FIFTH EDITION

THE STRUCTURE OF AMERICAN INDUSTRY

EDITED BY

WALTER ADAMS

the structure of American industry

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for
Mátyás Király

preface

One of the major transformations in political economy since the first edition of this book appeared in 1950 is the renewed recognition that power concentrations are a pivotal problem in social organization. There is an inchoate, if not systematic, awareness that the power relationships in society are a matter of profound social concern and require continuing confrontation by public policy makers.

Today, in the aftermath of Watergate and related revelations, it is no longer fashionable to dismiss the Founding Fathers as anachronistic philosophers or to ridicule Lord Acton's warnings about the consequences of concentrated power. The excesses of the imperial presidency, and the abuse of executive authority to harass and oppress individual citizens, have underscored the importance of a decentralized power structure within a framework of checks and balances. As Madison put it in *The Federalist*, No. 51, "If men were angels, no government would be necessary. If angels were to govern men, neither external nor internal controls on government would be necessary. In framing a government which is to be administered by men over men, the great difficulty lies in this: You must first enable the government to control the governed; and in the next place oblige it to control itself. A dependence on the people is, no doubt, the primary control on the government; but experience has taught mankind the necessity of auxiliary precautions. . . ." And these auxiliary precautions, said Madison, require primarily a separation of power between the different branches of government, and secondarily a dispersion of power among the citizenry. The underlying purpose, he wrote, is to prevent the rulers from oppressing the ruled, and to render it improbable, if not impracticable, for one segment of society to oppress another.

This traditional, peculiarly American distrust of concentrated power is reasserting itself today—not only with respect to political, but also economic institutions. There is a growing recognition that economic power is not merely

a decorative status symbol to be passively enjoyed in the counting houses and country clubs. Economic power, we are once again learning, may be used with statesmanlike forbearance and diplomatic skill. It may be used only where circumstances absolutely demand it, or when the political climate is particularly propitious. It may be accompanied by sophisticated public relations campaigns to purify its venality or sanitize the corporate image. But the fact remains that, in the long run, the possession of great power and the exercise of such power tend to coalesce. Wherever economic power exists it will eventually be used, and for ends chosen by those who control it.

Perhaps it is fitting that in 1976, as we celebrate the bicentennial of *The Wealth of Nations*, there is a growing awareness of the social role of competitive markets. Effective competition is once again being viewed not only as an instrument for achieving "the best allocation of resources, the lowest prices, the highest quality, and the greatest material progress," but also as the central nervous mechanism of a decentralized power structure. Competition is the euphemism for an economic system in which power is scattered into many hands "so that the fortunes of the people will not be dependent on the whim or caprice, the political prejudices, the emotional stability of a few self-appointed men." Competition is a device to be used by society for social purposes. It is a blueprint for limited power operating in a comprehensive framework of checks and balances. It is a network of safeguards against the use of private power to the detriment of the public interest.

Given the current concern with the control of power in a modern industrial society, the fifth edition of this book seems felicitously timed. It offers a kaleidoscopic view of American industry—a collection of case studies illustrating different types of structural organization, different behavior patterns, and different performance records. Although each industry is, of course, an "individual," the case studies offer to the student of industrial organization a "live" laboratory for clinical examination, comparative analysis, and the evaluation of public policy alternatives. For that reason the book, I hope, constitutes a useful supplement, if not a necessary antidote, to the economist's penchant for the abstractions of theoretical model building.

East Lansing, Michigan W. A.

contributors

Walter Adams is Distinguished University Professor, Professor of Economics, and Past President, Michigan State University, and erstwhile member of the Attorney General's National Committee to Study the Antitrust Laws.

Joel B. Dirlam is Professor of Economics, University of Rhode Island, and an economic consultant to government agencies and the private sector.

Kenneth G. Elzinga is Professor of Economics, University of Virginia, and erstwhile economic advisor to the Chief of the Antitrust Division, U.S. Department of Justice.

Manley R. Irwin is Professor of Economics, University of New Hampshire, and erstwhile chief of the AT&T Taskforce of the Federal Communications Commission.

David D. Martin is Professor of Economics, Indiana University, and erstwhile chief economist of the U.S. Senate Antitrust and Monopoly Subcommittee.

Walter S. Measday is Professor of Economics, University of Maryland, and chief economist of the U.S. Senate Antitrust and Monopoly Subcommittee.

Willard F. Mueller is William F. Vilas Research Professor of Economics, Agricultural Economics, and Law, University of Wisconsin (Madison), and erstwhile director of the Bureau of Economics, Federal Trade Commission.

Roger G. Noll is Professor of Economics, California Institute of Technology, and erstwhile Senior Fellow, Brookings Institution, and Senior Economist, Council of Economic Advisors.

Elton Rayack is Professor of Economics, University of Rhode Island.

William G. Shepherd is Professor of Economics, The University of Michigan, and erstwhile economic advisor to the Chief of the Antitrust Division, U.S. Department of Justice.

Daniel B. Suits is Professor of Economics, Michigan State University.

Lawrence J. White is Associate Professor of Economics, Graduate School of Business Administration, New York University.

the structure of American industry

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CHAPTER 1

agriculture

DANIEL B. SUITS

I. INTRODUCTION

As supplier of most of the food we eat and of raw materials for many industrial processes, agriculture is clearly an important sector of the economy. But the importance of the industrial performance of agriculture transcends even this. For in nations where the productivity of farmers is low, most of the working population is needed to raise food and few people are available for production of investment goods or for other activities required for economic growth. Indeed, one of the factors that correlates most closely with the per capital income of a nation is the fraction of its population engaged in farming. In the poorest nations of the world, more than half of the population lives on farms. This compares with less than 10 per cent in western Europe and less than 4 per cent in the United States.

In short, the course of economic development in general depends in a fundamental way on the performance of farmers. This performance, in turn, depends on how agriculture is organized and on the economic context, or market structure, within which it functions. In the following pages the performance of American agriculture is examined. It is appropriate to commence with a consideration of its market structure.

II. MARKET STRUCTURE AND COMPETITION

Number and Size of Farms

There are about 2,700,000 farms in the United States today. This is roughly 40 per cent of the peak number reached 50 years ago, and as the number of farms has declined, the average size has risen. Farms in the United States still

average fewer than 400 acres, but this average can be misleading. The truth is that modern American agriculture is characterized by large-scale operations. Although only 151,000 farms—5.5 per cent of the total—are as large as 1000 acres or more, they operate more than 40 per cent of the total farm acreage. Nearly a quarter of all wheat, for example, is grown on farms of 2000 acres or more, and the top 2.6 per cent of wheat growers raise roughly 50 per cent of our wheat.

The sizes of farms vary widely by product, but even where typical acreage is small, we find production concentrated. Nearly 65 per cent of our tomato crop is grown on farms of fewer than 500 acres, but the remaining 35 per cent is marketed by the largest 9 per cent of tomato growers. Broiler chickens are raised on still smaller farms, with 55 per cent coming from farms with fewer than 100 acres. However, more than 70 per cent of all broiler chickens are raised by the largest 2 per cent of growers.

The size of the farm also varies with production technique as this is affected by region, climate, and other factors. In the southern states of the United States, 60 per cent of cotton output comes from farms of fewer than 1000 acres, whereas farms that small produce only a third of cotton grown in the more capital-intensive western states. Over all, however, the largest 3 per cent of all cotton growers produced 40 per cent of all cotton and cotton seed in the United States.

Competition in Agriculture

Despite the scale and concentration of production, however, modern agriculture remains an industry whose behavior and performance are best understood in terms of the theory of pure competition. Although production is concentrated in the hands of a relatively small percentage of growers, total numbers are so large that the 2 or 3 per cent largest growers of any given product still constitute a substantial number of independent firms. For example, although only 2 per cent of grain growers (those with annual production valued at $40,000 or more) manage to produce about 50 per cent of all grain in the United States, this 2 per cent consists of 27,000 firms. Numbers like this are a far cry from those for manufacturing. The largest number of firms of all sizes found in any one manufacturing industry are the 10,000 sawmills and planing mills engaged in the production of lumber. However, typically, manufacturing industries have many fewer firms—even industries like men's work clothing (277 firms) and cotton weaving mills (218 firms) that are widely recognized as highly competitive. Thus, even if we ignore the competitive influence exerted by the thousands of smaller farms in each line of production and look only at the very largest, we are still talking about nearly 100 times as many independent firms as are found in the most competitive manufacturing industries.

In any event, the number and size of existing firms are only partial measures of the competitiveness of market structure. An important additional consideration is the extent to which ease of entry generates potential competition beyond the firms engaged in production at any given moment. Not only do the many

smaller farms produce and sell in the same market with the larger ones, but there are no special barriers to entry into agriculture. Moreover, many existing farms are adapted to the production of a variety of products and can shift output from crop to crop on the basis of the outlook for prices and costs.

As a result of this structure, even large modern farms are powerless to exert any appreciable individual influence on total output or prices through their own economic behavior. They can only plan production schedules on the basis of their own best expectations with the knowledge that the ultimate outcome will be virtually unaltered by anything they might decide. Plans for how much of which crops to grow and by which methods are arrived at on the basis of price and cost expectations. The resulting crop comes on the market and sells at prices determined by total volume in conjunction with existing demand.

Demand for Farm Products

Another important element in the structure of agriculture markets is the nature of the demand for farm products. Before exploring the nature of the demand for farm products in particular, however, it is useful to review some of the properties of demand curves in general. Potatoes are fairly typical farm products and can be used as a convenient illustration.

Demand for Potatoes

In Figure 1, the average farm price of potatoes in the United States is plotted vertically against the annual per capita consumption of potatoes, measured horizontally. Each point represents data for a recent year. The downward drift of the scatter of points from upper left to lower right confirms the everyday observation that people tend to buy more at low than at high prices. At the high price of $3.78, for example, average consumption in the United States shrank to 124 pounds per person in 1964, whereas at the low price of $1.57, consumption reached 153 pounds per person in 1971. Of course, as a glance at the chart reveals, price is not the sole influence on buying habits. Points labeled 1960, 1962, 1963, 1972, and 1973, for example, show that during these years annual consumption varied but little, yet prices ranged from more than $3.00 in 1973 to less than $2.00 in 1962 and 1963. Part of this price variation can be traced to the upward trend of income during this period. Note how the points corresponding to the three years in the early 1960s—when incomes were low—fall below those that represent the higher income years 1972 and 1973. But many other factors besides income were important. Some of the variation in potato buying can be ascribed to changes in the prices of other foods that could be substituted for potatoes in the diet, to the appearance of new ways to use potatoes—such as packaged mashed potatoes, frozen French fries, or new types of potato chips—or to changes in consumer tastes for potatoes compared to other foods.

By the use of appropriate statistical procedures it is possible to allow for the effects of many of these other influences and to estimate the effect of price alone on potato purchases. The result is shown by the curve DD, drawn through the

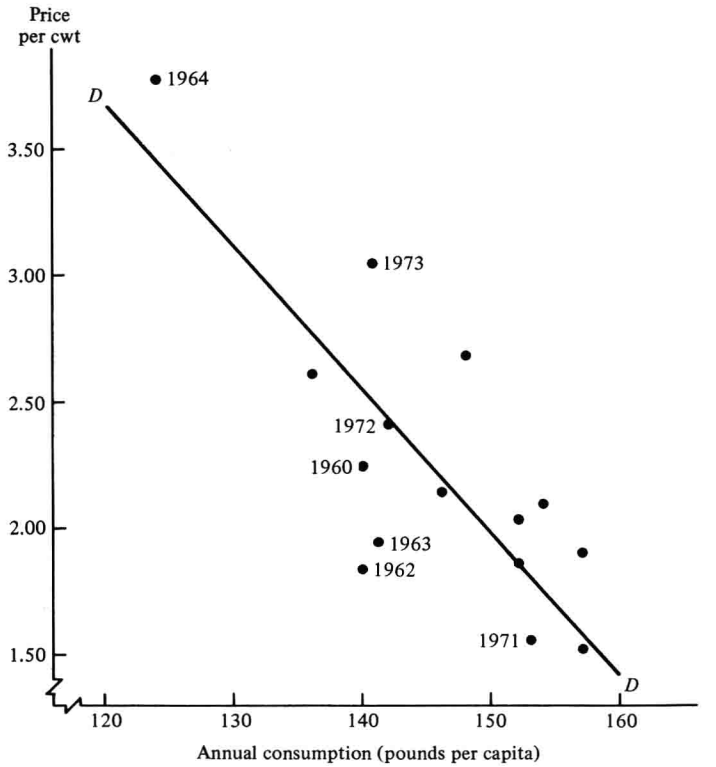

FIGURE 1

Demand for potatoes. Source: Data from the U.S. Department of Agriculture, *Agricultural Statistics*, various issues. Prices have been divided by the consumer price index to adjust for inflation.

midst of the observations.[1] Such a curve, called a *demand curve*, represents the quantity of potatoes buyers would be expected to purchase at each price, other influences being held constant.

Demand Elasticity

Elasticity Defined

The responses of buyers to changes in price are measured by the elasticity of demand. Elasticity expresses the percentage change in quantity purchased to be expected in response to a 1 per cent change in price. For example, if a 1 per cent price increase induced the buyers of a product to cut their purchases by 2 per cent, the elasticity of demand for the product would be expressed as -2. This

[1] The line was fitted by least-squares regression to obtain $P = 9.26 - 5.66Q + .526Y$, where P is price of potatoes, Q is per capita crop, and Y is real per capita income measured in thousands of dollars at 1958 prices. The position of the line DD in Figure 1 corresponds to demand at the average level of income during the period.

indicates that percentage changes in quantity purchased tend to be double the percentage change in price. The negative sign reminds us that quantity is altered in the opposite direction to the change in price, a rise in price being accompanied by a reduction in quantity, and vice versa. In similar fashion, the elasticity of $-.7$ would characterize the demand for a product when a reduction of only .7 per cent in purchases would occur in response to a 1 per cent price increase. An elasticity of -1 would indicate a demand when percentage changes in quantity and price tend to be equal, and so on.

The elasticity of demand for particular products is readily estimated from fitted demand curves by selecting two prices close together and reading the corresponding quantities shown by the curve. The elasticity is then calculated as the ratio of the percentage difference in the two quantities to the percentage difference in the two prices. For example, careful measurement on the demand curve *DD* indicates that purchasers would be ready to buy about 148 pounds per year at a price of $2.10, but if the price were lowered to $2.00, purchases would expand to about 150 pounds. The price reduction from $2.10 to $2.00 is a change of -5 per cent, whereas the increase in purchased quantity from 148 to 150 pounds is a change of only 1.4 per cent. This yields an estimated elasticity of demand for potatoes of about $1.4/-5$, or about $-.3$.

Of course, we are rarely interested in such exact measurement of elasticity, but we do need a general idea of how elastic the demand for a given product is. For this purpose it is convenient to classify demand curves into broad categories, using an elasticity of -1, called unit elasticity, as the dividing point. Demand curves with an elasticity smaller than 1 (in absolute value) are then referred to as inelastic demands. In these terms, the demand for potatoes with an elasticity of $-.3$ would be classified as *inelastic.*

Demand curves that have an elasticity greater than 1 in absolute value are termed relatively elastic. The demand for lettuce—estimated to have an elasticity of -2.8—is classified as relatively elastic.

Causes of Differences in Elasticity

Because elasticity measures buyer response to price, it varies widely among products, depending in each case on the characteristics of the product and on buyers' attitudes toward it. Products like potatoes, which generally are viewed as necessities, or food staples, have inelastic demands. Buyers feel that they need a certain amount in their diet and are reluctant to cut back on their use of the commodity as its price rises. By the same token, because they are already consuming about as much of it as they feel they need, they have use for only little more when prices fall.

In contrast, products viewed as luxuries exhibit relatively elastic demands, for their consumption can be reduced almost painlessly when prices rise, yet buyers are delighted at the chance to enjoy them when lower prices place them within reach of the budget. Among farm products, demands for fruits and fresh vegetables tend to be relatively elastic. The demand for peaches, for example, has been estimated to have an elasticity of -1.49, five times that of potatoes.

This high elasticity reflects the ease with which households can do without peaches when price rises, and the welcome accorded the fruit when it becomes cheap.

The elasticity of demand also depends on the relationship the product bears to others. In particular, products that have good substitutes to which buyers can turn as alternatives tend to have relatively elastic demands. Even small percentage changes in price lead large numbers of buyers to choose the cheaper substitute. This is probably one of the reasons that demands for fresh vegetables tend to be relatively elastic. The elasticity of demand for fresh tomatoes, for example, has been estimated at 2.2, and that of fresh peas at 2.8, largely because many other fresh vegetables can be used instead of these if the price is right.

Price elasticities of demand for a number of farm products are given in Table 1. Note that demands for basic commodities like potatoes and corn tend to be inelastic, as might be expected from their nature. On the other hand, many individual fresh fruits and vegetables have highly elastic demands, partly because of their less basic character and partly because of the availability of many close substitutes to which consumers can turn.

TABLE 1
Elasticity of Demand for Selected Farm Products

PRODUCT	ELASTICITY OF DEMAND	
	PRICE	INCOME
Cabbage	—.25	n.a.[a]
Potatoes	—.27	.15
Wool	—.33	.27
Peanuts	—.38	.44
Eggs	—.43	.57
Onions	—.44	.58
Milk	—.49	.50
Butter	—.62	.37
Oranges	—.62	.83
Corn	—.63	n.a.
Cream	—.69	1.72
Fresh cucumbers	—.7	.7
Apples	—1.27	1.32
Peaches	—1.49	1.43
Fresh tomatoes	—2.22	.24
Lettuce	—2.58	.88
Fresh peas	—2.83	1.05

[a] Not available.
Source: Potatoes, estimated from the data of Figure 1. All others estimated by the U.S. Department of Agriculture.

Elasticity of Derived Demands

A particularly important aspect of demand for farm products is that most are purchased from the farm by canners, millers, and other manufacturers who process the raw product before selling it to final consumers. Wheat is milled into flour and baked into bread before it is purchased for the table; meat is butchered and packaged before consumers buy it; and most fruit and vegetables are canned or frozen before consumers buy them—even those to be sold fresh require transportation, packaging, and other retailing costs before they can be delivered to the table.

As shown in Table 2, only 38 per cent of the retail value of food items purchased in the United States consists of their original value on the farm; 62 per cent consists of the value added by processing and marketing. Of course, these percentages vary widely among different farm products. Because of the lengthy production line required for bread and cereal products to reach the final consumer, farm value constitutes only 22 per cent of the retail price of such items. The value of the barley, rice, hops and other farm output in the retail price of a can of beer is even smaller. In contrast, the farm share is 65 per cent of the retail price of meat, poultry, and eggs that reach the table more directly.

Because of the value added by processing and marketing, the value of the farm products represents a small percentage of the retail price paid by ultimate buyers, and this tends to make the demand for raw farm products even less elastic. To make clear why this is so, let us consider a processed product with a relatively elastic demand—frozen peas, say, with a demand elasticity of about 2. This elasticity would mean that a 5 per cent reduction in the price of frozen peas would tend to increase consumption by about 10 per cent. But if frozen peas are typical of other vegetables, farm value constitutes only about 30 per cent of the final retail price, so a 5 per cent reduction in the farm price of peas would result in no more than a 1.5 per cent reduction in retail prices for frozen peas. Given

TABLE 2
Shares in Final Retail Value of Food Products

	BILLIONS OF DOLLARS	PER CENT
Final retail value	$132.2	100
Processing and marketing costs		
Labor	40.3	30
Rail and truck transportation	6.1	5
Power, containers, and other costs	31.3	24
Corporate profit (before taxes)	4.6	3
Farm value of products	49.9	38

Source: U.S. Department of Agriculture, *Agricultural Statistics, 1974* (Washington, D.C.: U.S. Government Printing Office, 1974).