

THE FIRST MERGER WAVE

TABLE 46
Merger Activity in Terms of Relative Importance of Transportation Costs
to the Industry, 1895-1904

<i>Transportation costs of—</i>	<i>Firm Disappearances</i>		<i>Percentage of Total Disappearances</i>	
	<i>All merger activity</i>	<i>Consolidations only</i>	<i>All merger activity</i>	<i>Consolidations only</i>
Major importance	1,457	1,258	48.4	50.5
Minor importance				
Local Industries	304	289	10.1	11.6
National industries: low transportation costs	785	573	26.1	23.0
Importance not ascertained	466	373	15.5	15.0
	3,012	2,493	100.0	100.0

Data for consolidations are listed separately (and examined separately throughout this test of the transportation hypothesis) because of the large differences in cut-off limits imposed on the consolidations and acquisitions series (see Chapter 2). There was the risk that measures of total merger activity might contain appreciable numbers of acquisitions of small firms, not comparable in size to consolidation disappearances, a factor that might weaken the test. Detail may not add to totals because of rounding.

Source: Table C-3.

59 per cent of allocable disappearances occurred in industries in which transportation costs were important.

The proportion of merger activity in which transportation cost reductions may have had an effect is sufficiently large to warrant further investigation. However, a substantial share of merger activity occurred in industries in which transportation cost declines would not have had an appreciable effect. Therefore it cannot be concluded, on the basis of this evidence, that mergers occurred in high transport-cost industries with greater intensity than in low transport-cost industries. The next section brings other evidence to bear.

GEOGRAPHICAL CONCENTRATION AND MERGER ACTIVITY

The transportation growth-merger thesis implies that high transport-cost industries exhibiting merger activity would have widely dispersing producing centers. If most producers were concentrated in small geographical areas there would be no exclusive local markets for reduced transportation costs to destroy.

At the same time, there is some logical reason to expect that high per-mile transportation costs and geographical concentration should go together. Firms with high transportation costs are forced to locate in those usually restricted areas which are optimally located with respect to materials, power and labor resources. and

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buyers. Thus, on the purely technical grounds of cost minimization, we should expect to find higher geographical concentration in industries with high per-mile transportation costs than in those with lower costs. It follows that we might expect to find closer proximity of firms in those very industries in which transport-cost reductions are supposed to break down barriers between distant firms. Thus the historical decline in transport costs might be credited wrongly with achieving a condition which already existed. This is merely an exercise in deductive logic, however. We shall do better to examine the empirical evidence.

An indication of the greater geographical concentration of high transport-cost industries is provided in Table 47. The geographical

TABLE 47
Geographical Concentration of Manufacturing among Industries Classified by the Size of Transportation Costs Relative to Product Price, 1895-1904

<i>Transportation Costs Relative to Product Price</i>	<i>Number of Industries</i>	<i>Average Index of Geographical Concentration</i>	
		<i>Simple</i>	<i>Weighted^a</i>
High	10	0.510	0.557
Low	6	.477	.479
Local markets	?	.312	.293
Cost not ascertained	5	.451	.454
Total	23	.471	.511

^a Weighted by net firm disappearances.

Source: Tables C-3 and C-4.

concentration of an industry was measured by using, as an index, the proportion of industry wage-earner employment in the three adjoining states of highest employment. These indexes were derived from the 1905 *Census of Manufactures* for 23 two- and three-digit industries for which merger activity was recorded. The industries accounted for 1,676 net disappearances, or 68.5 per cent of the 2,445 net manufacturing disappearances of 1895-1904. Among these industries the high transport-cost industries showed higher geographical concentration than either low transport-cost industries or merger industries in general.

To determine more directly whether there was a negative relationship between merger activity and geographical concentration, as the transportation growth-merger thesis implies, a correlation analysis was made. It was possible to correlate relative merger activity with geographical concentration for twenty two- and three-digit industries. The comparison is presented in Table 48. It can

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TABLE 48
Relative Merger Activity and Geographical Concentration for
Twenty Industries, 1895-1904

Standard Industrial Classification	Relative Merger Activity ^a		Geographical Concentration
	All merger activity	Consolidations only	
Meat products (201)	0.294	0.013	0.547
Dairy products (202)	.201	1.38	.290
Canning fruits and vegetables (203)	.786	.728	.307
Grain mill products (204)	.153	.138	.247
Tobacco products (21)	.949	.573	.543
Textiles (22)	.136	.135	.480
Lumber and furniture (24-25)	.083	.068	.180
Paper and allied products (26)	.561	.540	.455
Printing, publishing (27)	.031	.026	.336
Industrial organic chemicals (282)	.061	.041	.280
Paints (285)	.334	.324	.542
Fertilizers (287)	.953	.746	.274
Petroleum (291)	.007	.007	.365
Leather (311)	.163	.159	.505
Glass (321-323)	.402	.398	.636
Iron and steel (331-332)	2.505	2.311	.688
Farm machinery (352)	.730	.709	.518
Electrical machinery etc. (36)	.439	.388	.571
Motor vehicles (371)	2.190	1.654	.507
Ship and Boat building (373)	.342	.328	.348
Coefficient of rank correlation: ^b			
All merger activity		+0.421	
Consolidations only		+0.479	

^a Measured as ratio of merger capital to industry capital. For a more detailed description of this measure see Chapter 2.

^b Both coefficients of correlation are significant at the 5 per cent level but not at the 1 per cent level of significance.

Source: Table C-4.

be seen that a moderate degree of positive relationship existed between the merger activity of an industry and its geographical concentration, which suggests that less intensive merger activity occurred in industries in which producing centers were widely dispersed.

When the high- and low-transport cost industries are examined separately, the negative relation between geographical concentration and merger activity suggested by the transportation growth-merger hypothesis is further contradicted, as Table 49 shows. The average relative merger activity in high-transport cost industries (0.620 and 0.528) is lower than that in low-transport cost industries (0.721 and 0.574). Moreover, the rank correlation between mergers and geographical concentration in high-transport cost industries is

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TABLE 49
Relative Merger Activity and Geographical Concentration in Fifteen Industries with High and Low Transportation Costs, 1895-1904

Standard industrial classification	High Transport Cost		Geographical concentration	Low Transport Cost		Standard industrial classification	Geographical concentration
	Relative Merger Activity All merger activity	Consolidations only		Relative Merger Activity All merger activity	Consolidation only		
201	0.294	0.013	0.547	0.949	0.573	21	0.543
204	.153	.138	.247	.061	.041	282	.280
24-5	.083	.068	.180	.334	.324	285	.542
26	.561	.540	.455	.730	.709	352	.518
287	.953	.746	.274	.439	.388	36	.571
291	.007	.007	.365	2.190	1.654	371	.507
321-3	.402	.398	.636	.342	.328	373	.348
331-2	2.505	2.311	.688				
						All merger activity	
						Consolidation only	
						0.620	0.528
						0.721	0.574
						+0.571	+0.327
						+0.357	+0.286

Average relative merger activity:
 High transport-cost industries
 Low transport-cost industries
 Coefficient of rank correlation between merger activity and geographical concentration:
 High transport-cost industries
 Low transport-cost industries

Source: Table C-4.

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higher (+0.571 and +0.327) than in low-transport cost industries (+0.357 and +0.286). While the sampling reliability of this test is small, the findings are nonetheless opposite to the comparison that the transportation growth-merger hypothesis would lead us to expect.⁹ High-transport cost industries should, on that theory, exhibit a more negative merger-geographical concentration correlation than that exhibited by low-transport cost industries.

CONCLUSION

From an empirical examination of the relationship between the growth of the railroad transportation system and the 1895-1904 merger movement certain relationships have been demonstrated. First, the merger wave occurred during a large and protracted expansion of the railroad system, and during a substantial decline in the relative cost of transportation. Second, a considerable part of total 1895-1904 merger activity in manufacturing and mining took place in those industries in which transportation costs were large relative to the price of the product.

However, the geographical concentration of high-transport cost industries was higher than that for low-transport cost industries, suggesting that there were few geographical barriers to be broken down by transportation cost reductions. Moreover, while the transportation growth-merger hypothesis would lead us to expect a negative relationship between merger activity and geographical concentration, the results show a positive relationship between them. The relationship was more positive for industries with high transport costs than for those with low transport costs, again in contradiction to what we would expect if transportation growth had a significant effect on merger behavior. The findings therefore cast doubt on the theory that mergers occurred principally among firms that had seen the growth of transportation destroy their local markets, formerly protected by the barriers of high transport costs.

It appears that the high proportion of merger activity occurring in industries with high transport costs was not due to reductions in these costs. The more correct interpretation seems to be that the industries in which merger activity occurred were only incidentally those with high transport costs. Since mergers occurred in a number of important industries and since these industries

⁹ The samples are too small to permit firm conclusions to be drawn from the comparisons. Neither correlation departs significantly from zero at either the 1 per cent or the 5 per cent level of significance. The difference between the two correlation coefficients is likewise not statistically significant.

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were as commonly characterized by high as by low transportation costs, it follows that a substantial part of merger activity involved industries with high transportation costs. Beyond this, however, no cause and effect inference seems justified.

Examination of the English merger movement indicates that in England, too, transportation factors were not likely to have been important (see Appendix A). The significant developments in English transportation occurred too many decades before the merger movement to be credited with playing an important role in mergers.

The Capital Market

Another common explanation of the timing of the early merger wave is the development in the United States of an organized large-scale capital market. The existence by the late 1890's of a large capital market has been held necessary for the absorption of the large securities issues of the multimillion dollar consolidations of the era. A corollary thesis is that an organized capital market was the milieu in which financiers and promoters could marshal the financial power needed to induce or coerce independent firms to surrender their independence and enter the large consolidations. Without a highly developed market for capital, it is argued, the large, highly capitalized consolidations of the period would have been difficult, if not impossible to accomplish.

The emergence of the merger movement is so intricately interwoven with concurrent developments in the capital market as to prohibit simple cause and effect explanations. It has been argued with persuasiveness that an organized large-scale capital market was a prerequisite for absorbing the large securities issues of the multimillion dollar consolidations of the era.¹⁰ On the other hand it has been argued that the formation of many new highly capitalized consolidations was the substance upon which the capital market fed in its rapid growth to maturity.¹¹ Conclusive tests of these relationships are beyond the scope of this study. Instead a brief description of the growth of the securities markets in this period is offered, as a context in which to place subsequent examinations of specific aspects of the capital market-merger relationship.

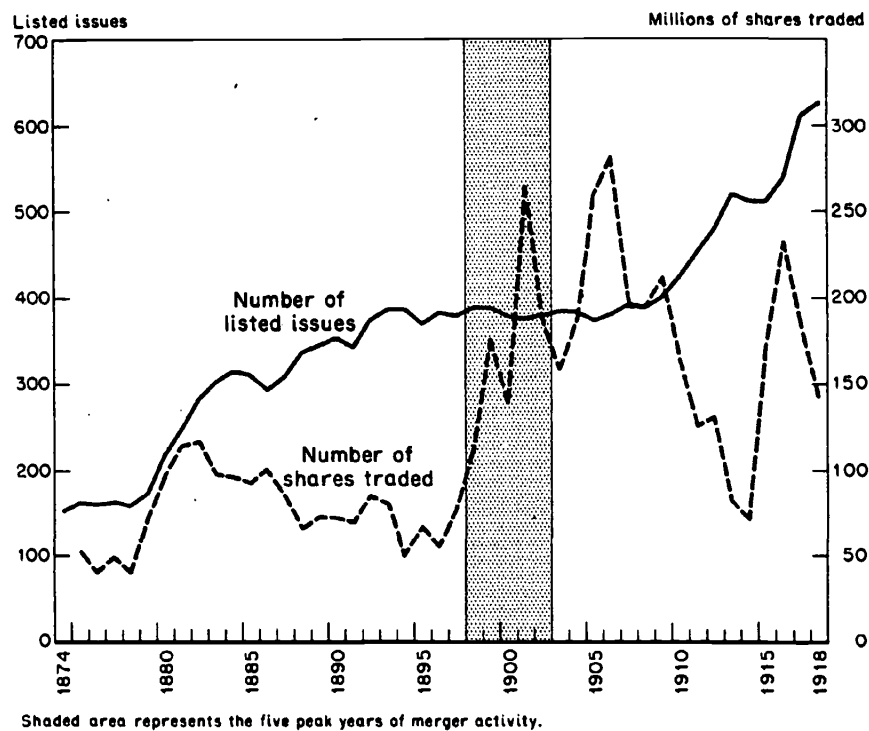
¹⁰ See, for example, George J. Stigler, "Monopoly and Oligopoly by Merger," *Papers and Proceedings of the American Economic Association*, May 1950, pp. 27-31.

¹¹ T. R. Navin and M. V. Sears, "The Rise of a Market For Industrial Securities, 1887-1902," *The Business History Review*, June 1955.

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The growth of the capital market in the years leading up to the merger movement is reflected in the growth of the New York Stock Exchange. From the years following the Civil War until the mid-1890's the number of stock issues listed rose almost continuously (Chart 4). An increasing number of firms, mainly railroads, elected

CHART 4
Number of Listed Stock Issues and Number of Stock Shares Traded,
New York Stock Exchange, 1874-1918



to seek the wider sources of funds available by listing securities on the organized exchange. In contrast to the growth in the number of issues, the period 1882-1896 exhibited a decline in the total number of shares traded. The average volume of trading per issue therefore declined markedly. Railroad stocks dominated the Exchange in this period as industrials had not yet gained general acceptance among investors.¹² It was therefore principally the rail-

¹² *Ibid.*

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road issues that suffered from the progressively more shallow market. This period was followed by the extensive railroad reorganizations of the 1890's, largely under the leadership of J. P. Morgan.¹³

After 1895 the number of listed issues leveled off, while trading activity rose sharply; the market for the average issue became much deeper than before. These changes probably reflected two developments. First, the extensive railroad reorganizations succeeded in replacing many small railroad issues with fewer large issues. Second, and less important, the listing of a new industrial consolidation often meant that the issues of the several firms entering the consolidation went off the list. The long-run increase in the number of issues listed was thus offset by the railroad and industrial consolidation issues of this period. Since the railroad reorganizations began in the early 1890's and industrial issues did not gain wide acceptance until 1897, it seems likely that the stock issues of industrial mergers were more the beneficiaries of the deepening of the market than its cause.

Among the outstanding stock market features of the period after 1897 was the increased sale of new industrial issues to the public,¹⁴ hitherto sold principally by stockholder subscription. The post-1897 period was also noted for the development of the large-scale underwriting of industrial securities—a development not fully established, however, until after 1902. It is worth notice that the total volume of trading activity of 1901 was exceeded in only one year before 1919.

This description suggests that, by the late 1890's, the capital market had reached a sufficiently advanced stage of development to be capable of playing an important role in the merger movement. The quantitative and qualitative growth of the New York Stock Exchange from the early 1880's to the late 1890's was appreciable and was apparently based largely on factors other than the financing of mergers. With these developments at least tentatively established, an examination of certain aspects of the role of the capital market in the merger movement may proceed.

A rough demonstration of the degree to which merging firms employed the organized securities markets in marketing their securities issues can be made by determining the proportion of 1897-1902 consolidations whose stock appeared in the lists of securities traded on the New York Stock Exchange in the three

¹³ See E. G. Campbell, *The Reorganization of the American Railroad System, 1893-1900*, Columbia University Press, 1938.

¹⁴ Navin and Sears, *op. cit.*

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years following the formation of each consolidation. Because case-by-case treatment of the disposition of stock issued by consolidations was impracticable, listing of a common or preferred stock on the New York Stock Exchange is here assumed to signify public trading activity for the stock. The share of the consolidations of the period of greatest merger activity, 1897-1902, whose stocks were traded on the New York Stock Exchange is presented by years in Table 50.

TABLE 50
Consolidations of 1897-1902 Whose Stocks Appeared on the New York Stock Exchange in the Three Years Following Consolidation

Year	Consolidations		Gross Disappearances		Capitalizations (millions of dollars)		Percentage of Traded to All Consolidation Activity		
	Traded	All	Traded	All	Traded	All	Consolidations	Disappearances	Capitalizations
1897	2	9	27	73	70.0	110.9	22.2	37.0	63.1
1898	11	26	177	311	527.2	616.2	42.3	56.9	85.6
1899	31	106	529	1213	1333.3	2038.9	29.2	43.6	65.4
1900	3	43	20	338	81.0	382.7	6.1	5.9	21.2
1901	4	52	29	413	1471.0	1872.8	7.7	7.0	78.5
1902	5	49	29	315	188.5	689.1	10.2	9.2	27.4
Total	56	285	811	2663	3671.3	5710.6	19.6	30.5	64.3

Source: Worksheets and *The Commercial and Financial Chronicle, Investors Supplement*, 1900-1905.

The proportion was about one-fifth of all 1897-1902 consolidations, accounting for about one-third of gross firm disappearances and more than three-fifths of authorized capitalizations.

These consolidations were the larger ones of the period. The average capitalization of the consolidations traded on the New York Stock Exchange was \$65.6 millions, while the average capitalization of consolidations not listed was \$8.9 millions. The average gross firm disappearances into listed consolidations was 14.5 firms, while the average for nonlisted was 8.1 firms. Only 19.6 per cent of consolidations of all sizes were listed on the Exchange, whereas 64.8 per cent of consolidations capitalized at \$20 million-and-over, and 78.6 per cent of \$50 million-and-over consolidations, were listed.

When securities not listed on the New York Stock Exchange but listed on the Boston, Philadelphia, or Baltimore exchanges are included in the list, the proportion of 1897-1902 consolidations whose stocks were traded on the organized exchanges increases somewhat. The percentage for consolidations increases from 19.6

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per cent to 23.2 per cent; that for gross firm disappearances from 30.5 per cent to 32.4 per cent; and that of consolidation capitalizations from 64.3 to 68.4 per cent.

These estimates of the proportion of consolidations that utilized the securities markets exclude those whose securities were traded on the unlisted markets and on the minor organized exchanges. By the very nature of the market, detailed statistics for such trading were not available. Some idea of the amount of unlisted and minor exchange trading is provided by the general quotation section of the *Commercial and Financial Chronicle, Investors Supplement*, which gives bid and asked quotations not only for securities of listed companies but also for unlisted and inactive stocks. A light sampling of this section uncovered a number of consolidations whose stocks were apparently traded in the minor exchanges or in the unlisted market. Therefore, the proportion of 1897-1902 consolidations using the major stock exchanges can be taken as a rough minimum limit of the proportion of consolidations whose securities were actively traded in the various securities markets.

From these findings we might infer that a substantial share of 1897-1902 consolidation activity resulted in the listing of securities on the organized securities markets. Without knowledge of how many consolidations used the stock exchanges directly to market their new security issues, it is still a reasonable conjecture that many of them found the organized exchanges either directly or indirectly helpful in raising capital. As anticipated, the issues of the more highly capitalized larger consolidations were listed more commonly than those of smaller consolidations.

Next to be examined is the importance of the sale of industrial securities to the general public for cash during the five-year period of high merger activity, 1898-1902. The findings will provide an indirect clue to the role of the securities markets of the period in selling new issues generally and, by inference, in marketing consolidation issues. The inferential error cannot be very grave because consolidation issues predominated among new securities issues of these years. The amount of common and preferred stock issues sold to the general public for cash can be compared with the amount of such issues exchanged for the tangible and intangible assets and the securities of other companies, including predecessor companies. In a period of high merger activity we should expect that the volume of stock exchanged for securities and assets of other companies would show a much greater degree of increase than the volume of stock sold to the general public for cash. If, instead, the relative increase proved greater for cash sales

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to the public, we might attach greater importance to such sales and to the organized exchanges, in feeding the merger boom.

Estimates of the amount of equity securities issued for public cash sale and to other companies for assets and securities are provided in *A Study of Saving in the United States*.¹⁵ These two values are compared in Table 51 for the low merger year 1897, the high

TABLE 51
Comparison of Cash Sale of Industrial Common and Preferred Stock to General Public and Issue of Such Stock for Assets or Securities of Other Companies, 1897-1907
(amounts of stock in millions of dollars)

Period	Amount		Percentage		Amount issued for all purposes ^a	Percentage of two indicated purposes to all purposes
	Cash issue to general public	Exchanged for assets or securities of other companies	Cash issue to general public	Exchanged for assets or securities of other companies		
1897	4	62	6.0	94.0	138	47.8
1898-1902	360	3,026	10.6	89.4	6,205	54.6
1903-1907	28	285	8.8	91.2	447	70.0

^a Includes (in addition to the indicated purposes) other cash issues, and stock issued to own shareholders for new money, or as stock dividends; and stock issued for acquisition or retirement of own securities. Some of total stock issued was classified as unissued, unsold, or disposition unknown.

Source: Raymond W. Goldsmith, *A Study of Saving in the United States*, Vol. I, Tables V-23 and V-24, pp. 503-505.

merger years 1898-1902, and the low merger years 1903-1907. The comparisons indicate that, as merger activity increased, volume of stock sold to the public for cash rose relatively more than that of stock exchanged for other companies' assets or securities. Also, the public sale of stock declined relatively more as merger activity waned.

These findings provide positive though not decisive support for the theory that the development of a large-scale capital market was necessary to support the merger movement. A well-developed market might be essential even though none of the new security issues was sold to the public for cash. The ability to readily "cash in" securities received in exchange for assets of merged firms would have been an important factor in persuading entrepreneurs to join consolidations. Without well-developed securities exchanges, un-

¹⁵ Raymond W. Goldsmith, *A Study of Saving in the United States*, 3 vols., Princeton University Press, 1955 and 1956.

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certainty about the ability to realize cash for consolidation securities might have precluded widespread consolidation activity.

Another way of testing indirectly the theory that development of the capital stock market was a factor in the timing of the large merger wave and in merger activity in general is by comparing changes in merger activity with changes in stock prices. Two measures of merger activity—net firm disappearances by merger, and adjusted merger capitalizations—have been correlated with the industrial stock price index, and with the industrial production index. The production index was introduced into the analysis on the assumption that the level of industrial activity is an important factor in mergers. If differences between the effects of industrial activity and of stock prices on mergers appear, they may help to reveal the influence of stock prices.

Quarterly series for mergers, stock prices, and industrial production were obtained for the period 1895–1904, which encompassed the huge turn-of-the-century merger wave. Table 52 gives

TABLE 52
Coefficients of Correlation of Merger Activity with Stock Prices
and Industrial Production by Quarters, 1895–1904

	<i>Measure of Merger Activity</i>	
	<i>Firm disappearances</i>	<i>Capitalization</i>
Coefficients of Simple Correlation between—		
Mergers and stock prices	+0.613	+0.536
Mergers and industrial production	+0.259	+0.179
Coefficients of partial correlation between—		
Mergers and stock prices after allowing for changes in industrial production	+0.608	+0.564
Mergers and industrial production after allowing for changes in stock prices	-0.243	-0.274

Source: Quarterly data, Tables B-1, B-2, and C-7.

the results of correlating each of the two measures of merger activity with stock prices and industrial production. Partial correlation analysis was also employed, as the intercorrelation between stock prices and industrial production was sufficiently high (+0.659) to make the simple correlation coefficients somewhat misleading.¹⁶

¹⁶ The coefficients of simple and partial correlation between mergers and stock prices are significantly greater than zero at the 1 per cent level of significance for both measures of merger activity. Neither the simple nor partial correlation coefficients between mergers and industrial production depart significantly from zero, with use of the 5 per cent level of significance, for either measure of merger activity.

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Merger activity exhibits a moderate positive relationship to stock price changes both before and after allowing for production level changes. This is true of both measures of merger activity in roughly the same degree. These correlations were obtained using unsmoothed merger data, which were subject to sharp interquarter irregular variations; with smoothed merger data, the correlations would be higher.

The relationship of merger activity to changes in industrial production is much lower than its relationship to stock price changes. The positive simple correlation coefficients and negative partial coefficients suggest that the changes in stock prices were responsible for the positive simple correlation between mergers and industrial production. When the effects of stock price changes are removed by partial correlation the "pure" relationship between industrial production and mergers becomes slightly negative. Since merger activity generally tends to follow business conditions rather than to move opposite to them, this finding suggests that, in years of peak merger activity, movements in stock prices may be more important than those in industrial production.¹⁷

STOCK MARKET EXPERIENCE OF LARGE CONSOLIDATIONS

Much of the debate over the desirability and consequences of the early merger wave has turned around the financial success of the large mergers of the period. Arthur Stone Dewing argued that "the trusts turned out ill," while Shaw Livermore argued that Dewing's findings needed reappraisal. Dewing compared the earnings of thirty-five prominent consolidations in the ten years following the merger with the earnings of the constituent companies before the merger, and with the promoters' estimates of prospective earnings. He concluded that the consolidations as a whole were not particularly successful.¹⁸ Livermore traced the earnings records of 328 mergers until 1932 and concluded that the proportion that were successful was large enough to raise a serious question about Dewing's findings.¹⁹

An important aspect of the financial experience of these early mergers, not examined in either of the two studies, is the dividend record and market-price experience of their common stock. Com-

¹⁷ The experience in the late 1920's also tends to support this hypothesis. Stock prices rose 150 per cent from 1926 to 1929, merger activity rose 165 per cent, and industrial production rose only 25 per cent.

¹⁸ Arthur S. Dewing, "Statistical Test of the Success of Consolidations," *Quarterly Journal of Economics*, November 1921, pp. 84-101.

¹⁹ Shaw Livermore, "The Success of Industrial Mergers," *Quarterly Journal of Economics*, November 1935, pp. 68-96.

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mon stock, unlike senior issues, carried no guarantee of dividends or interest. It was commonly issued in payment for the goodwill of the acquired companies, whereas bonds and preferred stock were issued for tangible assets. The behavior of the common stock, therefore, might indicate more accurately the degree to which organizers of mergers erected sound financial structures and succeeded in obtaining profitable control of their markets.

Therefore, an examination of the dividend and market-price records of the common stock of thirteen large 1899 or 1901 consolidations was undertaken.²⁰ The market price of the stock of each was recorded on the first market day in December of the year of the consolidation. As most of them were organized in the first half of the year, the observation date is five to ten months after the organization—sufficient time for the stock to have been “seasoned” in the market and for the promoters to have played their role and left the market. A nine-year interval was chosen for tracing the dividend records of the consolidations; that is, a medium-run period, with terminal dates of December 1908 and December 1910 at which the industrial stock price index was neither at a peak nor a trough. The stock was assumed to have been sold on December 21 of either 1908 or 1910. Crude rates of return were computed, representing the compound-interest growth in the value of the stock over the period. The dividends received were included in the growth, but were assumed to be not reinvested. The reinvestment assumption would have entailed a detailed investigation of market prices throughout the period and numerous other more complicated computations, which because of the relative shortness of the period would have increased the rate of return very little.

The market records of the common stocks of the thirteen large consolidations are presented in Table 53.

If an individual had invested the same amount of money in each of the thirteen stocks, his return on his investment over this hybrid nine-year period would have been 5.9 per cent. If he had invested an amount in each of the thirteen stocks proportional to the size of its authorized capitalization his return would have been 7.4 per cent. This would not have been much better than the 7 per cent dividend commonly offered on the industrial preferred issues of this period and the 5 per cent nominal interest rate on industrial bonds. However, it contrasts favorably with the yields on railroad bonds of 3.9 per cent in December 1899 and 3.7 per cent in

²⁰ Selection of the thirteen consolidations focused on the need for wide industrial representation in the sample as well as on highly capitalized firms whose securities had public sale and continuous price records in the financial journals.

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December 1901. Railroad bonds were the only securities for which true yield data could be found.

Thus, on the average, the common-stock investor realized a positive though not very large return on his investment in the nine-year period following the merger, a period which spanned two serious

TABLE 53
Nine-Year Market Experience of Common Stocks of Thirteen Large 1899
and 1901 Consolidations

Company	Date of Organi- zation	Market Price Dec. 1 (2) of Organi- zation Year	Market Price Dec. 21 9 years later	Dividends Received	Crude Average Annual Percentage Rate of Return
United Shoe Machinery	2/7/99	\$33.00	\$178.91	\$29.34	+22.7
American Car & Foundry	2/20/99	16.75	45.25	16.00	+15.5
American Smelting & Refining	4/4/99	40.25	79.00	31.25	+11.9
U.S. Steel	4/1/01	43.50	72.63	21.75	+9.0
American Locomotive	6/10/01	31.13	36.00	10.00	+4.4
American Woolen	3/29/99	22.00	28.00	0.00	+2.7
Distilling Co. of America	7/12/99	8.50	5.95	4.12	+1.9.
Republic Iron & Steel	5/3/99	25.38	24.00	0.00	-0.6
American Can	3/19/01	16.25	9.00	0.00	-6.4
Allis-Chalmers	5/7/01	20.50	8.13	0.00	-7.8
American Ice	3/11/99	34.13	4.65	9.00	-9.7
Union Bag & Paper	2/27/99	25.50	9.25	0.00	-10.7
U.S. Cotton Duck	6/4/01	20.50	4.60	0.00	-15.3
Geometric average of rates of return:					
Simple					+5.9
Weighted ^a					+7.4
Railroad bond yields: ^b					
Dec. 1899					+3.9
Dec. 1901					+3.7

^a Weighted by size of authorized capitalization.

^b Frederick R. Macaulay, *Some Theoretical Problems Suggested by the Movements of Interest Rates, Bond Yields and Stock Prices in the United States since 1856*, National Bureau of Economic Research, 1938.

Source: Moody's Manuals and *Commercial and Financial Chronical*, for appropriate years.

crises in the stock market and a major business depression. Further, common stock was junior to usually heavy issues of 7 per cent cumulative preferred stock and 5 per cent bonds. That seven of the thirteen common stocks paid dividends, and seven of the thirteen offered a positive return on the investment over this period indicates that the promise to investors of increasing equity value was at least partly realized in a fair share of cases.

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The almost equal number with unsatisfactory market records suggests, on the other hand, that a good fraction of the consolidations did not bear out this promise. Possibly the proportion of unsatisfactory outcomes corresponds to the risks promoters were willing to take. Yet, in the optimism of the years of peak merger activity, the risk of failure must have looked very small to promoters.

These findings, on balance, probably weaken the argument that the consolidation movement was due exclusively to the desire of promoters for high, quick-turnover profits to the neglect of sound financial principles. One need only recall the personal dislike of the conservative promoter J. P. Morgan for the speculative promoter "Bet-a-Million" Gates to illustrate the diversity of motives and techniques among the organizers of early mergers. It seems unlikely, for example, that Morgan, who had just spent a decade trying to produce order in the financial structures of railroads, would zealously participate in the gross overcapitalization of industrial mergers. The statistical test remains inconclusive. The market dominance achieved by many of these consolidations may have permitted profits sufficiently large to cover their high-interest and preferred-dividend commitments—fixed obligations that would have caused trouble to consolidations failing to secure strong market positions.

CONCLUSION

The organized securities market had experienced important and substantial growth in the last quarter of the nineteenth century, probably as a concomitant of the general economic growth of the country, and was therefore large enough to support the huge turn-of-the-century merger wave. The market's immediate relationship to the merger movement was complex; changes in the capital market permitted developments in merger activity which, in turn, caused further changes in the capital market. However, in view of the earlier and important role played by railroad reorganizations in these changes in the capital market, industrial mergers were probably more the beneficiaries of the changes in the capital market than a cause of them.

A large fraction of the larger and more important 1897-1902 consolidations listed their stock on the organized securities exchanges where it entered into trading activity. Moreover, industrial securities sold for cash to the general public became a relatively larger part of new securities issues during the large merger wave.

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A correlation analysis of merger activity and stock-price changes, using industrial production as a control variable, indicated that in this period of peak merger activity mergers were more closely related to stock-price changes than to industrial activity changes. Indeed, though mergers are probably related positively to long-run movements in industrial production, in this period the effect of stock-price changes apparently overrode the immediate influence of industrial production.

The market experience of the stocks of a small sample of consolidations suggests that investors in the common stocks of the leading consolidations fared not much worse than holders of preferred stock and perhaps a little better than bondholders. So far as it goes, this finding lends no support to either of the extreme views—that common stock of mergers was an investment success, or that it was merely a device for exploiting gullible investors.

The British merger movement also paralleled more closely changes in stock prices than changes in industrial production (see Appendix A). Since the greatest growth in the British capital market probably occurred much earlier than that in the United States, it is not a development that can be designated as an immediate cause of the British merger wave very late in the nineteenth century. Developments in business organization may be relevant here. Not until the 1880's in England were the full potentialities of limited liability realized in corporate practice (though legally prepared for much earlier): what was achieved quickly in the United States was achieved gradually in Great Britain. A convergence of unrestricted corporate behavior and large capital markets may have been important in setting the stage for mergers, and may help explain the almost simultaneous occurrence of great merger waves in the two countries. at the turn of the century.

The Market Control Motive

A frequent explanation for the merger movement is that mergers represented attempts on the part of businessmen and financiers to achieve market control.²¹ One cannot measure the market control motive directly. As one of the many manifestations of the profit motive, market control may be substituted for by other profit-increasing conditions. Moreover, it is inextricably tied up with

²¹ See, for example, Joe S. Bain, in *The Growth of the American Economy*, 2nd ed., H. F. Williamson, ed., Prentice-Hall, 1951, Chap. 32; and Hans B. Thorelli, *The Federal Antitrust Policy, Origin of an American Tradition*, Johns Hopkins Press, 1955, p. 280.

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external economic forces on the entrepreneur.²² Lacking direct observation of the motive, we may study its effects. By examining the results of the merger wave in terms of market control achieved we may be able to make inferences about the importance of the desire for such control.

EVIDENCE OF MARKET CONTROL

The data describing the degree of market control achieved by the major mergers of the 1895-1904 period are taken from *The Truth About The Trusts*.²³ In this book Moody estimated the share of the industry controlled by each of ninety-two important trusts. No attempt was made to construct independent estimates of shares of markets controlled, either for the trusts listed by Moody or for those he did not list, with the following exception. Two industries in which a high degree of local market control was the characteristic result of the merger have been added to Moody's list—breweries and ice companies. They were assigned to a percentage-controlled category designated "large." It should be added that Moody used this qualitative designation for a number of industries, where the apparent industry control was substantially more than 50 per cent.

If we assume that the Moody estimates individually are reasonably accurate, then our estimates of the proportion of merger activity resulting in market dominance can be regarded as minimum estimates. A considerable number of mergers not included by Moody probably achieved a high degree of control in local or regional markets, where the computations of exact percentages were not possible.

The number of consolidations achieving given degrees of market control presented below do not exactly correspond to those presented in Moody, for two reasons. First, the present writer adopted different class intervals than Moody's, in order to center the more common percentages within the class interval. Second, Moody listed a number of nonmanufacturing or nonmining mergers, and of pre-1895 trusts, which have been excluded because not covered by the merger data of this study. One major trust, Standard Oil, was left out because almost all of its merging activity took place well before 1896.

Certain adjustments were required in the totals for numbers of

²² A common explanation of the "increased desire for market control" in certain industries in the 1890's was the downward pressure on prices caused by what was thought to be declining demand for the product, aggravated by too much productive capacity.

²³ John Moody, *The Truth About The Trusts*, Moody, 1904.

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consolidations, firm disappearances, and capitalizations. Earlier consolidations entering into later consolidations were deducted from the totals, both for number and capitalizations of mergers; only the capitalization of the last consolidation in the period was included.²⁴ But firms absorbed by earlier consolidations later absorbed by further consolidations were included in the disappearances total. In industries in which acquisition was the dominant form of merger, the capitalization of the latest incorporation of the parent company was included in the capitalization totals, to make these mergers comparable to consolidations in this dimension of size.

The distribution of merger activity in industries in which market dominance was achieved is presented in Table 54. It is

TABLE 54
Proportion of Merger Activity Accounted for by Merged Firms That
Achieved Market Control, 1895-1904

Percentage of Industry Controlled	Consolidations and Parent Companies		Firm Disappearances		Capitalizations (millions of dollars)	
	Number	Per cent of total	Number	Per cent of total	Value	Per cent of total
42.5-62.5	21	6.7	291	9.7	613.5	10.3
62.5-82.5	24	7.7	529	17.6	2,130.6	35.7
82.5-over	16	5.1	343	11.4	998.0	16.7
"Large"	25	8.0	302	10.0	455.5	7.6
	<u>86</u>	<u>27.5</u>	<u>1,465</u>	<u>48.6</u>	<u>4,197.6</u>	<u>70.4</u>
Total merger activity	313	100.0	3,012	100.0	5,960.9	100.0

Source: See accompanying text.

evident that a substantial share of total 1895-1904 merger activity did result in securing a leading and often dominant share of the market. Almost one-half of firm disappearances, and seven-tenths of merger capitalizations were accounted for by mergers that gained a leading position in the market. Considering that these are minimum estimates, it might not be too misleading to place the actual share of disappearances into market-leading firms as high as two-thirds of all merger disappearances, and the share of such firms' capitalizations as high as three-fourths or four-fifths of all merger capitalizations.

²⁴ For a list of major consolidations subsequently entering larger consolidations, see Table C-6.

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CONCLUSION

Whatever the precise share of merger activity resulting in the control of markets, the above evidence shows that it was substantial. As we have noted, it would be extremely shaky reasoning to attribute this high "monopolization" activity to a fundamental increase in businessmen's desire for market control. But the findings do warrant certain inferences. First, they tend to demonstrate the existence of a fairly strong desire to avoid rigorous competition. Second, if we assume that the promoter and financier were important motive forces in the merger movement, it seems probable that the promise of "monopoly" profits would have served as one of the more effective inducements for firms to surrender their independence.

Note on Economies of Scale

Technological revolution leading to great economies of production in large-scale enterprises has been regarded by many merger students as of transcendent importance. Examination of this factor is not feasible, largely because the data on mergers lack sufficient detail for an assessment of scale economies on an individual merger basis. A few observations of certain aspects of the phenomenon may be in order, however, for indirect light on its importance in the early merger movement.

In scanning the basic data gathered in this study, one is struck by the overwhelming share of merger activity made up of what appear to be horizontal mergers. The vertical merger was characteristically found in the primary metals industries, but appeared only infrequently in the great variety of other industries having large merger activity. This suggests that the economies of vertical integration, upon which many merger students have placed great stress, played a relatively small role in the merger movement.

Another feature of the merger movement is the great diversity in types of production operations among the industries in which mergers occurred. The description of the industrial composition of the merger movement presented in Chapter 3 demonstrated that variety. It is hard to believe that such a variety of technological developments as would be needed to bring production economies of scale to these diverse industries could have converged in the same short period of time.

In the present chapter, the joint contribution of the capital market and the promoter in the creation of firms controlling major

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shares of their markets emerges as an important factor. It may have overridden other developments that presumably might have exerted an influence on merger activity. Emphasis on the control of markets might well have been more important than cost factors in determining firm size. It would be difficult to demonstrate that the most efficient or potentially most efficient firm size from the cost standpoint was systematically related to the size of the market—as would have to be demonstrated if scale economies were to be reconciled with market control.²⁵

Lacking more complete data with which to test the reasoning, however, this discussion of scale economies must remain conjectural.

Summary and Conclusions

We have examined four historical developments that have been prominent among the explanations of the early merger movement. Other common explanations could not be tested, notably economies of scale, for want of adequate data. Even although the examination is incomplete, the detailed tests of the several hypotheses serve to place the merger wave in clearer perspective.

The findings concerning the role of industry growth retardation in the early merger movement raise a serious question as to the validity of that hypothesis. The years preceding the merger wave saw a reversal of the pattern of retardation, especially in the very industries where merger activity was highest. The observed pattern of industry growth acceleration could hardly be credited with causing the kind of increased competitive pressure on business firms that the retardation hypothesis alleged. Indeed, we would expect that acceleration of market growth would cause a relaxation of competitive pressures, and thus a diminution of the impetus toward merging.

The transportation system underwent a large and protracted expansion in the decades preceding the merger wave. The effect of this development on merger activity is hard to assess, however. It probably did place geographically separated firms in more direct competition with one another. On the other hand, mergers occurred more commonly in industries that were geographically concentrated than in those more widely dispersed. Furthermore, the

²⁵ Stigler (*op. cit.*, p. 29) found that the near-monopolies created at the turn of the century almost invariably experienced a substantial decline in market share as time passed.

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growth of transportation was accompanied by, and was probably a partial cause of, acceleration in market growth, which permitted a firm to pursue a more independent course. The period was also characterized by substantial increases in the tariff, protecting domestic industries from international competition. In view of these offsetting factors it seems unlikely that transportation growth could be accounted a major cause of the merger movement.

The findings concerning the role of the capital market in the merger movement lend considerable support to the thesis that the development of the capital market was a major cause. The high correlation between merger activity and stock prices suggests that much of the merger activity of the period had its origin in, or was influenced by, the stock market. Further examination indicated that capital market factors overrode the level of industrial activity in influencing merger activity. This suggests that cost-price relationships in business firms were a less important influence than many students believed.

The desire for market control probably played at least a permissive role in the merger movement. The large proportion of merger activity resulting in market control suggests that the desire for the protection thus afforded to profits must have been a factor of substantial importance in inducing firms to merge. With the growth of the capital market this desire found an effective means of implementation. Coupled with the expectation of gains to be reaped from a rising stock market, the added promise of protected profits must have represented a compelling argument for independent firms to join into consolidations.