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7 The Structure of Industry

1. Richard E. Caves

The average citizen sees the economy around him as a confusing welter of transactions, and he may have no conviction about it other than that he himself pays too much for what he buys and receives too little for what he sells. An economist instinctively thinks of the economy as a series of markets in which prices are set by the rivalry of buyers and sellers. Some markets may be hard to define. Some prices may be set by the government or behave in quizzical ways. Nonetheless, the logic of market relationship proves overwhelmingly useful for thinking about the course of economic events and the effects of economic policies.

Our practical concern with the structures of industries stems from the market's value as an analytical tool for thinking about the economy. An "industry" is nothing but the participants on one side of a market. We normally identify an industry as the firms that sell some particular good or service, but the term applies with equal logic to the companies that compete as buyers for some intermediate product, or that engage in both buying and selling (scrap metal, for example). Still, we most often think of an industry as a collection of competing sellers. This chapter presents some data arranged to display key features of the changing structure of industries selling goods and services. The coverage will be economywide, but we omit markets for financial assets and pay little attention to the agricultural sector.

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7.1 The Sectoral Composition of the American Economy

The national income of the United States can be regarded as the sum of income originating in each producing sector of the economy—agriculture, mining, construction, manufacturing, and so forth. A useful measure of the importance of these economic sectors, therefore, is how much income is generated by each sector's payments for labor, capital, and natural resources. Table 7.1 shows how major sectors' percentage contributions to national income have changed over time. The figures cover various years since World War II, with 1929 included for an earlier point of reference. We expect to find that primary activities—agriculture, fishing, forestry, mining—have grown proportionally less important over time, and the table confirms that expectation. Agriculture shrank by growing much more efficient, and the other sectors' shrinkage partly reflects the partial exhaustion of our natural resources. Similarly, the table supports the commonplace belief that people spend increasing proportions of their incomes on services as their incomes grow larger. The principal services sectors have increased their share of national income throughout the postwar years, although a decline apparently occurred between 1929 and 1945 in the shares claimed by finance, insurance, and real estate, and in the residual category of services (such as health, education, and legal services). A slight decline has occurred in the share claimed by the wholesale and retail trade sector, perhaps because of the efficiency of chain stores and other large-scale retail outlets. Similarly, innovations have apparently reduced the relative cost of transportation (such as efficient motor vehicles and highways, large and specialized ships). In other service sectors productivity gains come very slowly. Apart from the temporary wartime inflation of the public sector apparent in 1945, the government sector appears to have undergone a large increase in proportional importance—at least until the late 1970s.

The division of sectors shown in table 7.1 is a traditional one, based on kinds of economic activities. For some purposes we may be interested in other bases for classifying the producing sectors of our economy. One basis might be the motives that we suppose chiefly guide the decisions made by their top executives. Do the firms maximize profits, subject to the competitive pressures of Adam Smith's famous "invisible hand" of competition? Are they nonprofit enterprises that pursue some goal other than the greatest possible surplus of revenue over cost (profit)? Are they part of the government sector, making decisions on some politically determined goal? Or are they profit-seeking firms whose decisions are regulated by such officials? Table 7.2 presents a very rough division of our economy's producing sectors according to the type of motivation and the mechanism of social control that chiefly influence

Table 7.1 **Percentage Distribution of United States National Income, by Sector of Origin, Selected Years, 1929–78**

Sector	1929	1945	1950	1955	1960	1965	1970	1975	1978
Agriculture, forestry, fisheries	10.0	8.4	7.3	4.6	4.2	3.6	3.0	3.4	2.9
Mining	2.4	1.5	2.2	1.8	1.3	1.1	1.0	1.6	6.9
Construction	4.4	2.4	4.9	5.0	5.1	5.4	5.5	5.4	
Manufacturing	25.2	28.8	31.6	32.6	30.0	30.1	26.8	25.1	26.4
Transportation	7.6	5.8	5.6	4.8	4.3	4.1	3.8	3.6	3.7
Communications	3.2	2.3	3.0	3.6	2.0	2.0	2.2	2.4	2.3
Electric, gas, sanitary services					2.1	2.0	1.9	2.1	1.9
Wholesale, retail trade	15.6	15.4	17.0	15.8	15.5	15.0	15.2	15.6	15.2
Finance, insurance, real estate	14.7	7.2	9.1	10.3	11.5	11.2	11.4	11.3	11.6
Services	10.1	7.8	9.0	9.4	10.7	11.3	12.8	13.5	13.6
Government, government enterprises	5.9	20.3	9.8	11.5	12.6	13.3	15.8	16.1	14.3
Rest of the world	0.9	0.2	0.5	0.5	0.6	0.8	0.6	0.8	1.0
Total[a]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Sources: U.S. Bureau of the Census, *Historical Statistics of the United States, Colonial Times to 1970* (Washington, D.C.: Government Printing Office, 1975), part 1, p. 239; U.S. Bureau of the Census, *Statistical Abstract of the United States, 1978* (Washington, D.C.: Government Printing Office, 1978), p. 446; *Survey of Current Business* 59 (March 1979): 13.

[a]Percentages may not sum up to 100.0 because of rounding errors.

Table 7.2 **Amount and Percentage Distribution of National Income Originating from Sectors Distinguished by Motivation and Social Control, Selected Years, 1950–75**

Sector		1950	1955	1960	1965	1970	1975
Investor-owned, unregulated	Amount[a]	186.6	249.2	306.0	407.8	554.4	847.8
	Percentage	77.8	75.7	73.6	73.0	69.3	68.7
Investor-owned, regulated	Amount	25.8	35.9	47.3	60.8	88.5	141.7
	Percentage	10.8	10.9	11.4	10.9	11.1	11.5
Nonprofit enterprise[b]	Amount	3.9	6.0	9.5	14.4	29.5	44.7
	Percentage	1.6	1.8	2.3	2.6	3.7	3.6
Government and government enterprise	Amount	23.6	38.1	52.7	75.4	127.4	199.9
	Percentage	9.8	11.6	12.7	13.5	15.9	16.2
Total national income of domestic origin	Amount	239.9	329.2	415.5	558.4	799.8	1234.1
	Percentage[c]	100.0	100.0	100.0	100.0	100.0	100.0

Source: U.S. Bureau of the Census, *Statistical Abstract of the United States, 1973* (Washington, D.C.: Government Printing Office, 1973), p. 325; ibid., *1978*, p. 446. U.S. Bureau of Economic Analysis, *The National Income and Product Accounts of the United States, 1929–74: Statistical Tables* (Washington, D.C.: Government Printing Office, 1977), tables 1.14 and 6.5; *Survey of Current Business* 59 (July 1979): 31, 54.

[a]In billions of current dollars.

[b]Secured by subtracting compensation of employees in private households (table 6.5 of National Income and Product Accounts) from national income originating in households and institutions (table 1.14). It is assumed that none of these nonprofit organizations are in the regulated sector.

[c]Percentages may not add to 100.0 because of rounding errors.

its decisions. The sectors consisting mainly of investor-owned and profit-seeking enterprises are divided into those subject to specific regulation of their prices and other activities and those that are not subject to such detailed economic regulation.[1] The third group of enterprises is described as "nonprofit," meaning that they are not part of the government sector but that they are also not formally organized for the pursuit of profit. Many nonprofit enterprises are devoted to providing health services (hospitals) and education (private colleges), but other diverse services are offered by many voluntary associations. The motives of decision-makers in the nonprofit sector are surely complex and diverse, and so we characterize them by what they are not. The fourth group comprises governments and government enterprises.

Table 7.2 shows that, since World War II, the unregulated investor-owned sector has declined from about three-fourths to two-thirds of our economy (in terms of the national income that it generates). The regulated sector has remained about constant in size while the nonprofit and government sectors have grown appreciably. For the most part these

changes did not occur because we reclassified industries among these four sectors. The government sector has taken over certain formerly private activities, but most other changes shown in the table result mainly from the fact that industries classified under the various sectors grew at different rates. Occasionally a major decision of public policy does make it appropriate to reclassify a sector. The airlines are now being deregulated. The petroleum industry was added to table 7.2's regulated sectors for 1975 although no other changes were deemed to affect individual nongovernment sectors during the years 1950–1975.

Our economy's activity could be broken down in many other ways as well. For example, there has been some research on the "information economy," the proportion of economic activity devoted to providing information products and services (as distinguished from the "real" things about which we need to be informed). The provision of information has been said to account for 46 percent of the net income in the economy in 1967—53 percent of all employee income (Porat 1977).

Manufacturing is the largest and most conspicuous of our economy's major sectors, even though its proportional size has declined somewhat in the past two decades. Hence we also provide in table 7.3 a summary of the changing size distribution of the major manufacturing industries between 1954 and 1972 (years when the Census of Manufactures was taken). The changes that have occurred are rather modest. Broadly, the net outputs of nondurable-goods industries have declined a bit in importance (chemicals are an exception) while those of most durable goods have expanded.

7.1.1 Input-Output Relations

So far, we have compared sectors of the economy in terms of the amount of national income that they generate. This approach, however, does not take into account the markets in which these sectors buy and sell. An overview of these market relations is provided by table 7.4, an input-output table describing flows of current goods and services through the United States economy in 1967. An input-output table shows who bought each sector's output and who sold its inputs, as well as its total sales and purchases. Each line of table 7.4 shows the disposition of one sector's 1967 output. Of its total output of $63.1 billion, the agricultural sector sold about half to manufacturers of nondurable goods ($30.2 billion), sold $9.3 billion directly to final demand (private and public consumption and investment), and plowed back $18.5 billion as inputs into other areas of agricultural production.

Similarly, each column of the table shows how a sector distributed its input purchases among other producing sectors, imported goods and services, and "value added" (the primary factors of production). The value of each input purchase for each sector can be divided by that

Table 7.3 **Percentage Distribution of Net Output (Value Added) among Major Industries within Manufacturing Sector, 1954 and 1972**

Sector	1954	1972
Food and kindred products	11.5%	10.1%
Tobacco manufactures	0.8	0.7
Textile mill products	4.1	3.3
Apparel and related products	4.4	3.8
Lumber and wood products	2.7	2.9
Furniture and fixtures	1.7	1.7
Pulp, paper and products	3.9	3.7
Printing and publishing	5.4	5.7
Chemicals and products	8.1	9.2
Petroleum and coal products	2.2	1.6
Rubber, miscellaneous plastics products	1.6	3.3
Leather and leather products	1.4	0.8
Stone, clay, and glass products	3.3	3.6
Primary metal industries	8.0	6.6
Fabricated metal products	6.5	7.6
Nonelectrical machinery	10.6	10.6
Electrical machinery	6.3	8.6
Transportation equipment	11.9	11.2
Instruments and related products	1.8	3.0
Miscellaneous manufactures	3.8	1.9
Total[a]	100.0	100.0

Sources: U.S. Bureau of the Census, *Census of Manufactures, 1954*, vol. I, *Summary Statistics* (Washington, D.C.: Government Printing Office, 1957), chap. 3, table 1; idem, *Census of Manufactures, 1972*, vol. 1, *Summary and Subject Statistics* (Washington, D.C.: Government Printing Office, 1976), General Summary, table 8.

[a]Percentages may not add to 100.0 because of rounding errors.

sector's total sales in order to secure a set of "input coefficients"—the number of cents spent on any given input per dollar's worth of output sold. For example, manufacturers of nondurable goods spent 11¢ on their sales dollar on outputs of the agricultural sector, 4.7¢ on outputs of the mining sector, and 5.5¢ on transportation and trade. These input coefficients contain information about the technology of production, and we shall use them below to describe how technology has been changing over time.

7.2 The Population of Enterprises

In this section we temporarily turn our attention from the structures of markets to traits of the whole population of business enterprises. We shall be concerned with the various legal forms of enterprises and the relative importance of the largest enterprises.

Table 7.4 **The Input-Output Structure of the American Economy, 1967 (Billions of Dollars)**

	Intermediate Industries										
	Agriculture	Mining	Construction	Manufacturing: Durable Goods	Manufacturing: Nondurable Goods	Transportation and Trade	Utilities	Services	Other	Final Demand	Total
Agriculture, etc.	18.5	0	.3	1.1	30.2	.2	0	2.8	.6	9.3	63.1
Mining	.1	1.2	.9	4.4	12.9	[a]	3.4	.3	.1	1.5	24.9
Construction	.6	.6	[a]	1.3	1.3	1.8	1.7	8.6	1.8	85.6	103.3
Manufacturing: durable goods	.8	1.6	32.7	111.6	10.9	4.6	.5	9.7	2.0	142.7	317.1
Manufacturing: nondurable goods	7.9	.7	4.8	14.6	79.3	8.7	.6	17.9	6.1	135.6	276.2
Transportation and trade	4.1	.7	10.8	15.8	15.2	11.4	1.0	8.7	6.9	141.5	216.2
Utilities	.5	.5	.4	5.0	4.1	5.0	7.5	9.5	1.3	26.0	59.8
Services	5.0	3.7	6.8	14.6	16.9	26.1	3.3	42.1	2.9	185.9	307.3
Other industries	.1	.3	.8	5.3	2.7	6.7	6.2	8.1	.1	93.7	123.9
Imports	1.0	2.1	.1	9.8	7.4	2.3	.3	.2	3.2	—26.4	0
Value added	24.4	13.5	45.6	133.6	95.4	149.3	35.3	199.5	98.9	—	795.4
Total	63.1	24.9	103.3	317.1	276.2	216.2	59.8	307.3	123.9	795.4	

Source: Unpublished consolidation of the published input-output table for 1967 prepared by the Bureau of Economic Analysis, U.S. Department of Commerce.

[a]Less than $50 million.

7.2.1 Legal Forms of Enterprise

The chief forms of investor-owned enterprise are the individual proprietorship, the partnership, and the corporation. Legally, the first two are distinguished from the corporation in that the single owner (in the case of the proprietorship) or at least some of the partners (in the case of a partnership) bear unlimited personal responsibility for any debts that the enterprise may incur. The owners of the corporation, by contrast, are limited in their liability for the enterprise's debts to the capital that they have initially subscribed. The limited-liability corporation is the standard large enterprise that we find about us in the economy today. By allowing the individual supplier of equity capital to limit his responsibility for the enterprise, the corporation attains something not possible in the other forms—a division of labor and a specialization between those who manage the company and those who own it. Two other types of enterprises, the cooperative and the government, may be noted briefly here. The cooperative enterprise is owned by persons who are its customers or suppliers. They generally do not enjoy limited liability for the cooperative's debts—they are, in effect, partners, and their equity shares in the cooperative are defined not by the amount of capital they have contributed but by the volume of business they currently do with the cooperative. Finally, a government enterprise may be organized in various ways, but its controlling shareholders in effect are the taxpaying public, who ultimately pay additional taxes if the public firm runs a loss, or who may enjoy a tax reduction if it turns a profit.

The corporation, because many individuals can participate in its ownership without facing excessive risks, is far and away the dominant form of enterprise in the American economy. Table 7.5 shows some features of the corporations in American industry along with their smaller neighbors, the proprietorships and partnerships. The table lists not only the total numbers of these enterprises, but also expresses them as a number per thousand persons in the United States population. It lists the total receipts of each class of enterprises (in current dollars) and the receipts per enterprise in constant dollars (the GNP implicit deflator was used in this calculation). The data on real receipts per enterprise for each type thus give a rough impression of what is happening to the average size of each.

Table 7.5 shows that, over the thirty-five years covered, the numbers of each type of enterprise have grown not only absolutely but also relative to the country's human population. This result is a little surprising, because international studies comparing countries at various levels of economic development show that the number of enterprises per thousand of the population actually tends to decline as the level of development increases (Caves and Uekusa 1976, pp. 101–6). The increase in the

Table 7.5 **Trends in Enterprise Structure of the United States Economy, Selected Years, 1940–75**

Type and Characteristics of Enterprise	1940	1945	1950	1955	1960	1965	1970	1975
Proprietorships								
Total number (thousands)	2,018	5,689	6,865	8,239	9,090	9,078	9,400	10,882
Number per thousand persons	15.2	40.5	45.1	49.7	50.3	46.7	45.9	51.0
Total receipts (billons of dollars)	31	79	n.a.	139	171	199	238	339
Receipts per proprietorship (thousands of 1958 dollars)	31	23	n.a.	19	18	20	19	17
Partnerships								
Total number (thousands)	271[a]	627	n.a.	n.a.	941	914	936	1,073
Number per thousand persons	2.1[a]	4.5	n.a.	n.a.	5.2	4.7	4.6	5.0
Total receipts (billions of dollars)	13	47	n.a.	n.a.	74	75	93	146
Receipts per partnership (thousands of 1958 dollars)	111	126	n.a.	n.a.	76	74	73	72
Corporations								
Total number (thousands)	473	421	629	807	1,141	1,424	1,665	2,024
Number per thousand persons	3.6	3.0	4.1	4.9	6.3	7.3	8.1	9.5
Total receipts (billions of dollars)	148	255	458	642	849	1,195	1,751	3,199
Receipts per corporation (thousands of 1958 dollars)	635	1,105	908	875	720	757	778	840

Sources: U.S. Bureau of the Census, *Historical Statistics of the United States, Colonial Times to 1970* (Washington, D.C.: Government Printing Office, 1975), part 1, p. 197, and part 2, p. 911; U.S. Bureau of the Census, *Statistical Abstract of the United States, 1978* (Washington, D.C.: Government Printing Office, 1978, pp. 6, 483, 561.

[a]Data pertain to 1939.

number of proprietorships and partnerships has only kept pace with the population of persons during the last two decades, but the corporate population has continued to outgrow the human population. One clue to this pattern appears in the changes in the real size (receipts) of the average enterprise in each class which reflect no growth and, if anything, a decline in the size of each. That decline suggests that the numbers of the smaller enterprises of each type have expanded somewhat faster than the larger ones.

Without further analysis, only some rather general conclusions can be drawn from the patterns shown in table 7.5. The table hardly suggests any withering away of the small-business sector. And it probably reflects changes in legal form of some enterprises (from proprietorship or partnership to corporation) without any change in their function—such as the use of incorporation by high-income professional persons, often undertaken for tax reasons.

7.2.2 Size Distribution of Companies

It is obvious to all that the largest corporations in the American economy are very large indeed, operating economic empires that stretch across many product markets in the United States and abroad. Our society distrusts unregulated concentrations of power (whether in private or public hands), and so there is always a social concern both about the behavior of the largest enterprises and also about their sheer size. Are they growing increasingly dominant, fulfilling Karl Marx's prediction of a "constantly diminishing number of the magnates of capital"? Economists like to distinguish clearly between two ways of treating corporate size. A company's size can be judged by its market share, which is relevant to the working of competitive processes. The concentration of market shares will be described in the next section. Corporate size can also be considered overall, in terms of the share of assets (sales, or some other size measure) accounted for by the largest companies. Overall concentration does not have the same clear significance for economic analysis as does concentration in particular markets, but it undeniably holds interest in the light of our society's concern with bigness and the concentration of influence.

In principle, one can use a variety of strategies for measuring the proportional size of the largest companies. It is logical, first of all, to concentrate on the size distribution of nonfinancial companies and leave financial institutions for separate treatment.[2] The available data are weaker for the whole population of nonfinancial companies than for the manufacturing sector, so we start with manufacturing companies. The Census of Manufactures provides data on the share of total activity in manufacturing accounted for by the largest manufacturing companies. It should be noted that these data do not reflect any nonmanufacturing

activities of the largest manufacturing companies (or of their smaller competitors). Nor are their overseas investments included.

There is room for debate over what size variable to employ for measuring the overall concentration of large companies. When we examine the concentration of sellers in particular industries, we are usually concerned with concentration's effect on processes of competition in the marketplace. Sales then become the obvious size measure to use. When we investigate overall concentration, however, there is no such clear motive for the inquiry, and correspondingly no way to know just what measure of companies' size is most revealing. Value added, which we shall mainly use, has the advantage of measuring the income originating with firms of various sizes, and thus it indicates their role as employers of the primary factors of production. The fifty largest manufacturing companies accounted for 25 percent of all value added in manufacturing in 1972. Their share of the value of factory shipments was almost the same, 24 percent. Their share of payroll to employees was smaller, 22 percent, and their share of all manufacturing employees was smaller still, 17 percent. That is, the fifty largest manufacturing companies use proportionally less labor in their production processes than do smaller companies, but their employees earn higher wages (U.S. Bureau of the Census 1975, table 4).[3]

Tables 7.6 and 7.7 show what has happened since 1947 to the concentration of the largest companies. Table 7.6 provides the more reliable data, dealing with the proportion of value added in manufacturing accounted for by the largest companies. The fifty largest companies' share has risen by nearly one-half, and this share has risen somewhat faster than the combined share of the other firms that make up the largest 200. It is surprising, though, that most of the increase took place shortly after World War II. The large wave of conglomerate mergers in the 1960s, which might have been expected to raise the share of the largest companies, was accompanied by a slowing down of the increase in the largest companies' share.

Table 7.6 **Share of Total Value Added by Size of Manufacturing Companies, Selected Years, 1947–72**

Company group	1947	1954	1958	1963	1967	1972
Largest 50	17	23	23	25	25	25
Largest 100	23	30	30	33	33	33
Largest 150	27	34	35	37	38	39
Largest 200	30	37	38	41	42	43

Source: U.S. Bureau of the Census, *Census of Manufactures, 1972, Concentration Ratios in Manufacturing*, Special Report Series MC72(SR)–2 (Washington, D.C.: Government Printing Office, 1975), table 1.

Table 7.7 presents some measures of concentration of the largest companies based on the assets they control rather than their value added; and the table addresses concentration among all nonfinancial companies and not just manufacturing. The concentration of corporate assets in the largest manufacturing companies is likely to be greater than the concentration of value added for several reasons: the largest firms

Table 7.7 **Concentration of Assets of the Largest 200 Manufacturing Companies and the Largest 200 Nonfinancial Companies, Various Years 1956–77, with Alternative Treatments of International Assets**

	Manufacturing Companies			
		Adjusted Series, International Assets Included on Gross Basis		
Year	Federal Trade Commission Series	Companies Ranked by Assets	Companies Ranked by Sales	All Nonfinancial Companies, International Assets Included, Companies Ranked by Assets
	(1)	(2)	(3)	(4)
1956		52.9	45.4	
1957		54.2	47.1	
1958		55.0	46.4	
1959		54.8	46.4	
1960	56.3	55.4	47.3	40.5
1961		55.7	45.9	
1962		55.2	47.0	
1963		56.0	47.7	
1964		55.4	47.6	
1965	56.7	55.4	47.5	40.1
1966		55.6	47.1	40.5
1967		57.7	48.8	41.2
1968		59.5	50.8	41.5
1969	60.1	59.4	50.7	40.4
1970	60.4	60.0	51.9	40.6
1971	61.0	59.5	52.8	40.8
1972	60.0	58.4	51.5	39.8
1973	56.9[a]	58.8	51.3	39.1
1974	56.7[a]	58.9	53.7	39.5
1975	57.5[a]	59.4	55.1	39.9
1976	58.0[a]	60.0	55.2	
1977	58.4[a]	61.1	56.6	

Sources: Column 1—Federal Trade Commission data from U.S. Bureau of the Census, *Statistical Abstract of the United States, 1978* (Washington, D.C.: Government Printing Office, 1978), p. 576. Columns 2–4—calculated by Professor J. Fred Weston using data from *Fortune*; Federal Trade Commission, *Quarterly Financial Reports*; and U.S. Treasury, *Internal Revenue Service, Statistics of Income, Corporations.*

[a]Not comparable to earlier figures; see text.

are more capital-intensive than are smaller firms; they are more diversified outside of manufacturing; and as multinational companies they hold proportionally more assets abroad. Column 1 of table 7.7 presents data published by the Federal Trade Commission on the concentration of assets in the 200 largest manufacturing companies. This series is distorted because a change after 1972 caused companies to exclude their overseas assets from the data they supply, whereas they had previously included overseas assets in whatever way they saw fit. It is necessary to add about 2.8 percentage points to the 1973–77 figures in column 1 to make them comparable to earlier data (Penn 1976),[4] in which case they show the asset concentration of the 200 largest manufacturing firms to exceed concentration based on value added (compare the last line of table 7.6) but to change little over the last decade.

Prof. J. Fred Weston has estimated in columns 2, 3, and 4 of table 7.7 a series of data that seeks to include the gross foreign assets of United States corporations throughout 1956–77; column 1 excludes foreign assets from 1973 on and includes them erratically before. Column 2 indicates the concentration of assets in the largest manufacturing companies when all companies' international assets are included and companies are ranked by asset size. Column 3 does the same except that it ranks companies by sales; this ranking shows a lower level of concentration but one that continues to increase during the 1970s. Finally, column 4 extends the measurement from manufacturing companies to the 200 largest nonfinancial companies in relation to all nonfinancial companies. The following conclusions seem to follow from tables 7.6 and 7.7: (1) corporate concentration of assets is greater than concentration of sales, which is in turn greater than concentration of value added; (2) concentration is higher with overseas assets included than if they are left out (that is, the larger companies undertake proportionally more investment abroad); (3) although there has clearly been a long-run increase in concentration of the largest companies, the trend may have slowed down in the last decade.

Another social concern about the largest companies is the staying power of the leaders. Is there much turnover among them? Table 7.8 gives some idea of the amount of turnover by analyzing what happened after 1947 to the fifty largest manufacturing companies of 1947, and what happened before 1972 to the fifty largest in 1972. The same companies accounted for half of the top fifty in both years. As for the rest, all but six of the largest fifty in 1947 could be found in the largest 200 for 1972; and all but five of the largest fifty in 1972 were among the largest 200 in 1947. The high survival rate of the 1947 firms may be a little surprising, given the frequency with which firms disappear by merger. On the other hand, acquiring smaller firms is one way to stay on top.

Table 7.8 **Turnover among the Fifty Largest Manufacturing Enterprises, Selected Years 1947–72**

Category	1947	1954	1958	1963	1967	1972
Largest 50 Companies in 1947						
Share of manufacturing value added	17	21	20	21	20	17
Number ranked:						
among the largest 50	50	35	34	30	24	25
among the largest 100	50	47	46	46	41	38
among the largest 200	50	50	50	49	46	44
Largest 50 Companies in 1972						
Share of manufacturing value added	12	19	20	22	23	25
Number ranked:						
among the largest 50	25	33	37	40	42	50
among the largest 100	35	44	43	46	50	50
among the largest 200	45	45	47	49	50	50

Source: U.S. Bureau of the Census, *Census of Manufactures, 1972, Concentration Ratios in Manufacturing*, Special Report Series MC72(SR)–2 (Washington, D.C.: Government Printing Office, 1975), tables 2, 3.

Some conclusions from economists' research on the turnover of large companies help to place table 7.8 in perspective (Collins and Preston 1961; Mermelstein 1969; Stonebraker 1979). When turnover is examined for earlier decades of the twentieth century, it appears that the amount after 1929 was smaller than in earlier years. Economists have wondered what hardening of the economic arteries might be involved. One factor determining corporate turnover is the changing mix of industries in the economy; a firm can rise to the top because it dominates a fast-growing industry, or sink because it is stuck in a slow-growing one, without any change occurring in its position vis-à-vis its immediate competitors. When we control for industry mix, however, the conclusion still holds that the turnover of leading firms slowed after 1929. The slower turnover is also partly explained by the number of major antitrust cases brought in 1911 or shortly afterward, which caused the dismemberment of some of the then leading firms. With this influence also controlled, turnover still appears to have been rather stable since around 1929, but somewhat higher before that time. The explanation for the slower turnover, most economists agree, is that in the 1920s large companies first began to diversify their activities significantly. They improved their chances of staying on top even if one of their industries—or their own activities in some sector—turned sour. If diversification permits a large corporation to ride out economic storms, is that a good or a bad sign for the flexibility and competitiveness of our economy? The ques-

tion is a subtle one. When resources must be moved from industry *A* to industry *B*, they can travel by two different routes. Companies in industry *A* can shrink or close down, and the resources they employed may find new jobs with different companies in industry *B*. Or companies in industry *A* can diversify and make administrative transfers to *B* of resources in their employ. The results of the two processes need not be the same, and there is no decisive way to determine which is better.

7.3 Structures of Individual Product Markets

The biggest companies in American industry owe their size partly to their tendency to operate in large markets. They also tend to compete in many markets each and to hold high shares of sales in their more important markets, and these properties also help to explain their bigness. We will consider data on market shares in this section and evidence on companies' multimarket activities in the section that follows.

A major public concern over the organization of industry has been with the amounts of monopoly and competition found in the United States economy. It is not easy to match up the structures of actual markets we observe with the theoretical prototypes of monopoly (one seller) and competition (many sellers, none of them large). Most markets contain "some" sellers, perhaps only "a few." Therefore economists usually evaluate the number and size distribution of firms in the market by measuring the share held by the largest few—often the largest four or eight. This "concentration ratio" can be used to measure how concentrated are either the sellers or buyers in a given market.[5]

Our information on seller concentration in the manufacturing sector extends back to the turn of the century. The beginning of the twentieth century was a critical period for the organization of American industry. Transportation and communication had been growing steadily cheaper during the nineteenth century. Markets were becoming more national and integrated, and business firms were discovering new methods of efficient large-scale organization. By 1900 many American manufacturing industries had assumed the shapes that they would retain throughout the century—partly through the wave of mergers mentioned above. One careful attempt was made by Warren Nutter (1951, pp. 35–48, 112–50) to patch together evidence on concentration in manufacturing at the turn of the century.[6] He concluded that 32.9 percent of all national income originating in manufacturing emanated from industries in which the four largest sellers accounted for 50 percent or more of output sometime during 1895–1904. Data provided periodically by the Bureau of the Census allow us readily to calculate a similar figure for present-day conditions. In 1972 it was 29.0 percent; in 1963 it was 33.1 per-

cent.[7] The obvious conclusion is that average seller concentration in manufacturing industries has shown no systematic trend over the twentieth century.

Many economists object to measuring overall concentration in this way—by classifying industries according to whether the largest four sellers hold more or less than 50 percent of shipments. Although industries less concentrated than the 50-percent mark are probably effectively competitive, those ranking above it surely vary a great deal in how closely the rival sellers manage to behave as if they were single monopolists. Therefore concentration is better summarized as a weighted average of the concentration ratios for individual industries. Prof. F. M. Scherer (1980) has provided such a calculation for 1972, the most recent year for which data are available. He found that 6.8 percent of value added in manufacturing came from industries in which the four largest firms account for 80 percent or more of industry shipments, and 21.5 percent of value added originated in industries whose four largest firms account for 60 percent or more of industry output.[8] This figure of 21.5 percent in 1972 can be compared (roughly) to the following figures for earlier years: 15.9 percent in 1947 and 20.7 percent in 1958.[9] The simplest device for summarizing concentration is to average industries' concentration ratios, each weighted by some measure of an industry's importance. Data calculated by Scherer and M. A. Adelman, going back to 1947, are presented in table 7.9. Both the weighted and unweighted average figures suggest that some slight increase in average concentration occurred since World War II, but the rate of change has been slow.

The measures of concentration examined so far reflect the changing mixture of industries in the United States manufacturing sector as well as whatever changes in concentration have occurred in the typical industry. The automobile industry, for example, has grown much larger as a proportion of the manufacturing sector since 1900, and it has become much more concentrated. Measures of average concentration in various

Table 7.9 **Average Seller Concentration, Selected Years, 1947–72, for All Manufacturing Industries, Unweighted and Weighted by Value Added**

	1947	1954	1963	1972
Simple (unweighted) average	39.7	39.5	40.7	41.5
Average weighted by value added[a]	36.3	38.1	37.8	38.5

Source: F. M. Scherer, *Industrial Market Structure and Economic Performance*, 2nd ed. (Chicago: Rand-McNally, 1980), table 3.7.

[a]Each industry's concentration ratio in any given year is weighted by its value added in that year to determine the weighted average.

years tend to register an increase due to both of these changes. For some purposes, however, we would like to abstract from the changing mix of industries in the economy to see what happens over time to concentration in an unchanging group of industries. The Bureau of the Census frustrates that desire by revising its industry definitions from time to time, but we have been able to follow 154 industries that survived unchanged from 1947 to 1972. The mere fact that they survived redefinition suggests that nothing much happened to their structures or technologies over this period. In that sense, they are critical for telling us whether any fundamental forces have been at work changing the level of industries' concentration. In table 7.10 these industries are subdivided according to whether they sell their outputs to producers, consumers, or a mixture of these two groups. Those groups serving consumers are also divided according to whether their products are differentiated or not. (The goods sold by an industry's manufacturers are differentiated if buyers easily distinguish between brands or the goods of different sellers; makers of differentiated goods usually apply brand names to their goods, and advertise and promote these brand names with the public.) These 154 industries on average showed a slight increase in concentration, about like that of the full population covered in table 8. However, concentration in the producer-goods industries fell while concentration in the other industries rose. Among the consumer-goods industries, those showing appreciable amounts of product differentiation grew in concentration much more than did the undifferentiated goods (Mueller and Hamm 1974).[10] Changes in marketing practices (network television?) or in the way consumers buy goods (the rise of supermarkets and dis-

Table 7.10 **Changes in Four-Firm Seller Concentration, 1947–72, for Population of 154 Consistently Defined Industries, by Type of Buyer and Degree of Product Differentiation**

	Number of Industries	Change in Concentration 1947–1972	Level of Concentration 1972
All industries	154	+ 1.71	41.5
Producer goods	87	− 1.67	41.3
Consumer goods			
low differentiation	18	+ 3.78	25.3
medium differentiation	22	+ 7.73	42.1
high differentiation	10	+ 8.00	53.9
Mixed industries			
low differentiation	5	+11.80	50.8
medium differentiation	10	+ 2.60	50.5
high differentiation	2	+ 2.50	55.0

Source: F. M. Scherer, *Industrial Market Structure and Economic Performance*, 2nd ed. (Chicago: Rand-McNally, 1980), table 4.8.

count stores?) may have somehow changed the structures of these consumer-goods industries.

Average changes in industries' concentration ratios give us no feeling for how much concentration typically changes for the individual industry. Table 7.11 addresses that question by cross-tabulating the concentration ratios of 196 industries in 1954 and 1972 (1970, for some). Industries that stayed within the same ten-point range appear along the diagonal of the table (italicized figures); industries appearing above the diagonal grew more concentrated, while those below the diagonal became less concentrated. Of the 196, 77 appear on the diagonal and thus saw little change. Concentration fell in 45 industries and rose in 74.[11] The numbers cluster rather closely around the diagonal, implying that for most industries concentration did not change much over two decades. The most common change was for industries with a concentration ratio of less than 30 percent in 1954 to become more concentrated by the 1970s. We have no good explanation of why so many unconcentrated industries underwent proportionally large increases in concentration during this period.

As mentioned above, a description of the structure of industry should in principle give equal time to the buyers' side of the market. Households buying consumer goods are numerous and unconcentrated, but the manufacturer of these goods must first sell them to retail outlets, and those may sometimes be concentrated in local shopping areas. Where buyers are or may be concentrated, that fact takes on importance for predicting how the market will behave. What is more, John Kenneth Galbraith (1952) argued that the concentration of buyers is directly influenced by the concentration of sellers: that the presence of concentrated sellers able to exercise some monopoly bestirs buyers to coalesce and confront them with some countervailing concentration. Galbraith's proposition has not fared well when tested against actual markets. The most concentrated buyers do not seem to have emerged in sectors where sellers are the most concentrated. Even if they had, there is no assurance that the household buyer at the end of the line of transactions benefits from bilateral struggles between concentrated buyers and sellers upstream. In any case, we would like to have evidence on the concentration of buyers facing major manufacturing industries in our economy.

Although such data are not simple to secure, there are two approaches that may be taken to estimate the concentration of industrial buyers facing those industries. The first approach, which is that followed by Guth, Schwartz, and Whitcomb, is to construct data first using the input-output table (see table 7.4) to determine which industries are the big customers for any given selling industry, and then drawing on official data on seller concentration in those industries to determine how concentrated an industry's buyers might be. Their results suggest that buyer

Table 7.11 **Distribution of Changes in Four-Firm Seller Concentration Ratios, 196 United States Manufacturing Industries, 1954 to 1970/1972**

Concentration Ratio in 1954	Concentration Ratio in 1972									
	0–10	11–20	21–30	31–40	41–50	51–60	61–70	71–80	81–90	91–100
0–10	4	8	1							
11–20	2	20	11	8	1	1				
21–30		5	12	11	2	1				
31–40			7	10	3	1	2			
41–50		1	1	3	13	7	2			
51–60				1	4	5	4	3		
61–70					2	7	5	2	1	
71–80						3	4	3		2
81–90							1	2	4	3
91–100								1	1	1

Source: U.S. Bureau of the Census, *Concentration Ratios in Manufacturing*, Special Report Series MC72(SR)–2 (Washingon, D.C.: Government Printing Office, 1975), table 5.

Note: [a]The period covered is normally 1954 to 1972. However, changes from 1954 to 1970 are shown for industries that were lost through reclassification in the 1972 Census of Manufactures, and for which data for 1954 were available. There are fifteen such industries.

concentration for any given industry is typically quite low; table 7.12 lists the ten manufacturing industries that they found to face the most highly concentrated buyers.[12]

The second approach for estimating buyer concentration is to examine levels of concentration of the retailing sectors that stand between the manufacturer and the final consumer. Of course, information on concentration in retailing and other service sectors is of interest because of the possibility that these sectors might function as concentrated sellers, whatever their behavior as buyers from the manufacturing sector. Table 7.13 lists concentration ratios for a selection of major retailing and service industries. These concentration data pertain only for the United States national market as a whole, and in that form they are appropriate to appraising the concentration of these sectors as buyers in national markets for manufactured goods. They can be quite deceptive, however, as guides to their concentration of sellers. The typical market for most retail stores and service businesses is far from national in scope, and is more likely to be only the size of an individual city or small region. Seller concentration for these sectors in appropriately defined local markets may be substantially higher than is indicated by the figures in table 7.12. On the other hand, some classes of retail businesses compete with other classes, lowering effective concentration.

7.3.1 Company and Plant Concentration

A major concern for public policy is whether existing levels of seller concentration rest on economies of scale. If they do, we could not have

Table 7.12 **Selected Manufacturing Industries with High Estimated Buyer Concentration Ratios, 1963**

Industry	Buyer Concentration Ratio		
	4-Firm	8-Firm	20-Firm
Tire cord and fabric	60	63	64
Primary aluminum	36	51	55
Padding and upholstery fillings	30	34	38
Synthetic rubber	29	36	39
Primary copper	26	40	48
Secondary nonferrous metals	25	46	74
Aluminum castings	24	26	31
Carbon and graphite products	23	26	34
Miscellaneous fabricated textile products	21	25	30
Collapsible tubes	21	27	29

Source: Louis A. Guth, Robert A. Schwartz, and David K. Whitcomb, "Buyer Concentration Ratios," *Journal of Industrial Economics* 25 (June 1977), tables 1, A.1.

Table 7.13 **Seller Concentration in Selected Service and Distribution Industries, 1972**

Industry	Share of 4 Largest	Share of 20 Largest
Department stores	38.8%	68.4%
Variety stores	51.1	75.5
Grocery stores	17.5	34.7
Gasoline service stations	3.7	8.0
Women's ready-to-wear stores	11.2	22.8
Furniture stores	4.4	9.0
Drug stores	11.4	28.8
Liquor stores	11.0	19.4
Merchant wholesalers	2.0	5.8
Merchandise agents, brokers	6.9	11.4
Hotels, motels	9.5	18.8
Laundry, cleaning, services	5.4	11.4
Advertising agencies	13.3	38.9
Computing and data processing	18.4	39.4
Automotive rental and leasing	26.4	39.3
Motion picture production, distribution	29.2	55.8
Legal services	0.7	2.7

Sources: U.S. Bureau of the Census, *1972 Census of Retail Trade*, vol. 1, *Summary and Subject Statistics* (Washington, D.C.: Government Printing Office, 1976), chart 1; idem, *1972 Census of Wholesale Trade*, vol. 1, *Summary and Subject Statistics* (Washington, D.C.: Government Printing Office, 1976), chart 4; idem, *1972 Census of Selected Service Industries*, vol. 1, *Summary and Subject Statistics* (Washington, D.C.: Government Printing Office, 1976), chart 1.

smaller firms, and thus more of them in each industry, without incurring higher costs of producing the industry's output. If they do not, more companies and thus more competition could exist without that cost of efficiency. Scale economies do or may exist in many aspects of a company's activities, but the best documented form of scale economies—and probably the most important—is in production activity at the plant level. Therefore we are concerned with the extent to which the leading companies operate more than one plant in their principal industry, and thus may be larger than is warranted by scale economies at the plant level.

Table 7.14 shows, for a number of narrowly defined manufacturing industries, how many plants are operated by the average member of the four largest companies. It shows that the leading companies are single-plant firms only in a small and declining proportion of manufacturing industries. A slight increase typically occurred between 1963 and 1972 in the number of plants per leading company. That change probably stemmed from the general growth of the economy during the decade; it was not the result of mergers in most cases.

Table 7.15 explores the connection between seller concentration and multiplant operations further by relating the number of plants per com-

pany (both the four leading companies and all companies in the industry) to levels of seller concentration. Although the number of plants per company seems to increase with concentration for *all* companies in the industry, it shows no such tendency for the four largest companies. If anything, the largest companies in the most concentrated industries tend to operate somewhat fewer plants than the leading companies in less concentrated industries, a fact that suggests some role for scale economies at the plant level in explaining seller concentration.[13]

7.4 The Activities of Large Companies

America's largest nonfinancial companies are conspicuous for the many markets in which they operate. A company can extend its activities beyond its principal or original base market in several directions. It can replicate its base-market activity in another geographic region. It can become active in a market that supplies inputs to or buys outputs from its base activity; the firm then becomes vertically integrated. Or it can enter a market with no direct relation to its base; it becomes diversified and gets called a "conglomerate" if its diversification is quite extensive. Finally, the expanding firm becomes multinational if any of these modes of growth carry it outside the boundaries of the United States (or into the United States from a foreign base of operations).

Table 7.14 **Extent of Multiplant Operation for Four Leading Firms in Manufacturing Industries, 1963 and 1972**

Average Number of Plants per Company, Four Leading Companies	1963		1972	
	No. of Industries	Percentage of Industries	No. of Industries	Percentage of Industries
1.00 to 1.50 plants	78	18.7	51	11.4
1.75 to 2.50 plants	89	21.3	107	23.9
2.75 to 4.00 plants	87	21.9	98	21.9
4.25 to 7.00 plants	87	21.9	94	21.0
7.25 to 10.00 plants	28	6.7	35	7.8
10.25 to 20.00 plants	35	8.4	46	10.3
More than 20.00 plants	13	3.1	17	3.8
All industries	417	100.0[b]	448	100.0[b]

Sources: U.S. Congress, Senate, Subcommittee on Antitrust and Monopoly, *Concentration Ratios in Manufacturing Industry, 1963*, Part 2, 89th Cong., 1st Sess. (Washington, D.C.: Government Printing Office, 1967), table 27; U.S. Bureau of the Census, *Concentration Ratios in Manufacturing*, Special Report Series MC72 (SR)-2 (Washington, D.C.: Government Printing Office, 1975), table 8.

[a]The gaps in the ranges occur because the leading firms' number of plants must be an integer, so the average number per firm can only take certain fractional values.
[b]Percentages may not add because of rounding errors.

Table 7.15 **Relation between Seller Concentration and Multiplant Operations for 448 Manufacturing Industries, 1972**

Four-Firm Concentration Ratio	Number of Industries	Average Number of Plants per Company	
		All Companies	Four Largest Companies
0–10	22	1.10	5.85
11–20	73	1.11	6.16
21–30	91	1.21	6.02
31–40	72	1.29	6.39
41–50	67	1.28	5.19
51–60	49	1.29	4.17
61–70	29	1.66	8.56
71–80	25	1.52	4.09
81–90	12	1.34	3.87
91–100	8	1.53	5.33

Source: U.S. Bureau of the Census, *1972 Census of Manufactures, Concentration Ratios in Manufacturing*, Special Report Series MC72(SR)–2 (Washington, D.C.: Government Printing Office, 1975), table 8.

The multimarket firm developed late in the history of business organization, and its rise has only recently been traced by business historians. notably Alfred D. Chandler, Jr. (1962 and 1977). Innovations in transportation and communication during the nineteenth century first made possible the coordination of far-flung economic activities by means of the firm's administrative apparatus. The opportunities born of these innovations were seized by large national firms that came to dominate United States national markets by the end of the century. Some of these enterprises discovered early in the twentieth century that they could use their resources (and adapt their administrative structures) to operate successfully in many markets, not just at the site of their initial success. Those discoveries started a process of multimarket expansion by large firms (especially diversification) that has continued to this day. Firms have expanded both by internal growth (organizing and financing new ventures in other industries) and by acquiring independent companies operating in other markets. The multimarket growth of large firms has been a controversial process, especially when carried out through acquisitions and mergers. "Horizontal" mergers between directly competing firms tend to increase the concentration of sellers, and are thus capable of promoting the evils of monopoly. Vertical integration and diversification raise different concerns for public policy. The vertically integrated firm, it is feared by some, can manipulate prices at various stages of production to the disadvantage of its nonintegrated rivals. And the diversified firm which can sustain losses in one of its markets from profits earned elsewhere might use this option to triumph artificially in market

warfare with undiversified rivals. The dilemma is that the large firm often seems to make better use of its own—and society's—resources by expanding into multimarket activities, but it may coincidentally attain the power to act in ways that restrain competition. The strength and importance of these counterpoised effects are still much debated among economists, and the issues and evidence are complex. Here we shall provide some background data on the structures of large multimarket companies.

7.4.1 Mergers and Acquisitions

It is convenient to review some evidence on acquisitions and mergers, before turning directly to firms' multimarket activities. The number of mergers among American businesses has shown wide fluctuations over time. This cyclical pattern has been evident from the beginning of the twentieth century. Prof. F. M. Scherer has recently assembled a statistical series that shows the value of corporate assets in manufacturing and mining acquired through merger from 1895 to 1977, with market values adjusted for price changes so as to reveal the real value of the assets acquired. (For the period 1920–48 he was forced to rely on a simple count of the number of mergers.) His results are shown in Figure 7.1. At its peak, the merger movement of the late 1960s involved a larger

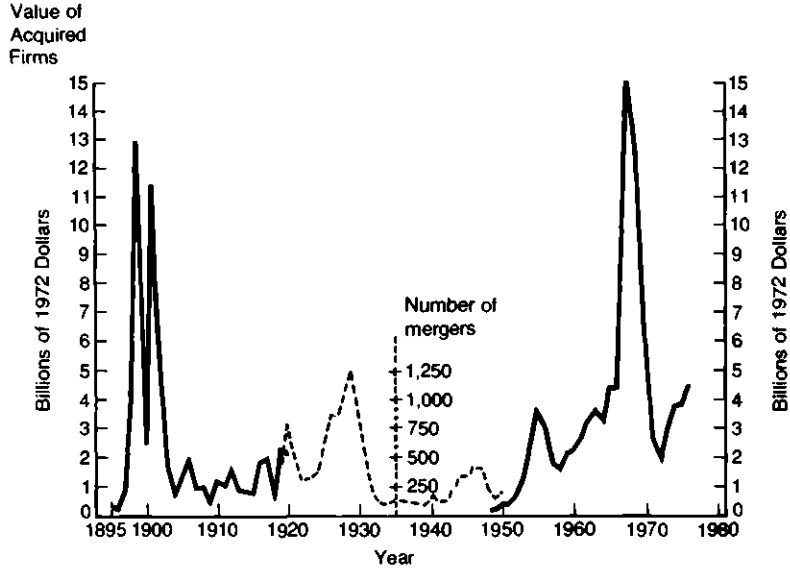

Fig. 7.1. Volume of manufacturing and mining firm acquisitions, 1895–1977. Based on data from F. M. Scherer, *Industrial Market Structure and Economic Performance*, 2d ed. (Chicago: Rand McNally, 1980), fig. 4.5.

amount of corporate assets than in any previous period. Smaller bursts occurred in the mid-1950s and the latter 1970s. At the beginning of the twentieth century, the amount of corporate assets involved in mergers was almost as great as that of the 1960s despite the fact that the economy was much smaller then. Mergers were also numerous in the late 1920s.

Economists have given some attention to the reasons for these large fluctuations in the volume of corporate assets changing hands (Nelson 1959 and Steiner 1975). For example, fluctuations tend to take place in prosperous periods when large corporations are enjoying large cash flows not needed at the time for reinvestment in their existing activities. Merger waves may be promoted by high prices of common stocks, which encourage the owners of closely held companies to sell out and realize their capital gains.

We mentioned that mergers and acquisitions may serve to combine directly competing firms ("horizontal" mergers), or they may unite firms in different markets. These types of mergers have occurred in varying proportions over time. At the beginning of the twentieth century, for example, most consolidations and acquisitions were horizontal, and they created many of the dominant firms that carry on today as leaders in their industries. Perhaps because of changes in antitrust policy, mergers came more often to involve firms in vertically related markets or in largely unrelated markets. The Federal Trade Commission classifies mergers among large manufacturing and mining companies according to whether they are horizontal, vertical, or conglomerate. And the conglomerate group is further subdivided according to whether an acquisition extends the acquiring firm's activity into a product market somehow related to its previous activities, into a new geographic market for the types of products it already offers, or into some unrelated activity. The distribution of mergers by type is shown in table 7.16. Horizontal mergers declined proportionally after the early 1950s, probably because legislation passed in 1950 (the Celler Kefauver Act) tightened legal restrictions on horizontal mergers. Conglomerate mergers have grown much more prevalent since that time, and product-extension mergers have given way to acquisitions involving more remote diversification.

7.4.2 Diversification

In large part due to conglomerate mergers, most large enterprises have become highly diversified. Diversification is an ambiguous thing to measure across sectors of the economy, because the measure depends on how we define the base activities beyond which a company's output becomes diversified. Suppose that we call a company undiversified if it operates in only one of the 115 manufacturing industries identified in the statistics on enterprises of the Census of Manufactures. Table 7.17

Table 7.16 **Distribution of Assets Acquired in Mergers Involving Large Manufacturing and Mining Companies, by Type of Merger, 1948–77**

Type of Merger	1948–55	1956–63	1964–72	1973–77
Horizontal	36.8%	19.2%	12.4%	15.1%
Vertical	12.8	22.2	7.8	5.8
Conglomerate:				
product extension	44.8	36.0	39.3	24.2
market extension	2.4	6.7	7.3	5.7
other	3.2	15.9	33.2	49.2
Total	100.0	100.0	100.0	100.0

Source: U.S. Congress, Senate, Committee on the Judiciary, Subcommittee on Antitrust and Monopoly, *Economic Concentration*, Hearings pursuant to S. Res. 40, Part 8A (Federal Trade Commission, *Economic Report on Corporate Mergers*) (Washington, D.C.: Government Printing Office, 1969), p. 637; Federal Trade Commission, *Statistical Report on Mergers and Acquisitions* (various issues).

Table 7.17 **Measures of Outbound and Inbound Diversification for Major Sectors of Manufacturing Industry, 1972**

Sector	Outbound Diversification[a]	Inbound Diversification[a]
	(1)	(2)
Rubber products	66.3%	32.6%
Petroleum and coal products	59.9	15.7
Electrical machinery	53.0	43.0
Pulp, paper and products	49.6	45.2
Leather and leather goods	43.5	18.9
Tobacco manufactures	39.9	1.7
Food and kindred products	35.2	28.5
Machinery, except electrical	34.1	41.3
Stone, clay, and glass products	34.0	28.3
Chemicals and products	33.1	31.8
Instruments and related products	31.0	30.5
Fabricated metal products	29.0	41.3
Lumber and wood products	28.2	31.4
Textile mill products	26.2	33.6
Transportation equipment	25.0	15.1
Primary metal industries	24.9	25.8
Miscellaneous manufactures	24.5	27.3
Furniture and fixtures	23.1	24.4
Printing and publishing	21.8	17.7
Apparel and related products	21.0	23.8

Source: U.S. Bureau of the Census, *Enterprise Statistics, 1972*, Part 1, ES72–1 (Washington, D.C.: Government Printing Office, 1977), tables 1, 2.
[a]See text for definitions of the measures. It should be noted that diversification is defined here so as to include vertical integration.

shows (col. 1) what fraction of the shipments of companies classified to each base industry emanate from plants of theirs whose principal outputs are classified to other industries. The table shows weighted averages[14] of these diversification percentages for twenty broad sectors of manufacturing. The sectors are listed in descending order of this variable. We can call the variable "outbound diversification." Column 2 presents a corresponding measure of how much "inbound diversification" has occurred into each sector. That is, it represents the proportion of shipments from the industry in question that come from plants belonging to firms based in other industries that have diversified into this one.

Certain patterns can be detected in table 7.17. The most diversified manufacturing sectors seem to be of two kinds. Some—electrical machinery, pulp and paper, nonelectrical machinery—contain companies that are highly diversified or vertically integrated among industries within the sector. For these sectors the measures of outbound and inbound diversification are both high. Other top-ranking sectors, such as rubber products, petroleum, and tobacco, have diversified heavily into activities in more remote manufacturing sectors—rubber and petroleum into chemicals, tobacco into food products. For these sectors inbound diversification is less than outbound diversification. At the bottom of the list are several sectors dominated by small firms—furniture, printing and publishing, apparel. Throughout the economy, small companies on average are proportionally less diversified than their larger brethren.

Table 7.17 shows the diversification prevailing in 1972, but it gives no feeling for how the pattern has been changing. Table 7.18 illustrates, over the short period 1967 to 1972, how the process of diversification has related to the migration of companies among the economy's major sectors. It tells how many companies classified to an industry in 1967 remained in the same industry[15] in 1972. Roughly two-thirds stayed in place, for all sectors together. Some companies simply went out of business (3 percent). The remainder were strongly affected by the diversification process. Either they were acquired by another company (15 percent) or they themselves changed their activities so much (by acquiring other companies or changing their output mix) as to be reclassified to another industry (14 percent). Table 7.18 suggests that company turnover due to acquisition and reclassification was highest in the mineral and manufacturing industries.

7.4.3 Vertical Integration

Vertical integration is if anything a more ambiguous concept than diversification to measure across the face of American industry. When a firm adds a further stage of fabrication to its activities, we say that it has become more vertically integrated. However, there is no meaningful way to compare the degrees of vertical integration of firms in two different

Table 7.18 Diversification and Turnover among Large Companies, 1967–72

Category of Companies		All Sectors	Mineral Industries	Construction Industries	Manufacturing	Wholesale Trade	Retail Trade	Service Industries
Large companies in 1967	N	5,238	88	298	3,506	177	709	460
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Classified to same industry	N	3,551	54	200	2,340	99	532	326
in 1972	%	67.8	61.4	67.1	66.7	55.9	75.0	70.9
Acquired since 1967 by	N	768	17	25	552	27	96	51
another company	%	14.7	19.3	8.4	15.7	15.2	13.5	11.1
No longer in operation	N	164	1	19	101	4	17	22
	%	3.1	1.1	6.4	2.9	2.3	2.4	4.8
Classified in another industry	N	755	16	54	513	47	64	61
category in 1972	%	14.4	18.2	18.1	14.6	26.6	9.0	13.3

Source: U.S. Bureau of the Census, *Enterprise Statistics, 1972*, Part 1, ES72–1 (Washington, D.C.: Government Printing Office, 1977), p. 324.

industries. Therefore any broadly based measurement of vertical integration must be restricted to its changes over time within particular sectors. Economic theory offers no strong hypotheses about how vertical integration is likely to change in modern industrial economies. On the one hand, the development of the profit-center organization lets the modern corporation coordinate discrete activities more efficiently and so might increase vertical integration. On the other hand, an industry's growth and development may allow production of some necessary inputs to be farmed out more efficiently to independent specialist firms.[16]

If we cannot compare vertical integration among sectors, we can at least measure its changes over time for a given sector. Note that the value of an industry's shipments is equal to the cost of the material inputs it purchases plus the payments that it makes to primary factors of production. If it becomes more integrated (say, by producing some inputs it previously bought on the market), the ratio of payments to primary factors to total sales should rise. Arthur Laffer (1969) calculated this ratio for ten broad sectors of the United States economy in 1929, 1965, and years in between, and derived an index of the changes that have occurred. Overall, his index for 1965 took almost the same value as for 1929, with no systematic fluctuations in between. The manufacturing sector showed some increase in integration (especially in durable goods), but vertical integration declined in contract construction, services, and agriculture. Tucker and Wilder (1977) similarly investigated trends in narrowly defined industries within the manufacturing sector for the years 1954–72. They also found a slight increase of vertical integration in manufacturing, with the average industry's ratio of value added to value of shipments rising roughly from 0.43 to 0.51 (the exact value depending on the weight used to combine individual industries). Their evidence suggests that increases in vertical integration are associated with increases in the size and market share of the industry's leading firms, but it is not clear what causal relation (if any) exists between these changes.

7.4.4 Multinational Companies

An increasingly visible form of multimarket enterprise is the multinational company. Various definitions of the multinational company have been offered; here, we mean simply an enterprise legally resident in one country that controls at least one industrial establishment in some other country. The multinational company is subject to many popular misconceptions. For example, American companies are said to have "gone abroad" only in the years since World War II. However, foreign investment by American enterprise began in the nineteenth century, and the ratio of the book value of American investment abroad to American gross national products was apparently just about the same in 1914 as

it was in 1966 (Wilkins 1970, p. 201). Similarly, multinational corporations are thought to be strictly an American specialty. However, other countries (among them Great Britain, the Netherlands and Switzerland) are also the homes of important multinational companies, and in some recent years investment by foreign companies entering the United States was greater than investment by United States companies abroad.[17]

For America's nonfinancial industries as a whole, 15.8 percent of all corporate assets were located abroad in 1972. Table 7.19 shows each sector's percentage of assets located abroad, with the sectors ranked in decreasing order of percentage. Some clear patterns emerge from the rankings. Some heavy foreign investors secure their raw materials overseas (petroleum, mineral industries). In others the leading firms acquire advanced technologies or special skills in differentiating their products.

Table 7.19 **Foreign Assets as a Percentage of Total Assets, United States Industries Ranked by Extent of Foreign Investment, 1972**

Sector	Foreign Assets Percentage of Total Assets
Petroleum and coal products	35.9
Machinery, except electrical	24.9
Food and kindred products	20.8
Rubber products	20.8
Heavy construction	19.2
Instruments and related products	18.4
Chemicals and products	16.8
Transportation equipment	16.5
Mineral industries, total	14.2
Tobacco manufactures	13.3
Stone, clay, and glass products	12.5
Pulp, paper, and products	11.2
Fabricated metal products	10.1
Electrical machinery	9.1
Other construction	8.4
Miscellaneous manufactures	8.3
Primary metal industries	8.0
Furniture and fixtures	6.2
Textile mill products	6.0
Printing and publishing	5.6
Retail trade	5.5
Business services	5.5
Apparel and related products	4.8
Leather and leather goods	3.3
Personal services	2.9
Wholesale trade	2.8
Lumber and wood products	2.4
Total, all industries	15.8

Source: U.S. Bureau of the Census, *Enterprise Statistics, 1972*, Part 1, ES72–1 (Washington, D.C.: Government Printing Office, 1977), pp. 310–15.

Such progressive and differentiated-goods industries include both consumer goods (food, transportation equipment) and producer goods (machinery, instruments). Industries at the low end produce undifferentiated goods (lumber) or serve intrinsically single-country or local markets (printing and publishing, retail trade, personal services).[18]

7.5 Strategic Features of Market Behavior

Industry structures are important because they affect the decisions made by buyers and sellers present in the marketplace. Investment decisions, short-run output and price levels, research, and advertising outlays —not to mention the diversification and foreign-investment decisions just considered—will come out differently for an industry, depending on the market's structure. How structure affects behavior is a complex problem of economic analysis that preoccupies economists working in the field of industrial organization.[19] Here we can only provide data on some of the consequences of these decisions by enterprises.

7.5.1 Advertising Outlays

One controversial category of business outlay is advertising expenditures. Advertising conveys some information that is useful to the consumer and would be more costly to secure in other ways. Even the ad that contains no hard facts may still fulfill an informative function: to show that the maker has enough faith in the product's quality that he will incur the cost of advertising to induce buyers to try it. On the other hand, advertising in some market settings may make competitive processes work less well.[20] And some citizens object to the values that advertising espouses.

Table 7.20 provides information on changes over time in total advertising outlays and the mixture of advertising media used. Each column represents an index ($1967 = 100$) of current-dollar advertising outlays through the medium in question. In 1977 total outlays on advertising, $38 billion, were 2 percent of gross national product. It does not appear that this percentage has been increasing over time. Table 7.20 shows that total advertising outlays in 1935 were 6.25 percent of their 1970 level. The current-dollar gross national product of the United States in 1935 was only 5.68 percent of its 1970 level. This same impression persists if we examine the ratios of advertising outlays to total sales for selected manufacturing industries that are heavy advertisers. Michael E. Porter matched data on 1935 advertising-sales ratios for thirteen industries to data on these same industries for 1965; the (unweighted) average advertising-to-sales ratio for the thirteen in 1935 was 10.0 percent, but in 1965 it had fallen to 5.0 percent.[21]

Table 7.20 **Trends in National Advertising Expenditure, by Medium, 1935–70 (Indexes, 1967 = 100)**

Year	Total	Magazines	Network Radio	Spot Radio	Network Television	Spot Television	Newspapers	Business Papers	Outdoor Advertising
1935	7	11	98	5	0	0	16	7	18
1950	31	40	306	43	6	3	57	36	76
1955	52	57	131	43	37	26	79	63	103
1960	70	74	67	71	54	53	89	86	109
1965	91	94	94	88	85	90	93	95	95
1970	112	103	88	118	114	125	108	105	122
1975	162	117	130	179	159	191	160	130	175
Percentage distribution, 1975	100%	8.3%	0.4%	10.3%	12.5%	16.0%	45.7%	5.0%	1.8%

Sources: U.S. Bureau of the Census, *Historical Statistics of the United States, Colonial Times to 1970* (Washington, D.C.: Government Printing Office, 1975), part 2, p. 857; U.S. Bureau of the Census, *Statistical Abstract of the United States, 1978* (Washington, D.C.: Government Printing Office, 1978), p. 855.

How did this decline in the proportional importance of advertising come about? Table 7.20 shows that the mix of advertising media has changed considerably over the period. The big change is, of course, the rise of television at the expense of network radio. For local advertising messages there has apparently been some displacement of newspapers and outdoor advertising by spot radio and television (outdoor advertising has been legally restricted on the interstate highway system since the 1960s). It seems quite possible that television is an efficient medium for disseminating advertising messages, in the sense that the cost of placing a message before a given number of viewers is less than by any other medium. The total number of advertising messages per citizen may have grown substantially, even while the total cost of advertising has fallen in relation to the nation's gross national product.

7.5.2 Research and Development Outlays

In the postwar period American industry has spent heavily on research and development, as developments in basic science were translated into new products and more efficient processes. An industry's "progressiveness" is rightly regarded as one of the most important features of its social performance. The potential for innovation is not evenly spread across the manufacturing sector. Science simply offers more scope for technical innovation in pharmaceuticals, say, than it does in colonial furniture. Accordingly, the proportion of sales revenue spent on research and development varies greatly from industry to industry. Table 7.21 shows the trend over time (1957–76) for a number of manufacturing industries (no benchmark before World War II is available). High rates of research and development (R&D) spending are concentrated in the chemicals, machinery, aircraft, and instruments sectors, where most of the opportunities are found for embodying scientific discovery in useful articles. Even in more traditional sectors, however, appreciable amounts of R&D spending are carried on. Such sectors undertake R&D in quest of products that are new, or provided in new forms, but without depending on any basic scientific advances.

Table 7.21 also shows the trend in rates of R&D expenditure over the past two decades. Some economists have expressed concern over a falling off of R&D spending, clearly apparent in the table. For the manufacturing industry as a whole the spending rate fell by one-third between the mid-1960s and 1976. The decline is unevenly spread among the industries shown in the table, and appears most evident in chemicals, electrical equipment, and aircraft. Some other sectors have held their own or shown increases. This decline in aggregate R&D spending partly reflects cutbacks in the federal government's support of industrial research. During the period 1957–65 federally funded R&D accounted for about 57 percent of total outlays on R&D. Since then the federal pres-

Table 7.21 **Research and Development Funds as a Percentage of Net Sales in Manufacturing Companies Performing R&D, by Industry, Selected Years 1957–76**

Industry	1957	1963	1965	1967	1969	1971	1973	1974	1975	1976
Food and kindred products	.3	.4	.4	.5	.4	.5	.4	.4	.4	.4
Textiles and apparel	[a]	.5	.5	.5	.6	.5	.4	.4	.4	.4
Lumber, wood products	[a]	.5	.4	.3	.4	.7	.7	.8	.7	.7
Paper and allied products	.6	.8	.8	.9	1.0	.8	.7	.8	.9	.9
Chemicals and allied products	3.5	4.3	4.3	5.7	3.9	3.9	3.5	3.5	3.7	3.7
industrial chemicals	5.0	5.1	4.7	4.8	4.0	3.8	3.4	3.2	3.5	3.6
drugs, medicines	3.6	4.7	6.4	8.0	6.0	6.2	6.5	6.3	6.4	6.3
other chemicals	1.3	2.8	2.3	2.3	2.1	1.9	2.0	2.1	2.2	2.1
Petroleum refining, extraction	.7	1.0	1.0	.8	.9	.9	.7	.6	.7	.7
Rubber products	1.7	2.3	1.9	1.9	2.2	2.6	2.6	2.5	2.5	2.4
Stone, clay, glass products	[b]	1.6	1.6	1.8	1.7	1.8	1.7	1.7	1.2	1.2
Primary metals	.5	.8	.8	.8	.8	.8	.7	.6	.8	.8
ferrous metals, products	[a]	.7	.7	.8	.7	.7	.5	.5	.6	.6
nonferrous metals, products	[a]	1.1	.9	1.0	1.0	1.0	.9	1.0	1.2	1.1
Fabricated metal products	1.6	1.6	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2
Machinery	3.4	4.2	4.0	4.2	3.8	4.0	4.6	4.6	4.8	4.8
office, computing, accounting machines	[a]	[a]	[a]	[a]	[a]	[a]	11.6	12.6	12.0	11.6
Electrical equipment and communication	7.6	10.1	9.1	8.6	7.9	7.2	6.9	6.6	6.5	6.5

Table 7.21—*Continued*

Industry	1957	1963	1965	1967	1969	1971	1973	1974	1975	1976
Radio, TV receiving equipment	[c]	[c]	[c]	1.9	2.2	2.4	1.7	1.7	1.4	1.3
electronic components							6.2	6.2	6.9	7.4
communication equipment	[a]	13.0	11.4	10.3	9.7	9.2	8.1	7.6	7.6	7.4
other electrical apparatus	[a]	7.3	7.0	7.3	6.6	6.4	6.3	6.3	6.0	6.1
Motor vehicles, equipment	2.9	3.4	3.1	3.4	3.1	3.1	3.5	3.7	3.5	3.2
Other transportation equipment							1.2	1.3	1.3	1.3
Aircraft and missiles	16.8	26.7	27.0	19.7	20.2	16.2	13.3	14.1	12.7	12.2
Professional and scientific instruments	7.0	5.9	5.9	5.4	6.4	5.7	6.1	6.1	5.9	6.0
Other manufacturing	[a]	.7	.7	.6	.8	.8	.8	.9	.8	.7
All manufacturing	3.4	4.5	4.3	4.2	4.0	3.5	3.3	3.1	3.1	3.0

Source: National Science Foundation, *Research and Development in Industry, 1976* (Washington, D.C.: National Science Foundation, 1978), table B-35.

[a]Not available separately; included in total.
[b]Included in the other manufacturing industries group.
[c]Included in the other electrical equipment group.

ence in the research laboratory has shrunk steadily, and in 1976 federal funds accounted for only 35 percent of the total. Between 1965 and 1976 company-financed R&D increased by 170 percent (in current dollars), while federal funds rose by only 20 percent, (and thus fell in real terms, given the rising cost of R&D inputs).[22]

Rates of R&D spending differ among large and small companies. One virtue claimed for large corporations is their ability (or inclination) to mount major research and innovative efforts. Most small companies do little or no formal R&D spending. Among medium-size and large companies, however, the rate of R&D spending does not clearly increase with the size of the company. The National Science Foundation issues data on company-financed R&D outlays, as a percentage of sales, by size of company, for those companies that do undertake research. For the years 1972–1976 these figures were as follows:

Fewer than 1,000 employees	1.5 percent
1,000 to 4,999	1.2
5,000 to 9,999	1.5
10,000 to 24,999	1.4
More than 25,000	2.5.

Thus, if the rate of private R&D spending increases with companies' size, it is only for the very largest companies in comparison to all others that perform some R&D. Economists have investigated the relation of R&D activity to size comparing R&D spending rates for companies competing with one another in the same industry. Their studies generally conclude that R&D spending as a percentage of sales does not increase with company size in most industries. Furthermore, their analyses of the productivity of R&D activities, measured by the number of patents issued or the number of major innovations achieved, suggest that the largest companies may be less productive with their R&D outlays than are their medium-size competitors.[23] It should be kept in mind, though, that the proportion of companies doing some research increases with companies' size.

7.5.3 Productivity Growth

A close relation probably exists between research outlays and the growth of productivity in American industry, even though increases in productivity also come from finding better ways to do things or doing them on a larger and more efficient scale, rather than from formal research efforts. Table 7.23 presents three measures of the annual rate of growth of productivity, as well as the growth rate of real output (adjusted for price changes) in each sector. The concept of productivity refers to the amount of ouput secured from a given bundle of inputs; when we say that productivity has grown, we mean that the amount of output has increased more than the amount of all inputs. A popular

measure of productivity is labor productivity, which is shown in table 7.22 as the growth of output per unit of labor input. This measure is incomplete because inputs of capital and intermediate goods and services may also have been changing. To compare the growth of output to the growth only of labor inputs is to neglect changes in these other inputs. The column headed Total Factor Productivity partly remedies this problem by making allowance as well for the growth of inputs of capital. The growth of total factor productivity is less than the growth labor productivity if capital inputs have been increasing. Because labor in the highly productive American economy has been getting more expensive relative to capital, entrepreneurs substitute capital for labor, and so we are hardly surprised at the growing role of capital. Nonetheless, table 7.22 shows that output in most sectors has grown faster than inputs of capital (because most figures in the last column are positive). Only if they are negative can the growth of labor productivity be larger or wholly explained by substitution of capital for labor.

Several interesting patterns emerge in table 7.22. The rates of growth of total output and of total factor productivity are obviously correlated. Causal influence runs both ways between the two variables. Productivity grows because an industry can offer better products or offer its old products more cheaply. People buy more at the lower prices, and output grows faster. Also if demand is growing fast, producers are more likely to take a chance on investments in large-scale plants capable of lower-cost production, and they may be induced to spend more on research. The broad sectors experiencing the greatest gains in productivity are the public utilities and mining industries. The manufacturing sectors with the highest rates of growth of total factor productivity are those with the highest rates of R&D spending (table 7.21). However, productivity growth rates differ among manufacturing industries a good deal less than do rates of R&D spending. In part this fact reflects the sources of productivity growth other than research. Also, the productivity gains from R&D spending often appear not in the industry that does the spending but in the industry that uses the improved equipment or other inputs made possible by the research.

The growth of productivity in the economy feeds back to the structure of industry in a way not shown in table 7.22. Improved production processes not only reduce the labor (and perhaps the capital) required to produce a given output, but they also change the bundle of intermediate goods that the process requires. When a particular intermediate good (plastics, for example) comes to be produced more efficiently, its price usually falls relative to the prices of similar intermediates. Producers substitute it for other inputs, so that its use grows rapidly.

Input-output analysis, described above (see table 7.4), helps us to trace these effects of technological change on the structure of the econ-

Table 7.22 **Annual Percentage Rates of Output Growth and Productivity Growth (Overall, Labor Productivity, Capital Productivity), by Industry, 1948–66**

Sector	Output	Total Factor Productivity	Output per Unit of Labor	Output per Unit of Capital
Manufacturing	4.3	2.5	2.9	0.8
Nondurable goods	3.8	2.6	3.2	0.7
food (excluding beverages)	3.1	3.0	3.4	1.8
beverages	2.7	2.2	2.9	1.0
tobacco	1.9	1.1	2.7	−0.1
textiles	2.8	4.0	4.3	2.7
apparel	3.1	1.9	2.2	−0.9
paper and paper products	5.0	2.5	3.0	1.0
printing	4.1	2.7	2.7	1.8
chemicals	8.2	4.9	6.0	2.8
petroleum refining	4.1	3.0	5.5	1.0
rubber products	7.2	3.9	4.0	3.3
leather products	1.2	1.7	1.7	1.0
Durable goods	4.7	2.4	2.8	0.3
lumber	2.3	3.5	3.9	0.3
furniture	4.3	2.9	2.9	2.7
stone, clay, and glass	3.9	2.4	3.2	−0.2
primary metal products	2.5	1.6	2.1	−0.7
fabricated metals	3.9	1.9	2.2	−0.3
machinery (excluding electric)	4.8	2.6	2.7	1.9
electric machinery	8.0	3.7	4.1	1.5
transportation equipment	6.7	3.2	3.2	1.5
instruments	7.0	2.9	3.7	−0.7
miscellaneous manufactures	4.0	3.5	4.0	0.6
Mining	2.1	4.2	4.6	2.9
Metal	2.0	2.4	2.9	−0.4
Coal	−1.3	5.2	5.8	0.4
Crude oil and natural gas	2.9	3.2	2.3	5.4
Nonmetallic mining and quarrying	4.6	2.6	3.2	−0.2
Contract construction	3.1	1.5	2.0	−3.8
Transportation	2.3	3.4	3.7	0.6
Railroads	0.6	5.2	5.8	0.6
Intercity bus	0.0	n.a.	1.5	n.a.
Intercity trucking	8.5	n.a.	3.1	n.a.
Waterways	0.2	0.5	0.7	−2.1
Air transport	14.6	8.0	8.2	6.1
Pipelines	6.0	n.a.	9.1	n.a.
Communications and public utilities	7.1	4.0	5.8	1.2
Communications	7.0	3.8	5.5	0.7
Electric, gas and sanitary services	7.1	3.9	6.1	1.5

Source: John W. Kendrick, assisted by Maude R. Pech, *Postwar Productivity Trends in the United States, 1948–1969*, National Bureau of Economic Research, General Series, No. 98 (New York: National Bureau of Economic Research, 1973), tables 5.1, 5.5, and 5.6.
n.a.—not available.

omy. Anne P. Carter (1970) analyzed the structure of the American economy in 1961 and showed how input requirements would have differed if the bundle of final goods and services actually purchased in 1961 had been produced with the technology of the American economy as it was in 1958, 1947, or 1939. For the period 1939–1961 her figures indicate that the total requirement of labor inputs needed to produce the 1961 output was falling at a rate of 2.4 percent annually. The capital required to produce the 1961 output was also falling, at a rate of 1.2 percent annually. These changes were accompanied by a very slight increase in the total bundle of intermediate goods needed to produce the 1961 output. Thus, technological progress tended to involve the substitution of intermediate commodities for inputs of *both* capital and labor. Labor was becoming more expensive and capital no cheaper, and so producers economized on these costly primary inputs by using relatively more of the cheaper inputs of intermediate goods and services. Another part of the story was that some producing establishments were growing specialized, buying inputs of goods and services from outside suppliers rather than making them in-house.[24]

While inputs of intermediate goods were growing slightly more important overall, rapid changes were taking place in requirements for particular intermediates. From the thirty-eight sectors included in Carter's study, table 7.23 presents the ten intermediate inputs with the most rapidly growing requirements and the ten with the most rapidly shrinking requirements. The annual rate of change in these requirements from 1939–61 is shown. The list indicates the changes in sources of power (electricity for coal) and means of transportation (highways and aircraft for railroads) that were taking place in those years, as well as such materials substitutions as plastics (included in the chemicals sector) for wood and steel. Inputs of communications increased rapidly because of the increasing specialization of individual production units in the economy as well as the cheapening of communication. And the rising inputs of instruments used for measurement and control reflects what we popularly call "automation."[25]

7.5.4 Profits

Profits play a vital role in allocating resources in our economy and in signaling the performance of individual sectors, as well as in determining the distribution of income. The accounting profit that a company reports actually may contain components that differ widely in economic significance. Profit includes the supply price of equity capital—what each sector must pay to bid for its portion of the nation's equity funds. Profit includes windfalls—unexpected gains or losses that occur because economic conditions turned out differently from what people expected. Finally, profit may contain elements of pure surplus or rent—monopoly rents earned by an industry when new competitors are somehow pre-

Table 7.23 **Intermediate-Good Sectors of the American Economy Experiencing the Largest Increases and Decreases in Unit Input Requirements by Their Users, 1939–61**

Sector	Annual Rate of Change of Requirements
Largest Increases	
Aircraft	5.5%
Electric and gas utilities	3.4
Communications	3.1
Scientific and professional instruments, cameras, etc.	3.0
Electrical and service equipment	2.6
Nonelectrical machinery and equipment	2.4
Wholesale and retail trade	2.1
Automobile repair	2.0
Chemicals, synthetic materials, drugs, paint	1.9
Engines and turbines	1.8
Largest Decreases	
Coal mining	−4.5%
Construction	−3.2
Nonferrous metal mining	−2.1
Iron and steel	−1.9
Iron mining	−1.7
Leather and shoes	−1.7
Agriculture, forestry, and fishing	−1.5
Wood and wood products	−1.1
Scrap materials	−0.8
Trains, ships	−0.6

Source: Anne P. Carter, *Structural Change in the American Economy* (Cambridge: Harvard University Press, 1970), p. 39.

vented from entering, or efficiency rents that can accrue to individual firms that happen to be more productive than their competitors. Identifying these components in actual profit figures is a complex and controversial problem of analysis, but most economists agree on two propositions. (1) Profits do perform their function of signaling that resources should be shifted from one sector to another: when demand rises, for example, a sector's profits rise, existing firms expand their output, new firms enter, and the inflated profit rate is competed down. (2) Persistent lumps of monopoly profit arise captured in industries with few sellers who are protected by entry barriers from new entrants. Which of the sources of entry barriers are "unnatural" and call for intervention by public policy is the issue on which there is considerable disagreement.[26] Some economists have tried to measure the real cost of monopoly to the American economy (which is not the same thing as monopoly profit). Most studies report costs that are less than one percent of gross

national product, although some have argued for higher numbers (cf. Harberger 1954 and Kamerschen 1966).

Most of the research that economists have done on the profit rates of industries and companies has been designed to test hypotheses about sources of inefficiency or of monopoly in American industry. However contentious may be the debates over these tests, there is no evidence that the results are changing over time. As far as we can tell, the structures of markets and characteristics of firms that produced good (or bad) economic performance three decades ago still do so today. There is a good deal of interest, however, in the levels of companies' profits and their trends over time. This is a complex question because the familiar nominal measures of profits are not the same thing as the economic rate of return on the assets of America's corporations. Table 7.24 shows two measures of nominal profits for all manufacturing corporations—the ratio of profits after income taxes to stockholders' equity and the ratio of profits after income taxes to total sales. A simple average of the annual rates of profit on stockholders' equity for the thirty-two years covered in the table is 11.9 percent. Similarly, profits on sales averaged 5.0 cents on the dollar. Both series fluctuate with the business cycle, but neither shows a clear trend.

These conventional figures do an increasingly poor job of representing a real rate of return on the assets held by United States corporations. Inflation is the main source of distortion, and so nominal profits lately have diverged sharply from a measure of real rates of return. One source of distortion arises because the replacement cost of the wear and tear on its capital equipment must be subtracted from a company's revenues before we can measure its rate of return. Depreciation allowances, which fill this function in the calculation of nominal profits, fail to recognize that inflation may elevate the replacement cost of real corporate assets sharply above their historical cost; in addition, reported depreciation allowances are heavily influenced by tax considerations. A second and similar source of distortion lies in the fact that the real cost of the materials that a company uses from its inventories is the cost of replacing them, whereas nominal profit figures often reflect materials costs at the time the company put the materials into its inventory. (The company makes a capital gain when the price of materials rises. But that is not the same thing as a real return on its capital, and it supplies no incentive for any more capital formation.) Finally, nominal profits fail to reflect the capital losses that companies suffer when the nominal dollars in their balances of cash (and similar assets) depreciate through inflation. The right-hand column of table 7.24 presents a rate of return on the assets of all nonfinancial corporations that is corrected for all three of these distortions. This column cannot be compared directly to the other two,

Table 7.24 **Selected Data on Nominal Profit Rates and Real Rates of Return on Corporate Assets, 1947–78 (Percentages)**

Year	Manufacturing Corporations		All Corporations
	Profits after Income Taxes Divided by Stockholders' Equity	Profits after Taxes Divided by Total Sales	Income Accruing to Capital Divided by Total Capital (Adjusted for Inflation)
	(1)	(2)	(3)
1947	15.6%	6.7%	4.1%
1948	16.0	7.0	6.9
1949	11.6	5.8	7.5
1950	15.4	7.1	6.4
1951	12.1	4.8	4.7
1952	10.3	4.3	5.3
1953	10.5	4.3	4.8
1954	9.9	4.5	5.3
1955	12.6	5.4	6.7
1956	12.3	5.3	5.4
1957	10.9	4.8	4.8
1958	8.6	4.2	4.3
1959	10.4	4.8	5.7
1960	9.2	4.4	5.4
1961	8.9	4.3	5.3
1962	9.8	4.5	6.5
1963	10.3	4.7	6.9
1964	11.6	5.2	7.9
1965	13.0	5.6	8.6
1966	13.4	5.6	8.5
1967	11.7	5.0	7.7
1968	12.1	5.1	7.0
1969	11.5	4.8	6.0
1970	9.3	4.0	4.8
1971	9.7	4.1	5.2
1972	10.6	4.3	5.9
1973	12.8	4.7	5.3
1974	14.9[a]	5.5[a]	3.3
1975	11.6	4.6	4.3
1976	13.9	5.4	4.8
1977	14.2	5.3	4.9
1978	14.6[b]	5.3[b]	4.6

Sources: Columns 1 and 2—*Economic Report of the President, 1979* (Washington, D.C.: Government Printing Office, 1979), table B–83. Column 3—data provided by Patrick J. Corcoran, Federal Reserve Bank of New York, as described in his article "Inflation, Taxes, and Corporate Investment Incentives," *Federal Reserve Bank of New York Quarterly Review*, Autumn 1977, pp. 1–10.

[a]Data from 1974 on are not fully comparable to those for earlier years.

[b]Provisional figure based on first three quarters.

which pertain only to manufacturing corporations and only to profits on equity capital. Nonetheless, it is safe to conclude that the rising trend in nominal profit rates in recent years is not an accurate reflection of real rates of return, which in the 1970s have lain below their peak in the mid-1960s. Many explanations for this decline in the real rate have been suggested, but no consensus has been reached.

7.6 Summary: Major Trends in Structure and Performance

The structure of industry has not been an area of revolutionary change in the postwar American economy. The mixture of industries and companies that make up our economy does not alter much from year to year. Nonetheless, this survey has uncovered some trends, most of them proceeding at a measured pace, that may have important implications in the long run:

1. Economic activity continues to shift away from the primary and manufacturing sectors and into most service industries and the public sector. Activity within manufacturing has shifted toward the high-technology sectors and those making capital goods and synthetic materials.
2. Economic activity has shifted away from the investor-owned sector subject only to general regulation by the government and into closely regulated, nonprofit, and government-enterprise sectors.
3. In the nonfinancial sector a long-term trend has continued toward the concentration of the assets of nonfinancial corporations in the hands of the largest corporations. This trend stretches back to the 1920s (and probably earlier). It has proceeded rapidly since World War II, especially in the manufacturing sector, but it has not been accelerating lately.
4. The increasing diversification of the largest enterprises is surely a major factor explaining the concentration of assets in the hands of the largest companies, although the merger waves of the 1960s and 1970s have not much affected the proportional importance of the 100 or 200 largest nonfinancial companies.
5. About 16 percent of the assets of United States nonfinancial corporations are now located abroad, and more and more of our larger companies are multinational. Although data are not readily available, it is clear that foreign multinationals have similarly grown more numerous on American soil, and competitive processes in many industries would appear to be growing more international in scope.
6. Whatever one makes of the increased concentration and diversification of the largest enterprises, the population of smaller companies has not been drying up; the population of companies continues to grow faster than the human population.
7. The concentration of sellers in individual markets in manufacturing has shown no trend over the twentieth century as a whole, although

there has been a slight increase since World War II. This average pattern masks a postwar decline in concentration in producer-goods industries and an increase in consumer goods, especially industries selling heavily advertised products.

8. Sales-promotion outlays are a no larger proportion of total industrial sales now than in the 1930s, but the mix of advertising media has shifted toward television and away from other media.

9. Research and development outlays of United States manufacturing, 3 to 4 percent of sales by those companies performing research and development, have dropped proportionally by about one-third since the mid-1960s.

10. The real rate of return to the assets of United States nonfinancial corporations, which averaged 5.8 percent since World War II, was one-third lower in the 1970s than it was during the 1960s.

Notes

1. The regulated sectors are taken to be transportation, public utilities (electricity, gas, communication), banking, and insurance carriers. The intensity with which they are regulated in fact varies a good deal, both between and within these sectors. Insurance, for example, may not on average be regulated more than agriculture. We must recognize that all sectors of the economy are regulated in terms of such factors as their effects on the environment or the health and safety of their employees. All are subject to laws that enforce contracts, define property rights, and prevent violence and fraud. By "unregulated" we mean that their conduct in the marketplace is regulated only by general laws that prevent artificial restrictions on competition (the "antitrust laws").

2. This is the case because the assets of financial corporations are to a significant extent the liabilities (bonds, common shares, liabilities to banks) of the nonfinancial companies; to compare the sizes of financial and nonfinancial companies is thus, in a sense, to double-count.

3. The same conclusions would be reached if we considered the largest 200 rather than the largest 50 companies.

4. Before 1973 the Federal Trade Commission allowed companies to report their international assets in whatever way they wished. Some reported as a corporate asset only their net equity in their foreign subsidiaries, while others consolidated their subsidiaries and thus reported all their subsidiaries' assets. Prof. J. Fred Weston's procedure, which is described in this text, attempts to include all foreign-subsidiary assets on a consolidated or gross basis.

5. For a formal statement of the relation between measures of concentration and economic welfare, see Dansby and Willig (1979).

6. A brilliant qualitative description of the evolution of the modern large company is provided by Chandler (1977).

7. F. M. Scherer (1980, p. 68) calculated these figures from Census of Manufactures data for the years in question.

8. Scherer's data came originally from U.S. Bureau of the Census (1975).

9. Shepherd (1964, table 2). In calculating his average, Shepherd used industry shipments as a weight rather than value added. The 1947 figure is probably atypically low due to the state of the economy immediately after World War II. Compare table 7.7 of this text.

10. This pattern is not apparent among the industries serving a mixture of households and business buyers, but the number of industries involved here is very small.

11. The count of increases and decreases depends on our choice of decile blocks for defining when an industry's concentration is unchanged. A different choice of blocks would change the details of our conclusions but not the general picture.

12. Buyer concentration may typically be low, but its level can nonetheless make a difference for the performance of markets. See Guth, Schwartz, and Whitcomb (1976).

13. The distribution of plants per company for the four largest companies is subject to some inaccuracy because of the form in which the Bureau of the Census publishes the underlying data. The resulting errors should not bias the distribution as a whole up or down, but they may cause a few industries to be misclassified.

14. Each industry's diversification percentage is weighted by the total sales of companies allocated to it.

15. The statistical measure of "base industry" is that underlying table 7.17; the manufacturing sector we mentioned for illustration is divided into 115 industries.

16. Compare Chandler (1962, concluding chapter) and Stigler (1951).

17. Between the beginning of 1971 and the beginning of 1978 the book value of direct investment in the United States grew by 157 percent, that of United States direct investment abroad only 97 percent. At the latter date, however, foreign investment in the United States was still only 23 percent of United States investment abroad (U.S. Bureau of the Census, 1978, pp. 856, 866).

18. These propositions have been tested statistically. See, for example, Pugel (1978, chap. 4).

19. The field is well summarized in Scherer (1980). For a brief account, see Caves (1977).

20. For a recent survey of the economic issues, see Comanor and Wilson (1979).

21. Caves, Porter, and Spence (1980, chap. 6). Porter's sources of data were: Neil Borden, *The Economic Effects of Advertising* (Chicago: Richard D. Irwin, 1942), pp. 62, 442; and United States Internal Revenue Service, *Sourcebook of the Statistics of Income* (Washington, D.C.: IRS 1965).

22. Calculated from National Science Foundation (1978, table B–1). For more information, see chapter 8 of this volume, by Edwin Mansfield.

23. This research is summarized by Kamien and Schwartz (1975, esp. pp. 15–19).

24. Carter (1970, pp. 33–44). The calculated rate of change for the capital inputs is based on the period 1939–1958 rather than 1939–1961.

25. The inputs discussed here and in table 7.23 are only current inputs and do not reflect the capital goods also supplied by some of these sectors. Although changing input requirements have been important for explaining differing rates of output growth among United States industries, we should note that changes in the composition of final demand have apparently been still more important. See Vaccara and Simon (1968, pp. 19–58).

26. A survey of the controversy over profits, monopoly, and efficiency is provided in Goldschmid et al. (1974, chaps. 2, 4).

2. *Walter B. Wriston*

From the Hall of Mirrors to the Floppy Disk

Public policy in a democracy results from the complex interaction of what people think an economic and political system should be and what they believe it to be at the moment. It is the disparity between what they conceive of as the "ideal" and what they perceive as "real" that fuels the engine of social change. Both concepts, the ideal and the real, have always been influenced by the products of the pamphleteer or his equivalent, which nowadays may range from the studies of a respected think tank to the lines and lyrics of a rock song at a Jane Fonda rally.

The difference between then and now is that the incendiary words of Thomas Paine were read by a few hundred people, but the staged television demonstration at a nuclear plant enters fifty million living rooms on the seven o'clock news with devastating effect.

The impact of this continuous flow of facts, fiction, data, information, and misinformation has had a profound effect on American society in general and on business in particular. We have become the first human society to live in a state of what George Gallup has called "a continuous audit."

In this age of unlimited data proliferation, it is now always possible to look back and find a piece of data somewhere in the memory banks to "prove" that somebody "knew" something years ago and failed to act upon this information responsibly in violation of some law or regulation. As long as the trail is wide and long and prolix, which the computer assures it will be, commentators, lawyers and regulators can dig through a billion pieces of paper, or their electronic equivalents, as they are currently doing in the IBM and American Telephone and Telegraph antitrust suits, until it becomes statistically inevitable that any given proposition can be "proved" after the fact. There is always a piece of data that can be produced and, taken by itself and in hindsight, used to prove that the manager or policy-maker has committed an inexcusable oversight.

This data may range from the presence of a Russian brigade in Cuba that appears and reappears like the Cheshire cat sitting on an international limb, to a loan or investment that goes bad, thereby proving to the critics that it should never have been made in the first place. This continuous audit cannot fail to have a significant and inhibiting effect on the way we conduct our affairs.

Just as we find it increasingly hard to determine *when* we know something, so we also find it harder to determine *what* we know. The line

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between "information" and the "real" things about which we need to be informed, in Professor Caves's phrase, has become blurred. Indeed it can be argued that the importance of the legal and regulatory paper trail has made the manual of procedure more important than the act itself. We resemble the French in the line uttered by Professor Higgins in *My Fair Lady*: "the French don't care what you do, actually, so long as you pronounce it properly." We have become so entranced with pronouncing it properly in our electronic data that we sometimes forget what it is we are trying to do. The production of statistics has become an end in itself.

It might add to our perspective a bit if we reminded ourselves of where we got this word "statistics" in the first place. It was given to us by a Scottish gentleman named Sir John Sinclair, who imported it from Germany in 1791 and used it in the title of his book, *A Statistical Account of Scotland*. The German term, he tells us in his preface, did not quite describe his own purposes, because, whereas he himself was interested in "the quantum of happiness enjoyed by the inhabitants and the means of its improvement," in Germany the word was confined to matters concerning the political strength of the state. A case can be made that the original German concept of statistics is now working its way into our country on the back of the technologically driven data explosion.

Underlying the whole process is, of course, the revolution that began with the first electronic computer in 1946—a computer that belonged, by the way, to the Ordnance Corps of the United States Army. Every item in an inventory today leaves a paper trail and an electronic trail —of research, development, design, manufacture, distribution, marketing, and accounting. And we find the laws and regulations concerned more with assuring a clearly marked trail, than with the final results. A single number, which appears to be finite, is itself the end result of many guesses and can be—and often is—communicated worldwide in minutes. We have reached the point where the statistics of the GNP, or the composite index of leading indicators, when released, can cause a major rally or slump on Wall Street.

In this situation, the index is not a statistical report about what is happening in the world: publication of the statistic *is* the happening, even though the probability is that the number will be revised in a few weeks. No business executive prior to the Second World War had to live in such an environment.

Governments have fared no better. There is an old adage that "what you don't know can't hurt you." That would be a precarious rule to follow; nevertheless, there is more than a little truth in the remark of a former British Chancellor of the Exchequer that there was no balance of payments problem in the nineteenth century because there were no balance of payments statistics. In fact, nobody ever attempted to work

out the statistic before the 1930s. The old-time policy-makers only dimly realized that it might theoretically exist. They looked instead to the movement of gold reserves, and if this was creating a problem, it was usually something that could at least wait until after lunch.

Today, any government in the world that announces a change in its fiscal or monetary policies can find out in a matter of minutes what the world thinks of the development by watching the cross-rate on their currency, which alters almost instantly in the currency markets in London, Zurich, or Tokyo. The old gold exchange standard of yesterday has in fact been replaced by the electronic information system of today, which can be more or less harsh than the gold standard, but in the end is just as sure and just as certain.

The incessant production of new data and its instantaneous communication throughout the world thus creates a paradox: information, which we have always viewed as the thing that eliminates uncertainty, now increases everybody's feeling of insecurity because of the failure to convert data into knowledge.

There is an insatiable demand, both in public opinion and in the halls of government, to "get things under control." If we subjected our health to the same process, we would take our blood pressure every hour. This drumbeat of data could lead us to the conclusion that we seem to be very sick men and women, when in fact we are only measuring the normal rhythm of life.

The resulting hypochondria is providing a ready market for the peddlers of miracle cures in bottles of all shapes and sizes. What they have in common is almost always a label that reads: "To be taken with large doses of government intervention."

The power of the computer has made possible a flow of data about any perceived "problem" which must then be "solved" by legislation or regulation. We have now reached the level of legal sophistication where it is probable that each of us is now in violation of some law or regulation—we just don't have enough time and money to find out which ones. This state of affairs gives a prosecutor the selective power to accuse anyone of violation of law, usually on page one of the newspapers.

Since a new set of numbers is always being produced somewhere in the world, it is only a matter of time before a law or regulation appears requiring their publication regardless of their utility. Under the banner of protecting the small investor, the SEC now requires reams of data that are so comprehensive that no small investor could possibly get anything out of them. It is clear, upon reflection, that the requirement to produce these data is part of an effort to control the governance of American business, rather than any concern to protect the small investor.

The mere production of all this data affects business decisions no less

than government policy: in fact, they feed on each other. Thousands of pages of data are regularly produced with an eye solely to influencing a possible business decision or a government policy and are instantly communicated all over the world in order to measure the reaction. All of this is done without a brick being laid or a dollar changing hands.

This chain of events is pushing business back to an old discredited form of economic policy, which has now been dressed up in new mod fashions which appeal to some modern business managers. It has been packaged most attractively by the president of the United States, who has referred to it in a State of the Union address as a partnership between government, business, and labor.

For such a partnership to exist, we would have to adopt the view that business has become a separate class with separate interests which are independent of the interests of its owners and its employees. We would also have to accept the proposition that the almost three million workers in the Federal government are no longer the servants of the citizens as envisioned by our Constitution, but that they, in effect, also have become a separate estate with interests distinguishable from those of the people whom they are elected or appointed to serve.

Once one swallows that premise, the popular argument that there has been a separation of ownership and management of the American corporation logically follows. This, in turn, may be used to make the argument that the corporation has a life of its own, independent of its owners and their interests, and doubt is thus cast upon the corporation's legitimacy. Data may then be produced to show to the prosecutor's satisfaction that corporate power to influence output, employment, and the income of millions of Americans is growing year by year. The historical justification for private ownership of the means of production, namely that it would produce, via the force of competition in the marketplace, the highest social product, appears to have been undermined. The length of the road we have come can be measured by two incidents. The flap caused in 1953 by the misquotation of Charlie Wilson allegedly saying what was good for General Motors is good for America, has now been enshrined as public policy by the 96th Congress for Chrysler Corporation.

Private ownership has become so subverted that the employees—including the professional managers—have in effect become wards of the state. Indeed the bailout of Chrysler Corporation by the Federal government is a denial of the right of private owners to fail, which follows logically the denial of the right to succeed. If all this is accepted, it becomes clear that so-called excess earnings are now justifiably claimed by government. The chain is complete in which the government has transferred the wealth of savers and equity holders to others in our

society. Since markets cannot be fooled over time, this massive income transfer is reflected by the fact that the real rate of return on the Standard and Poors common-stock index has been negative since 1967.

The litany of what we have done to effect this transfer of wealth from the saver to the spender would make Colbert green with envy. Dean Mecking of Rochester put it this way: "It includes what products can be marketed, how they can be advertised, what the terms of sales can be, who can be hired, what kinds of working conditions must be provided, what kind of fringe benefits are allowed, how land can be used, what financial reports must contain, who can be on the board of directors, whether plants can be closed, whether production lines can be altered and whether new production techniques can be introduced."

All this adds up to a kind of modern mercantilism in electronic clothing which is packaged as "partnership." However flattering this "partnership" role might seem to the businessman, and it is very attractive to some, there are at least two things wrong with it. First of all, it contradicts the basic American principle that our society is a collection of individuals, not institutions, and that the basis of our political liberty is individual liberty. Carried to its logical conclusion, this view of society must ultimately replace the idea of the individual as the center of our society with the notion of the *standestaat*. The second thing wrong with the partnership concept is that, to the extent that it succeeds, it will be an economic disaster. It replaces economic competition among various entities with political competition. It creates an environment in which a corporation's well-being depends less and less on its ability to produce a saleable product or service and more and more on its ability to secure a favorable interpretation of some obscure subparagraph in the Federal Register.

Corporations are the economic agents of the people just as surely as governments are their political agents. The failure to preserve this distinction between the proper role of economic agents and political authorities threatens to politicize all economic decision-making. To the extent this occurs, it will, and in fact already has begun to, impair fundamentally the capacity of the business system to provide jobs and raise productivity. Once the economic marketplace is replaced by the political process, what Franklin Roosevelt called the "great arsenal of democracy" will be replaced by a shrinking pie with special-interest political groups fighting over their share. The state will become the receiver in bankruptcy of impotent individual responsibility.

In the short run, some corporate managers are tempted to participate in the political game to curry favor, and many have done so in the belief their enterprises' survival depends on it. But the longer term result of this business/political strategy is to bring all decisions concerning output, employment, and resources allocation to Washington. Once this is

achieved, one of the most powerful effects of the resulting flood of regulations and laws and publicity is to create a powerful incentive for us all to avoid risk of any kind. Indeed, risk has already become the regulators' new four-letter word, and is now used as a pejorative, as in risky policy or risky investment even though these phrases are redundant. This process tends to nullify the capital value of organizations designed to make economic decisions on economic grounds. Although there are undoubtedly many reasons for the significant decline in the real market value of American corporations, this phenomenon surely has to rank as one of the most important.

We have revived Colbert's ancient and disastrous "system of restraint and regulation" with an efficiency beyond anything he could have dreamed or imagined. Today it is even more dangerous because we have something Colbert lacked. We have computerized data. The combination of mercantilist ideas with the torrents of information that now inundate American society may be a greater threat to the survival of our system of democratic capitalism than the Great Depression or the Second World War.

Oliver Wendell Holmes once remarked that there are times when "we need education in the obvious more than investigation of the obscure." What needs to be made obvious today is that the solutions concocted by Colbert and Louis XIV will not work any better among the computer banks than they did in the Hall of Mirrors in Versailles.

3. *James R. Schlesinger*

Whither American Industry?

Dramatic changes have taken place both in the position and structure of American industry in the years since World War II. Despite substantial strides in technology and in productivity, there has been a general erosion of the once preeminent position of American industry, which had emerged from World War II with perhaps 60 percent of the world's manufacturing capacity. Some of that relative slippage was both inevitable and desirable with the sought-for revival of other nations, now both competitors and partners, which had suffered a general flattening of industry in the course of the war. By the later 1960s, changed motivations, attitudes, and expectations, combined with the burden of the Vietnam War, the environmental movement, and the course of new

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social and economic programs—embodied, for example, in the Great Society—accelerated the trend towards a more rapid erosion of the position of American industry. By 1980 it had become apparent to all but the most quixotic observers that something more fundamental was wrong with the performance of American industry than could be explained by some mechanism like gap-narrowing or catch-up.

From its elevated position as model for the entire world, American industry had gradually slipped so that some segments (such as steel) were regarded as basket cases, while much of industry, if not yet in the category of basket cases, could only be regarded as having lost entrepreneurial initiative and no longer in the forefront of industrial development. This slippage was, of course, reflected in comparative productivity as well as in a relative drop in income per head. By the later 1970s, the decline of America's industrial fortunes, marked by the virtual cessation of productivity growth and a weakened ability to compete internationally, had become an object of concern to our competitors and industrial allies, who gradually came to fear that neither the American position of international leadership nor the performance of the international economy could be sustained in the absence of more vigorous performance by American industry.

In reviewing dramatic changes, we should also note the truly astonishing alteration in the climate of opinion. In the closing years of the war and the early postwar years, the prevailing expectation was that postwar economic trends would—in the absence of sustaining activity by governments—revert to the conditions of the 1930s. Such expectations were reflected at Bretton Woods and elsewhere. The prevailing wisdom was that a combination of employment policy and exchange rate adjustments would sustain a tolerable level of economic activity and maintain some modest economic growth.

All of this has changed dramatically. Rather than the feeble economic performance that was expected, the postwar period was characterized by an astonishing explosion, marked by an unbelievable expansion of international trade and investment that led to rapid increases in economic activity and standards of living throughout the industrial world. To some extent that explosion depended upon certain noneconomic factors. The paramount position of the United States provided a degree of security for international trade and investment, a corollary of the Pax Americana. The availability of cheap and abundant energy, rapidly exploited by the flow of international investment, permitted rapid industrialization and the significant diminution in backbreaking human labor.

Nonetheless, the change in perspective is still striking. The prevailing view of a declining marginal efficiency of investment has happily proved to be absurdly wrong. Perhaps most significant of all, the concept of a closed economy, even for the United States, has had an increasingly

fall-off sound. Policies can no longer be *prudently* pursued on the expectation that international repercussions will be minimal. Moreover, there is substantial reason to doubt whether the very self-equilibrating mechanisms on which we have counted to sustain the international financial system can effectively operate given the explosion of oil prices, the limitations on oil production, and the consequences that have flowed from those developments. Increasingly, achieving balance in international trade, investment, and finance will require mechanisms which we have, as yet, not devised. The defectiveness of self-equilibrating mechanisms in this area of special concern is a far cry from the prevailing faith at Bretton Woods that a satisfactory outcome could be attained through the manipulation of government employment policy and exchange rates.

A large proportion of the economists of the 1940s would scarcely recognize this postwar world. Yet, I suspect that Schumpeter would have done so. With his abiding faith in the *inherent* vigor of the unfettered enterprise system, he would not have been too surprised by the explosive growth we have experienced in the last generation. His concern lay in the long-run smothering effect, stemming from attitudes and institutions which economic prosperity itself tended to foster. The objective performance of the economy provided little protection against the host of critics, who by their ill-conceived actions would sap the motivations and alter the interpretation of reality in a way that would ultimately hobble economic performance.

Neither would Schumpeter have been surprised by the difficulties that we have encountered since the middle 1960s, nor by the flow of superficial and destructive commentary that has marked our political life. Certainly the role of "intellectuals"—reflected, for example in the post-Vietnam, post-Watergate press—would have appeared to him as the chief pitfall lying in the path of necessary economic adjustment and of economic progress. Although we may not yet have reached "capitalism in the oxygen tent"—his abiding fear—the vital signs of the American economic organism are now flickering.

I am, of course, hesitant to introduce into the sanctum of quantitative economics, that is the National Bureau, a view that places principal emphasis upon the sociological setting in which business operates. Yet I see no recourse, for I believe Schumpeter was correct, that the ultimate driving force in this and other industrial societies is the overall culture in which business operates and which it simultaneously reflects and forms.

Of course, I could go back even further to the Adam Smith of *The Theory of Moral Sentiments* (not *The Wealth of Nations*) to underscore a point far better understood by our British brethren: that economic performance in the enterprise economy is not simply the product of a system of self-serving individualistic exchanges among amoral economic

men, but rather is something shaped in a larger moral and social context. A free economy, to be acceptable to the participants, must be based upon a set of social habits, motivations, and educated and *socially constrained self-interest*—in short, a set of (normally) accepted social norms and obligations. Otherwise, it will provide justification for Leviathan.

A set of habits perfectly satisfactory in one period, if they become ingrained, may prove to be hollow and pernicious in the next period. Thus to understand the performance of American industry one must examine the overall social context and how it has influenced business motivations. It is this that will determine the evolving position and structure of industry, which Professor Caves has so admirably delineated in his paper. In order to understand this larger culture, one must cast one's net over a broader area than American industry alone. One must examine areas that other speakers will comment on. In particular, one must examine the changing social environment, as it is so heavily influenced by government, as well as the broader international setting that helps determine the range of activities in which American industry can profitably operate.

In the sixties and seventies, American society underwent a set of external shocks and adjustment of internal values that led to the *systematic* weakening of the social order. Over the past two decades, two debilitating trends, somewhat inconsistent, could be observed. These were: a steady rise in the services that the public demands the government perform, and a steady decline in the authority of government.

The business community has rightly questioned the first trend, but it has frequently fostered and exploited the second. Yet, in the long run, the business community will suffer more than most from weakened governmental authority. Like the Irish of old, an attitude of being "agin' the Government," irrespective of function, is surprisingly commonplace among businessmen. Ultimately, however, only government, limited to its proper sphere, can provide the firm social structure in which business can flourish and satisfactory economic performance be attained. No doubt government, driven by public demands and by faulty analysis, has been a principal offender. Yet the business community appropriately should regard the government not as rival but as shield.

Consider the following phenomena:

1. Government, in pursuit of such ends as the equitable distribution of income, the stimulation of purchasing power, and a higher "marginal propensity to consume," has diminished incentives for and reduced the pace of capital formation in the American society substantially below that existing in comparable industrial societies. It has simultaneously imposed upon business such social goals (and economic burdens) as aiding the handicapped, equal employment opportunity, hiring the hard-core unemployed, cleaning up the environment, and eliminating risks to health and safety. In short, business under the purview of government

is to be the vehicle for achieving a just society. It has thereby created a regulatory maze embodying risks that require a higher rate of return to elicit the investment of capital. In short, it has gone a considerable way along the path of killing the goose that lays the golden eggs.

2. Social discipline, properly a major concern of government, has deteriorated. Despite the spread of universal education and the increasing number of high school graduates, it is now necessary for business concerns in some urban areas to teach employees with high school degrees how to count and how to read. Relative to (say) the Japanese, enough American employees are mellow, "laid back," or worse that production and quality control suffer.

3. The post-Watergate, post-Vietnam political framework in the United States has suffered considerable damage. The presidency has been weakened, so that it must devote massive effort and political resources (i.e., side-payments) to attain its necessary goals in foreign policy, not to speak of domestic policy. Social programs have acquired a life of their own beyond the capacity (or perhaps the desire) of the executive branch to control. Discipline within the Congress has broken down. Responding to their own constituencies, the members are less inclined to follow the leadership. Congressional committees, given a weakened executive branch, can reach through to executive branch agencies to achieve objectives, either parochial or emotional, not necessarily in the general interest.

4. Leading businessmen have simultaneously been tantalized, repelled, and enticed by the political process. Enormous energies are devoted by CEO's and others to serial visits to Ways and Means or Finance Committee members, meetings at agencies, and consultations with presidential assistants. From a social standpoint, if not a corporate standpoint, there is unquestionably better use that can be made of that time.

5. The burden seems particularly heavy for those firms—such as steel and automobile producers—under severe pressure either from foreign competition or from regulation. Their time might better be invested in design, production, and marketing. To cite the extreme case, Chrysler's executives' efforts have been diverted from the internal management decisions necessary to salvage the company (if possible) to the political game. At the other end of the spectrum, firms that are especially prosperous, such as oil, are under continued pressure to justify their prosperity. Firms at intermediate points on the spectrum do not suffer such a degree of diversion or harassment. Nonetheless, the upshot is clear: most firms will find it far easier to strike a gusher in Washington than to pursue ordinary production activities.

6. Among traditional bellwethers of American industry, the ability to anticipate the future has not been spectacularly good. The handwriting has been on the wall, at least since 1973, for the mass market for the

heavy, high-acceleration automobile. Yet, without government prodding, the United States industry's general inclination has been to leave the market for fuel-efficient vehicles to its foreign competitors. The consequences are now quite distressing.

In general, there has been limited effort in strategic investment in creating new capabilities and new markets—for example, in creating an effective organization to market abroad. This may reflect that, aside from speeches, government has given precious little support to such activities.

7. Almost alone amongst major industrial nations, the United States government takes a suspicious attitude toward business activities, even those that involve foreign sales. Japan, Incorporated, may be a polar case, but almost all socialist governments have a decent regard for the ability of their firms to produce competitively and sell overseas—for balance of payments reasons. In the relations between the United States government and business, the appropriate balance of cooperation and review has been singularly absent. In the United States the prevailing relationship is one of mutual suspicion, recrimination, and unwarranted harassment. Perhaps these attitudes could somehow be justified when the American economy was preponderant and the balance of payments and strength of the dollar not a source of daily concern. These attitudes can be justified no longer. They have become socially pernicious.

8. In the post-Vietnam world, the United States, under public pressure, has become neglectful of the foreign policy and national security requirements indispensable for the preservation of the existing international economic order. Pax Americana may be finished. Nonetheless, there is a minimum requirement for adequate security and avoidance of basic instabilities if international trade and investment are to flourish. Today, given the obvious risks to energy supplies in the Middle East, the vital interests of the United States and the free world are under threat to a degree that we have not known since World War II.

These are serious and disturbing problems. The economic agenda for the next decade must handle these in a satisfactory way if the enterprise system, indeed free societies, are to survive.

To be concrete, how do these burdens affect the performance and the structure of American industry? Let me cite a few examples from my own governmental experience. In 1973, after the close of the Middle Eastern war, I sought ways to substantially increase tank production. Inventory drawdowns had been sizable, and the lesson of the war was the high prospective rate of attrition in combat. Congress was more lenient with funds, yet I discovered that there was an intractable bottleneck. Much of American foundry capacity, which had been marginal, had been forced to close because of low profitability and the high cost of compliance with the new environmental regulations. For turrets we had to turn to foreign supplies.

No greater change from World War II could be imagined: the great Arsenal of Democracy without foundry capacity! It raises an interesting question. Should the elaboration of social goals, rather haphazardly, be permitted to destroy a segment of industry necessary for the national security? But more generally the episode points to the unanticipated as well as extraordinary burdens recently placed on American industry.

Last spring, after the Iranian oil cutoff, American law hindered the attempt to distribute petroleum supplies evenly. Given the law and the advice of the Antitrust Division, it was impossible for the Department of Energy and the major suppliers jointly to discuss supplies of crude oil and product. Consequently, the immediate problem was intensified by the scarcity of information and by the growth of uncertainty. Given Department of Justice attitudes, the companies quite correctly refused to discuss supply or price. As a result, a handful—I mean a *handful*—of Department of Energy employees were obliged through bilateral conversations with major oil companies to acquire piecemeal an overview of the market, which they could not adequately convey to the participants.

Yet, at that time, we had (for better or worse) a price control system and an impending shortage. The antitrust laws were at best irrelevant in those conditions. Refiners were scampering around looking for crude oil and attempting to provide more product; they could not charge prices higher than the regulations permitted. Nonetheless, the Department of Justice was alert to the possibility of a conspiracy to restrict supply and raise prices. Clearly the effect of the antitrust laws under these circumstances was to frustrate the very purpose for which the legislation was enacted[1] and to worsen the impact of the shortfall. Ingrained habits in novel circumstances have pernicious effects.

Let me cite one further illustration. The crude oil equalization tax (COET) provided a mechanism by which the oil industry could have worked its way out of controls over a number of years, and the economy would have simultaneously benefited from moving to world oil prices. Yet the majors were ambivalent about, and the independents resistant to, any compromise on the COET. They (quite naïvely) expected the whole loaf—and felt it was their just due. The ultimate outcome will be the imposition of a windfall profits tax which, instead of fading out by 1985, will probably be permanent. It will prolong de facto regulation and impose a financial burden during the 1980s alone at least four times as great as that of the COET. Putting aside the serious longer term implications, I can only suggest that industry, no less government, must learn the art of timely compromise.

Internationally the American economy now labors under heavy burdens. Its ability to compete has been significantly weakened. One does not need to spend much time recounting the anecdotes and myths one hears traveling abroad. Generally speaking, foreign manufacturers, who

in the past were eager to visit American plants, now feel they have little to learn from such visits, although they still believe they have much to learn from the United States in marketing. Nonetheless, in such areas as process engineering, quality control, cost control, and production the United States in all too many industries no longer has a net advantage.

Ill-conceived protectionist devices have impeded the dynamics of adjustment. To cite one horrendous case, quantitative limits on steel imports have resulted both in the erosion of markets for higher quality steel for American producers and in higher costs for American firms that purchase steel.

For the longer term, the basic goals must be a restored ability to compete and a renewed growth of productivity. Admittedly, movement of exchange rates, in principle, should permit adjustment by the American economy to lower rates of productivity growth. But adjustment of exchange rates is inhibited by the position of the American dollar as the key currency—as a store of value as well as a medium of exchange. We must recognize that a steadily eroding dollar, while solving the problem of higher relative inflation and disparate productivity growth, poses even more serious problems for the maintenance of the international financial structure.

The disabilities under which the United States now labors reflect the alteration of the social framework. The resuscitation of the social framework is the task for the next decade. It is, of course, far easier to describe than to reverse major social trends. Nonetheless, the tasks are clear. We should: (1) rebuild government authority; (2) better confine government activities to those roles which are proper and which government can effectively perform; (3) generally restore social discipline; and (4) achieve a far more effective and harmonious relationship between business and government, especially in the international sphere in which there is no adequate substitute for material support.

If we pursue these goals, the competitive position of American industry will improve, and there will be a better balance amongst the various sectors of American industry. Given the trends of recent years, it will require dedication and imagination to achieve these results. Recent experience has scarcely been encouraging. Nonetheless, the United States continues to be the most resilient society on earth. If it is obliged to adjust, I remain confident that it can adjust.

Note

1. One might add that, under conditions of rigorous international competition, neither the antitrust laws nor the conventional data on *domestic* industrial concentration seem particularly relevant from an economic, as opposed to a sociopolitical, point of view.

Summary of Discussion

Robert Gordon set the theme for much of the discussion by asking whether the trend towards increasing regulation of business is a phenomenon particular to the United States economy. He pointed out that growing regulation in America could not be a major explanation of the decline in United States relative competitiveness if the regulatory process is expanding as well in Europe and Japan. James Schlesinger and Walter Wriston emphasized that a distinctive feature of United States regulation is the regulatory maze which confronts businesses on individual business decisions. As an example, Schlesinger cited the welter of agencies and regulatory bodies now overseeing nuclear energy development. David Packard, Wriston, and Ruben Mettler each noted that their companies' experiences demonstrate a special United States penchant for over-regulation. Packard and Mettler speculated that the traditional concern of European governments for their economies' competitiveness in international trade leads them to a more pragmatic approach to regulation. Jack Sawyer and Irving Kristol pointed out that Europe has a long tradition of government intervention in support of business. Sawyer suggested that the United States regulatory tradition reflected instead the populist hostility to railroads and big business that emerged in the late nineteenth century.

Milton Friedman cautioned against laying the blame for over-regulation on government. Most regulations reflect the wishes of individuals, businesses, or other groups trying to use government to pursue particular private ends. He cited our energy regulations as such a case. In the mid-1950s when foreign oil was cheap, the oil industry sought to block its importation. Then in the 1970s when it became expensive, our regulations actually subsidized its importation.

Arthur Okun worried that in the zest to criticize government regulation, many of the benefits of recent regulations might be overlooked. He pointed out that free markets seem to be quite poor at generating appropriate information for consumers, and cited the truth-in-lending and truth-in-advertising legislation as important examples where regulations have helped to deliver important market information.

Richard Caves took up a second issue raised by Wriston's commentary: whether the increase in information flows following the "information revolution" has harmed economic performance. Caves said that the issues of over-regulation and information are not as closely linked as Wriston argues. While the computer technology may make greater regulation feasible, the example of many poor countries throughout the world demonstrates that extensive regulation does not depend on computer technology. Caves stressed that the new methods of information process-

ing also have a marked positive effect on market efficiency by allowing businesses to take more rapid, accurate decisions.

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