1927	727.4	47.2	52.8	306	49.5	50.5
1928	1653.2	28.6	71.4	507	46.0	54.0
1929	1993.3	30.9	69.1	587	22.1	77.9
1930	1756.8	26.1	73.9	281	10.6	89.4
1919-1925	4876.4	30.1	69.9	1063	36.7	63.3
1926-1930	7265.7	29.8	70.2	1946	34.5	65.5
1919-1930	12142.1	29.9	70.1	3009	35.3	64.7

Consolidation - Acquisition Time Pattern

The proportions of total 1919-1930 merger activity accounted for by consolidations and acquisitions are presented in Table 3-12. Table 3-13 presents the same breakdown, using the alternate method of considering two-firm consolidations, as consolidations. For the period as a whole, acquisitions were the more important form of merger accounting for about 65 per cent of firm disappearances and 70 per cent of merger value. Substantially the same proportions apply to the sub-periods 1919-1925 and 1926-1930.

TABLE 3-13

Distribution of Merger Activity
By Consolidation and Acquisition 1919-1930
(Two-Firm Consolidation Counted As Consolidations)

	Merger Value		Firm Disappearances	
Year	Per Cent By Consolidation	Per Cent By Acquisition	Per Cent By Consolidation	Per Cent By Acquisition
1919	65.3	34.7	55.4	44.6
1920	63.5	36.5	36.9	63.1
1921	1.8	98.2	5.7	94.3
1922	16.7	83.3	31.7	68.3
1923	8.4	91.6	29.7	70.3
1924	45.4	54.6	40.3	59.7
1925	26.2	73.8	49.3	50.7
1926	25.6	74.4	50.0	50.0
1927	55.0	45.0	55.4	44.6
1928	32.1	67.9	49.7	50.3
1929	35.3	64.7	25.3	74.7
1930	27.8	72.2	14.2	85.8
1919-1925	33.2	66.8	40.2	59.8
1926-1930	33.2	66.8	38.2	61.8
1919-1930	33.2	66.8	39.0	61.0

There does not appear to be any secular trend in the importance of acquisitions relative to consolidations, nor do fluctuations in the percentage accounted for by consolidations appear to be related to the overall level of merger activity.

Although there are sharp yearly fluctuations acquisitions accounted for at least 50% of total activity in every year with the exceptions of 1919 and 1920. These two years witnessed two very large consolidations, Transcontinental Oil-$198 million-, and Allied Chemical and Dye-$283 million-, which contributed much to merger value but represented only eight net disappearances. These eliminated, acquisitions represented 47% of total merger value in 1919 and 57% in 1920.

Industrial Distribution of Consolidations and Acquisitions

The relative number and values of consolidations and acquisitions varied considerably among industries. Tables 3-14 and 3-15. If we omit the Clothing Industry (23) with only 12 disappearances, all by acquisition, the share of acquisitions in total merger value ranged from 90% in Metal Mining and 85% in Petroleum Products to 23% in Non-Metallic Mineral Mining and 35% in Professional and Scientific Instruments. In disappearances, the share of acquisitions ranged from 84% in Metal Mining and 80% in Petroleum Extraction to 16.5% in Non-Metallic Mineral Mining and 33% in Printing and Publishing. In each of the five industries of greatest merger value (Primary Metals (33),

TABLE 3-14

Industrial Distribution of Consolidations
and Acquisitions 1919-1930
(Two-Firm Consolidations Counted as Acquisitions)

	Industry Group	Merger Values			Firm Disappearances		
		Total (Millions of Dollars)	Percentage By		Total	Percentage By	
			Consol-idation	Acqui sition		Consol-idation	Acqui-sition
20	Food & Kindred Products	1520.3	29.8	70.2	739	31.1	68.9
21	Tobacco Products	77.0	14.5	85.5	22	27.3	72.7
22	Textiles	316.2	37.4	62.6	127	36.2	63.8
23	Apparel	20.2	--	100.0	12	--	100.0
24	Lumber, Wood Products (excl. 25)	76.0	40.1	59.9	30	43.3	56.7
25	Furniture & Fixtures	103.8	51.6	48.4	23	52.2	47.8
26	Paper & Allied Products	243.4	15.8	84.2	71	29.6	70.4
27	Printing, Publishing, Etc.	89.9	58.7	41.3	73	67.1	32.9
28	Chemicals & Allied Products	1075.5	34.1	65.9	220	27.3	72.7
29	Petroleum Products	2211.8	14.7	85.3	104	31.7	68.3
30	Rubber Products	119.8	21.4	78.6	17	23.5	76.5
31	Leather & Products	77.2	19.0	81.0	33	30.3	69.7
32	Stone, Clay, Glass Products	374.1	31.3	68.7	163	44.8	55.2
33	Primary Metals Industries	2598.9	34.3	65.7	201	25.9	74.1
34	Fabricated Metal Products	446.4	23.2	76.8	138	23.9	76.1
35	Machinery (except Electric)	552.0	46.3	53.7	192	33.3	66.7
36	Electrical Machinery & Equip.	278.8	23.3	76.7	110	28.2	71.8
37	Transportation Equipment	806.6	31.3	68.7	170	24.7	75.6
38	Scientific Instruments, Etc.	106.1	65.0	35.0	39	48.7	51.3
39	Miscellaneous Manufacturing	57.7	16.3	83.7	28	35.7	64.3
	Ice, Natural and Manufactured	147.4	60.9	39.1	173	63.0	37.0
10	Metal Mining	64.0	9.5	90.5	26	15.4	84.6
12	Coal Mining	238.8	33.1	66.9	76	55.3	44.7
13	Petroleum & Gas Extraction	380.7	22.8	77.2	98	20.4	79.6
14	Non-Metallic Mineral Mining	159.5	76.6	23.4	80	83.5	16.5

TABLE 3-15

Industrial Distribution of Consolidations and Acquisitions 1919-1930
(With Two-Firm Consolidations Counted As Consolidations)

	Industry Group	Merger Values Percentage By		Firm Disappearances Percentage By	
		Consolidations	Acquisitions	Consolidations	Acquisitions
20	Food & Kindred Products	32.1	67.9	32.6	67.4
21	Tobacco Products	14.5	85.5	27.3	72.7
22	Textiles	51.1	48.9	45.6	54.4
23	Apparel	12.9	87.1	8.3	91.7
24	Lumber & Wood Products	46.7	53.3	53.3	46.7
25	Furniture & Fixtures	63.0	37.0	69.6	30.4
26	Paper & Allied Products	19.5	80.5	35.2	64.8
27	Printing, Publishing, Etc.	60.8	39.2	71.2	28.8
28	Chemicals & Allied Products	39.4	60.6	30.9	69.1
29	Petroleum Products	14.7	85.3	31.7	68.3
30	Rubber Products	21.4	78.6	23.5	76.5
31	Leather Products	19.0	81.0	30.3	69.7
32	Stone, Clay & Glass Products	38.2	61.8	47.9	52.1
33	Primary Metals Industries	34.7	65.3	28.4	71.6
34	Fabricated Metals Products	38.4	61.6	29.0	71.0
35	Machinery (except Electric)	57.3	42.7	42.7	57.3
36	Electrical Machinery	28.8	71.2	39.1	60.9
37	Transportation Equipment	32.1	67.9	28.8	71.2
38	Scientific Instruments	71.9	28.1	56.4	43.6
39	Miscellaneous Manufacturing	46.8	53.2	42.8	57.2
	Ice, Natural and Manufactured	62.0	38.0	63.6	36.4
10	Metal Mining	20.9	79.1	26.9	73.1
12	Coal Mining	36.0	64.0	57.9	42.1
13	Petroleum & Gas Extraction	22.8	77.2	20.4	79.6
14	Non-Metallic Mineral Mining	76.6	23.4	83.5	16.5

Petroleum Products (29), Food Products (20), Chemicals (28), Transportation Equipment (37)) acquisitions accounted for at least 65% of total value. Similarly, acquisitions accounted for at least 65% of total disappearances in each of the five industries having the greatest number of firm disappearances (Food Products (20), Chemicals (28), Primary Metals (33), Non-Electrical Machinery (35), Transportation Equipment (30)).

In nine of the twenty-four two-digit categories the share of acquisitions as measured by value differed by more than ten percentage points from the share as measured by disappearances. This suggested that the size of to-be-acquired firms might have a bearing on the process of merger. Accordingly an examination was made of the average size of acquisition disappearances as compared to consolidation disappearances, to determine whether there were any systematic differences between them.

The crude measure of average size was determined by dividing the total merger value by the number of disappearances for a given industry, for consolidations and acquisitions separately. This was done for all industry groups. In general, the average size of acquisition disappearances was found to be not significantly different than that of disappearances by consolidation (Table 3-16).

In eighteen of the twenty-four industry groups the average size of acquisition disappearances was larger than consolidation disappearances. However, the size differences

TABLE 3-16

Comparison of Average Disappearance
Size by Acquisition and Consolidation

	Industry Group	Average Size of Disappearance by Consolidation (Million Dollars) (1)	Average Size of Disappearance by Acquisition (Million Dollars) (2)	Ratio (1) to (2) (3)
20	Food & Kindred Products	1.97	2.10	.94
21	Tobacco Products	1.87	4.11	.46
22	Textiles	2.57	2.44	1.05
24	Lumber, Wood Products	2.34	2.68	.87
25	Furniture & Fixtures	4.47	4.56	.98
26	Paper & Allied Products	1.84	4.09	.45
27	Printing, Publishing, Etc.	1.08	1.55	.70
28	Chemicals	6.12	6.68	.92
29	Petroleum Products	9.82	26.59	.37
30	Rubber Products	6.43	7.24	.89
31	Leather & Products	1.47	2.50	.59
32	Stone, Clay, Glass Products	1.60	2.86	.56
33	Primary Metals Industries	17.16	11.45	1.50
34	Fabricated Metals Industries	3.13	3.27	.96
35	Machinery (except Electric)	4.00	2.31	1.73
36	Electrical Machinery & Equipment	2.10	2.71	.77
37	Transportation Equipment	5.96	4.35	1.37
38	Scientific Instruments, Etc.	3.63	1.86	1.95
39	Miscellaneous Manufacturing	.94	2.68	.35
	Ice, Natural and Manufactured	.82	.90	.91
10	Metal Mining	1.65	2.85	.58
12	Coal Mining	1.95	4.85	.40
13	Petroleum & Gas Extraction	4.46	3.87	1.15
14	Non-Metallic Mineral Mining	1.91	3.01	.63

were not very large. In twelve of the twenty-four industries the ratio of average consolidation disappearance to average acquisition disappearance fell between .7 and 1.4. In nineteen industries the ratio fell between .5 and 1.95. There were only five industry groups in which the average acquisition disappearance was twice as large as the average consolidation disappearance. The Miscellaneous Products group (39) was very heterogeneous and had relatively little merger activity, as did Tobacco Products (21) in which the average disappearance by consolidation was based on only one consolidation of six firms. In both Paper (26) and Coal Mining (12), the disparity was mainly due to one atypically large acquisition. Omitting these two acquisitions, the average disappearance by acquisition would be $2.91 million in the Paper Industry, and $3.18 million in Coal Mining, increasing the consolidation to acquisition disappearance size ratio to .63 and .61 respectively. The one remaining major disparity is in Petroleum Refining where consolidations commonly combined small and medium sized companies while large firms were more commonly absorbed by other large firms one at a time. There was only one multi-firm consolidation, Transcontinental Oil Co., in which the new firm had assets of more than $50 million, while ten firms, each with assets of more than $50 million, disappeared by acquisition into very large oil companies.

These findings suggest that with few exceptions, the average size of acquisition disappearances was not signi-

ficantly different than consolidation disappearances. This would tend to cast doubt on the proposition that the size of a firm entering a merger, was an important factor in determining the process of merger that was used.

State of Incorporation

The freedom of action that a corporation has depends in large measure on the state granting its corporate charter. Its charter affects, among other things, the corporation's ability to diversify, to raise capital and to hold stock in other corporations. State laws and policies concerning corporate charters can also affect the ease with which a firm can engage in merger activity, and so can be a key factor in determining in which state a new consolidation will choose to be incorporated. The popularity of states chosen for merger incorporations, and shifts in popularity over time, may reflect the degree to which consolidation activity has responded to changes in the corporation laws of different states.

Distributions of consolidation activity by state of incorporation for 1919-1930 are presented in Table 3-17 and Table 3-18. Table 3-17 includes only consolidations of three or more formerly independent firms, while Table 3-18 includes consolidations of two firms as well. Comparison of the two tables indicates that the distributions for the two definitions of consolidations are substantially the same.

TABLE 3-17

Distribution of Consolidations By State of Incorporation 1919-1930

State	Number of Consolidations		Net Firm Disappearances		Value of Consolidations	
	Number	Percentage	Number	Percentage	$ Millions	Percentage
Delaware	126	49.6	559	53.1	1918.1	52.9
New York	19	7.5	74	7.0	449.1	12.4
Massachusetts	16	6.3	46	4.4	114.5	3.2
Maryland	14	5.5	74	7.0	225.6	6.2
Ohio	14	5.5	41	3.9	81.6	2.3
Pennsylvania	9	3.5	27	2.6	67.3	1.9
Michigan	7	2.8	15	1.4	54.0	1.5
California	7	2.8	31	2.9	44.2	1.2
Indiana	6	2.4	34	3.2	74.8	2.1
Virginia	6	2.4	32	3.0	54.7	1.5
New Jersey	4	1.6	11	1.0	408.7	11.3
West Virginia	4	1.6	25	2.4	25.7	.7
Illinois	4	1.6	11	1.0	30.5	.9
Texas	3	1.2	8	.8	4.5	.1
Maine	2	.8	5	.5	14.7	.4
Other States	8	3.2	44	4.2	35.0	1.0
Not Identifiable	5	2.0	15	1.4	19.9	.6

TABLE 3-18

Leading States of Incorporation
Including Two-Firm Consolidations

State	Number of Consolidations		Net Firm Disappearances		Value of Consolidations	
	Number	Per Cent	Number	Per Cent	$ Millions	Per Cent
Delaware	178	47.3	611	52.0	2299.3	52.6
New York	35	9.3	90	7.7	541.4	12.4
Ohio	19	5.1	46	3.9	112.9	2.6
Massachusetts	19	5.1	49	4.2	122.9	2.8
Michigan	16	4.3	24	2.0	80.8	1.8
Maryland	15	4.0	75	6.3	246.3	5.6
Pennsylvania	12	3.2	30	2.6	76.4	1.7
New Jersey	7	1.9	14	1.2	418.8	9.6

Delaware was overwhelmingly the predominant state of incorporation, on all measures, accounting for approximately one-half of total consolidation activity. Other important states are New York, Maryland, Ohio, and Massachusetts. New Jersey incorporated relatively small numbers of consolidations, but was third in consolidation value principally because of the very large Republic Steel Corporation consolidation of 1930. New York's proportion of merger values was almost double its proportion of the number of consolidations and firm disappearances, primarily because of its incorporation of Allied Chemical & Dye in 1920.

Table 3-19 describes shifts in the pattern between 1919-1925 and 1926-1930. In both periods Delaware accounted for approximately one-half of consolidation activity by all three measures. There were no radical changes in the relative positions of other states with the exception of New Jersey, for which the study recorded no merger consoli-

TABLE 3-19

Distribution of Consolidations By Leading States of Incorporation for Two Sub-Periods

State	1919-1925 Per Cent of Consolidations	1919-1925 Per Cent of Disappearances	1919-1925 Per Cent of Consol. Value	1926-1930 Per Cent of Consolidations	1926-1930 Per Cent of Disappearances	1926-1930 Per Cent of Consol. Value
Delaware	48.4	57.6	53.0	50.0	50.7	52.9
New York	8.4	9.0	22.1	6.9	5.9	6.0
New Jersey	--	--	--	2.5	1.6	18.7
Ohio	8.4	5.5	2.3	3.8	3.0	2.2
Maryland	4.2	4.5	7.5	6.3	8.4	5.4
Massachusetts	7.4	5.0	3.1	5.7	4.0	3.2
Indiana	--	--	--	3.8	5.0	3.4
Virginia	4.2	3.7	3.0	1.3	2.7	.5

TABLE 3-20

Distribution of Consolidations by Leading States For Largest Twenty-Seven Consolidations (Top 10%) With Assets Greater Than Twenty-Five Million Dollars

State	Number of Consolidations: Number	Number of Consolidations: Percentage	Consolidation Values ($ Millions)	Consolidation Values: Percentage
Delaware	19	70.4	1143.8	55.4
New York	2	7.4	355.5	17.2
New Jersey	2	7.4	387.8	18.8
Maryland	2	7.4	104.3	5.1
Indiana	1	3.7	46.0	2.2
Massachusetts	1	3.7	27.3	1.3

dations in the early part of the period. New York's decline in consolidation value reflected its incorporation of the very large Allied Chemical & Dye consolidation in 1920. Among the minor changes were increases in the positions of Indiana and California and decreases in Virginia and West Virginia. Maryland showed a considerable increase in number of consolidations and number of disappearances, but a decline in their proportion of total value. Maryland's high 1919-1925 value reflects the formation of the large ($67 million) Continental Baking Corporation in 1924.

Table 3-20 presents the distribution by state for the largest ten per cent of consolidations. This was done to learn if the pattern differed from that for all consolidations. It includes only the largest 27 consolidations, each having more than $25 million in assets. Together they accounted for 57% of total consolidation values. The Table confirms the previous finding of the pre-eminence of Delaware as the leading state for consolidation incorporations.

These results were next compared to the distribution of general business incorporations for the 5-year period, 1926-1930 (Table 3-21). The comparison dramatizes even more strongly the role of Delaware in consolidation activity. The Evans study[11] provides the data on general incorporations, and for the period 1926-1930 provides data for only eight states.[12] Accordingly, consolidation data for the same eight states was used in the comparison. The Evans

data provide no breakdown by size, and probably include many very small incorporations. By contrast, as described in Chapter 2, the coverage of very small consolidation incorporations in this study is incomplete and uneven. Though the coverages of the two distributions are thus not strictly comparable, the differences are so striking as to cause no change in the impression that Delaware accounted for a much greater proportion of consolidation incorporations than of general business incorporations.

TABLE 3-21

Comparison of Consolidation and General Business Incorporations for Eight States 1926-1930

State	General Business Incorporations		Consolidation Incorporations	
	Number (1)	Percentage (2)	Number (3)	Percentage (4)
New York	127,497	57.0	16	10.0
Illinois	29,625	13.2	7	4.4
Delaware	29,304	13.1	110	68.7
Ohio	19,872	8.9	9	5.6
Virginia	5,351	2.4	2	1.2
Maryland	5,197	2.3	11	6.8
Connecticut	5,056	2.3	4	2.5
Maine	1,834	.8	1	.9
Total	223,736	100.0	160	100.0

Source: Col. 1 computed from Appendix Three, George H. Evans Jr., Business Incorporations in the United States 1800-1943, N.B.E.R., Waverly Press, Baltimore, 1948.

Delaware also showed the greatest industrial variety of incorporations, having consolidations in each of the twenty-four industry groups that recorded consolidations. The next most widely diversified states were New York, with

consolidations in fourteen different groups, and Maryland which had consolidations in eleven.

Type of Integration

The motivation for and economic effects of mergers between competing firms at the same state of production (horizontal) are often quite different than for mergers between firms engaged in successive states of production (vertical) and mergers of firms selling non-competing products (diversified). Accordingly a classification of mergers by type of integration achieved was made for the years 1926-1930. For reasons of data availability and time limitations this classification was limited to consolidations whose new assets were at least $9 million, and acquisitions in which the size of the acquired firm was at least $3 million. This sample included 25% of all disappearances and 73% of total merger value for this 5-year period of peak merger activity.[13]

Though not fully comprehensive, the classifications are probably sufficient for many purposes. For example, one purpose of the study is to shed light on factors in the trend in industrial concentration and monopoly, and the effect of public policies toward merger in affecting this trend. This trend primarily involves the disappearance of relatively large firms and so the sample of larger firm mergers probably will capture the more significant part of merger activity for this purpose.

It can be seen from Table 3-22 that mergers between firms selling competing products -- horizontal mergers -- were by far the most important, both in number of disappearances and in the value of disappearing firms. There was a reasonably close relationship between the proportionate number of disappearances and value in each major category with the exception of the Horizontal-Vertical category. The excess of proportion of value over proportion of disappearances in this category, is due in large part to several mergers in the petroleum industry. In each, the merger was one in which one very large integrated firm (operating in the oil extraction, petroleum refining and distribution fields) either acquired, or was acquired by, another very large firm, which was also vertically integrated though possibly in different proportions. Accordingly the merger was classified in this mixed Horizontal-Vertical category. A similar pattern was found in the copper industry, though such mixed mergers were not as important as in oil. The disparity between the two measures in the Market Extension category can be attributed to one consolidation of 29 ice manufacturing firms spread over the South and Southwest, having total assets of only $18.4 million.

Table 3-23 classifies mergers not only by type of integration, but also by merger process, i.e., by consolidation or acquisition. (This same classification, but defining two-firm consolidations as consolidations,

is given in parenthesis after each figure.) The breakdown indicates that a much larger proportion of the value of disappearances by consolidation than by acquisition involved horizontal integration. This suggests that multi-firm consolidations were used relatively more than acquisitions in attempts to expand a company's share of a specific industry or market.

TABLE 3-22

Distribution of Merger Activity
By Type of Integration 1926-1930
Large Firm Mergers

Type of Integration	Per Cent of Disappearances in Sample	Per Cent of Total Value in Sample
Horizontal	44.0	38.2
Vertical	4.8	4.6
Diversified	17.6	20.6
Horizontal-Vertical	9.7	24.2
Horizontal-Diversified	13.9	10.3
Vertical-Diversified	.7	.4
Market Extension	8.3	1.2
Not Identifiable	1.0	.5
	100.0	100.0
Total 1926-1930 Disappearances	1946	Value 7265.7 Million Dollars
Classified Mergers as Per Cent of Total Mergers	25%	73%

Both the Vertical and Horizontal-Vertical categories account for a significantly greater proportion of acquisitions than consolidations. As already mentioned, the high percentage for Horizontal-Vertical merger values reflected large petroleum and copper mergers where large integrated

firms commonly acquired other large integrated firms one at a time. These two industries also saw a considerable amount of simple vertical integration in mergers in which the acquired firm was a large, but not integrated, enterprise. Among the large firms in these industries using the acquisition process to gain control over other large firms were Anaconda Copper, Kennecott Copper, Standard Oil of New York, Standard Oil of California, Standard Oil of Indiana and the Texas Company.

TABLE 3-23

Distribution of Merger Value By Type of Integration, Classified By Consolidation and Acquisition 1926-1930, Large Firm Mergers

Type of Integration	Per Cent of Acquisition Value in Sample		Per Cent of Consolidation Value in Sample	
Horizontal	30.8	(29.6)	53.5	(53.6)
Vertical	6.2	(6.5)	1.4	(1.2)
Diversified	20.7	(19.5)	20.2	(22.4)
Horizontal-Vertical	29.9	(31.4)	12.4	(11.3)
Horizontal-Diversified	10.7	(11.2)	9.5	(8.7)
Vertical-Diversified	.3	(.3)	.5	(.5)
Market Extension	.6	(.7)	2.5	(2.3)
Not Identifiable	.8	(.8)	--	--
	100.0	(100.0)	100.0	(100.0)
1926-1930 Total Merger Value ($ Millions)	5100.5		2165.2	
Classified Merger Value as Per Cent of Total Merger Value	70.1%		79.7%	

The findings may lead to some revision of existing opinions about the form and direction of merger activity in the 1920's. One opinion is that of Jesse Markham,[14]

who characterized merger activity in the period as follows: " . . . Illustrative cases permit no sweeping generalizations, [however] they suggest that a large portion of the mergers formed in the 1920's brought together firms producing totally different lines of products, the same products in non-competing territories, or firms engaged in different stages of fabrication."

The comprehensive classifications developed in this study permit a test of the quantitative distribution of merger activity implied by the Markham statement. If all Horizontal-Vertical mergers are arbitrarily classified as Vertical, thus understating the size of the Horizontal category, the Vertical category would account for 28.8% of total value. Similarly, if we were to classify all Horizontal-Diversified mergers as Diversified, the Diversified category would account for 30.9% of total value. Both these percentages are smaller than the purely Horizontal percentage; and, of course, mergers in both the Horizontal-Vertical and Horizontal-Diversified categories contain significant elements of horizontality.

The proportion of Horizontal mergers may have been exaggerated in the table by the rule used in classifying mergers as Market Extension. Such classifications were made only when it was clear that the geographical markets of merging firms did not overlap. If there was no evidence concerning the market areas of the merging firms, and if the products were competitive the merger was classified as

Horizontal. Mergers of firms with products serving essentially local markets accounted for 16% of the value and 33.5% of the disappearances listed in the "Horizontal" category.[15] If we omit all mergers of firms in these six local market categories, the Horizontal category would account for 32.1% of total value and 29.3% of all disappearances. This, of course, would be an over-compensation and would understate the share of horizontal mergers, since it is likely that some of the merging firms in these six industries operated in the same market area.

Perhaps a rough measure of the share of horizontal mergers might be made by recognizing the horizontal element in the two relevant mixed categories. If we were to assign half of the value of the mixed Horizontal-Vertical and Horizontal-Diversified categories to Horizontal, Horizontal mergers would then account for 49.4% of total value. Add back some of the mergers categorically eliminated in the preceding paragraph as being Market Extension and the percentage in the Horizontal category becomes even higher than first indicated. The findings suggest that, for the merger wave of the late 1920's, Markham's emphasis on the importance of mergers for vertical integration, expansion into new markets, and product diversification may be too strong.

CHAPTER 3 - NOTES

1. The date of the merger could not be determined any closer than the year for 5.9% of all disappearances. To this extent the annual series contains more than the sum of the quarterly series. This 5.9% of disappearances is distributed throughout the period and does not distort the sub-annual time pattern. In addition most of these were small firms (primarily dairy and ice) whose effect on the value series is negligible.
2. Discussion of the broad underlying economic conditions prevalent during this period, and accompanying cyclical fluctuations, rely heavily on George Soule, Prosperity Decade, From War to Depression: 1917-1929 (New York: Holt, Rinehart and Winston, 1947).
3. In 1923 there were seven acquisitions in which the acquired firm had assets of more than $50 million, four of which were larger than $90 million.
4. Turning points in the Thorp merger series (presented in Table 3-3, Column 4) were identified by the Business Cycle Unit of the N.B.E.R. and presented in Ralph Nelson, Merger Movements in American Industry 1895-1956, p. 109.
5. Ibid.
6. Ibid., p. 111.
7. Anthracite Coal mining (11) was combined with bituminous

coal mining (12), making four two-digit mining industries all of which experienced merger activity.

8. Although data on total capital by industry are available for the years 1919 and 1929, the 1929 data were considered to be more relevant, since 56% of total firm disappearances and 51% of total merger value occurred during 1927-1930. In any event, using 1919 capital data would not significantly alter the results.

9. Primary Metals (33) and Fabricated Metal Products (34) were combined as were Lumber and Wood Products (24) with Furniture and Fixtures (25), because the data on capital size made it impossible to divide them in the same manner as they are separated in the S.I.C. system.

10. The undercoverage of merger activity by these firms is discussed in Chapter 2.

11. George H. Evans, Jr., Business Incorporations in The United States 1800-1943 (Baltimore: Waverly Press for N.B.E.R., 1948).

12. For the early 1920's there is even more limited coverage. The Index of Incorporations, published by Survey of Current Business, covering this period, is an aggregate based on only four of the states, Delaware, New York, Illinois and Maine.

13. The consolidation - acquisition breakdown of this sample is not significantly different than its breakdown in the total. Consolidations in the sample accounted for 32.6% of the total merger value in the

sample. In the same period all consolidations accounted for 29.8% of the value of all mergers.

14. "Survey of the Evidence and Findings on Mergers", Business Concentration and Price Policy, p. 171.

15. Classification of "market oriented" industries relied heavily on the distinction drawn by Thorp and Crowder between national and regional markets, in T.N.E.C. Monograph 27, The Structure of Industry.

CHAPTER 4

OLIGOPOLY AND MERGER 1919-1930

Merger For Oligopoly

Professor Stigler has contrasted the objectives and effects of mergers taking place at the turn of the century with those of the 1920's. The purpose and result of many mergers before 1904 was the establishment of a monopoly or near monopoly, the merged firm controlling a large proportion of the market. Such control was diluted in the two decades that followed the turn-of-century wave. The mergers of the 1920's, however, did not seek to restore the previously achieved levels of control.

> One great change has taken place in the merger movement since the 'Northern Securities' decision: the share of the industry merged into one firm has fallen sharply. In the early period, as we have seen, the leading firm seldom has merged less than 50 per cent of the industry's output; in the later period the percentage has hardly ever risen this high. The new goal of mergers is oligopoly.
>
> The change has been most striking in the industries which were merged for monopoly at the beginning of the century. The merger firm has declined continuously and substantially relative to the industry in almost every case. The dominant firm did not embark on a new program of merger to regain its monopolistic position, however; the new mergers were undertaken by firm of the second class. The industry was transformed from near-monopoly to oligopoly.[1]

Professor Stigler goes on to offer a possible explanation for this pattern:

> The Sherman Law seems to have been the fundamental cause for the shift from merger for monopoly to merger

> for oligopoly. Sometimes its workings were obvious, as when Standard Oil was dismembered and when the leading baking mergers were prevented from combining. More often, its workings have been more subtle: the ghost of Senator Sherman is an ex officio member of the board of directors of every large company. The explanation for the new direction of mergers is vulnerable to the criticism that it is simple and obvious, but no plausible alternative explanation is available.[2]

The primary thrust of the Stigler analysis is toward industries that had dominant firms, and near-monopolistic in structure. Presumably it would apply to all such industries whether the dominant firm was the result of earlier merger activity or some other process. In these industries, the dominant firm would not attempt to increase its share of the market through merger. Instead, firms of the second rank might more freely engage in mergers so as to compete on more equal terms with the leading firm. Mergers by firms of the second rank created one or several larger firms, changing the structure of the industry from near-monopoly to oligopoly.

There is, however, a second important aspect of the Stigler analysis which received less emphasis. Anti-trust policy might also affect the structure of industries that initially had a basically competitive structure (polypoly). These industries usually had not previously experienced widespread merger activity. In the second wave, when mergers occurred in these industries, firms embarking on a program of mergers would not attempt to create a monopoly, but would stop after gaining control over a much smaller share of the

market. The "ghost of Senator Sherman" hypothesis could serve to explain both kinds of merger patterns. That is, it could explain why a dominant firm would not attempt to increase its share of the market through merger, and why a merger firm emerging out of polypoly would stop short of seeking a near-monopoly position.

If one distinguishes between these two cases, then some of the apparent controversy that appeared in the literature might be clarified. For example, Jesse Markham commenting on Stigler's hypothesis, wrote, "While mergers in the 1920's increased oligopoly, oligopoly provided a motive for no more than a small fraction of them. Merger for oligopoly presupposes an extremely high order of oligopolistic rationalization - a much higher order than events or logic can support."[3]

However, if the two cases are considered separately, the criticism becomes inapplicable in one, and trivial in the other. In the dominant firm situation, the main effect is that the leading firm is precluded from merging because of fear of anti-trust prosecution. It follows that any significant merger activity by the smaller firms will tend to change the industry structure towards oligopoly. This, even though they give no specific attention to the advantages of industry rationalization and interdependence. No parallel action by others is necessary to create an oligopoly. (In a later paragraph, Markham does seem to concede that the analysis is sometimes applicable under conditions of partial

monopoly.)

In the case of polypoly, the criticism seems trivial. Stigler does not say that the motive was the explicit choice of oligopoly as contrasted to monopoly, and that a small firm would undertake merger activity only because it was felt that several other small firms would do likewise. The motive, then as always, was market power, but the existing market structure and the anti-trust laws led the new mergers to positions of market power short of monopoly -- i.e., a share consistent with oligopoly -- regardless of whether any other firms were expected to act likewise.

Test of the Hypothesis

The detailed merger data gathered in this study enable a testing of only the oligopoly-from-monopoly aspect of the hypothesis. A test of the oligopoly-from-polypoly hypothesis would require information on specific industry shares achieved by a merger, for a large number of small firms. As shown in Chapter 2, data on small firm mergers gathered in this study are incomplete and uneven. They are probably expecially rare for the relatively smaller industries where significant oligopoly and monopoly power may have been achieved by merger during this period.

However, the data do permit some test of the hypothesis that in dominant firm, near monopoly industries, merger activity was generally more actively pursued by the second ranked

firms. While it was not possible in all cases to compute specific market shares, several studies of industry structure for this period identify near-monopoly or dominant firm industries. They enable us to partition the recorded merger activity in these industries into the percentage of the total accounted for by the dominant firms and that accounted for by the lower-ranked firms. In addition we will be able to compare the findings for the group of dominant firm industries with those for another group of industries in which the leading firms had relatively small shares of their markets. In the latter group, leading firms presumably had less to fear from prosecution under the Sherman Act. The comparison will help determine whether there were any significant differences between the two groups that could be attributed to the existence of the anti-trust laws and fear of their implementation.

Based on a minimum market share of 40%, the following firms were identified as being dominant in their industries, by one or more of several studies on industry structure:[4] U. S. Steel, American Can, U. S. Gypsum, International Harvester, National Biscuit, U. S. Industrial Alcohol, Procter and Gamble, and Pittsburgh Plate Glass. This group of firms was compared to another group of firms who also were the leading firms in their industries, but which had much smaller shares of their markets. These include General Mills, International Paper, International Shoe, Harbison-Walker Refractories, and

Owens-Illinois. Two other companies, Anaconda Copper and Lehigh Portland Cement, were also included in this category. Their inclusion is somewhat arbitrary as they were not the leading firm over the whole period. The reasons for their inclusion will be discussed in a later section.

Table 4-1 shows the shares of industry merger activity, measured as both number of firm disappearances and merger value, that was accounted for by the leading firm.[6] Only mergers that had elements of horizontal expansion(broadly defined) were included in compiling this table. Data for dominant and non-dominant leading firms are presented separately for purposes of comparison. Table 4-2 provides summary measures for all firms in each group. To provide a more representative measure for comparison, weighted averages for the group of dominant firms were also computed, excluding the steel industry. The reason for excluding steel was that it accounted for 78.8% of the merger value in the group of dominant firm industries; U. S. Steel, which engaged in relatively little merger activity, strongly influenced the weighted average. These alternative weighted averages are presented in Table 4-2, rows 3 and 6.

The sample is too small to test the statistical significance of the findings. However the results are suggestive. They show a higher percentage of disappearances accounted for by leading firms in dominant positions than by those in the non-dominant positions on the basis of the simple average and one weighted average, and only slightly less according to

TABLE 4-1

Per Cent of Industry Merger Activity Accounted for by the Leading Firm - Dominant and Non-Dominant Firm Industries

Group 1 - Leading Dominant Firms

Industry or Product	Name of Leading Firm	Total Industry Disappearances	Per Cent by Leading Firm	Total Industry Value $ Million	Per Cent by Leading Firm
Soap and Detergent	Procter & Gamble	10	50.0	65.4	28.6
Gypsum Prod.	U. S. Gypsum	10	40.0	35.2	30.1
Biscuits and Crackers	National Biscuit	25	36.0	59.3	56.2
Flat Glass	Pittsburgh Plate Glass	21	14.3	50.5	8.1
Industrial Alcohol	U. S. Industrial Alcohol	26	11.5	67.5	11.6
Agricultural Machinery	International Harvester	25	8.0	124.3	5.0
Primary Steel	U. S. Steel	77	.5	1566.0	2.7
Tin Containers	American Can	16	--	22.6	--

Group 2 - Leading Non-Dominant Firms

Flour Milling	General Mills	23	34.8	79.5	45.3
Glass Containers	Owens-Illinois	11	27.3	42.6	54.7
Copper Mining	Anaconda Copper Mining	18	16.7	389.7	54.4
Shoes	International Shoe	17	11.8	45.3	70.0
Refractories	Harbison-Walker Refractories	20	10.0	30.6	7.8
Paper	International Paper	43	9.3	188.3	9.7
Cement	Lehigh Portland Cement	34	3.0	151.1	2.2

the other weighted average. This would tend to cast doubt on the hypothesis that, as a general rule, dominant firms were more reluctant to expand through acquisition because of the underlying fear of anti-trust prosecution.

TABLE 4-2

Summary Measures of Comparison of the Two Groups of Leading Firms

	Per Cent of Industry Merger Activity Accounted for by Leading Firm	
	Dominant Firms	Non-Dominant Firms
Disappearances		
1. Simple Average	20.0%	16.1%
2. Weighted Average	12.9%	13.9%
3. Alternate Weighted Average	19.5%	
Merger Value		
4. Simple Average	17.8%	34.9%
5. Weighted Average	6.1%	35.2%
6. Alternate Weighted Average	18.9%	

On the other hand, the group of leading non-dominant firms accounts for a higher percentage of merger values than the dominant firms for all three kinds of weighted average. The horizontal acquisitions of leading non-dominant firms more typically involved relatively large firms while the leading dominant firms acquired relatively smaller companies.

Effects of the Anti-trust Laws

One interpretation of this pattern relates it to the enforcement of the anti-trust laws. Dominant firms may not have been afraid to engage in mergers as such, but only those that would increase their leadership positions in a dramatic and immediate manner. This attitude may have resulted from the Federal Trade Commision's interpretation of the standard of illegality that constituted a Clayton Act violation. It held that,

> An acquisition completely eliminating the competition between the two firms does not substantially lessen competition between the two firms unless the competition is substantial. . . . The commission adopted the policy of requiring as a prerequisite to an order of divestment the existence, prior to the acquisition, of substantial competition between the acquiring and the acquired firms.[7]

Within this framework, the Supreme Court ruled that "the preexisting competition is to be considered substantial only if its elimination would constitute a Sherman Act violation."[8] Presumably a Sherman Act violation involved the combination of principal firms in industries, and not simply the merger of any firms in the industry.

However the weak general enforcement of Section 7 during this period raises the question of whether the F.T.C. could be so discriminating in applying the standard of illegality. Even before judicial interpretation of Section 7, the F.T.C. recognized that it could not prevent acquisition of assets. It held "that the mere purchase of such competitor other than capital stock is not prohibited

by the Clayton Act or the Federal Trade Commission Act."[9] The Supreme Court later ruled that the F.T.C. could not order divestiture of assets even if their acquisition followed an unlawful acquisition of stock. Therefore, any firm wishing to effect a merger could have taken advantage of the "assets loophole" and thus have become immune to prosecution.

Furthermore, the possibility of conviction even for acquisition of stock was sharply diminished by the 1920 Supreme Court decision in the U. S. Steel case. Whitney discusses the court's ruling that "the law does not make mere size an offense or the existence of unexerted power an offense," and maintains that, "from this opinion emerged the concept of a 'good trust' - one that had abandoned its objectionable practices and no longer attempted to drive competitors out of business or to increase its domination of the industry."[10] He concluded that the result of this decision was that, "Since mere size was no offense, other companies proceeded to expand actively through mergers."[11]

In addition to the F.T.C., the other agency most directly concerned with enforcing the anti-trust laws is the Anti-Trust Division of the Justice Department. The Division claimed to be following a policy of closely scrutinizing all proposed mergers to determine whether they were in the public interest.

> The policy instituted a year ago [1926] of examining at their inception into the surrounding facts and conditions of proposed consolidations has been pursued. The results obtained have confirmed our opinion that it is in the public interest to obtain

> and consider the salient facts relative to any proposed centralization of business before that has become an established fact.[12]

However, these noble intentions seem to be at sharp variance with the Division's record of performance. David D. Martin states that, "the Justice Department played a minor role in the administration of Section 7 from 1914 until 1950,"[13] and almost none during the 1920's. Referring to this period he writes that, "the Justice Department failed to follow a policy of systematic investigation of acquisitions with the consequent continuing litigation of Section 7 cases," and concluded that, "this appears to have been the result of a deliberate policy of division of labor with the Federal Trade Commission. . . ."[14]

Perhaps part of this divergence between word and deed is explained by the view of William J. Donovan, who until 1928, was Assistant to the Attorney General, in charge of the Anti-Trust Division.

> It is believed that consolidations may in some degree correct the evils of destructive competition and that it [the movement] represents an effort to adjust the relations between production and consumption, supply and demand. It is only when these consolidations attempt to eliminate competition, to enhance existing prices and to exercise permanent control in the industry that they constitute violations of the law.[15]

This feeling that if the new combinations did not pursue predatory policies, their formation was beneficial to the economy, was a theme vigorously espoused by the nation's business leaders. Several articles appeared in leading business periodicals,[16] not only maintaining that the large

firms resulting from mergers would be more efficient, but also assuring the public that any increase in the power of large firms will not be used against the public interest.

One additional point might be made. Even if a firm were liable to be prosecuted, it may have had little to lose by trying merger, since the remedy would be an order for divestiture of the acquired stock. Since there was a good chance that it would not be prosecuted,[17] and since divestiture would probably leave it no worse off than before, there was little reason to decide not to attempt a merger.

A far more striking contrast is observed between the merger activity by leading firms that had already been prosecuted for violation of the anti-trust laws and those that had not. Of the fifteen firms considered, only U. S. Steel, American Can, and International Harvester had been faced with Government attempts at dissolution.[18]

In 1920, the Supreme Court in a close decision, dismissed the Government request for the dissolution of U. S. Steel that had been pending in the courts for several years. However, the litigation seemed to affect the merger policies of U. S. Steel. Whitney states that even before the Supreme Court decision, "U. S. Steel had already ceased to expand for fear of losing the suit, and, realizing its narrow escape, slowed down its expansion for some time."[19]

The Government filed suit to dissolve American Can in 1913, charging it with restraint of trade and monopoly. The

District Judge's decision delivered in 1916 stated,

> . . . that dissolution would be "inexpedient," but reserved to the Department of Justice the right to ask again for this or other relief if the "size and power" of American Can should ever result in injury to the public or even in unintended domination of the industry.
>
> The government dropped its appeal to the Supreme Court after that tribunal ruled against dissolution of the U. S. Steel Corporation in 1920. The two cases were analogous, for each involved a corporation whose nonpredatory policies and declining share of the market caused its monopolizing intent to be forgiven.[20]

It seems likely that any attempt by American Can to increase its share of the market - especially through merger - might have resulted in an adverse decision from the Courts; and this realization probably was a powerful deterrent for American Can, just as Whitney says, as it was for U. S. Steel.

In 1914, the U. S. District Court of Minnesota directed the dissolution of International Harvester. After the Supreme Court twice heard arguments on appeal without a decision, the company consented in 1918 to dispose of three lines of machinery. In 1923 the Justice Department again asked the District Court to split International Harvester into three corporations. In 1925 the Court denied the government's petition; and this decision was affirmed by the Supreme Court in 1927. The Supreme Court's decision in favor of International Harvester relied heavily on the precedence of the U. S. Steel decision in 1920, and on the fact that the company's share of harvesting machines sold had been declining.[21]

In all three cases, the declining market shares of

these firms was an important factor in the Supreme Court's decisions against dissolution. It is likely that each of these firms, having barely escaped with its corporate life intact was anxious to show that it really was a 'good trust.' Consequently each refrained from any action such as merger that might destroy this image, and possibly reopen the case. The dramatic contrast between the three firms that faced dissolution and the other twelve firms is presented in Table 4-3, rows 1 and 2. The weighted average of total industry merger value accounted for by the leading firm is 1.8% for the group of three firms that were prosecuted, and 33.3% for the twelve other leading firms.

TABLE 4-3

Comparison of Several Groups of Leading Firms by Degree of Dominance and Anti-Trust Prosecution

		Simple Average Value	Weighted Average Value
1.	U. S. Steel, American Can International Harvester	2.6%	1.8%
2.	Twelve Leading Firms Not Prosecuted	31.6%	33.3%
3.	Five Dominant Firms Not Prosecuted	26.9%	28.6%
4.	Seven Non-Dominant Firms Not Prosecuted	34.9%	35.2%

The Table shows that the group of five dominant firms not threatened with dissolution engaged in a markedly greater degree of merger activity than the three firms that were prosecuted. (Table 4-3, lines 1 and 3.) The simple average of 26.9% and the weighted average of 28.6% of total industry

merger value accounted for by the five non-prosecuted dominant firms compares to 2.6 per cent and 1.8 per cent respectively for the three prosecuted ones. It would appear that dominant firms that had not faced dissolution may not have felt the same need to show how 'good' they were, as did the three firms that had faced dissolution. There did not seem to be any 'demonstration effect' at work.

Omitting the three prosecuted firms from the group of dominant firms will enable a comparison of leading dominant and non-dominant firms, none of whom had been subject to a serious threat of dissolution. The comparison shows a much smaller difference between dominant and non-dominant leading firms than earlier observed (Table 4-3, lines 3 and 4). The simple average value accounted for by the five dominant but non-prosecuted firms is 26.9% compared to 34.9% for the seven non-dominant firms. The weighted average value accounted for by the five firms is 28.6% compared to 35.2% for the seven firms. Given the small number of firms compared, it is not possible to test the significance of the difference. It is not impressively large, however.

These findings seem to confirm the opinion of Milton Handler concerning the effectiveness of the anti-trust laws during this period.

> No one can read the cases or study the recent mergers without feeling that the chief effect of the federal anti-trust laws in this field has been the prevention of complete domination - the consolidation movement has not been otherwise repressed. The Sherman Law under the latest pronouncement of the Court has imposed no serious fetters upon the merger processes

> and an area large enough to satisfy the most optimistic of promoters — 64% according to the 'Harvester' decision — has been left free of governmental restraint. The virtual disappearance or dilution of competition in a number of important industries has not been prevented.[22]

Based on his interpretation of the data, Prof. Stigler concluded his analysis by offering the 'student of social policy' the "promising hypothesis: it is possible to change the trend of industrial organization by the lackadaisical enforcement of an anti-trust law."[23] The patterns revealed by our data suggests that while an attempt at enforcement may have affected the future policies of those firms directly concerned, it apparently did not cause any significant changes in the actions of other firms.

The relative ineffectiveness of the anti-trust laws during this period can be contrasted to the changing pattern of merger activity after the 1950 Celler-Kefauver anti-merger amendment to the Clayton Act. In Appendix A, the degree of horizontal merger activity is compared for five periods between 1926-1964. The findings indicate that horizontal mergers declined sharply immediately after 1950 as a likely result of the amendment, and continued to decline. This suggests that the enactment and vigorous enforcement of anti-trust legislation can be an effective method of preventing competition reducing mergers.

Mergers and Changes in Industry Structure: Selected Industries

To provide a different perspective on the effect of mergers on the pattern of industry structure, a brief summary of patterns will be presented for several industries. This will illuminate the distinctions between the merger activity of leading firms and those of the second rank.

Steel

In 1901 U. S. Steel produced 61.6% of the ingot steel castings in the U. S.[24] Its share of the market had fallen to 39.9% in 1920 and 37.2% in 1930. Between 1919 and 1930 its only acquisition of a primary steel manufacturer was in 1930, when it acquired Columbia Steel, a West Coast company with assets of $41.7 million. Due to a revaluation, its asset[25] size declined from $2366 million in 1919 to $2286 million in 1929, despite its internal growth and several other acquisitions.

In 1930 the second, third and fourth ranked companies in total assets were Bethlehem, Republic and Youngstown respectively, each of which engaged in significant merger activity during the decade. Bethlehem acquired $380.4 million of primary steel producing capacity including Midvale Steel & Ordnance which had been the third largest steel company

in 1919. Republic's acquisitions totalled $243.2 million and Youngstown's, $158.5 million during the decade. Growth by merger 1919-1930 as a percentage of total 1930 assets, was 47.4% for Bethlehem, 73.3% for Republic and 67.1% for Youngstown, compared to 5.1% for U. S. Steel.

In addition, if we consider the next four firms in asset size in 1930, two of them, Wheeling Steel and National Steel, were formed as a result of consolidations in 1920 and 1929 respectively. The five second rank firms mentioned, accounted for 72.6% of all merger value in the primary steel industry. The combined share of Bethlehem and Republic increased from 8.2% in 1920 to 19.9% in 1930.

For steel, it seems clear that mergers by second rank firms during the period 1919-1930 were instrumental in moving the structure of the steel industry from a dominant firm situation toward oligopoly. Although U. S. Steel's share remained roughly constant, mergers among the second rank firms enabled several to become large enough to pose some threat to U. S. Steel.

Cans

American Can has dominated the tin container industry since its organization at the turn of the century. Its share of the market, which was 80% in 1901, declined to 60% by 1902 and 52% by 1914. It then levelled off showing 52% in 1923 and 53% in 1929. Its closest rival has been

Continental Can which accounted for 17% from 1914 through 1923. However between 1923 and 1930 its share grew to 33% of the market, almost entirely through the acquisition of other tin can manufacturers. In this industry also, mergers were instrumental in transforming an industry dominated by a single leading firm into duopoly.

Copper

In 1900 Anaconda Copper Mining accounted for approximately 40% of all the copper mined for the U. S. market.[26] By 1921, although still the largest, its share had fallen to 9.1%. Primarily through its acquisitions of Chile Copper it jumped to 21.8% in 1922. Through other acquisitions it remained close to 20% through 1930. Anaconda also expanded vertically to a significant extent. It acquired American Brass, a major copper and brass fabricator with assets of $47.0 million in 1922 and formed a subsidiary, Anaconda Wire & Cable in 1929, as a combination of several wire and cable firms. Total acquisitions between 1919 and 1930 accounted for 42% of its 1930 assets.

Kennecott Copper produced only 1.9% of the copper in the U. S. in 1919. In 1923 it jumped to 17.9% primarily through the acquisition of Utah Copper, and in 1926 it jumped to 26.7% through the acquisition of Ray Consolidated Copper. This made Kennecott the leading copper mining firm, a position it has retained to the present day.

Since Anaconda was not the leading firm for the entire period, it might be argued that it should not be included in the group of leading firms. It was the leader at the beginning of the period, however, and two out of its three horizontal acquisitions, representing 73% of the total value of its mergers occurred when it was still the leading firm. In any event it seems clear that the aggressive policy of growth by acquisition pursued by both Anaconda and Kennecott contributed significantly to the development of an oligopolistic market structure. A third firm, Phelps-Dodge, grew rapidly in the early 1930's, largely through merger, to a position rivalling the other two.

Cement

Lehigh Portland Cement was the leading cement producer in the U. S. from 1919 through 1929. Universal-Atlas Cement, a subsidiary of U. S. Steel, was formed in 1930 as a merger of Universal Portland Cement and Atlas Portland Cement. The two companies had been the second and third ranking firms in the industry, and became the largest cement producer with 13.0% of 1930 output compared to Lehigh's 11.0%. As seen in Table 4-1 Lehigh accounted for a very small percentage of merger activity within the cement industry, in spite of the fact that it presumably had little to fear from anti-trust prosecution. Yet, mergers within this period did operate to foster an oligopolistic market structure. In

1930 the two firms mentioned plus the next three — International Cement (now Lone Star), Penn-Dixie and Alpha Portland Cement, accounted for 41% of the total output. International Cement and Penn-Dixie Cement were formed as the result of multi-firm consolidations during this period. These five top firms accounted for 61.8% of the disappearances and 65.7% of the merger value in this industry.

Biscuits and Crackers

National Biscuit was the dominant firm in the biscuit and cracker industry accounting for between 40% to 55% of the industry's output during this period.[27] It accounted for a substantial proportion of the merger activity in this industry (Table 4-1). However, the second ranking firm, Loose-Wiles Biscuit, with approximately 20% of the market, also engaged in a moderate amount of acquisition. The United Biscuit Company was formed as a consolidation in 1927 to become the third ranking firm, and by 1930 had absorbed a total of twelve biscuit manufacturers.

Soap

Procter & Gamble was the leader in the soap and detergent industry with approximately 40% of the market during and following this decade. It had no close rival for this leadership.[28] It accounted for a significant proportion of merger activity in the soap industry. However, the Palmolive

Company, which acquired Peet Bros. in 1927, and merged with Colgate in 1928, as well as with several other smaller firms, recorded greater growth by merger. The resulting firm, Colgate-Palmolive-Peet accounted for approximately 20% of the market and became with Lever Bros. (20%) the closest rivals to Procter & Gamble.

In the soap and biscuit industries the dominant firms accounted for a substantial proportion of the total merger activity, contrary to the hypothesis that firms in their category abstained from merger activity. However, even in these two industries, the growth of second rank firms through merger tended to increase the degree of oligopoly.

Conclusion

Consideration of these representative industries indicates that in certain instances the leading firm engaged in relatively little merger activity, as compared to second rank firms, while in others the leading firm was quite active. Even where the leading firm was active in acquiring other firms, quite often second rank firms also achieved substantial growth through mergers. The result, would appear to be that, in many cases, mergers whether transforming a dominant firm structure to oligopoly or strengthening an existing oligopolistic market structure, led to increased levels of industry concentration.

This conclusion must be qualified, however. For one

thing, it is not possible to measure the changes in concentration that would have taken place in the absence of merger activity, or to determine the precise changes in concentration as a result of mergers. In addition, concentration ratios were generally not available for this period. However, in view of the substantial merger activity recorded by the largest firms in many industries, it seems reasonable to assume that this activity achieved higher levels of industry concentration than otherwise would have prevailed.

CHAPTER 4 - NOTES

1. George Stigler, "Monopoly and Oligopoly by Merger," American Economic Review Papers and Proceedings, XL, No. 2 (May, 1950), p. 31.
2. Ibid., p. 32.
3. "Survey of the Evidence and Findings on Mergers," Business Concentration and Price Policy, p. 171.
4.

Firm	Source of Identification
U. S. Steel	B, WA, BL
American Can	B, N&D, BL
International Harvester	B, WA
National Biscuit	B, N&D, BL
Procter & Gamble	N&D, BL
U. S. Industrial Alcohol	B, W
Pittsburgh Plate Glass	N&D, WA
U. S. Gypsum	W

Code: B - Arthur R. Burns, The Decline of Competition (New York: McGraw-Hill Book Co., 1936).

WA - Myron Watkins, Industrial Combinations and Public Policy (Boston: Houghton Mifflin Co., 1927).

BL - John M. Blair and Others, Economic Concentration and World War II, U. S., Congress, Senate, Small Business Committee (Washington: U. S. Government Printing Office, 1946).

N&D - Edwin G. Nourse and Horace B. Drury, Industrial Price Policies and Economic Progress (Washington: The Brookings Institution, 1938).

W - Clair Wilcox, Morograph No. 21 Competition and Monopoly in American Industry, Temporary National Economic Committee (Washington: U. S. Government Printing Office, 1940).

For some industries specific data on market shares are based on data for the period 1919-1930. In others, specific data on market shares relate to a later date; however, the evidence suggested that the shares had not changed significantly from the 1920's.

5. Stigler's prime example, U. S. Steel, accounted for approximately 40% of its market during this decade. This percentage was therefore taken as the dividing line between "dominant" and "non-dominant" leading firms.

6. The percentages presented are probably overstated, because of the limited coverage of merger activity by small firms. However, there is no reason to suppose that the degree of overstatement varies greatly among the different industries, which would significantly reduce the validity of any comparisons.

7. David D. Martin, Mergers and the Clayton Act (Berkeley: University of California Press, 1959), p. 146.

8. Ibid.

9. Federal Trade Commission, 1916 Annual Report (Washington: 1916), p. 52, quoted in D. D. Martin, p. 98.

10. Simon N. Whitney, Antitrust Policies (2 Vols.; New York: The Twentieth Century Fund, 1958), I, p. 259.

11. Ibid., p. 260.

12. U. S., Department of Justice, 1927 Annual Report of the Attorney General (Washington: U. S. Government Printing Office, 1927), p. 25.

13. Mergers and the Clayton Act, p. 205.

14. Ibid., p. 219.

15. In a 1927 speech to a paint industry convention, quoted in Willard Thorp, "The Persistence of the Merger Movement," American Economic Review Papers and Proceedings (March, 1931), p. 80.

16. For example see O. A. Cheney, "Even the Big Can't Stand Alone," Nations Business (July, 1929), and Joseph Lawrence, "Are Mergers a Threat or a Promise?," Nations Business (February, 1930).

17. During this period, the anti-trust agencies were operating with only skeleton staffs. See Corwin D. Edwards, "Can the Antitrust Laws Preserve Competition," American Economic Review Papers and Proceedings (March, 1940).

18. There were other firms who faced prosecution during this period, including Alcoa, United Shoe Machinery and Corn Products Refining. They were not included in this analysis because total industry mergers were too few to permit meaningful comparisons.

19. Whitney, I, p. 160.

20. Ibid., II, p. 200.

21. The discussion of International Harvester is taken

from Whitney, II, pp. 230-234.

22. Milton Handler, "Industrial Mergers and the Anti-Trust Laws", Columbia Law Review, Vol. XXXII, No. 2 (February, 1932), p. 271.

23. Stigler, American Economic Review Papers and Proceedings, (May, 1950), p. 34.

24. Specific market shares over time for the steel, tin can and cement industries are from Weston, The Role of Mergers in the Growth of Large Firms, pp. 39-41.

25. All data on asset size presented in this section are from A. D. H. Kaplan, Big Enterprise in a Competitive System (Rev. ed.; Washington: The Brookings Institution, 1964), pp. 142-145.

26. Market shares in the copper industry are from John M. Blair and Others, Economic Concentration and World War II, p. 358.

27. Ibid., p. 220

28. Ibid., p. 202.

CHAPTER 5

MERGERS, COMPANY GROWTH, AND ECONOMIC ACTIVITY

Introduction

A number of studies have found mergers to be related to the level and direction of general economic activity.[1] In these studies the association between mergers and two kinds of broad economic change were distinguished. The first explored the relationship of mergers to the business cycle; the second, their relationship to the longer run process of acceleration and retardation in economic growth. The data developed in this study permit independent empirical examinations of both types of relationships. Each will be discussed in turn.

Mergers and Business Cycles

The most comprehensive and definitive analysis of the relationship between merger activity and business cycles is provided by Ralph Nelson in Chapter 5 of Merger Movements in American Industry, 1895-1956. Here, the behavior of merger activity from 1895 through 1954 is analyzed, a period encompassing all the large merger waves in manufacturing and mining and all but one of the minor flurries. Nelson found that:

> The merger activity of the past six decades

> has exhibited high, though not perfect, conformity to changes in general business conditions. The National Bureau of Economic Research has recorded fourteen cycles in general business activity between 1897 and 1954. The series of merger disappearances exhibited twelve cycles of activity. Eleven of the twelve merger cycles showed a definite timing relationship to the turning points of reference cycles . . . .[2]
>
> Peaks of merger activity most commonly preceded the peaks of the reference cycle. The average merger lead for the eleven peaks common to both cycles was 3.4 quarters. . . . The time sequence for troughs was somewhat less consistent than that for peaks. Merger troughs preceded reference troughs, on the average, by only 0.8 quarters, and lagged them on three occasions.[3]

In a later study,[4] Prof. Nelson updated the time series on mergers to 1962 and broadened the analysis of the relationship between mergers, the reference cycle, and other indices of economic activity. The findings, based on a comparison of cyclical turning points for the years 1919-1961 (spanning ten reference cycles), reinforce the conclusions reached in the earlier study. Merger peaks led reference cycle peaks in six out of eight possible direct comparisons, with an average lead of 9.38 months. Merger troughs led reference cycle troughs in six out of seven possible direct comparisons, with an average lead of 1.22 months.[5]

In his testimony before the Senate Subcommittee in 1965, Dr. Willard Mueller stated that, "the rate of merger activity appears to be rather closely associated with overall business activity or so-called business cycles. This is to say, merger activity is positively correlated with good times in the business community."[6] He observed further

that, "the conclusion suggested by our analysis is this: Although there may be a variety of unique reasons underlying particular mergers, the overall rate of merger activity is associated with general economic conditions. . . ."[7]

Dr. Mueller's conclusions are based on his F.T.C. study of dairy industry mergers from 1919 to 1962 which corroborates the findings of more general studies. "To my knowledge," Mueller stated, "all prior statistical analyses of merger cycles have been confined to overall merger activity. Analysis of merger cycles in a particular industry usually is not possible because there are not enough companies to participate fully in more than a single merger movement."[8] The dairy industry, however, is characterized by an extremely large number of firms. This permitted extensive merger activity over a long time period, and enabled a detailed analysis of the time pattern of mergers within this industry. Mueller reported, "[The] facts demonstrate that the timing of dairy mergers is very closely associated with relative business prosperity."[9]

Merger data for that part of the business cycle chronology spanning the 1920's used in the several broad statistical studies are those developed by Willard Thorp. As noted in Chapter 2, the only measure of merger activity which Thorp presented is the number of firm disappearances. The data developed in this study permit a more rigorous examination of this relationship, in that they present merger value as another and perhaps a more relevant measure

of merger activity.

As was discussed in Chapter 3, both the series on firm disappearances and merger value reveal a merger cycle during the period 1921-1923, a cycle absent from the Thorp series. This merger cycle is especially evident in the series on merger values. (Table 3-2, Chart 3-2) Between 1920 and 1930 each of the four reference peaks and three reference troughs was accompanied by cyclical points in the Kis merger series. (Table 3-3) The finding of this additional merger cycle thus increases the conformity of merger cycles to reference cycles and so reinforces Nelson's findings for the period 1895-1962.

Mergers Relative to Internal Expansion

Data on merger value also permit the measurement of merger activity in a way that overcomes what may be a serious methodological deficiency in existing merger studies. This deficiency was noted by Mrs. E. T. Penrose who questioned the validity of studies comparing absolute measures of merger activity to business conditions.

> Merger is one of two possible methods of expansion, and whether or not it is the method chosen will depend on its relative profitability. The number of mergers in a given period, or even the ratio of the number of mergers to the number of existing firms, will tell us nothing about the ratio of expansion through merger to expansion through new capital formation; yet this is the information we require if the purpose of comparing merger activity to other indices of business behavior is to discover the conditions under which merger is promoted.
>
> If the number of mergers rise in a period, for

> example, but expansion through new investment rises even faster, presumably the existing constellation of circumstances, while favorable for expansion of capital investment, is not particularly conducive to the choice of merger as a method of expansion. And whether high or low security prices are conducive to merger can only be tested by finding out whether the proportion of merger to total expansion varies with the level of security prices. . . . , the relevant question is whether or not acquisition forms a larger percentage of total expansion at times when real investment is high than it does when investment is low. The answer to this is not a priori clear; yet to know whether prosperity or depression is relatively more favorable to expansion by acquisition than to internal expansion, we would have to examine this percentage in the two conditions.[10]

Though not directed against any specific work, it would seem to apply to the afore-mentioned findings that mergers were associated with periods of prosperity.

The detailed data on mergers developed in this study enable an examination of the relationship between merger activity and internal expansion, and thus meets the objection raised by Mrs. Penrose. Total merger value within the manufacturing sector was expressed as a percentage of Manufacturing Investment in Plant and Equipment.[11] Percentages are presented for two-or three year periods. Though available on annual and quarterly bases, data for longer periods were presented, as the merger series was subject to considerable short run fluctuation.

Another reason for presenting the data in two-or three year periods is that the data are probably too crude to identify fine differences in the processes of merger and internal expansion. There may be varying and unknown differences in the time lag between the original merger or

internal expansion decision and its implementation.

> The interval required to conceive, plan, and execute a merger is a complicating factor in the response of mergers to the business cycle. Whether this time lag is longer than that found in the ordinary investment action is open to question. Unlike an ordinary act of investment, the merger requires initial steps that are likely to be complex and time consuming. . . . Once arranged, however, the transfer of control may be carried out rapidly for the 'new plant' is already a fully operating business. The construction of a new plant - a type of investment that is quickly arranged may take a considerable period of time.[12]

If, for example, mergers had significantly longer periods of gestation than new construction, widespread decisions reflecting preferences for merger in Year 1 might not be consummated until Year 2. However, by Year 2 the general constellation of economic conditions may have changed in favor of internal expansion. The data would thus lead to the spurious conclusion that the economic climate of Year 2 was more conducive to mergers than to internal expansion.

No attempt was made to develop an index of merger preference, since no direct data exist on the merge or build decision.[13] The aggregation of data into periods of two or more years probably envelops many of these differences and at the same time it captures the broader trend in relative preference as this unfolded through the 1920's.

The period 1919-1929[14] was divided into five sub-periods, four of two years and one of three. (Table 5-1) The ratio of mergers to internal expansion rose steadily over the decade, reaching a 1928-1929 high of 71.4%, an increase of

more than 150% above the early part of the period.

TABLE 5-1

Value of Acquisition by Manufacturing Companies as Percentage of Capital Investment in Manufacturing Plant and Equipment 1919-1929

Years	Average Annual Merger Value ($ Million) (1)	Plant & Equip. Investment ($ Million) (2)	Col. (1) as Per Cent of Col. (2)
1919-1920	700.8	2694.5	26.0
1921-1922	374.3	1454.4	25.7
1923-1924	723.9	1890.5	38.3
1925-1927	799.2	2142.3	37.3
1928-1929	1800.5	2522.5	71.4

It might be objected that the sharp rise in merger activity in the late 1920's might be largely illusory. The increase in merger values in 1928 and 1929 is measured in monetary terms, not necessarily in real terms, and so might reflect primarily the increase in stock prices with little change in the real size of companies disappearing into mergers. To gain an idea of the size of this possible bias, those 1928 and 1929 mergers whose measure of size was likely to have been affected by changes in the level of security prices were deflated by the Standard and Poors stock price index. These included consolidations where the newly combined assets may have been revalued at the time of consolidation, and acquisitions where part or all of the purchase price was paid in stock. Using the deflated values for these mergers, total merger value as a percentage of

physical investment was 59.4%, still considerably above the levels in the earlier parts of the decade. Moreover, this procedure probably over-deflates the merger value data. The stock price index, in addition to measuring pure price rises, also reflects the physical growth of capital. Increases in the index are thus greater than the increase in the pure price level of securities, reflecting in part the real growth of these companies.

The data presented in Chapter 3 (Table 3-1 and Chart 3-1) describe an increasing trend of absolute merger activity over the decade, culminating in the 1928-1930 merger frenzy. The ratio of mergers to physical investment, which reflects the relative preference for mergers, shows an even greater increase over this period. For this period at least, measures of absolute merger activity and of merger preference seem to follow the same broad time pattern. This suggests that when the Penrose objection is considered, the trend in absolute activity, if anything, understates the increase in the preference for merger over internal expansion. The dramatic increase in mergers relative to internal expansion toward the end of the decade adds weight to Thorp's statement that, "the merger movement once more reached the hysteria state in the late twenties."[15]

Mergers and Industry Growth

Other studies have concentrated on the relationship

of merger activity to the longer run process of acceleration and retardation in economic growth. Myron Watkins has explained the turn-of-the-century merger wave as the culmination of several centralizing tendencies.

> The opening of a new and wider market involves pioneering costs which call for the compact association of producers. But once a new market has been opened by the joint action of the associated producers, its development attracts the ambition and varied talents of many producers, the prizes for successful competition being high. The third and final phase is reached when the limit of the expansion of a given market has been touched, and the amount and character of its consumption have become settled and known. The gains from initiative and ingenuity are then no longer sufficient to hold producers upon an independent course, and they fall in together for their common enrichment at the expense of the consumers.[16]

Mergers in this context were interpreted as devices whereby producers could preserve profits in the face of slackening demand and greater pressures of competition.

Watkins went on to describe the convergence of several historical trends that resulted in retardation of market growth at the end of the nineteenth century. Although this theory was presented as an explanation of the turn-of-the-century merger wave, the implications for merger activity would seem to be applicable whenever an industry is experiencing a secularly declining rate of growth. Proponents of this thesis have recognized that it is retardation of growth within an industry, rather than in aggregate industrial growth that is most relevant for merger behavior.

Nelson tested this hypothesis for the turn-of-the-

century merger wave, and concluded that:

> Statistical examination of the growth-retardation-merger relationship indicates that there is little empirical basis for believing that the turn-of-the-century merger wave was caused by a general retardation in industry growth thought to be prevalent at that time. . . . In the industries of high merger activity, the reversal of retardation was even more pronounced than it was for industry in general. . . . Indeed the findings suggest that more satisfactory explanations of merger movements may be found in periods of accelerating growth than in periods of retardation.[17]

The merger data developed in this study permit an independent test of the merger-retardation hypothesis for a later period in the history of industry growth, 1919-1929. As a first test of the hypothesis, a rank correlation of relative merger activity and industry rates of growth of physical output was run for the twelve two-digit industries for which these data were available (Table 5-2). These twelve[18] industry groupings account for over 80% of total merger value in manufacturing recorded in this study.

The coefficient of rank correlation (Spearman) is +.60, statistically significant at the $\alpha = 5\%$ level, indicating a positive association between industry rates of growth and relative merger activity. This finding suggests that contrary to the merger-retardation hypothesis, industry merger activity is a result of acceleration rather than retardation in its rate of growth.

Alternatively, the analysis can be directed to an examination of the growth patterns of industries experiencing significant merger activity. In this context, it might be

TABLE 5-2

Rankings of Major Industry Groups by Relative Merger Activity and Rates of Growth of Physical Output 1919-1929

Industry Group	Percentage		Rank	
	Growth Rate	Relative Merger Activity	Growth Rate	Relative Merger Activity
Petroleum Prod.	156	38.5	1	1
Chemical Prod.	94	27.3	2	3
Paper Prod.	89	11.8	3	6
Rubber Prod.	86	11.2	4	7
Printing & Publishing	85	3.4	5	12
Iron & Steel Prod.	70	36.2	6	2
Transportation Equip.	64	24.7	7	4
Foods	54	19.4	8	5
Textile Prod.	49	5.3	9	10
Tobacco Prod.	44	6.7	10	8
Forest Prod.	27	4.7	11	11
Leather Prod.	11	6.6	12	9

Data on relative merger activity are from Table 3-9. 1919-1929 rates of growth are taken from Solomon Fabricant, The Output of Manufacturing Industries 1899-1937 (New York: N.B.E.R., 1940) Table 5, Pp. 60-61.

noted that the use of broad two-digit industry groups ignores their heterogeneity. Transportation equipment, for example, had a 64% growth rate for the decade. Within this broad classification, automobiles (including auto bodies and parts) grew at a rate of 255%, while all other kinds of transportation equipment industries had negative growth rates. The rapidly growing automobile industry accounted for 73.6% of total merger value in the more comprehensive two-digit group, and this pattern is hidden from the analysis on a two-digit level.

Therefore, a list was compiled of more homogeneous, three- or four-digit industry groups. To be included in the list, an industry had to be among the most important in terms of recorded merger activity, and had to be one for which

Fabricant presented decade rates of growth. The 13 industries so selected and their respective rates of growth are presented in Table 5-3, Col. 1. They accounted for 60% of total merger value for all manufacturing. The table also presents the decade growth rate for Total Manufacturing, which Fabricant computed to be 64%.

Using the growth rate of Total Manufacturing as the measure of "average" rate of growth, only four of the thirteen important merger industries had below average rates of growth. The simple average rate of growth for the thirteen industries is 99%, which is more than 50% greater than the growth index for manufacturing as a whole.

A more appropriate aggregate measure of the thirteen industries' average rate of growth would be one calculated by weighting each individual industry's growth rate by its merger activity. The more meaningful weighting system would be based on the measure of the industries' relative merger activity (industry merger value as a percentage of total industry capital). However, data on industry capital were available for only a few of these more narrowly defined industries.

In the absence of relative measures, the weights were assigned according to each industry's absolute merger activity. The difference in the weighted average should not be large, however. A high correlation between measures of absolute and relative merger activity was found in Chapter 3. Moreover, eight of the thirteen industries

TABLE 5-3

Net Percentage Change in Physical Output, for 13 Important Merger Industries

Industry	Percentage Change 1919-1929 (1)	Percentage Change 1909-1919 (2)	Column (1) Minus Column (2) (3)
Autos and Parts	+255	+1467	-1212
Industrial Gases	201	906	- 705
Petroleum Refining	194	209	- 15
Chemicals N.E.C.[a]	108	61	+ 47
Knit Goods	80	67	+ 13
Paper	76	45	+ 31
Cement	75	32	+ 43
Copper	67	28	+ 39
Ice	67	101	- 34
Steel Mills[b]	58	46	+ 12
Blast Furnaces[b]	43	20	+ 23
Dairy Prod.[c]	34	159	- 125
Cotton Goods	28	15	+ 13
Index of Total Manufacturing	64	41	+ 23

Source: Various sections in S. Fabricant, The Output of Manufacturing Industries 1899-1937.

a-Fabricant's group, Chemicals N.E.C., corresponds very closely to the S.I.C., Industrial Organic and Inorganic Chemicals (281) which was the basis for merger classification.

b-Fabricant has separate series for Blast - Furnace Products and Steel - Mill Products. The two are combined in S.I.C. group 3312 and also are not separated in the merger classification.

c-The percentage growth of Dairy Prod. presented, is the simple average of three related Fabricant series - Canned Milk, Butter and Cheese. There was no series on fluid milk, which was the most important segment of the dairy industry in terms of merger activity, or on ice cream which also experienced significant merger activity.

are part of the five two-digit industries that were the most important both in terms of absolute and relative merger activity, and for whom the relationship of the two measures was particularly close. Though the correlation was based on more broadly defined industries, the thirteen narrowly defined industries are sufficiently representative to justify the inference that measures of their absolute merger activity are tolerably good indices of their relative merger activity.

The weighted average growth rate for the thirteen industries presented in Table 5-3 is 123.3%,[19] almost double the growth index for total manufacturing. This indicates that, for the 1920's, industries exhibiting a high degree of merger activity, were also experiencing higher than average rates of growth. The finding suggests, at the very least that it is extremely unlikely that the driving force behind widespread merger activity is the retardation of industry rates of growth.

The hypothesis was next tested in the context of a longer run measure of acceleration or retardation. Rates of growth for the 1919-1929 decade are compared to those of the preceding decade, 1909-1919 (Table 5-3, Col. 2 and 3). Of the thirteen high-merger industries, five would appear to have undergone retardation in the 1920's, in the sense that their decade growth rate was lower than in the preceding decade. However, three of the five had 1919-1929 growth rates in excess of 190 percent. It would seem in-

appropriate to consider an industry with a decade rate of growth of 190% or higher, to be suffering the usual pressure of retardation because in the previous period, its rate had been even higher. Omitting these three, only two of the other industries were undergoing clear retardation. These two industries, Ice and Dairy Products, accounted for only 9.3% of the total merger value in the thirteen industries.

Conclusion

The results of the three tests made above all serve to cast doubt on the hypothesis that merger activity occurred primarily in industries undergoing retardation in growth rates. On the contrary, the data would suggest that, during the 1920's, mergers were more likely to be associated with industry conditions of acceleration in growth rates. They are generally similar to those of Nelson for the turn-of-the-century merger wave. Like Nelson's, they corroborate the broad association between mergers and general conditions of prosperity that were based upon the shorter-run association found between mergers and business cycles.

CHAPTER 5 - NOTES

1. Nelson, Merger Movements . . . ; Weston, The Role of Mergers . . . ; Myron Watkins, Industrial Combinations and Public Policy (Boston: Houghton Mifflin Co., 1927).
2. Nelson, Merger Movements . . . , pp. 108-111.
3. Ibid., pp.111-112.
4. Ralph Nelson, "Business Cycle Factors in the Choice Between Internal and External Growth," The Corporate Merger, ed. William W. Alberts and Joel E. Segall (Chicago: University of Chicago Press, 1966).
5. Ibid., p. 57, Table 1.
6. U. S. Congress, Senate, Subcommittee of the Committee on the Judiciary, Hearings, Mergers and Other Factors Affecting Industry Concentration, 89th Cong., 1st sess., 1965, p. 505.
7. Ibid., p. 507.
8. Ibid., p. 505.
9. Ibid., p. 506.
10. E. T. Penrose, The Theory of the Growth of the Firm (New York: John Wiley and Sons Inc., 1959) pp. 241-242.
11. Investment data are taken from Lowell J. Chawner, Survey of Current Business, Vol. 21, No. 3, (March, 1941) p. 10. It is recognized that the two series are not strictly comparable, since expenditures on

mergers include inventories and other short term assets as well as good will.

12. Nelson, Merger Movements . . ., pp. 107-108.

13. The extreme difficulty in obtaining data on dates when the 'merge or build' decisions are made, is discussed in Nelson, "Business Cycle Factors . . .," The Corporate Merger, p. 59.

14. The analysis was not extended into 1930 because it would mean that only one year of the period after the 1929 peak would be included, and this could lead to the distortions discussed above. For the record, the 1930 ratio of merger to internal investment was 80.7%, the highest for the entire period. Most of the merger activity, especially several very large ones, occurred in the early part of the year and had been in progress since 1929.

15. Thorp, The Structure of Industry, p. 232.

16. Watkins, Industrial Combinations . . ., pp. 12-13.

17. Nelson, Merger Movements . . ., pp. 77-78.

18. A supplementary test of the hypothesis was made using undeflated value added as the measure of industry growth. This permitted a correlation based on all sixteen industries presented in Table 3-9, instead of the twelve for which physical output data were available. The coefficient of rank correlation (Spearman) is +.64 which is statistically significant at the $\alpha = 5\%$ level.

19. In computing the weighted average, twelve separate industries were included. Blast Furnaces and Steel Mills were combined because there was no way to distinguish between them in terms of merger value. The average of the two, 51% was used as the growth rate for both components in computing the weighted average.

CHAPTER 6

SUMMARY OF FINDINGS

For the period 1919-1930, this study recorded more than 3000 firm disappearances through merger in the manufacturing and mining industries of the United States, mergers whose total value[1] exceeded $12 billion. The merger movement was most intensive in the later years of the period, with $7.3 billion or 60% of total value, and 1946 or 65% of total firm disappearances being recorded in the five years 1926-1930.

The $7.3 billion in recorded merger value for the five years 1926-1930, compares to the $6.3 billion in merger capitalization estimated by Ralph Nelson for 1898-1902, the five peak years of the first merger wave.[2] However when the roughly two fold increase in the price index of manufacturing capital is considered, the 1926-1930 total is approximately 60% of that for 1898-1902. Moreover, when set against manufacturing and mining sectors roughly six times larger (measured in terms of total book capital), the relative size of the second merger wave is seen to be considerably smaller than that of the first. Indeed, given the levels of economic concentration that the first movement achieved, it is difficult to see how the second wave could have been as large.

While mergers took place in almost all industries, they were not uniformly distributed. Approximately 40% of total merger value was accounted for by the Petroleum and Primary Metals industries; forty-two of the eighty largest mergers took place in these two industries. In terms of the number of firms disappearing into mergers, the Food Products industry was by far the most important, accounting for approximately 25% of total recorded disappearances.

There were several cycles in merger activity in this period. These cycles were found to conform to the cycle in general economic activity, or reference cycle (in N.B.E.R. terminology). The more comprehensive data developed in this study uncovered a cycle in merger activity in the early 1920's not reported in previous investigations. The "missing" merger cycle had puzzled merger students, because the 1921-1923 reference cycle with which it would have been associated was a relatively strong one. Based on the new merger cycle chronology, the seven merger turning points (four peaks and three troughs) are in complete conformity with the seven reference cycle turning points of the period.

Relying on the Thorp data for the 1920's, Nelson identified fifteen merger cycles for the period 1897-1962. During the same period, the National Bureau of Economic Research recorded sixteen reference cycles. Of the fifteen merger cycles, the turning points of thirteen were directly

associated with the turning points of reference cycles. Merger cycles thus showed 81% conformity to the reference cycle chronology. With the identification in this study of the 1921-1923 merger cycle, the conformity was increased to 88%, suggesting that mergers were even more closely related to the reference cycle than hitherto believed.

In examining the limited evidence on the merger activity of the 1920's, Jesse Markham and others have pointed to the apparent importance of vertical and diversified mergers in this period. In interpreting this pattern, they have stressed the desire to achieve vertical integration and product diversification, both for improved technical efficiency and financial security.

This study questions the validity of the empirical evidence on which these conclusions were based. For the years 1926-1930, all medium and large mergers were classified by type of integration achieved. Classifications based on various assumptions indicated that horizontal mergers accounted for from 50% to 56% of total merger value in the group of classified mergers, and were by far the most important type. This suggests that the importance of vertical and diversified mergers may not have been as great as previously assumed.

A related analysis of several important industries[3] indicated that this stress on horizontal mergers may have had a significant effect on their level of concentration, particularly as such mergers contributed to the strengthening

of oligopolies. In certain industries, merger activity by firms of the second rank helped transform an industry dominated by a single leading firm into some form of oligopoly, in others they strengthened an existing oligopolistic structure, while in still others they replaced many-firm markets by oligopoly.

The data developed in this study were used to test several proposed explanations of the merger patterns of the period. One set of hypotheses dealt with the effects of the anti-trust laws, and their enforcement. Analysis of fifteen industries suggested that except for firms previously faced with the threat of dissolution, the existence of anti-trust legislation did not have a significant effect on the direction or magnitude of an industry's merger activity. This finding supports the opinion of Milton Handler, reached in 1932, that during the 1920's, the anti-trust laws were relatively ineffective in preventing the reduction of competition through widespread merger activity.

The merger data for the 1920's were used to help examine the presumed effects of the 1950 Celler-Kefauver Amendment to the Clayton Act. The historical record for the 1920's permitted a more definitive before-and-after comparison to be made. The marked decline in the importance of horizontal mergers after 1950 suggests that the redirection and expanded enforcement of the merger law that came with the 1950 Amendment had a significant effect on the pattern of merger activity.

Mergers were compared to internal expansion as alternative forms of business investment. As an index of firms' preference for expansion by merger relative to internal growth, the merger value series for manufacturing was expressed as a percentage of the Chawner series on expenditures by manufacturers on new plant and equipment for the period 1919-1929.[4] This index for the years 1928-1929 was approximately 150% greater than the index for the early part of the period. This suggests that merger activity was not merely a reflection of general business expansion over the decade, but rather went far beyond this. In the late 1920's it reached an intensity that could properly be called "merger fever."

The data were also used to make an additional test of the relationship between mergers and longer run patterns of industry acceleration and retardation in growth rates. Using turn of the century merger data, Nelson had tested the hypothesis that mergers were a consequence of retardation in industry growth rates. He found, on the contrary, that they were more likely to be a result of accelerating growth rates.

A similar test, based on more detailed data than available in the earlier period, was made for the 1920's with parallel results. It was found that, for the 1920's, mergers were most common in industries experiencing high rates of growth. There were thirteen manufacturing industries showing high rates of merger activity, for which

data on growth rates were also available. These thirteen industries had 1919-1929 growth rates significantly higher than the average of all manufacturing industries. Moreover, comparisons of 1919-1929 rates of growth with those for 1909-1919 indicated that only two of the thirteen industries may have been experiencing the pressures of industry retardation. In the 1920's, as at the turn of the century, merger activity appeared to be much more a result of acceleration than of retardation in growth rates.

CHAPTER 6 - NOTES

1. As discussed in Chapter 2, the most accurate size measure of a merger is total assets of the disappearing firm. Where this information was not available, the purchase price or other estimate of size was used.
2. Affecting the comparison is the fact that Nelson's measure of firm size, authorized capitalization, may have overestimated the size of a merger, relative to this study's measure, which is based primarily on total assets. An example of this is the U. S. Steel consolidation with an authorized capitalization of $1.37 billion, of which Nelson estimated $650 million to have been "water."
3. These industries were steel, tin cans, copper, cement, biscuits and crackers, and soap.
4. The reasons why 1930 was not included are detailed in note 5-14, above.

APPENDIX A

THE 1950 AMENDMENT TO THE CLAYTON ACT AND THE DECLINE OF HORIZONTAL MERGERS

Background of Section 7 and the 1950 Amendment

In 1914, the Clayton Act was enacted to amend and strengthen the Sherman Act, the basic statute embodying the antitrust law policy of the United States. Section 7 of the Clayton Act became the main tool available to the Federal Trade Commission to combat mergers. The relevant paragraph of Section 7 read:

> That no corporation engaged in commerce shall acquire, directly or indirectly, the whole or any part of the stock or other share capital of another corporation engaged also in commerce where the effect of such acquisition may be to substantially lessen competition between the corporation whose stock is so acquired and the corporation making the acquisition, or to restrain such commerce in any section or community or tend to create a monopoly of any line of commerce.[1]

The specific wording of this paragraph and judicial interpretation of its intent, made this section relatively ineffective in preventing widespread merger activity. The difficulty in enforcement centered on the 'assets loophole' and on the standard of illegality.

Even before the judicial interpretation of Section 7, the F.T.C. adopted a narrow view on its jurisdiction in acquisitions by stating, "that the mere purchase of such competitor other than capital stock is not prohibited by

the Clayton Act or the Federal Trade Commission Act."[2] Its jurisdiction was further narrowed by the Supreme Court ruling that the F.T.C. could not order divestiture of assets even if their acquisition followed an unlawful acquisition of stock. According to D. D. Martin, "In 1934 . . . , the Supreme Court dealt the apparent death blow to Section 7 of the Clayton Act by holding that even though a complaint was issued prior to the acquisition of properties, the Commission could not order the divestment of the properties."[3] "The Court thus held explicitly that the Commission could under no circumstances order the divestment of physical property."[4]

The power and jurisdiction of the F.T.C. was further weakened by the Supreme Court's interpretation of the standard of illegality. "Even if the power of the Commission to order asset divestment had been upheld, the standard of illegality was interpreted in such a way that Section 7 would have provided no effective supplementation of the Sherman Act."[5]

The wording of Section 7 which established the criterion for illegality in terms of the effect that an acquisition of stock may have on competition between the acquiring and the acquired corporations, is ambiguous and is open to different interpretations. The F.T.C. interpreted this section in a manner which led it to "adopt the policy of requiring as a prerequisite to an order of divestment the existence, prior to the acquisition, of substantial competition between

the acquiring and the acquired firms."[6] However, the Commission failed to develop any meaningful criteria for determining whether the preexisting competition was substantial. "In the International Shoe decision, the Supreme Court merely set forth the basis on which this latter question must be answered - the preexisting competition is to be considered substantial only if its elimination would constitute a Sherman Act violation."[7]

The pattern of court decisions led some observers to conclude that:

> By judicial interpretation many limitations other than those inherent to Section 7 have been imposed upon the Commission's authority to act thereunder; in fact it is believed that the effectiveness of this section has been completely emasculated as the result of court decisions.[8]

In 1946 the F.T.C. renewed its twenty year old call for Congress to amend the Clayton Act. It maintained that even if the Court were to reverse its decision and affirm an F.T.C. order for a firm to divest itself of assets acquired after an illegal acquisition of stock, business would rely almost exclusively on asset acquisitions not involving stock, which would remain legal under any decision of the Court. The effect would be "to substitute what might be termed the 'completely-by-assets' loophole for the 'stock-first, assets-later' loophole. Such a substitution of loopholes can hardly be regarded as an adequate remedy for this outstanding defect in the law."[9] The report was also critical of the Court's interpretation of the phrase "to substantially lessen competition between the corporation whose

stock is so acquired and the corporation making the acquisition," which constitutes one standard of illegality, and called for a change in the wording of this section. It concluded,

> Anything which seriously weakens the antitrust laws imperils the free enterprise system. And, today, there is no greater internal threat to the antitrust laws and to the maintenance of the competitive system, than this gap in the law which permits corporations to do by mergers and acquisitions that which they are specifically prohibited from doing as independent concerns.[10]

In 1950 Congress passed the Celler-Kefauver Amendment to the Clayton Act. The first paragraph of Section 7 was changed to read:

> That no corporation engaged in commerce shall acquire directly or indirectly, the whole or any part of the stock or other share capital and no corporation subject to the jurisdiction of the Federal Trade Commission shall acquire the whole or any part of the assets of another corporation engaged also in commerce where in any line of commerce in any section of the country the effect of such acquisition may be substantially to lessen competition or to tend to create a monopoly.

The amendment has thus closed the 'assets-loophole' for corporations subject to the jurisdiction of the Federal Trade Commission. The amendment also significantly changed the standard of illegality. The 1914 act provided coverage only if there had previously existed substantial competition between the acquiring and acquired corporations. The new Section 7 is more concerned with the effect of mergers in reducing the general level of competition than in the lessening of competition between the acquiring and the acquired firms. In this respect, the coverage of the new

Section 7 seems to be more comprehensive than the original, and applicable in a greater number of merger cases.

The broader powers which the 1950 amendment gave to combat mergers applied to all categories of integration.

> . . . The bill applies to all types of mergers and acquisitions, vertical and conglomerate as well as horizontal which have the specified effects of substantially lessening competition or tending to create a monopoly.
>
> If for example, one or a number of raw material producers, purchase firms in a fabricating field (i.e. a 'forward vertical' acquisition), and if as a result thereof competition in that fabricating field is substantially lessened in any section of the country, the law would be violated even though there did not exist any competition between the acquiring (raw material) and the acquired (fabricating) firm.[11]

However, even though the new Section 7 can be directed at certain vertical and conglomerate mergers, it probably has a much greater degree of application in preventing horizontal mergers, in which the effect on competition is more obvious and direct.

Existing Analyses of the Amendment's Effect

In a recent article[12] Professor Stigler has attempted to empirically test the effects of the anti-trust laws on economic behavior. According to Stigler, a primary goal of the anti-trust laws, the prevention of monopoly, "was sought by two routes: the prohibition of attempts to monopolize in Section 2 of the Sherman Act; and the prohibition of mergers that tend to reduce competition."[13] One of the "basic tests of the effectiveness of our policies to prevent

monopoly and high concentration . . . is the comparison of periods before and after passage of antitrust laws."[14] Within this framework, he feels that a "comprehensive set of data look to the impact of the 1950 anti-merger amendment to the Clayton Act,"[15] and that a comparison of pre-1950 and post-1950 merger patterns can serve to test the effectiveness of the amendment.

The article cites a study by Dr. Willard F. Mueller of the Federal Trade Commission who classified 720 large manufacturing and mining mergers during 1948-1964. The basis for classification was the market relationship between the acquired and acquiring companies (Table A-1).[16]

TABLE A-1

Distribution of Large Manufacturing and Mining Acquisitions by Type and Period of Acquisition 1948-1964

Type of Merger	1948-1953 Number	Percent	1954-1959 Number	Percent	1960-1964 Number	Percent
Horizontal	18	31.0	78	24.8	42	12.0
Vertical	6	10.3	43	13.7	59	17.0
Conglomerate						
Market Extension	4	6.9	20	6.4	24	6.9
Product Extension	27	46.6	145	46.2	184	52.9
Other	3	5.2	28	8.9	39	11.2
Total	58	100.0	314	100.0	348	100.0

In summarizing his study before the Senate Subcommittee on Antitrust and Monopoly, Dr. Mueller commented,

> There has been a rather marked change in types of mergers during the period 1948-1964. On the one hand, the relative number of horizontal mergers declined substantially - from 31% during 1948-1953 to

> 12.0% in 1960-1964. On the other hand, the percent of product extension and other conglomerate mergers increased from 51.8% in 1948-1953 to 64.1% in 1960-1964. Actually, the composition of the merger movement may have changed even more markedly than these comparisons suggest. In the latter period quite a number of horizontal mergers apparently involved very small product overlaps and were primarily of the product extension type."[17]

This finding led Professor Stigler to observe: "These merger data suggest that the 1950 anti-merger statute has been a powerful discouragement to horizontal mergers. The fraction of horizontal mergers by large companies has fallen to low levels."[18] However, he also commented that, "Unfortunately, the extent of horizontal mergers in earlier times has not been measured - it seems incredible but it is true that all forms of merger are combined in the standard merger series. . . . The deficiency in the statistical history of mergers is of course remediable."[19]

Professor Stigler's analysis rests on a comparison of horizontal mergers before and after the 1950 amendment. The period 1948-1953 is used as the measure of pre-amendment horizontal merger activity. When we consider that this period was one of relatively little merger activity, his observations about the lack of data on horizontal mergers in earlier periods are especially relevant. The 1948-1953 breakdown was based on only 58 large mergers, compared to more than 300 in each of the later two sub-periods. The smallness of the merger sample for 1948-1953 would tend to weaken the use of this period an an indication of the

importance of horizontal mergers before the Amendment. Also, the Amendment went into effect in the middle of the 1948-1953 period. Of the 58 mergers during 1948-1953, only 13 or 22% occurred during 1948-1950, and so the data on horizontal activity for 1948-1953 were the result, to a great extent, of merger activity after the Amendment. This tends to weaken the significance of the comparisons and makes the need for additional historical data even more urgent.

New Evidence on Historical Importance of Horizontal Mergers

This section presents the distribution of merger activity by type of integration for two periods before 1948. For the period 1926-1930, this classification was presented in Chapter 3 of this study. A similar breakdown for the period 1940-1947 was made by the F.T.C. in the Merger Movement, A Summary Report, published in 1948. Since the 1930's were a period of low merger activity, the two most recent pre-1950 periods of high merger activity, 1926-1930 and 1940-1947, will be compared to the post-1950 record.

Table A-2 reviews this study's findings for the period 1926-1930 as discussed in Chapter 3, and presented in Table 3-22. It will be recalled that this classification for the period 1926-1930 covers acquisitions in which the acquired firm had assets of at least $3 million and consolidations with combined assets of $9 million. Separate categories are

presented for mergers involving more than one type of integration and for those whose objective was market extension.

TABLE A-2

Distribution of Merger Activity
by Type of Integration 1926-1930
Large Firm Mergers

Type of Merger	Per Cent of Disappearances	Per Cent of Value
Horizontal	44.0	38.2
Horizontal-Vertical	9.7	24.2
Horizontal-Product Extension	13.9	10.3
Vertical	4.8	4.6
Product Extension	17.6	20.6
Product Extension-Vertical	.7	.4
Market Extension	8.3	1.2
Not Identifiable	1.0	.5
	100.0	100.0

For the period 1940-1947, the F.T.C.[20] classified 62% of all 2062 recorded disappearances by merger and acquisition as horizontal, approximately 17% as vertical and 21% as conglomerate. However, the categories used for classification are very broad. The horizontal category includes cases where the acquired firm makes a product which can be substituted for that of the acquiring firm, for example, the acquisition by Continental Can Company of several firms producing paper and fiber containers. Market extension mergers were also included in the horizontal category. The classification covered mergers of all sizes and was not limited to relatively large ones, as were both the 1926-1930

classification and the F.T.C. study for 1948-1964. Of the 2062 acquisitions that were classified, 1468 acquired firms had assets of less than $1 million and only 81 had assets of more than $10 million.

Summary Comparison of Five Time Periods

Table A-3 presents a summary of the five periods for which data are now available. However, in order to make these periods more comparable, the 1926-1930 method of classification had to be modified. Both the 1940-1947 and 1948-1964 F.T.C. studies classify a merger as horizontal if even a small fraction of their sales overlapped. As Dr. Mueller explained, "In the latter period quite a number of horizontal mergers apparently involved very small product overlaps, and were primarily of the product extension type."[21] Moreover, the 1940-1947 study included market extension mergers in the horizontal category, while the 1948-1964 study classified them separately.

Since both F.T.C. studies include all mergers with even a small degree of product overlap in the horizontal category, and it is not possible to isolate them, the 1926-1930 totals were adjusted to make them more comparable to the method of classification used by the F.T.C. The two mixed categories in Table A-2, Horizontal-Vertical and Horizontal-Product Extension, were included in the Horizontal category, since each contained significant elements of horizontality.

TABLE A-3

Percentage Distribution of Merger Disappearances by Type and Period of Acquisition 1926-1964

Type of Merger	1926-1930	1940-1947	1948-1953	1954-1959	1960-1964
Horizontal	67.6	62.0	31.0	24.8	12.0
Vertical	4.8	17.0	10.3	13.7	17.0
Market Extension	8.3	--[a]	6.9	6.4	6.9
Product Extension & Other	19.3	21.0	51.8	55.1	64.1
Total	100.0	100.0	100.0	100.0	100.0
Number of Disappearances	486	2062	58	314	348

[a]For this period, Market Extension mergers are included in Horizontal.

For the period 1926-1930, there is probably an understatement of the Market Extension category relative to the Horizontal category, since the convention adopted was to classify mergers as horizontal on the basis of product similarity, unless evidence was found that the geographical markets did not overlap. Omitting from the Horizontal category all mergers involving products whose markets are essentially local in nature reduces the percentage of horizontal mergers to 52.9%. This is an overcompensation, however, since there was some overlapping of local markets. If we arbitrarily assume some market overlap in half these cases, the percentage of 1926-1930 mergers in the Horizontal category is partially restored, to 60.2%.

For 1940-1947, the F.T.C. included market extension mergers in the Horizontal category. To estimate the percent-

age of these that were of the market extension variety, the highest and lowest percentages for market extension in the four other periods, were used to set a range of estimates for 1940-1947. Thus adjusted, the estimate of the percentage of horizontal mergers (excluding market extension) for 1940-1947 ranges between 53.7% and 55.6%.

These figures describe a sharp decrease in horizontal mergers in the 1948-1953 period as compared to the two earlier periods. Horizontal mergers for this period accounted for 31% of all mergers in the sample, approximately half the percentage of horizontal mergers in the two earlier periods. Since 78% of all mergers (in the sample) in the 1948-1953 period occurred between 1951-1953, the sharp drop in horizontal mergers for the whole period is probably a reflection of the effects of the 1950 amendment. The percentage of horizontal mergers continued to decline after 1953, sinking to 12% for the period 1960-1964.

Conclusion

The 1950 Amendment to the Clayton Act gave the F.T.C. wider power to combat mergers in general and horizontal mergers in particular. Comparisons based on the historical evidence here presented reveal that horizontal mergers accounted for a much larger proportion of merger activity before 1950 than they did after 1950. Horizontal mergers declined sharply in the period immediately following the

Amendment, and continued to decline in subsequent periods. These findings thus seem to confirm Professor Stigler's contention, "that the 1950 anti-merger statute has been a powerful discouragement to horizontal mergers."

APPENDIX A - NOTES

1. Public Law No. 212, 38 U. S. Stat. at L. (1914), 730-740, cited by D. D. Martin, p. 42.
2. Federal Trade Commission, 1916 Annual Report (Washington: 1916) p. 52, quoted in D. D. Martin, p. 98.
3. Martin, p. 118.
4. Ibid., p. 120.
5. Ibid., p. 145.
6. Ibid., p. 146.
7. Ibid.
8. U. S., Temporary National Economic Committee, Hearings Pursuant to Public Resolution Number 113, 76th Cong. 1st sess., 1939, Part 5-A, p. 2379, quoted by D. D. Martin, p. 144.
9. Federal Trade Commission, The Merger Movement, A Summary Report, p. 6.
10. Ibid., p. 8.
11. U. S., Congress, House, Judiciary Committee Report 1191, 81st Cong., 1st sess., 1949, p. 11, quoted in Federal Trade Commission, Report on Corporate Mergers and Acquisitions (Washington: 1955), p. 155.
12. Journal of Law and Economics IX (October, 1966).
13. Ibid., p. 227.
14. Ibid., p. 228.
15. Ibid., p. 232.
16. U. S. Congress, Senate, Subcommittee of the Committee

on the Judiciary, Hearings, Mergers and Other Factors Affecting Industry Concentration, 89th Cong., 1st sess., 1965, p. 516. The sample was based on a minimum acquired firm size of $10 million.

17. Ibid.

18. Journal of Law and Economics, IX, pp. 232-233.

19. Ibid., p. 233.

20. Federal Trade Commission, The Merger Movement . . . , p. 29 and Chart 5, p. 30.

21. U. S. Congress, Senate Subcommittee of the Committee on the Judiciary, Hearings, Mergers and Other Factors . . . , p. 516.

APPENDIX B

LISTS OF THE LARGEST CONSOLIDATIONS AND ACQUISITIONS

TABLE B-1

Twenty Five Largest Multi-Firm Consolidations

Name of Consolidation	Date	Size $ Millions	Number of Firm Disappearances
Allied Chemical & Dye	1920	282.7	5
Allied Packers	1919	41.7	8
Bendix Aviation	1929	72.5	6
California-Eastern	1926	31.8	14
Consolidated Automatic Merchandising	1928	27.0	5
Continental Baking	1924	67.3	11
Curtiss-Wright	1929	40.0[a]	6[a]
General Cable	1927	56.0	5
General Mills	1928	34.8	5
General Theatres Equipment	1929	50.0[a]	6[a]
Indiana Limestone	1926	46.0	24
Interlake Iron	1930	72.8	4
Meridian Petroleum	1920	28.2	3
National Radiator	1927	27.2	6
National Steel	1929	120.9	3
Oliver Farm Equipment	1929	46.2	5
Pennsylvania-Dixie Cement	1926	33.9	4
Remington Rand	1927	74.2	9
Republic Brass	1928	37.0	5
Republic Steel	1930	331.8	4
Richfield Oil of California	1926	48.5	5
Standard Brands	1929	83.1	4
Transcontinental Oil	1919	198.3	5
Union Oil of Delaware	1919	45.2	3
Wheeling Steel	1920	116.8	3

[a]Number of firm disappearances refers only to the manufacturing firms in the consolidation, not the total amount, which also included firms classified in service industries. Similarly, the size listed, is an estimate of the manufacturing firms' assets.

TABLE B-2

Five Largest Two-Firm Consolidations

Name of Consolidation	Date	Size $ Millions
American Radiator and Standard Sanitary	1929	187.6
Botany Consolidated Mills	1924	44.9
Colgate-Palmolive-Peet	1928	63.0
Congoleum-Nairn	1924	33.6
Tidewater Associated Oil	1926	236.0

TABLE B-3

Fifty Largest Acquisitions

Acquired Firm			
Name	Size $ Millions	Date	Acquiring Firm
American Brass	47.0	1922	Anaconda Copper Mining
Atlas Portland Cement	32.0	1930	U. S. Steel
Beacon Oil	33.4	1929	Standard Oil of N. J.
Brier Hill Steel	50.0	1923	Youngstown Sheet & Tube
California Petroleum	102.3	1928	Texas
Central Steel	37.4	1926	United Alloy Steel
Chase Companies	29.8	1929	Kennecott Copper
Cheek Neal Coffee	33.0	1928	Postum (General Foods)
Chile Copper	151.5	1923	Anaconda Copper Mining
Continental Oil (Maine)	89.1	1929	Marland Oil
Columbia Steel	41.7	1930	U. S. Steel
Crown Willamette Paper	62.0	1928	Zellerbach
Delaware, Lackawanna & Western Coal	60.0	1921	Glen Alden Coal
Dodge Bros.	127.0	1928	Chrysler
General Petroleum	128.0	1926	Standard Oil of N. Y.
Grasselli Chemical	50.6	1928	Du Pont de Nemours
Greene Cananea Copper	57.6	1929	Anaconda Copper Mining
Hood Rubber	34.0	1929	B. F. Goodrich
Household Products	30.2	1930	Drug Inc.
Independent Oil & Gas	46.2	1930	Phillips Petroleum
Indian Refining	26.0	1930	Texas
Kraft-Phenix Cheese	51.3	1930	National Dairy Products
Lackawanna Steel	89.6	1922	Bethlehem Steel
(E. H.) McElwain	30.7	1921	International Shoe
Midwest Refining	96.2	1921	Standard Oil of Indiana
Midvale Steel & Ordnance	270.8	1923	Bethlehem Steel
Morris & Co.	91.4	1923	Armour & Co.
National Electric Products	28.1	1930	Phelps-Dodge

TABLE B-3 - Continued

Acquired Firm			
Name	Size $ Millions	Date	Acquiring Firm
Nichols Copper	25.3	1930	Phelps-Dodge
Oil Well Supply	26.4	1930	U. W. Steel
Oklahoma Producing & Refining	31.3	1920	Pure Oil
Pacific Oil	95.4	1926	Standard Oil of California
Pan American Petroleum & Transport	194.0	1925	Standard Oil of Indiana
Pan American Western Petroleum	52.9	1928	Richfield Oil of California
Producers and Refiners	66.7	1923	Prairie Oil & Gas
Railway Steel Spring	42.2	1926	American Locomotive
Ray Consolidated Copper	55.2	1926	Kennecott Copper
Shaffer Oil & Refining	29.9	1919	Standard Gas & Electric
Spang Chalfant & Co.	38.7	1930	National Supply of Delaware
Standard Milling	41.7	1929	Gold Dust
Steel & Tube Co.of America	108.5	1923	Youngstown Sheet & Tube
Sterling Products	36.3	1928	United Drug (Drug Inc.)
Trans-Continental Oil	64.6	1930	Ohio Oil
Trumbull Steel	51.2	1928	Republic Iron & Steel
Union Oil of Delaware	62.5	1922	Shell Petroleum
Utah Copper	66.0	1923	Kennecott Copper
Vick Chemical	28.0	1930	Drug Inc.
Victor Talking Machine	68.0	1929	Radio Corp. of America
White Eagle Oil & Refining	35.7	1930	Standard Oil of N. Y.
Yellow Truck & Coach Manufacturing	27.8	1925	General Motors

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Carl Eis was born January 10, 1939, in New York City and graduated from Rabbi Jacob Joseph High School. He received a B.B.A. from the The City College. Since 1963 he has been enrolled in the doctoral program in Economics at the City University of New York. He and his wife, the former Rosalie Baumrind, are the parents of three children. He has taught at The City College and is currently an Instructor of Economics at Richmond College of the City University of New York.