

The Growth of Modern Business Enterprises in the Twentieth Century

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ABSTRACT

This paper uses the census bureau's *Enterprise Statistics* to document the growth of the modern multiunit firm in the American economy. The data show that, although the great majority of American business enterprises operated as traditional single-unit firms, a small number of modern multiunit firms exerted a significant influence on the American economy. By the second half of the twentieth century, these multiunit firms accounted for over half of all employees. In addition, the paper uses a unique Federal Trade Commission data on retail chain stores, as well as data from the *Enterprise Statistics*, to examine the rise of multiunit firms in distribution and in production. These data sources suggest that economies in marketing rather than those of scale and scope explain the rise of the modern multiunit business enterprise.

I. INTRODUCTION

The analysis of the origins of the modern multiunit firm by the business historian, Alfred Chandler, has significantly influenced the work of historians and economic historians.¹ In *The Visible Hand* (1977), Chandler argued that the modern multiunit firm replaced the traditional single-unit firm when administrative rather than market coordination became more efficient. According to Chandler, for most of the eighteenth and the early nineteenth centuries, when the processes of distribution and production of goods were based on traditional sources of energy such as man, animal, and wind power, the market mechanism remained efficient. However, in the middle of the nineteenth century, when firms began using coal, and as the speed and volume of goods moving from production to distribution increased, the managers of multiunit enterprises became more efficient at coordinating the distribution and production of goods in the economy.

Chandler argued that the first modern business enterprises appeared in the railroad and telegraph industries for technological as well as organizational reasons. The steam engine, which replaced horses, increased the speed of locomotives significantly. However, the greater speed of throughput came with a potential hazard. Since most trains ran on single tracks, the railroads were subject to accidents unless the trains ran at very low speeds or unless the traffic schedules were centrally coordinated and monitored. The integration in one firm of station agents, conductors, locomotive engineers, shop foremen, and the master of transportation allowed the trains to achieve speed with safety. The efficient running of the various operating units also necessitated collecting and interpreting a constant flow of information concerning their efficiency. To evaluate and monitor the performance of the geographically dispersed operations of multiunit firms, the managers of the railroads invented most of the modern accounting and

statistical practices.

The rise of modern business enterprise in the railroad and telegraphs, which led to the establishment of the necessary infrastructure in transportation and communication, set the stage for the rise of modern business enterprise in mass distribution and in mass production. According to Chandler, the transformation came quickly in the mass distribution sector since the revolutions in transportation and communication made possible the speedy flow of goods through the economy. Moreover, the products distributed by the wholesalers and retailers were in traditional labor intensive and technologically simple industries. In the mass production sector, the revolution came more slowly since it required further technological and organizational innovations. In many industries, advances in basic production technologies, often intensive in capital and energy, were necessary to achieve the high-speed of throughput. Finally, the revolution culminated with the integration of mass production and mass distribution as the modern industrial firms integrated forward into distribution and backward into raw materials.

In *The Visible Hand* (1977), Chandler presents a narrative history of the rise of the modern business enterprise and, in concert with his more recent work, *Scale and Scope* (1990), provides an analysis of the sources of modern economic growth. According to Chandler, modern economic growth is based upon high volume production technology which takes advantage of economies of scale (or throughput) and scope. However, in order to realize these economies, Chandler argued that it was necessary for firms to vertically integrate forward into distribution to ensure sales of sufficient volume and to vertically integrate backward into raw materials to ensure a constant flow of inputs. In the modern economy, the pace of economic growth was ultimately set by hierarchy of middle managers who coordinated and monitored the activities of

the modern multiunit firms.

Yet, despite the elegant narrative framework of *The Visible Hand* and despite the use of numerous anecdotal evidence, answers to many basic questions concerning the rise of the modern business firm and its contribution to modern economic growth remain largely unsubstantiated by systematic evidence. For example, how important is the modern multiunit firm in the American economy? In which sectors of the economy are the multiunit firms most important? What are the sizes and structures of multiunit firms? Do multiunit firms achieve their sizes by operating larger plants or do they achieve their sizes by acquiring more establishments? If multiunit firms are vertically integrated, what is the extent of their industrial diversification? While Chandler provides answers to many of these questions, the results are based on a small sample of large multiunit enterprises and on relatively limited information.

This paper uses the census bureau's *Enterprise Statistics* to document the extent to which distribution and production are organized by modern multiunit firms in the American economy. In order to assess the economic importance of modern business enterprises, it is necessary to establish the extent to which economic activity is organized in multiunit versus traditional single-unit firms. The paper also uses data on retail multiunit firms collected by the Federal Trade Commission and the *Enterprise Statistics* data to examine the rise of mass distribution and mass production firms. In order to determine the economic contribution of multiunit firms to the modern economy, it is also necessary to compare the costs and benefits of organizing economic activities in multiunit firms as compared with that of single-unit firms. However, the magnitude of the benefits of organizing economic activities in multiunit firms as compared with single-unit firms is determined by the sources of the economic efficiency of multiunit firms and these

sources, in turn, depend critically upon the causes of the rise of modern multiunit firms.

The data show that, although the great majority of American business enterprises operated as traditional single-unit firms, a small number of modern multiunit firms exerted a significant influence on the American economy. By the second half of the twentieth century, these multiunit firms accounted for over half of all employees. However, the importance of multiunit firms varied widely across industries. The data also suggest that the multiunit firms emerged in the various industries to take advantage of multiunit economies in marketing and research and development. Thus, contrary to claims made by Chandler, the contribution of modern multiunit firms on economic growth are likely to hinge on the magnitude of economies of marketing rather than those of scale and scope.

The paper is organized as follows. Section II documents the general characteristics of American business enterprises. Section III investigates the causes of the rise of multiunit firms in mass distribution and mass production. The section also examines the contribution of modern multiunit firms to economic growth. Finally, section IV concludes with a summary.

II. THE GENERAL CHARACTERISTICS OF THE AMERICAN BUSINESS ENTERPRISE

This section uses the census bureau's *Enterprise Statistics* to document the growth of modern multiunit firms in the major sectors of the economy.² Using the *Enterprise Statistics*, it is possible to determine the extent to which modern multiunit firms have penetrated the American economy in the twentieth century. In addition, the data source provides significant information concerning the general characteristics of single-unit and multiunit firms such as the industry clustering of multiunit activity, the firm sizes of single-unit and multiunit firms, the number of

plants owned by multiunit firms, industry specialization ratios, and the size and composition of the central administrative organizations of multiunit firms. This data on the general characteristics of firms provide important clues to the rise of the modern business enterprise.

The *Enterprise Statistics*' definition of a company or a firm consists of all operating establishments, such as factories, mines, stores, sales offices, etc., including any administrative or auxiliary activities, such as central offices, central warehouses, research and development laboratories, and other supporting services, which were reported as being under common ownership or control.³ Each company or firm is classified into an industry category which differs slightly from that of the 3-digit Standard Industrial Classification system. Over time, the industrial coverage of the *Enterprise Statistics* has increased slightly. In 1958, there were 135 industry categories which covered mining, wholesale trade, retail trade, manufacturing, warehousing, and select service industries; in 1987, there were 146 industry categories which also included the construction and transportation industries.⁴

The Extent of Single-unit and Multiunit Firms

In the second half of the twentieth century, most business firms in the United States were traditional single-unit rather than modern multiunit enterprises. Table 1 shows that in 1958, single-unit firms accounted for 97.1 percent of all firms or 3.06 million of the 3.15 million firms in the sample of the *Enterprise Statistics*. In 1987, 3.71 million of 3.88 million or 95.7% of firms were of the single-unit type. However, a small number of large multiunit firms exerted considerable influence on the American economy. By the second half of the twentieth century, the modern multiunit firms employed a majority of the labor force. In 1958, the 91,323 multiunit firms which represented a mere 2.9 percent of all firms accounted for 53.8 percent of the 31

million employees. The importance of multiunit firms in terms of employment increased slightly over time. In 1987, the 166,546 multiunit firms which represented 4.3% of all firms accounted for 55.5 percent of the 68.1 million employees.

The importance of multiunit firm activity differed considerably across, and often within, the broad sectors of the economy. In 1958, multiunit activity was most significant in manufacturing and in mining, moderately significant in retail trade, and insignificant in services and in wholesale trade. Table 1 shows that multiunit manufacturing firms accounted for nearly 70 percent of employees in their sector; mining firms, 57 percent; retail trade firms, 40 percent; and multiunit services and wholesale trade firms, less than 30 percent.⁵ It also shows that, except for the mining sector, the importance of multiunit firms rose over time. The growth was only modest in the manufacturing sector but quite significant in retail trade, wholesale trade and services. By 1987, approximately 60 percent of employees worked in multiunit firms in the retail sector and over 40 percent in the wholesale trade and service sectors.

In many sectors, the differences in the importance of multiunit activity in industries within these major sectors were just as significant. In minerals, multiunit activity was significantly above that sector's average for metal mining in 1958 and 1987 and for coal mining in 1987. In retail trade, general merchandise was significantly above the industry average for both years whereas food and apparel became above industry average in 1987. In the manufacturing sector, tobacco, chemicals, petroleum, primary metals, electrical, transportation, and instruments industries were significantly above that sector's average for both years. Finally, in services, multiunit employment in the motion pictures industry was significantly higher than other service industries for both years.

The Industrial Distribution of Firms

The importance of multiunit firms in the overall economy increased only marginally over the second half of the twentieth century even though, in many industries, its importance increased significantly. The moderate growth in the importance of the multiunit firm is accounted for by a shift in the industrial distribution of firms away from manufacturing to wholesale trade, retail trade, and other service industries. In 1958, manufacturing firms led all sectors in terms of employment with 55.8 percent; however, by 1987, their share fell to 39.5 percent as shares in wholesale trade, retail trade, and services increased from 42.3 to 59.7 percent.⁶ Since multiunit activity is relatively more important in manufacturing than in these service industries, the changes in the industrial distribution of firms placed downward pressure on the importance of multiunit firms in the overall economy. However, this pressure was mitigated by the growth in the importance of multiunit activity in the various service industries.

TABLE 1 ABOUT HERE

The Sizes of Firms

The few multiunit firms exerted disproportionate influence on the American economy because they were considerably larger than the traditional single-unit firms. Table 2 shows that in 1958, the size of multiunit firms was 182.4 employees per worker as compared to only 4.7 for single-unit firms. The predominance of small single-unit firms, especially in retail trade and services, was responsible for the low overall average. In these two industries, the single-unit firms averaged fewer than 3 workers per firm. In wholesale trade and minerals, the size of single-

unit firms was slightly larger at 8 workers and in manufacturing, the figure was 22. In comparison, the size of multiunit firms was significantly larger than single-unit firms in all industries. The average size of multiunit firms in wholesale trade, retail trade and services ranged between 40 and 70 workers; the size of multiunit firms in the mineral and manufacturing industries was 175 and 1,000 employees, respectively.

The sizes of both single-unit and multiunit firms increased between 1958 and 1987, but the disparity in their sizes remained the same. Although the size of single-unit firms almost doubled from 4.7 to 8.2, it remained significantly smaller than that of multiunit firms which increased to 224 workers. Table 2 shows that the increase in the firm sizes of single-unit firms was primarily due to their growth in retail trade and services, whereas, in multiunit firms, the increase was due to growth in minerals, wholesale trade, retail trade, and services. On the other hand, the sizes of manufacturing firms of both types decreased over this period.

TABLE 2 ABOUT HERE

Multiunit firms were significantly larger than single-unit firms because they owned many establishments. Table 3 shows that the multiunit firms, on average, owned between three to ten establishments in 1958 and 1987. However, in some industries, such as in general merchandise retail and in tobacco and petroleum manufacturing, the number was much higher. Firms in these industries owned and operated anywhere between 40 to 70 establishments. The multiunit firms were also larger than single-unit firms because they operated significantly larger establishments or plants than single-unit firms. Tables 2 and 3 show that in general plant sizes of multiunit firms

were 8 or 9 times larger than those of single-unit firms.

TABLE 3 ABOUT HERE

The Structure of Firms by Employment Size Classes

The study of firms by size classes shows that employment is clustered in two different classes located at the opposite ends of the spectrum.⁷ Table 4 shows that in 1958, the 2.98 million firms whose sizes were fewer than 20 workers accounted for 23 percent of the total whereas the 223 firms whose firm sizes were greater than 10,000 also accounted for 23 percent. Similarly, in 1987, the 3.47 million firms in the smallest employment category accounted for 23 percent of employment whereas the 484 firms in the largest category accounted for 25 percent. Thus, the handful of the very largest enterprises representing a tiny fraction of all firms accounted for nearly a quarter of all employment in the United States.

A closer examination of firms in different size classes by industries show that there were distinct patterns across industries. Table 4 shows that small firms dominated the wholesale trade and the select service industries in 1958. In these two industries, the firms, whose sizes were fewer than 20, accounted for over 40 percent of activity whereas the firms in the largest category accounted for less than 5 percent. The data in table 4 show that the disproportionate influence of the very largest firms occurs mainly in manufacturing and, to a much lesser extent, in retail trade. In manufacturing, the small firms, whose sizes were fewer than 20 workers, accounted for only 7 percent of employment whereas the 181 firms, whose sizes were 10,000 and greater, accounted for over 33 percent. In retail trade, the firms in the smallest-sized category accounted for half of

total retail employment; however, the 37 firms in the largest-sized category also accounted for close to 16 percent of retail trade workers. In the minerals industry, the share of employment was distributed evenly across the nine different size classes.

The importance of firms in the largest employment category, 10,000 and greater, became more significant over the second half of the twentieth century. In 1987, the firms in this largest-sized category not only became more important in manufacturing and retail trade, but also made inroads into other sectors of the economy. Table 4 shows that in 1987, in manufacturing, the 267 firms whose sizes were greater than 10,000 accounted for 40 percent of total employment. In retail trade, the importance of firms in this category increased significantly as 117 firms accounted for 29 percent of employment. In transportation, a mere 11 firms accounted for 20 percent of employment; in services, the 72 firms in this category employed 12 percent of this sector's employment.

TABLE 4 ABOUT HERE

The Central Administrative Organizations and Auxiliaries of Multiunit Firms

Modern multiunit firms employed a majority of the labor force by the second half of the twentieth century. However, the benefits to organizing distribution and production in multiunit firms did not come without costs. Unlike traditional single-unit firms, multiunit firms required a class of managers who monitored and coordinated the activities of numerous establishments which were often located in different regions. In 1958, 0.8 million or 4.53% of multiunit employees worked in central administrative organizations (CAOs); in 1987, 1.9 million or 5.02%

of multiunit employees worked in CAOs.⁸ In 1958, the salary cost of CAOs was \$6.8 billion or 1.85% of the national income; in 1987, it was \$90.5 billion or 2.47%. The data also indicate that managerial intensity of firms rose with firm size and with the number of establishments.⁹ Thus, the costs of monitoring and coordinating activities increased not only as firms became larger but also as firms acquired more establishments. In addition, managerial intensity in minerals, retail trade, and manufacturing were significantly greater than in the other services industries.

III. THE RISE OF MODERN BUSINESS ENTERPRISES

This section investigates the causes of the rise of modern multiunit firms in distribution and in production and examines the social savings of multiunit firms.¹⁰ First, in order to examine the rise of mass distribution firms, this section exploits a unique but rich data set on retail chain stores or retail multiunit firms compiled by the Federal Trade Commission (FTC) in the early 1930s. As a part of the Senate inquiry into the chain store system of marketing and distribution, the FTC collected extensive information on chain store operations for 1928 and other years. Second, in order to examine the rise of mass production firms, this section utilizes data from the *Enterprise Statistics*. Finally, the section suggests some estimates concerning the contribution of multiunit firms to modern economic growth.

The Rise of Mass Distribution Firms

The FTC sample of firms consists of 1727 retail chains in 26 lines of retail businesses. These retail chains operated 66,246 stores and sold more than \$5 billion worth of merchandise and represented about one-half of all stores and sales operated by chains in 1928. The FTC data on 26 lines of businesses can be categorized into 12 major classes: food, drug, tobacco, variety,

apparel, dry goods, dry goods and apparel, department store, general merchandise, furniture, musical instruments, and hardware. The FTC did not collect data on retail firms in some industries such as gasoline filling stations and automobile accessories. Although, due to reporting irregularities, the sample of firms differs by the types of information provided, the FTC reports provide extremely valuable data on retail chains. The information on chains includes volume of sales, number of stores, state distribution, sources of merchandise, backward integration into manufacturing and wholesale trade, advertising, use of private brands, and pricing policies (among others). In addition, the statistical information is often augmented by useful survey questionnaires.

The analysis of the FTC data on chain stores suggests that the rise of multiunit firms in the retail industry are unlikely to be explained by economies in sales.¹¹ The data on store sales volume by chain sizes presented in Table 5 suggest that chain stores which owned more stores did not necessarily operate stores with higher sales volumes. Table 5 shows that across almost all size classes of chains, the majority of stores were concentrated in sales volumes of between \$25,000 to \$99,000. In fact, the chains which owned only 6 to 10 stores had a higher percentage of stores doing volumes of business above \$500,000 than chains which owned over 1,001 stores. Table 5 shows that chains which had 2-5 stores and 6-10 stores had 4% and 6.6% of stores doing sales volumes of over \$500,000 as compared to no stores for chains which owned over 1,001 stores. Thus, the evidence suggests that the advantage of retail chain stores did not necessarily come from large sales volume per retail unit.¹²

TABLE 5 ABOUT HERE

The FTC data provide a variety of evidence in support of the hypothesis that the rise of multiunit firms in the retail industry is due to economies in advertising and in transactions. The data suggest that the rise of retail chains coincided with urbanization in the early twentieth century because urban density provided significant economies in advertising.¹³ The data indicate that while urban density expanded the size of retail markets for some stores, the expansion was limited for those in most lines of businesses. In the early twentieth century, the size of retail markets was limited by the transportation and household technologies available to consumers. Thus, most retail stores, except the department stores, remained relatively small. However, for retail stores that horizontally integrated into a chain, urban newspapers presented significant opportunities to economize on advertising.

Indeed, the FTC data on advertising expenditures suggest that there were significant economies in advertising for multiunit retail firms.¹⁴ The data presented in Table 6 show that while large chains spent significantly greater amounts in advertising, the expenditures per store or expenditures as a percentage of sales were both significantly lower for these large chains. In 1928, the smaller chains, those owning 2-5 stores and 6-10 stores, spent on average \$19,444 and \$45,051 respectively, whereas the larger chains, those owning 501-1,000 and more than 1,001 stores, spent \$225,000 and \$1,425,000 respectively. However, the advertising outlay per store for chains in the two smallest size categories was \$6,000 as compared to less than \$400 for chains in the two largest size categories. The data also show that the ratio of advertising expenditures to sales fell almost monotonically by chain size. While firms which owned 2-5 stores spent 3.57% of their sales on advertising, the figure was only 0.67% for firms which owned more than 1,001

stores.¹⁵

TABLE 6 ABOUT HERE

There are many reasons for advertising. However, one of the most important goals of advertising by chains in the early twentieth century was to develop a reputation for their private brands or trademarks. While some products developed a national brand recognition through direct advertisement by manufacturers, many did not. In these non-nationally branded items from manufacturers, especially when the quality of goods could not be easily inspected in the stores, the establishment of a private brand by chains often signaled a certain level of quality. For example, A&P, the largest grocery and meat chain, reported:

In many types of merchandise which we handle, the consuming public has gradually reached a point where it prefers to order or buy on the basis of brand or trade names. This has probably been accentuated by large expenditures in advertising of trade names; it is probably due also to the greater ease to the customer in making his wants known and being sure of getting the same thing every time he uses that certain trade name or brand. When he wants a certain article, he knows that if he calls for it by that name he will get it; conversely, if he calls for an article under that brand he knows what he will get.¹⁶

The FTC data on retail chains suggest that the advertising expenditures made by large multiunit firms were focused on establishing a reputation of the chain through the development of private brands. The FTC data on the use of private brands by chains indicate that about a quarter of 1,660 chains in the sample owned private brands. However, as expected, the chains which owned private brands were large; the 412 chains which owned private brands accounted for over 75 percent of sales and stores.¹⁷ The data also indicate that the ownership of brands was positively correlated with chain size. The rate of ownership of private brands rose steadily from

14% for stores which operated 2-5 stores to 90% for chains which operated more than 1,001 stores.¹⁸ Thus, the data suggest that the economies in advertising by multiunit retail firms were largely achieved by establishing reputations for their private brands.

The extent of backward integration into manufacturing by retail chains was relatively limited.¹⁹ However, when retailers integrated backward into manufacturing, the evidence suggests that they did so to ensure a consistent quality that was necessary for establishing a chain's private brand reputation.²⁰ There is little evidence that retail chain stores integrated backward into manufacturing in order to exploit economies of scale or stock turn. The reason most often reported by chains for manufacturing some of their products was quality control. For example, confectionary chains in the early twentieth century were almost always integrated into manufacturing because their products were highly perishable and could not be sold over a great distance. For similar reasons, grocery chains manufactured many items such as coffee, tea, mayonnaise, and bread. Certainly, manufacturing these items in these retail stores was helpful in maintaining consistent quality, but it probably came at the cost of achieving economies in the scale of production or in the distribution of these goods.

The data on the sources of merchandise indicate that retail chains, unlike the independent single-unit firms, purchased most of their goods directly from manufacturers and growers. The FTC report found that the chains purchased 75.5% of their merchandise from manufacturers, 7% from growers, 7.3% from brokers and commission men, 7.9% from wholesalers and jobbers, and 2.3% from other sources.²¹ The data in Table 7 also show that the percentage of direct purchase from manufacturers and growers also increased with the size of the chain for five broad categories of businesses. As the importance of private brands increased, a direct relationship with

the manufacturer rather than the indirect one with the wholesaler is likely to have lowered the cost of ensuring a consistent quality of their private brands. In addition, a study by Hoffman (1940) suggests that the chain store system saved significant labor cost by reducing duplication in labor.²²

TABLE 7 ABOUT HERE

The Rise of Mass Production Firms

The *Enterprise Statistics* data shed considerable light on the causes of the rise of mass production firms. The evidence provides little support for Chandler's claim that it was necessary for modern multiunit firms to vertically integrate forward into distribution and backward into raw materials in order to take advantage of economies of scale. Rather, the evidence suggests that multiunit firms in production, like those in distribution, arose to take advantage of economies in marketing. Whereas the multiunit retail firms integrated backward into wholesale distribution, the multiunit manufacturing firms integrated forward into wholesale distribution to take advantage of economies in marketing. However, multiunit manufacturing firms did not integrate backward into raw materials, nor conglomerately, since multiunit firms did not arise to take advantage of economies of scale or economies of scope.

There is little evidence that multiunit firms grew by vertically integrating backward into raw materials or by integrating conglomerately. The data from the *Enterprise Statistics* indicate that most American business enterprises in distribution and production specialized in one kind of business activity. The data in Table 8 show that, in both 1958 and 1987, more than 95 percent of

establishments and 87 percent of employment were classified in a single 3-digit enterprise industry.²³ Among the industries which were extremely specialized were wholesale trade, retail trade, construction, transportation and services. In these industries, more than 90 percent of employment was engaged in the firm's primary industry category. The minerals industry was close behind with more than 85 percent. Even in the manufacturing sector, the only sector to exhibit some industrial diversification, more than 70 percent of employment was categorized in a single industry. However, the level of diversification varied widely within manufacturing. A few industries exhibited a considerable level of diversification. For example, in 1958, only 57.3 percent of workers in the petroleum industry were engaged in their primary industry and in 1987, only 28.7 percent of workers in the tobacco industry were categorized in their primary industry.

TABLE 8 ABOUT HERE

The *Enterprise Statistics* also provides a more detailed list of other industry activities in 1958. In addition to the aggregate firm specialization ratio, the *Enterprise Statistics* reports data on firms' activities in each of the 135 industries. According to this data, only 13 of 91 industries in manufacturing employed more than 30 percent of their employees in vertical or unrelated industries. Table 9 examines in greater detail the extent of diversification in these 13 industries. A closer examination of the data indicate that if horizontal integration is measured by two-digit rather than three-digit industries, the level of diversification falls sharply for firms in three industries: pulp paper and board, engines and turbines, and aircraft engines and propellers. For most firms that are diversified, vertical or unrelated employment occurred in other

manufacturing rather than in non-manufacturing industries. The major exceptions were the integrated petroleum industry which employed 25 percent of its employment in the mineral and transportation industries and 17 percent in wholesale and retail trade, and the office machines industry which employed 24 percent of its employment in wholesale and retail trade.

TABLE 9 ABOUT HERE

Although the *Enterprise Statistics* data in Table 3 indicate that plant sizes of multiunit firms were significantly larger than that of single-unit firms, it is unlikely that this provides evidence that multiunit firms arose to take advantage of economies of scale in production. Rather, it is more likely firms with larger plants had more incentives to market their products more widely. The data also indicate that the larger multiunit production firms increased their sizes by operating many more establishments rather than operating plants of larger sizes which suggests that they integrated horizontally to take advantage of economies in marketing. The data in Table 4 show that the clear difference between firms whose sizes were 250-499 and those whose sizes were 10,000 and greater was in their number of establishments. For example, in 1958, the data show that these medium-sized firms owned only 5 establishments as compared to 343 establishments for the very largest firms. The medium-sized firms operated smaller plants, but their establishments were only a third smaller than those of the largest-sized firms.

Finally, Kim (1999b) provides additional evidence which suggests that multiunit manufacturing firms arose to take advantage of economies in marketing rather than those of R&D, scale and scope. He finds that multiunit firms integrated forward into distribution in order

to take advantage of economies in marketing. Since advertising, brand names, and reputation could more easily be established for the selling of similar products, and since these proprietary assets are difficult assets to transfer from one plant to another through the use of contracts, firms organized as horizontal multiunit firms to take advantage of these economies.

Social Savings of Modern Business Enterprises

The economic benefits of organizing economic activities in modern multiunit firms depend critically upon why they arose in the first place. For Chandler (1977, 1990), the modern business enterprise arose to take advantage of economies of scale in distribution and in production. Chandler argued that, in mass distribution firms, the economies of scale came from speed not size. For example, mass retailers did not build larger stores; they increased their stock-turn. In mass production firms, Chandler claimed that the economies of scale came from the construction of larger plants. Thus, in principle, if Chandler's hypothesis concerning the rise of modern business enterprises is correct, then the contribution of multiunit firms to economic growth can be calculated by estimating the benefits of increased stock-turn and increased plant-size of mass distribution and mass production firms, respectively. While Chandler has made little systematic attempt at estimating the social savings of multiunit firms, he suggests that the benefits are substantial. In particular, Chandler (1990, 24-5; 1992, 82) has used the formation of the Standard Oil trust to provide evidence for the importance of economies of scale.

Unfortunately, Chandler's estimate of the benefits of economies of scale of the Standard Oil trust is not only unreliable, the inference that these benefits can be generalized to capture the overall benefits of modern multiunit firms is also likely to be wrong.²⁴ Even if firms in some industries benefitted from economies of scale, it is unlikely that these firms needed to organize as

multiunit firms to capture these economies. Rather, the analysis of this paper suggests that modern multiunit firms in distribution and production arose to take advantage of economies in marketing and research and development. While it is beyond the scope of this paper to provide a systematic estimate of the benefits of these kinds of economies, the following case study of benefits of marketing in the retail industry suggests some bounds on the magnitude of these benefits.

The benefits of distributing goods through multiunit retail chain stores can be measured by comparing the prices of identical items sold in retail chain and independent stores. The FTC, between 1929 and 1931, collected information on identical grocery and drug store items sold on the same day by chains and independents in four cities, Washington D.C., Cincinnati, Memphis and Detroit. The data indicate that the chains were much more efficient at distributing grocery and drug store items than the independent stores. The chain store prices of groceries as compared to that of independent stores were 6.4%-10.47% lower whereas, for the drug store items, they were lower by 17.48%-22.72%.²⁵ Thus, the social savings of modern business enterprises in some industries may be substantial. The overall contribution of multiunit enterprises, however may depend critically upon whether single-unit and multiunit firms are goods substitutes. For example, the relatively smaller price differential between chains and independents in groceries compared to drug store products are likely to be accounted for by the fact that numerous cooperatives arose in the former line of business. Evidence indicates that grocery cooperatives captured much of the benefits of the multiunit marketing economies. Like the chains, grocery cooperatives developed private brands and benefitted substantially from economies of advertising.²⁶

IV. CONCLUSION

The modern multiunit firms which arose in the late nineteenth century exerted a significant influence on the American economy by the twentieth century. Although these firms represented only a tiny fraction of all business enterprises, they accounted for more than half of all employees by the second half of the twentieth century. The multiunit firm was most predominant in manufacturing where it accounted for more than 70 percent of that sector's employment, but its influence broadened to include other industries such as retail trade, transportation and services. However, the benefits to organizing production within a multiunit firm also came with costs. The data indicate that the costs of monitoring and coordinating the activities of employees in multiple establishments increased the managerial intensity of firms.

The evidence presented in this paper suggests that the modern multiunit business enterprise arose to take advantage of economies in marketing rather than to take advantage of economies of scale and scope. The data suggests that firms organized as multiunit firms in industries where economies of marketing could be shared over many establishments. Since brand names, trade marks and reputation are difficult assets to transfer from one plant to another through the use of contracts, it was often optimal for plants which produced similar lines of products to operate under a common ownership.

The historical development of the modern multiunit firm can also be re-interpreted using economies of marketing rather than economies of scale and scope. Although the revolutions in transportation and communications industries led to the development of an integrated national goods market, the integration occurred in different stages. The wholesale trade firms became the first modern business enterprises because these firms efficiently handled the distribution of

goods when consumers of final goods were dispersed in rural areas. Since costs of advertising in rural markets were prohibitive, wholesale merchants with sales forces arose to market products to rural consumers. In this period, the retail firms in rural areas found it more cost effective to deal with wholesale merchants who provided them with sufficiently different lines of products rather than to deal directly with manufacturers.

The importance of the multiunit form of organization in wholesale trade was rather short-lived. As the population became increasingly urban, economies in marketing grew at the retail level. As population density grew, direct advertising became an effective marketing device.²⁷ However, as markets became increasing national and as manufacturers perceived significant benefits to establishing brand names for their products, advertising agencies emerged to coordinate the task of advertising. When advertising remained mostly a local affair, agencies, such as N.W. Ayer & Son, provided valuable information concerning the potential value of advertising in the various local newspapers around the country.²⁸ Over time, the emergence of the national media, such as magazines, radio and television, significantly lowered the costs of establishing national brand names for manufacturers.

For Chandler, the rise of the multiunit firm marked a significant transition in the history of the American economy. It signaled the coming of managerial capitalism where economic growth is dependent upon the 'visible hand' of multiunit firms rather than the Smithian 'invisible hand' of markets. However, while the evidence of the rapid displacement of single-unit firms by multiunit firms in a cluster of industries may signal the relative efficiency of the latter organizational form, it does not indicate the magnitude of the multiunit firm's superiority. The magnitude of the economic importance of multiunit firms depends upon whether multiunit firms

and single-unit firms are reasonably good substitute means of organizing production. To the extent that the two modes of organizing production are good substitutes, the importance of the modern multiunit firm for economic growth may have been overstated. The obvious next step in this research is to estimate the social savings of multiunit firms.

Table 1

The Extent of Multiunit Activity, 1958-1987
(Percent of Activities in Multiunit Firms)

	1958			1987		
	Firms	Est.	Emp.	Firms	Est.	Emp.
All Companies	2.9%	12.4%	53.8%	4.4%	21.6%	55.5%
Minerals	6.2	22.8	56.7	4.9	25.4	57.3
10 Metal	3.4	21.4	82.9	7.2	54.3	83.4
12 Coal	3.8	23.6	63.1	6.2	45.8	72.4
13 Oil & gas	7.5	22.0	45.3	4.1	17.5	43.0
14A Non-metallic	6.5	24.1	51.2	7.5	32.2	53.7
Construction	-	-	-	0.8	2.6	16.9
15 General	-	-	-	0.8	2.5	17.0
16 Heavy	-	-	-	2.5	10.8	39.8
17 Special	-	-	-	0.6	1.8	9.8
Transportation	-	-	-	3.6	18.2	50.9
42 Trucking	-	-	-	2.6	17.0	52.2
44 Water	-	-	-	5.2	24.7	61.9
47 Transport	-	-	-	6.3	20.1	36.9
Wholesale Trade	6.7	19.3	29.8	8.1	24.5	43.1
50 Durable	8.0	21.9	33.3	8.3	24.7	42.3
51 Non-durable	6.1	18.1	27.9	7.8	24.1	44.2
Retail Trade	2.8	10.8	40.2	6.0	32.3	58.8
52 Building	3.7	11.6	22.0	6.4	25.2	45.8
53 General	2.2	14.4	80.3	7.6	78.6	97.3
54 Food	1.7	9.7	54.5	5.3	35.7	70.4
55 Automotives	2.5	7.5	13.8	6.0	24.5	27.5
56 Apparel	6.9	24.9	48.1	10.3	52.3	71.5
57 Furnitures	4.3	12.0	27.8	8.0	30.2	48.2
58 Eating	2.2	7.7	19.1	4.2	27.3	51.1
59 Miscellaneous	3.3	10.8	27.4	6.3	27.1	48.4

Sources: U.S. Bureau of Census: *Enterprise Statistics*, 1958; *Company Statistics*, 1987.

Table 1 - continued

The Extent of Multiunit Activity, 1958-1987
(Percent of Activities in Multiunit Firms)

	1958			1987		
	Firms	Est.	Emp.	Firms	Est.	Emp.
Manufactures	4.3%	32.0%	67.5%	6.2%	39.2%	76.2%
20 Food	6.6	39.3	63.3	11.7	63.1	82.5
21 Tobacco	12.0	62.4	90.3	26.1	95.1	99.3
22 Textiles	8.4	36.2	64.9	12.2	53.9	80.7
23 Apparel	3.1	11.7	31.1	5.1	26.5	52.3
24 Lumber	1.6	6.8	27.8	2.9	11.3	40.1
25 Furniture	3.1	12.0	33.9	5.3	29.9	63.8
26 Paper	9.9	47.0	77.3	13.4	65.3	85.6
27 Printing	2.3	9.3	43.2	3.1	20.7	62.6
28 Chemicals	8.8	53.1	88.4	12.6	68.1	90.8
29 Petroleum	16.0	96.9	97.3	19.1	94.4	97.2
30 Rubber	5.5	51.0	72.6	9.2	47.0	66.1
31 Leather	5.1	40.9	49.1	8.7	36.4	56.6
32 Stone	6.5	30.7	66.4	9.0	44.7	73.5
33 Primary	7.4	51.4	86.0	13.9	63.3	83.0
34 Fabricated	3.8	18.7	53.5	6.9	26.6	58.3
35 Machinery	3.4	24.9	68.2	5.0	26.5	69.8
36 Electrical	7.3	54.4	83.5	9.2	51.6	81.2
37 Transportation	6.0	39.9	89.0	7.9	63.4	94.1
38 Instruments	6.4	46.7	80.3	9.2	56.2	89.1
39 Miscellaneous	3.0	13.0	47.0	3.7	12.9	43.4
Services	1.7	5.7	27.5	3.2	12.4	40.3
70 Hotels	2.0	5.6	29.3	4.3	20.7	49.5
72 Personal	1.6	4.8	19.8	4.4	18.2	37.5
73 Business	2.1	8.3	40.2	3.8	16.9	48.3
75 Automotive	1.5	6.1	15.8	2.7	13.9	28.7
76 Misc. Repair	0.4	1.2	10.6	1.8	5.3	15.3
78 Motion Pictures	13.1	45.1	63.5	6.0	28.5	61.6
79 Amusement	1.7	4.3	13.1	3.2	11.1	31.8
80 Health	-	-	-	3.0	9.3	37.5
81 Legal	-	-	-	1.9	4.4	24.8
82 Education	-	-	-	4.8	17.5	40.1
83 Social	-	-	-	3.3	15.3	27.8
87 Engineering	-	-	-	3.2	10.2	39.9
89 Miscellaneous	-	-	-	0.9	2.5	14.1

Sources: U.S. Bureau of Census: *Enterprise Statistics*, 1958; *Company Statistics*, 1987.

Table 2
The Size of Firms, 1958-1987
(Number of Employees per Company)

	1958			1987		
	All	Single	Multiunit	All	Single	Multiunit
All Companies	9.8	4.7	182.4	17.6	8.2	224.3
Minerals	19.1	8.8	174.6	18.8	8.4	221.8
10 Metal	36.5	6.5	881.0	65.3	11.6	757.6
12 Coal	26.9	10.3	441.1	52.9	15.6	617.1
13 Oil & gas	13.8	8.1	82.8	11.7	7.0	124.2
14A Non-metallic	17.7	9.3	138.9	20.0	10.0	142.5
Construction	-	-	-	9.7	8.1	208.8
15 General	-	-	-	8.5	7.1	182.1
16 Heavy	-	-	-	25.0	15.5	394.1
17 Special	-	-	-	8.6	7.8	142.7
Transportation	-	-	-	15.1	7.7	210.8
42 Trucking	-	-	-	16.5	8.1	330.6
44 Water	-	-	-	29.5	11.9	349.2
47 Transport	-	-	-	8.5	5.7	50.4
Wholesale Trade	9.9	7.4	43.7	13.4	8.3	71.4
50 Durable	11.3	8.2	46.6	12.5	7.9	63.9
51 Non-durable	9.2	7.1	41.9	15.0	9.1	85.2
Retail Trade	4.8	2.9	68.4	17.4	7.6	171.4
52 Building	4.4	3.5	26.3	11.2	6.5	79.7
53 General	11.0	2.2	405.0	205.2	6.0	2619.8
54 Food	3.8	1.8	120.5	23.4	7.3	308.6
55 Automotives	3.9	3.5	21.8	12.3	9.5	56.2
56 Apparel	6.7	3.7	46.7	15.0	4.8	104.1
57 Furnitures	4.0	3.0	25.7	8.8	5.0	52.9
58 Eating	4.7	3.9	41.3	21.1	10.7	254.4
59 Miscellaneous	3.3	2.5	27.3	8.7	4.8	67.1

Sources: U.S. Bureau of Census: *Enterprise Statistics*, 1958; *Company Statistics*, 1987.

Table 2 - continued

The Size of Firms, 1958-1987
(Number of Employees per Company)

	1958			1987		
	All	Single	Multiunit	All	Single	Multiunit
Manufactures	64.0	21.8	1002.1	69.8	17.8	852.7
20 Food	54.1	21.3	520.9	118.1	23.3	832.0
21 Tobacco	298.2	32.9	2243.8	2210.7	19.6	8419.2
22 Textiles	145.4	55.7	1126.2	159.9	35.2	1056.3
23 Apparel	42.2	30.0	420.6	51.4	25.8	526.1
24 Lumber	15.3	11.2	271.2	20.3	12.5	280.0
25 Furniture	35.1	23.9	383.0	54.4	20.8	659.8
26 Paper	149.4	37.6	1172.0	193.6	32.2	1236.1
27 Printing	26.0	15.1	483.8	30.7	11.9	610.3
28 Chemicals	107.1	13.7	1073.0	155.8	16.4	1120.3
29 Petroleum	528.6	17.0	3212.4	428.4	15.0	2178.0
30 Rubber	100.1	29.1	1318.6	70.4	26.2	507.3
31 Leather	88.7	47.6	859.2	52.6	25.0	340.9
32 Stone	48.1	17.3	494.2	51.0	14.9	417.4
33 Primary	248.2	37.5	2885.9	163.7	32.3	975.6
34 Fabricated	46.6	22.5	656.3	43.7	19.6	369.7
35 Machinery	52.2	17.2	1060.7	44.3	14.1	615.6
36 Electrical	203.5	36.2	2336.5	127.2	26.3	1123.7
37 Transportation	340.8	39.8	5016.2	353.1	22.7	4190.1
38 Instruments	105.1	22.2	1309.6	165.3	19.9	1593.2
39 Miscellaneous	33.0	18.0	519.3	22.8	13.4	264.4
Services	3.0	2.2	49.9	10.8	6.7	135.9
70 Hotels	6.1	4.4	89.8	33.3	17.6	386.3
72 Personal	2.3	1.9	28.2	7.0	4.6	60.7
73 Business	5.6	3.4	107.3	20.1	10.8	257.5
75 Automotive	2.1	1.8	21.8	6.1	4.5	64.6
76 Misc. Repair	0.8	0.8	20.0	5.0	4.3	42.8
78 Motion Pictures	15.7	6.6	76.3	13.3	5.4	137.0
79 Amusement	3.6	3.2	26.9	12.8	9.0	128.3
80 Health	-	-	-	9.5	6.1	117.3
81 Legal	-	-	-	6.0	4.6	78.7
82 Education	-	-	-	11.7	7.4	97.7
83 Social	-	-	-	9.1	6.8	76.1
87 Engineering	-	-	-	9.9	6.1	124.7
89 Miscellaneous	-	-	-	2.9	2.5	45.9

Sources: U.S. Bureau of Census: *Enterprise Statistics*, 1958; *Company Statistics*, 1987.

Table 3

Multiunit Firms: Number of Establishments and Plantsizes, 1958-1987

	Number of Establishments Owned by Multiunit Firms		Plantsizes of Multiunit Firms	
	1958	1987	1958	1987
All Companies	4.7	6.1	38.4	37.0
Minerals	7.7	6.7	39.0	33.3
10 Metal	7.7	15.3	114.9	49.4
12 Coal	3.5	12.7	57.0	48.4
13 Oil & gas	4.5	5.0	23.9	24.8
14A Non-metallic	4.5	5.8	30.5	24.5
Construction	-	3.4	-	61.2
15 General	-	3.2	-	57.3
16 Heavy	-	4.7	-	84.3
17 Special	-	3.0	-	47.7
Transportation	-	5.9	-	35.9
42 Trucking	-	7.7	-	43.1
44 Water	-	5.9	-	59.0
47 Transport	-	3.8	-	13.4
Wholesale Trade	3.2	3.7	13.2	19.3
50 Durable	3.4	3.6	14.6	17.5
51 Non-durable	3.3	3.8	12.4	22.6
Retail Trade	4.2	7.5	16.3	22.9
52 Building	3.5	4.9	7.6	16.3
53 General	7.5	44.4	53.9	59.0
54 Food	6.2	9.9	19.4	31.3
55 Automotives	3.2	5.0	6.9	11.1
56 Apparel	4.5	9.6	10.4	10.9
57 Furnitures	3.0	5.0	8.5	10.6
58 Eating	3.8	8.5	10.9	29.9
59 Miscellaneous	3.5	5.6	7.8	12.0

Sources: Data for all industries, except manufacturing, are from U.S. Bureau of Census: *Enterprise Statistics*, 1958; *Company Statistics*, 1987; Data for manufacturing are from *Census of Manufactures: Type of Organizations*, 1958, 1987.

Table 3 - continued

Multiunit Firms: Number of Establishments and Plantsizes, 1958-1987				
	Number of Establishments Owned by Multiunit Firms		Plantsizes of Multiunit Firms	
	1958	1987	1958	1987
Manufactures	10.5	9.7	240.7	177.7
20 Food	9.2	12.9	114.4	157.7
21 Tobacco	12.2	55.4	374.7	629.0
22 Textiles	6.2	8.4	327.8	278.9
23 Apparel	4.1	6.7	161.1	175.1
24 Lumber	4.6	4.2	91.6	92.6
25 Furniture	4.3	7.7	161.6	182.6
26 Paper	8.1	12.2	227.8	175.7
27 Printing	4.3	8.0	176.5	125.1
28 Chemicals	11.7	14.8	166.6	132.2
29 Petroleum	162.2	71.1	220.2	72.2
30 Rubber	17.8	8.8	321.1	130.5
31 Leather	13.0	6.0	246.7	178.1
32 Stone	6.4	8.2	110.3	69.8
33 Primary	13.3	10.6	534.3	231.2
34 Fabricated	5.8	4.9	200.4	126.1
35 Machinery	9.6	6.8	325.0	172.9
36 Electrical	15.2	10.5	484.8	293.7
37 Transportation	10.3	20.1	1126.6	662.4
38 Instruments	12.8	12.6	400.5	324.6
39 Miscellaneous	4.8	3.8	314.5	120.6
Services	3.6	4.3	14.0	31.6
70 Hotels	2.9	5.9	30.6	65.9
72 Personal	3.1	4.9	9.1	12.4
73 Business	4.3	5.2	25.2	49.6
75 Automotive	4.2	5.8	5.2	11.1
76 Misc. Repair	2.7	3.1	7.4	13.7
78 Motion Pictures	5.5	6.3	14.0	21.8
79 Amusement	2.6	3.8	10.5	33.4
80 Health	-	3.3	-	35.7
81 Legal	-	2.4	-	32.7
82 Education	-	4.2	-	23.3
83 Social	-	5.3	-	14.4
87 Engineering	-	3.5	-	35.8
89 Miscellaneous	-	2.9	-	15.9

Sources: Data for all industries, except manufacturing, are from U.S. Bureau of Census: *Enterprise Statistics*, 1958; *Company Statistics*, 1987; Data for manufacturing are from *Census of Manufactures: Type of Organizations*, 1958, 1987.

Table 4

Firm Characteristics by Employment Size Class, 1958

<u>All Firms</u>	<u>All</u>	<u>less 20</u>	<u>20-99</u>	<u>100-249</u>	<u>250-499</u>	<u>500-999</u>	<u>1000-2499</u>	<u>2500-4999</u>	<u>5000-9999</u>	<u>10,000+</u>
Companies	3,151,606	2,981,413	143,746	17,043	4,889	2,195	1,291	442	255	223
Est.	3,493,770	3,052,194	2,031,874	6,253	26,070	21,367	26,353	19,420	22,421	76,505
Employees	30,952,031	7,224,457	5,556,909	2,563,239	1,723,951	1,503,260	1,968,452	1,524,796	1,780,589	7,106,378
Companies	100 %	94.6 %	4.6 %	0.5 %	0.2 %	0.1 %	0.0 %	0.0 %	0.0 %	0.0 %
Est.	100 %	87.4 %	5.8 %	1.3 %	0.7 %	0.6 %	0.8 %	0.6 %	0.6 %	2.2 %
Employees	100 %	23.3 %	18.0 %	8.3 %	5.6 %	4.9 %	6.4 %	4.9 %	5.8 %	23.0 %
Est./Co.	1.1	1.0	1.4	2.7	5.2	9.7	20.4	43.9	87.9	343.1
Firm Size	9.8	2.4	38.7	150.4	344.9	684.9	1,524.7	3,449.8	6,982.7	31,867.2
Plant Size	8.9	2.4	27.3	55.4	66.1	70.4	74.7	78.5	79.4	92.9
<u>Minerals</u>	<u>All</u>	<u>less 20</u>	<u>20-99</u>	<u>100-249</u>	<u>250-499</u>	<u>500-999</u>	<u>1000-2499</u>	<u>2500-4999</u>	<u>5000-9999</u>	<u>10,000+</u>
Companies	30,133	25,926	3,575	402	99	61	49	13	8	*
Est.	36,613	26,853	5,028	1,411	596	684	1,132	352	557	*
Employees	574,759	114,219	137,725	61,589	34,478	40,558	75,072	44,551	66,567	*
Companies	100 %	86.0 %	11.9 %	1.3 %	0.3 %	0.2 %	0.2 %	0.0 %	0.0 %	*
Est.	100 %	73.3 %	13.7 %	3.9 %	1.6 %	1.9 %	3.1 %	1.0 %	1.5 %	*
Employees	100 %		19.9 %	24.0 %	10.7 %	6.0 %	7.1 %	13.1 %	7.8 %	11.6 %
Est./Co.	1.2	1.0	1.4	3.5	6.5	11.2	23.1	27.1	69.6	*
Firm Size	19.1	4.4	38.5	153.2	348.3	664.9	1,532.1	3,427.0	8,320.9	*
Plant Size	15.7	4.3	27.4	43.6	57.8	59.3	66.3	126.6	119.5	*

Source: Bureau of Census, *Enterprise Statistics: 1958*, part 1, General Report, Table 8..

Note: Est./Co. is the number of establishments per company, firm size is the number of employees per company, and plant size is the number of employees per establishment. * Due to problems of disclosure, these totals are included in the previous size category.

Table 4 - continued

Firm Characteristics by Employment Size Class, 1958

<u>Manufacturing</u>	<u>All</u>	<u>less 20</u>	<u>20-99</u>	<u>100-249</u>	<u>250-499</u>	<u>500-999</u>	<u>1000-2499</u>	<u>2500-4999</u>	<u>5000-9999</u>	<u>10,000+</u>
Companies	269,834	194,750	57,582	10,674	3,559	1,604	955	333	196	181
Est.	379,896	195,931	63,655	17,392	10,313	8,396	12,321	9,199	12,038	50,651
Employees	17,273	1,129	2,430	1,627	1,231	1,102	1,468	1,142	1,386	5,756
Companies	100 %	72.2 %	21.3 %	4.0 %	1.3 %	0.6 %	0.4 %	0.1 %	0.1 %	0.1 %
Est.	100 %	51.6 %	16.8 %	4.6 %	2.7 %	2.2 %	3.2 %	2.4 %	3.2 %	13.3 %
Employees	100 %	6.5 %	14.1 %	9.4 %	7.1 %	6.4 %	8.5 %	6.6 %	8.0 %	33.3 %
Est./Co.	1.4	1.0	1.1	1.6	2.9	5.2	12.9	27.6	61.4	279.8
Firm Size	64.0	5.8	42.2	152.4	345.9	687.2	1,537.6	3,430.4	7,072.5	31,802.8
Plant Size	45.5	5.8	38.2	93.5	119.4	131.3	119.2	124.2	115.2	113.6
<u>Wholesale Trade</u>	<u>All</u>	<u>less 20</u>	<u>20-99</u>	<u>100-249</u>	<u>250-499</u>	<u>500-999</u>	<u>1000-2499</u>	<u>2500-4999</u>	<u>5000-9999</u>	
Companies	213,054	190,506	20,555	1,577	290	121	*	5	*	
Est.	246,175	201,125	32,258	6,333	2,349	2,610	*	1,500	*	
Employees	2,100,808	899,948	750,210	228,508	98,759	98,783	*	24,600	*	
Companies	100 %	89.4 %	9.6 %	0.7 %	0.1 %	0.1 %	*	0.0 %	*	
Est.	100 %	81.7 %	13.1 %	2.6 %	1.0 %	1.1 %	*	0.6 %	*	
Employees	100 %	42.8 %	35.7 %	10.9 %	4.7 %	4.7 %	*	1.2 %	*	
Est./Co.	1.2	1.1	1.6	4.0	8.1	21.6	*	300.0	*	
Firm Size	9.9	4.7	36.5	144.9	340.5	816.4	*	4,920.0	*	
Plant Size	8.5	4.5	23.3	36.1	42.0	37.8	*	16.4	*	

Source: Bureau of Census, *Enterprise Statistics: 1958*, part 1, General Report, Table 8.

Note: Est./Co. is the number of establishments per company, firm size is the number of employees per company, and plant size is the number of employees per establishment. * Due to problems of disclosure, these totals are included in the previous size category.

Table 4 - continued

Firm Characteristics by Employment Size Class, 1958

<u>Retail Trade</u>	<u>All</u>	<u>less 20</u>	<u>20-99</u>	<u>100-249</u>	<u>250-499</u>	<u>500-999</u>	<u>1000-2499</u>	<u>2500-4999</u>	<u>5000-9999</u>	<u>10,000+</u>
Companies	1,688,322	1,641,862	42,813	2,443	613	269	181	67	37	37
Est.	1,839,234	1,684,572	72,672	15,450	9,410	7,869	9,661	7,020	7,591	24,989
Employees	8,034,128	3,745,306	1,512,779	359,747	209,918	187,089	274,642	233,618	238,120	1,272,909
Companies	100 %	97.2 %	2.5 %	0.1 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %
Est.	100 %	91.6 %	4.0 %	0.8 %	0.5 %	0.4 %	0.5 %	0.4 %	0.4 %	1.4 %
Employees	100 %	46.6 %	18.8 %	4.5 %	2.6 %	2.3 %	3.4 %	2.9 %	3.0 %	15.8 %
Est./Co.	1.1	1.0	1.7	6.3	15.4	29.3	53.4	104.8	205.2	675.4
Firm Size	4.8	2.3	35.3	147.3	342.4	695.5	1,517.4	3,486.8	6,435.7	34,402.9
Plant Size	4.4	2.2	20.8	23.3	22.3	23.8	28.4	33.3	31.4	50.9
<u>Services</u>	<u>All</u>	<u>less 20</u>	<u>20-99</u>	<u>100-249</u>	<u>250-499</u>	<u>500-999</u>	<u>1000-2499</u>	<u>2500-4999</u>	<u>5000-9999</u>	<u>10,000+</u>
Companies	942,804	921,943	18,294	1,866	418	171	71	25	16	*
Est.	983,295	936,998	28,310	5,456	3,284	2,795	2,175	1,623	2,654	*
Employees	2,869,443	1,303,274	690,912	274,432	143,176	114,422	106,322	90,612	146,293	*
Companies	100 %	97.8 %	1.9 %	0.2 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	*
Est.	100 %	95.3 %	2.9 %	0.6 %	0.3 %	0.3 %	0.2 %	0.2 %	0.3 %	*
Employees	100 %	45.4 %	24.1 %	9.6 %	5.0 %	4.0 %	3.7 %	3.2 %	5.1 %	*
Est./Co.	1.0	1.0	1.5	2.9	7.9	16.3	30.6	64.9	165.9	*
Firm Size	3.0	1.4	37.8	147.1	342.5	669.1	1,497.5	3,624.5	9,143.3	*
Plant Size	2.9	1.4	24.4	50.3	43.6	40.9	48.9	55.8	55.1	*

Source: Bureau of Census, *Enterprise Statistics: 1958*, part 1, General Report, Table 8. Note: Est./Co. is the number of establishments per company, firm size is the number of employees per company, and plant size is the number of employees per establishment.* Due to problems of disclosure, these totals are included in the previous size category.

Table 4 - continued

Firm Characteristics by Employment Size Class, 1987

<u>All Firms</u>	<u>All</u>	<u>less 20</u>	<u>20-99</u>	<u>100-249</u>	<u>250-499</u>	<u>500-999</u>	<u>1000-2499</u>	<u>2500-4999</u>	<u>5000-9999</u>	<u>10,000+</u>
Companies	3,878,866	3,467,779	351,219	40,204	10,872	4,590	2,493	776	449	484
Est.	4,731,694	3,540,948	490,955	23,023	1,196	61,386	72,347	59,936	60,434	251,469
Employees	68,140,393	15,303,143	13,628,904	5,985,712	3,713,449	3,141,070	3,802,328	2,712,412	3,151,806	16,701,569
Companies	100 %	89.4 %	9.1 %	1.0 %	0.3 %	0.1 %	0.1 %	0.0 %	0.0 %	0.0 %
Est.	100 %	74.8 %	10.4 %	2.6 %	1.5 %	1.3 %	1.5 %	1.3 %	1.3 %	5.3 %
Employees	100 %	22.5 %	20.2 %	8.8 %	5.4 %	4.6 %	5.6 %	4.0 %	4.6 %	24.5 %
Est./Co.	1.2	1.0	1.4	3.1	6.5	13.4	29.0	77.2	134.6	519.6
Firm Size	17.6	4.4	38.8	148.9	341.6	684.3	1525.2	3495.4	7,019.6	34,507.4
Plant Size	14.4	4.3	27.8	48.7	52.2	51.2	52.6	45.3	52.2	66.4
<u>Minerals</u>	<u>All</u>	<u>less 20</u>	<u>20-99</u>	<u>100-249</u>	<u>250-499</u>	<u>500-999</u>	<u>1000-2499</u>	<u>2500-4999</u>	<u>5000-9999</u>	<u>10,000+</u>
Companies	25,145	21,777	2,873	310	88	48	25	14	8	2
Est.	32,074	22,164	3,983	1,110	756	651	522	1,253	1,252	383
Employees	458,046	97,311	109,942	47,203	30,150	32,918	38,127	37,500	47,395	17,500
Companies	100 %	86.6 %	11.4 %	1.2 %	0.3 %	0.2 %	0.1 %	0.1 %	0.0 %	0.0 %
Est.	100 %	69.1 %	12.4 %	3.5 %	2.4 %	2.0 %	1.6 %	3.9 %	3.9 %	1.2 %
Employees	100 %	21.2 %	24.0 %	10.3 %	6.6 %	7.2 %	8.3 %	8.2 %	10.3 %	3.8 %
Est./Co.	1.3	1.0	1.4	3.6	8.6	13.6	20.9	89.5	156.5	191.5
Firm Size	18.2	4.5	38.3	152.3	342.6	685.8	1,525.1	2,678.6	5,924.4	8,750.0
Plant Size	14.3	4.4	27.6	42.5	39.9	50.6	73.0	29.9	37.9	45.7

Source: U.S. Bureau of Census: *Company Statistics*, 1987. Note: Est./Co. is the number of establishments per company, firm size is the number of employees per company, and plant size is the number of employees per establishment.

Table 4 - continued

Firm Characteristics by Employment Size Class, 1987

	<u>All</u>	<u>less 20</u>	<u>20-99</u>	<u>100-249</u>	<u>250-499</u>	<u>500-999</u>	<u>1000-2499</u>	<u>2500-4999</u>	<u>5000-9999</u>	<u>10,000+</u>
<u>Construction</u>										
Companies	529,194	482,526	42,121	3,452	705	248	108	16	13	5
Est.	539,171	482,994	44,269	5,145	2,023	1,555	1,531	427	647	580
Employees	5,106,076	2,206,759	1,568,893	504,116	237,576	166,644	157,777	75,000	89,311	100,000
Companies	100 %	91.2 %	8.0 %	0.7 %	0.1 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %
Est.	100 %	89.6 %	8.2 %	1.0 %	0.4 %	0.3 %	0.3 %	0.1 %	0.1 %	0.1 %
Employees	100 %	43.2 %	30.7 %	9.9 %	4.7 %	3.3 %	3.1 %	1.5 %	1.7 %	2.0 %
Est./Co.	1.0	1.0	1.1	1.5	2.9	6.3	14.2	26.7	49.8	116.0
Firm Size	9.6	4.6	37.2	146.0	337.0	672.0	1,460.9	4,687.5	6,870.1	20,000.0
Plant Size	9.5	4.6	35.4	98.0	117.4	107.2	103.1	175.6	138.0	172.4
<u>Manufacturing</u>										
Companies	307,120	223,482	64,695	11,489	3,758	1,772	1,053	372	232	267
Est.	473,353	224,411	72,706	22,177	14,101	12,451	17,267	14,803	17,975	77,462
Employees	21,447,990	1,320,148	2,708,269	1,749,175	1,296,117	1,223,455	1,625,687	1,278,282	1,614,698	8,632,159
Companies	100 %	72.8 %	21.1 %	3.7 %	1.2 %	0.6 %	0.3 %	0.1 %	0.1 %	0.1 %
Est.	100 %	47.4 %	15.4 %	4.7 %	3.0 %	2.6 %	3.6 %	3.1 %	3.8 %	16.4 %
Employees	100 %	6.2 %	12.6 %	8.2 %	6.0 %	5.7 %	7.6 %	6.0 %	7.5 %	40.2 %
Est./Co.	1.5	1.0	1.1	1.9	3.8	7.0	16.4	39.8	77.5	290.1
Firm Size	69.8	5.9	51.9	152.2	344.9	690.4	1,543.9	3,436.2	6,959.9	32,330.2
Plant Size	45.3	5.9	37.2	78.9	91.9	98.3	94.1	86.4	89.8	111.4

Source: U.S. Bureau of Census: *Company Statistics*, 1987.

Note: Est./Co. is the number of establishments per company, firm size is the number of employees per company, and plant size is the number of employees per establishment.

Table 4 - continued

Firm Characteristics by Employment Size Class, 1987

	<u>All</u>	<u>less 20</u>	<u>20-99</u>	<u>100-249</u>	<u>250-499</u>	<u>500-999</u>	<u>1000-2499</u>	<u>2500-4999</u>	<u>5000-9999</u>	<u>10,000+</u>
<u>Transportation</u>										
Companies	125,355	112,611	11,046	1,165	297	127	65	21	12	11
Est.	147,611	114,424	14,927	3,779	2,110	1,965	2,291	2,234	1,283	4,598
Employees	1,891,399	466,952	423,051	171,505	100,725	88,746	94,443	78,800	83,610	383,567
Companies	100 %	89.8 %	8.8 %	0.9 %	0.2 %	0.1 %	0.1 %	0.0 %	0.0 %	0.0 %
Est.	100 %	77.5 %	10.1 %	2.6 %	1.4 %	1.3 %	1.6 %	1.5 %	0.9 %	3.1 %
Employees	100 %	24.7 %	22.4 %	9.1 %	5.3 %	4.7 %	5.0 %	4.2 %	4.4 %	20.3 %
Est./Co.	1.2	1.0	1.4	3.2	7.1	15.5	35.2	106.4	106.9	418.0
Firm Size	15.1	4.1	38.3	147.2	339.1	698.8	1,453.0	3,752.4	6,967.5	34,869.7
Plant Size	12.8	4.1	28.3	45.4	47.7	45.2	41.2	35.3	65.2	83.4
<u>Wholesale Trade</u>										
Companies	354,676	307,321	42,297	3,761	844	268	131	34	10	10
Est.	431,869	318,872	70,629	16,473	7,858	5,901	5,167	3,356	1,135	2,478
Employees	4,756,294	1,576,839	1,603,321	554,553	282,276	184,232	205,856	116,223	67,227	165,767
Companies	100 %	86.6 %	11.9 %	1.1 %	0.2 %	0.1 %	0.0 %	0.0 %	0.0 %	0.0 %
Est.	100 %	73.8 %	16.4 %	3.8 %	1.8 %	1.4 %	1.2 %	0.8 %	0.3 %	0.6 %
Employees	100 %	33.2 %	33.7 %	11.7 %	5.9 %	3.9 %	4.3 %	2.4 %	1.4 %	3.5 %
Est./Co.	1.2	1.0	1.7	4.4	9.3	22.0	39.4	98.7	113.5	247.8
Firm Size	13.4	5.1	37.9	147.4	334.5	687.4	1,571.4	3,418.3	6,722.7	16,576.7
Plant Size	11.0	4.9	22.7	33.7	35.9	31.2	39.8	34.6	59.2	66.9

Source: U.S. Bureau of Census: *Company Statistics*, 1987. Note: Est./Co. is the number of establishments per company, firm size is the number of employees per company, and plant size is the number of employees per establishment.

Table 4 - continued

Firm Characteristics by Employment Size Class, 1987

	<u>All</u>	<u>less 20</u>	<u>20-99</u>	<u>100-249</u>	<u>250-499</u>	<u>500-999</u>	<u>1000-2499</u>	<u>2500-4999</u>	<u>5000-9999</u>	<u>10,000+</u>
<u>Retail Trade</u>										
Companies	1,069,713	950,100	106,632	9,141	2,108	879	465	166	105	117
Est.	1,484,922	983,546	167,894	46,772	29,149	27,196	31,492	26,946	28,031	143,896
Employees	18,622,014	4,408,512	4,070,845	1,332,494	717,535	602,623	708,118	587,745	735,232	5,458,910
Companies	100 %	88.8 %	10.0 %	0.9 %	0.2 %	0.1 %	0.0 %	0.0 %	0.0 %	0.0 %
Est.	100 %	66.2 %	11.3 %	3.1 %	2.0 %	1.8 %	2.1 %	1.8 %	1.9 %	9.7 %
Employees	100 %	23.7 %	21.9 %	7.2 %	3.9 %	3.2 %	3.8 %	3.2 %	3.9 %	29.3 %
Est./Co.	1.4	1.0	1.6	5.1	13.8	30.9	67.7	162.3	267.0	1,229.9
Firm Size	17.4	4.6	38.2	145.8	340.4	685.6	1,522.8	3,540.6	7,002.2	46,657.4
Plant Size	12.5	4.5	24.2	28.5	24.6	22.2	22.5	21.8	26.2	37.9
<u>Services</u>										
Companies	1,467,663	1,369,962	81,555	10,886	3,072	1,248	646	153	69	72
Est.	1,622,694	1,394,537	116,547	27,567	15,199	11,667	14,077	10,917	10,111	22,072
Employees	15,832,758	5,226,622	3,144,583	1,626,666	1,049,070	842,452	972,320	549,832	514,333	1,906,880
Companies	100 %	93.3 %	5.6 %	0.7 %	0.2 %	0.1 %	0.0 %	0.0 %	0.0 %	0.0 %
Est.	100 %	85.9 %	7.2 %	1.7 %	0.9 %	0.7 %	0.9 %	0.7 %	0.6 %	1.4 %
Employees	100 %	33.0 %	19.9 %	10.3 %	6.6 %	5.3 %	6.1 %	3.5 %	3.2 %	12.0 %
Est./Co.	1.1	1.0	1.4	2.5	4.9	9.3	21.8	71.4	146.5	306.6
Firm Size	10.8	3.8	38.6	149.4	341.5	675.0	1,505.1	3,593.7	7,454.1	26,484.4
Plant Size	9.8	3.7	27.0	59.0	69.0	72.2	69.1	50.4	50.9	86.4

Source: U.S. Bureau of Census: *Company Statistics*, 1987.

Note: Est./Co. is the number of establishments per company, firm size is the number of employees per company, and plant size is the number of employees per establishment.

Table 5

Sales Volume Distribution by Number of Stores per Chain, 1928

Stores Per Chain	Sales Size Categories by Stores									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2-5	0.2%	1.2%	14.7%	29.5%	26.0%	18.9%	5.5%	1.9%	2.1%	100%
6-10	0.3	1.3	11.1	27.1	27.0	22.5	4.1	2.8	3.8	100
11-25	0.8	3.0	15.6	33.9	23.3	15.5	4.0	2.2	1.7	100
26-50	0.2	0.3	17.6	35.5	27.9	16.4	1.6	0.3	0.2	100
51-100	-	1.0	17.7	33.6	22.9	17.6	6.1	1.1	-	100
101-500	-	0.3	16.4	33.8	29.7	13.2	3.9	1.6	1.1	100
501-1000	-	-	0.2	4.3	23.6	49.7	13.9	6.3	2.0	100
1,001+	-	0.2	10.5	40.4	28.2	15.2	5.3	0.2	-	100

Source: "Chain Stores: Sizes of Stores of Retail Chains," *Chain Stores*, Federal Trade Commission, 1934.

Note: Sales size categories are as follows: (1) less than \$5,000; (2) \$5,000-\$9,999; (3) \$10,000-\$24,999; (4) \$25,000-\$49,999; (5) \$50,000-\$99,999; (6) \$100,000-\$249,000; (7) \$250,000-\$499,999; (8) \$500,000-\$999,999; (9) \$1,000,000 and over; (10) total percentage. The sample consists of 949 chains which own 21,026 stores.

Table 6

Economies in Advertising for Multiunit Firms in Retail Trade, 1928

Stores Per Chain	Chains	Stores	Sales (\$ mil.)	Advertising (\$ mil.)	Adv./Sales (percent)
2-5	792	2595	\$433.1	\$15.4	3.57%
6-10	293	2179	353.2	13.2	3.74
11-25	205	3248	258.1	6.7	2.58
26-50	97	3404	268.9	5.1	1.88
51-100	55	4052	236.9	3.9	1.63
101-500	48	10600	704.1	8.1	1.15
501-1000	8	4831	359.4	1.8	0.51
1,001+	8	29030	1708.2	11.4	0.67
Total	1506	59939	4322.1	65.6	1.52

Source: "Chain Store Advertising," *Chain Stores*, Federal Trade Commission, 1934.

Table 7

Proportion of Merchandise Purchased from Manufacturers by Retail Chain Stores, 1928

Stores Per Chain	(A) Dry Goods & Gen Mer.	(B) Grocery	(C) Drug, Tob., Hard., Music	(D) Meat, Variety, Dry Goods	(E) Apparel, Dept. Store, Furniture
2-5	29.4%	27.2%	39.5%	61.2%	83.8%
6-10	16.9	40.6	53.8	56.0	93.5
11-25	25.0	35.3	76.6	70.0	92.9
26-50	-	43.2	73.0	88.4	98.7
51-100	-	53.2	91.9	72.4	96.4
101-500	-	54.4	77.2	89.6	95.0
501-1000	-	38.9	95.2	90.0	-
1,001+	-	66.4	95.1	95.0	-

Source: "Sources of Chain-Store Merchandise," *Chain Stores*, Federal Trade Commission, 1934.

Table 8

Industry Specialization Ratios, 1958-1987

	1958		1987	
	Establishment	Employees	Establishment	Employees
All Companies	97.0%	88.3%	95.6%	87.6%
Minerals	93.4	88.9	90.8	86.3
10 Metal	93.6	76.6	66.5	73.8
12 Coal	88.6	89.0	73.3	79.3
13 Oil & gas	95.5	92.1	95.8	92.6
14A Non-metallic	94.2	89.8	91.6	89.0
Construction	-	-	99.0	96.2
15 General	-	-	99.2	96.4
16 Heavy	-	-	94.3	88.5
17 Special	-	-	99.5	98.4
Transportation	-	-	97.7	96.2
42 Trucking	-	-	97.6	96.6
44 Water	-	-	91.7	-
47 Transport	-	-	99.2	-
Wholesale Trade	95.5	96.0	95.3	92.4
50 Durable	96.8	96.6	96.5	94.2
51 Non-durable	94.9	95.6	93.2	89.8
Retail Trade	98.7	95.7	96.3	93.8
52 Building	98.7	97.8	98.0	96.3
53 General	97.1	88.2	63.5	83.4
54 Food	99.2	95.6	95.5	94.4
55 Automotives	98.9	98.6	96.9	96.9
56 Apparel	98.9	96.3	97.3	93.1
57 Furnitures	98.6	97.9	98.7	97.1
58 Eating	98.7	98.5	97.9	95.0
59 Miscellaneous	98.9	98.2	98.1	96.0

Sources: U.S. Bureau of Census: *Enterprise Statistics*, 1958; *Company Statistics*, 1987.

Notes: The specialization ratio is the percent of establishment or employment that is classified within the industry category classification of the owning company.

Table 8 - continued

Industry Specialization Ratios, 1958-1987

	1958		1987	
	Establishment	Employees	Establishment	Employees
Manufactures	82.4	78.5	81.9	71.3
20 Food	81.8	88.9	61.3	70.3
21 Tobacco	84.5	90.5	19.7	28.7
22 Textiles	85.9	87.9	68.7	73.3
23 Apparel	96.3	96.9	86.0	93.2
24 Lumber	97.4	94.1	96.0	90.0
25 Furniture	97.1	96.1	83.5	83.8
26 Paper	76.5	72.5	60.3	60.2
27 Printing	97.2	93.6	91.5	85.5
28 Chemicals	75.5	72.1	59.0	59.5
29 Petroleum	6.6	57.3	12.2	28.1
30 Rubber	60.4	78.6	71.1	81.2
31 Leather	69.1	92.9	77.1	93.1
32 Stone	90.1	83.7	84.1	75.0
33 Primary	74.1	74.4	58.0	70.2
34 Fabricated	93.8	82.8	88.6	79.1
35 Machinery	92.8	79.5	89.5	76.6
36 Electrical	68.4	72.4	74.0	72.3
37 Transportation	82.8	72.0	52.6	56.4
38 Instruments	78.8	78.0	63.5	52.4
39 Miscellaneous	76.6	72.1	95.1	91.8
Services	99.4	98.1	98.6	95.4
70 Hotels	98.8	97.8	95.6	93.8
72 Personal	99.6	99.2	98.7	96.5
73 Business	99.4	97.5	97.8	95.3
75 Automotive	99.4	98.8	99.1	95.1
76 Misc. Repair	99.8	98.7	99.2	-
78 Motion Pictures	96.9	93.7	94.9	88.6
79 Amusement	99.2	98.6	98.5	95.4
80 Health	-	-	99.0	96.1
81 Legal	-	-	100.0	-
82 Education	-	-	98.8	96.5
83 Social	-	-	98.9	98.2
87 Engineering	-	-	98.5	93.1
89 Miscellaneous	-	-	99.6	-

Sources: U.S. Bureau of Census: *Enterprise Statistics*, 1958; *Company Statistics*, 1987.

Notes: The specialization ratio is the percent of establishment or employment that is classified within the industry category classification of the owning company.

Table 9

Specialization and Diversification in U.S. Manufacturing, 1958
(Employment in Thousands)

	26A Pulp, Paper, Board		28A Basic Chemicals		29A Integrated Petroleum		30A Rubber		34A Blast Furnace	
All Company	304.6	100.0%	516.9	100.0%	508.2	100.0%	298.3	100.0%	720.8	100.0%
Primary 3-digit	177.4	58.2	285.3	55.2	0.0	0.0	209.3	70.2	474.2	65.8
Primary 2-digit	65.4	21.5	25.7	5.0	131.6	25.9	3.4	1.1	25.9	3.6
Other Mfg	34.8	11.4	98.9	19.1	17.6	3.5	44.0	14.7	95.7	13.3
Other Ind.	4.2	1.4	24.9	4.8	126.5	24.9	2.0	0.7	64.1	8.9
Warehouse	0.06	0.0	0.01	0.0	0.01	0.0	0.0	0.0	0.06	0.0
Wholesale- Retail	5.3	1.8	1.8	0.3	86.4	17.0	17.7	5.9	11.1	1.5
Sales	3.9	1.3	24.0	4.6	4.1	0.8	12.2	4.1	11.7	1.6
CAO	13.5	4.4	56.4	10.9	142.8	28.1	9.7	3.3	37.9	5.3
	34A Metal Cans		35A Engines and Turbines		35G Office Machines		36B Other Electric		37A Motor Vehicles	
All Company	107.3	100.0%	88.0	100.0%	251.3	100.0%	807.9	100.0%	938.1	100.0%
Primary 3-digit	47.8	44.6	46.0	52.3	113.2	45.1	498.1	61.7	539.3	57.5
Primary 2-digit	6.4	5.9	21.4	24.3	6.3	2.5	48.5	6.0	39.1	4.2
Other Mfg	41.7	38.8	15.8	18.0	50.6	20.1	158.8	19.7	223.1	23.8
Other Ind.	0.2	0.2	0.03	0.0	5.7	2.3	13.6	1.7	16.9	1.8
Warehouse	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.06	0.0
Wholesale- Retail	0.2	0.2	0.1	0.1	0.8	0.3	27.2	3.4	4.0	0.4
Sales	2.9	2.7	3.7	4.2	60.6	24.1	26.4	3.3	46.1	4.9
CAO	8.2	7.6	0.9	1.0	14.2	5.6	35.3	4.4	69.6	7.4

Source: Bureau of Census, *Enterprise Statistics: 1958*, part 1, General Report, Table 6.

Table 9 - continued

Specialization and Diversification in U.S. Manufacturing, 1958
(Employment in Thousands)

	37B Aircraft		37C Aircraft Engines		38C Photographic Equipment	
All Company	461.9	100.0%	390.6	100.0%	85.9	100.0%
Primary 3-digit	361.9	78.3	272.6	69.8	55.4	64.5
Primary 2-digit	19.8	4.3	25.0	6.4	1.1	1.3
Other Mfg	74.1	16.0	70.8	18.1	14.9	17.4
Other Ind.	3.6	0.8	4.5	1.1	4.6	5.4
Warehouse	0.0	0.0	0.0	0.0	0.0	0.0
Wholesale- Retail	0.8	0.2	3.5	0.9	1.3	1.5
Sales	0.06	0.0	1.1	0.3	5.0	5.8
CAO	1.8	0.4	13.1	3.4	3.6	4.2

Source: Bureau of Census, *Enterprise Statistics: 1958*, part 1, General Report, Table 6.

NOTES

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1. The literature is simply too vast to be reviewed here. For a review of the literature see Schmitz (1993). Also see Atack (1985), Lamoreaux (1985), Field (1987), Hounshell (1984), Hannah (1980, 1999), Williamson (1985), and the volumes edited by Temin (1991) and Lamoreaux and Raff (1995). For analysis concerning the rise of single-unit firms, see Sokoloff (1984a, 1984b) and Atack (1977).
 2. A number of factors were responsible for the development of the *Enterprise Statistics*. When the census bureau began conducting censuses through mail instead of field enumeration, it found it more convenient to obtain individual establishment reports to central headquarters of firms and began collecting information on firms as a by-product. Moreover, as the scope of the censuses increased to cover wholesale trade, retail trade, and other select services, it became possible to construct information on firm activities in all sectors of the economy. The *Enterprise Statistics* began in 1954 when the advent of computers made it possible to coordinate the information contained in all the censuses and publish the data in a timely manner.
 3. All other census publications, such as the *Census of Manufactures*, report information based on the establishment or plant: "An establishment, as defined by the 1958 Censuses, is an economic unit which produces or distributes goods or performs services. In most instances, an establishment is at a single physical location and is engaged in a type of activity for which there is an applicable industry or kind of business classification in the Standard Industrial Classification system... When more than one business is conducted at a single location, each business under separate ownership is regarded as a separate establishment for Census purposes. Also, in some cases, more than a single establishment is identified in a given location under one ownership. For example, in instances where a company conducts distinctly different lines of manufacturing activity in one location, it is considered for Census purposes to comprise more than one establishment, provided that the records of the business permit such a separation and the activities are substantial in size (*Enterprise Statistics*: 1958, General Report, Part 1, p.3)."
 4. This section provides information on firms for 1958 and 1987. In 1958, the *Enterprise Statistics* covered 100 percent of activities in mining, manufacturing, wholesale trade and retail trade, 34 percent in services and 1 percent in transportation (warehousing); in 1987, the coverage increased to 100 percent of construction, 76 percent of services, and 29 percent of transportation and public utilities. Given the changes in the coverage of industries and changes in the definition of industries between 1958 and 1987, the comparisons over time must be interpreted with caution. The *Enterprise Statistics'* out of scope industries, for which no separate information is reported, were agriculture, forestry, fisheries, communication, electric, gas, and a number of service industries. However, if a firm in one of the scope industries, such as a manufacturing firm, owns an establishment in an out of scope industry such as fisheries, the information is reported as part of the non-primary industry employment for the manufacturing firm. Thus, the *Enterprise Statistics* do not artificially limit the boundaries of firms to those industries that are in scope.
 5. Using data from Thorp (1924) and Thorp et. al (1941), Kim (1999b) reports additional information on the extent of multiunit activity in manufacturing for 1919 and 1937. The data show that 7.4 percent and 15.4 percent of establishments were part of multiunit firms in 1919 and 1937 respectively. The data also show that over half of manufacturing employment was accounted for by multiunit firms in 1937.
 6. This calculation corrects for the increase in the industrial coverage in 1987 by omitting construction, transportation, and a number of service industries.
 7. The *Enterprise Statistics* provides information for nine different employment size classes: fewer than 20, 20-99, 100-259, 250-499, 500-999, 1,000-2,499, 5,000-9,999, and more than 10,000 employees.
 8. The *Enterprise Statistics* reports information on the multiunit firms' central administrative organizations which engaged in general administrative, supervisory, purchasing, accounting, and related management functions, and their auxiliaries such as research and development laboratories, warehouses, and other support services (repair shops and data processing). Between 1958 and 1987, employment in auxiliaries grew from 0.2 to 0.9 million employees. The data show that research and development auxiliaries were important for manufacturing whereas warehousing auxiliaries were important for the retail trade and wholesale trade industries.

9. The results of cross-sectional regressions of managerial intensity (central administrative employee per company) on firm size (employee per company) and number of establishments per firm indicate that these variables are highly statistically significant for 1958 and 1987.

10. In general, a theory of multiunit enterprises must explain two related phenomenon. First, the theory must explain why there is one or more plants operating in different localities. This issue is addressed in Kim (1995, 1998, 1999a, 1999c). Second, the theory must explain why firms own one or more establishments. This second issue is addressed in Kim (1999b) and in this paper. See Kim (1999b) for a more complete discussion on these issues.

11. Chandler (1977) argued that the economies of scale in retailing came from economies in stock-turn rather than sales. Typically, stock-turn is measured as sales divided by inventory. It is not clear how the stock-turn variable should be interpreted. One interpretation is that a rise in stock-turn indicates an increase in the turnover rate of goods. However, the inverse of stock-turn is the cost of holding inventory. Alternatively, a rise in stock-turn, as measured by sales divided by inventory, may be caused by a fall in inventory rather than by an actual increase in the turnover rate of goods. Unfortunately, the FTC report does not contain information on inventory. An examination of stock-turn by retail chain sizes in 1948, using data from the *Census of Distribution*, suggests that stock-turn rises with chain sizes. Thus, one of the benefits of organizing production in multiunit retail firms may come from economies in inventory.

12. The results reported in Table 5 hold for most kinds of retail businesses. See FTC's *Chain Stores: "Sizes of Stores of Retail Chains,"* Appendix VI.

13. The FTC data on chain stores show a significant correlation between chain stores and urbanization. The regression of the number of chain stores per 100,000 inhabitants in states on the percent of urban population and percent of population filing federal income taxes suggests that the density of chain stores is significantly correlated with urbanization and purchasing power.

14. In 1928, the 1506 chains which reported total advertising expenditures spent over \$65 million in all forms of advertising, an average of \$43,552 per chain. The data on the 1030 chains which reported information on expenditures by different kinds of advertising, show that these chains spent 72.3% of the total in newspaper advertising, 14.1% in window and counter advertising, and 4.1% for pamphlet and dodger advertising; the remainder is accounted for by free goods, billboards, street car and bus, loss-leader, magazine, radio, direct mail, and other advertising.

15. The examination of the ratio of advertising expenditures to sales by chain sizes differed significantly for the different types of retail business. However, in a majority of these businesses, the ratio declined as chain sizes increased.

16. See p.4 in FTC's *Chain Stores: "Chain Store Private Brands."* The FTC analysis of 70 grocery and grocery meat chains operating over 30,000 stores in 1928 indicate that coffee was the most frequently reported commodity sold under private brand. Other items were flour, tea, mayonnaise, canned milk, and butter. The leading commodities sold under private brands in seven leading large chains were canned beans, catsup, coffee, canned corn, flour, jelly, canned peaches, canned peas, sandwich spreads, canned tomatoes, and tea. Of these chains, Kroger Grocery & Baking Co. and the Great Atlantic & Pacific Tea Co. led the use of private brands with 92 and 69 commodities; the remaining stores reported fewer than 40.

17. The FTC defined private brand as a commodity sold by the chain only through its own stores under its own distinctive mark of identification. However, since the chain store schedule did not contain a definition, the retail chains were given certain liberties in defining what constituted a private brand. For example, F. W. Woolworth included any commodity with a trade mark "W" as a private brand; however, others, like Sears, Roebuck & Co. included only those items that were registered trademark brands.

18. See Table 8 in FTC's *Chain Stores: "Chain Store Private Brands."*

19. The FTC report on chain store manufacturing show that 162 chains out of 1,068 reporting firms manufactured part of the goods sold by them in their stores in 1930. The retail sales of goods manufactured by these chains represented only 8.1% of total sales of all 1,068 reporting firms (see FTC's *Chain Stores: "Chain Store Manufacturing"*).

20. The manufacturing chains were much more likely to own private brands than non-manufacturing chains. Of 1,044 chains, 80% of manufacturing chains owned private brands as compared to only 20% for non-manufacturing chains. In addition, based on a smaller sample of firms, the FTC reports that private brand sales for manufacturing chains were 34.1% whereas it was only 14.6% for non-manufacturing firms. One men's shoe store chain reports its reason for manufacturing its shoes: "To supply our stores with a product of known uniformity and a standard merchandise conforming in every respect to the product advertised by us (see p.45 in FTC's *Chain Stores: "Chain Store Manufacturing"*).

21. The 1396 chains which reported information on sources of merchandise accounted for 81.2% of stores and 76.5% of sales of the 1727 chains which provided reports to the FTC (see p.2-3 in FTC's *Chain Stores: "Sources of Chain Store Merchandise"*).

22. Hoffman (1940) investigated the labor cost of distributing fresh fruits and vegetables in Philadelphia for the A&P chain and independents. Hoffman estimated that chain systems required half the labor hours to put a given volume of produce in stores as were required by the wholesale channels.

23. The level of industry specialization depends critically upon the definition of industries. In general, as industries are defined more finely, industry specialization will rise by definition. The *Enterprise Statistics* calculates the industry specialization ratio, or the percentage of activity engaged in the firm's primary industry, using the 3-digit enterprise industrial classifications.

24. Using data from Williamson and Daum (1959) and Hidy and Hidy (1955), Chandler claimed that the average cost of a typical plant in the mid-1880's, with a daily charging capacity of 1,500-2,000, was 1.5 cents per gallon whereas in Standard Oil's plants, each with daily capacities of 5,000-6,500, the cost was 0.534 cents per gallon. According to Chandler, the multiunit trust was able to exploit economies of scale by consolidating kerosene production in a few plants and by coordinating the flow of materials to these refineries. However, the reliability of the evidence on the cost advantages enjoyed by Standard Oil over its independent rivals is questionable. Williamson and Daum (1959, 483) derived their estimate of the average cost of refining for independent refineries from a Cleveland refiner who testified that the cost of refining 150,000 barrels a year was \$70,000 a year. On the other hand, Standard Oil's average cost of refining was derived from a report compiled for its Manufacturing Committee (Hidy and Hidy, 1955, 107). There are at least two potential problems with comparing these two cost measures. First, there is no reason to believe that the two estimates compare refining of identical products using identical inputs. For the cost estimate of the independent refinery, there is no mention of what type of crude was used to produce what types of petroleum products whereas, for Standard Oil, it was based on all the refineries and lubricating oil works in the combination. Given the tremendous variation in the type and quality of crude and in the resulting final products which existed at the time, it is quite possible that many independent firms produced higher quality products than Standard Oil. Second, there were significant variations in the refining capacity of Standard Oil's plants and few achieved the daily charging capacity of the Bayonne plant which was estimated to be approximately 6,000-7,000 barrels a day. Finally, Granitz and Klein (1996) demonstrate that the decline in the price of kerosene was due to fall in the price of crude rather than due to economies of scale achieved by Standard Oil.

25. The FTC secured data from as many chains and independents in Washington DC, Cincinnati, Memphis and Detroit for as many products. For example, in Washington DC, prices for 274 items were collected from independents and chains. Since the independents and chains did not sell the same volume of goods on all items, the FTC also collected information on the store volumes of these products carried by independents and chains. The prices reported are the geometric averages of the figures weighted by chain and by independent volumes.

26. There were approximately 395 cooperative grocery chains in 1929. The FTC report provides information on

319 cooperative grocery chains with retail membership of 43,141 stores. In general, the cooperative headquarter coordinated developing private brands, homogenous stores and store signs and group advertising. In return, it received initiation and advertising fees from its stores (see FTC's *Chain Stores*: "Cooperative Grocery Chains").

27.

See Emmet and Jeuck (1950), Hower (1946), Twyman (1954), Lebharr (1963), Pope (1983), Strasser (1989) and Tedlow (1996) among others.

28. The N.W. Ayer & Son advertising agency possessed valuable knowledge concerning the value of numerous local newspapers around the country for their various clients. For example, N.W. Ayer & Son's Directory of Newspapers and Periodicals contained: "a list of all newspapers and periodicals published in the United States and Dominion of Canada, arranged alphabetically by towns in states grouped in geographic sections, giving counties in which the places are situated, with the population of each according to the United States and Canadian census, the political majority of each state and county in the United States at the last presidential election, and in connection with papers, the year of establishment, time of issue, politics, denomination, or general character, publisher's price for the ten lines one month, etc. (Hower (1949, 83))."

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