SECTION 5

Competition in Agricultural Markets

Until about 1930, agricultural markets were usually considered the very prototype of perfect competition. But times and theoretical concepts change. Economic theory was revolutionized by the development of theories of monopolistic and imperfect competition associated with the names of Chamberlin and Robinson. These new theories emphasized the pervasive nature of monopoly elements and the view that, in most actual market situations, monopoly and competition are likely to be alloyed, rather than either one existing in its pure form.

Agricultural economists began to point to significant departures from perfect competition. They found that imperfections of knowledge, foresight, and mobility — the importance of which agricultural marketing specialists had long recognized — were not the only barriers to the achievement of conditions of perfect competition. Rather, they now saw that even the complete elimination of these imperfections — while creating the prerequisites for a perfect market *— might still not insure* perfect competition *for other reasons. First, either buyers or sellers might be dominated by a few large business organizations. Second, even small business organizations — if engaged in local assembly in country markets or local distribution at retail — might find it possible to differentiate their services or exploit a locational advantage. These developments have brought a much better understanding of the functioning of agricultural markets, while more closely integrat-*

ing research in agricultural markets and prices with the concepts and tools of general economic theory.

In this section we review the trends toward concentration in the assembly, processing, and distribution of farm products. We present some analyses of the causes of these trends and conclude with readings that provide useful concepts of imperfect competition and apply them to the appraisal of actual agricultural markets.—EDITOR

5.3.8 Hoffman, A. C. "Large-scale Organization in the Food Industries."
5.3.9 Nicholls, William H. *Price Polices in the Cigarette Industry.*

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5.1 Trends in Size of Business

The typical pattern in the processing and distribution of farm products has become that of a few large firms handling a major share of the total business, with a relatively large number of small firms handling the remainder. We present four summaries of this development. The first three discuss the structure that had emerged prior to World War II in a number of industries, drawing primarily upon data from the Federal Trade Commission's *Agricultural Income Inquiry,* published in 1938. The fourth, dealing with sizes of plants rather than firms, discusses changes during the war.—*Ed.*

5.1.1 Nicholls, William H. ***Imperfect Competition Within Agricultural Industries.*** **The Iowa State College Press, Ames, Iowa, 1941. Pp. 68–70.**

A ranking of the nation's largest industrial corporations (excluding railroads, utilities, and financials) for 1935, on the basis of assets, shows that fourteen of the first 100 were corporations engaged in the processing or distribution of agricultural products. Among these fourteen firms were four meat packers (of which the two largest ranked first of the fourteen), three tobacco companies, two dairy corporations, one food chain organization, and one firm each in fruit distribution, bakery products, corn products, and sugar refining. The range of assets among the fourteen firms was from 76 million dollars for the smallest to 321 million dollars for the largest. Had corporations been ranked on the basis of dollar sales, such processing-distributing firms (because of their relatively high turnover) would undoubtedly have shown an even more important relative position in the national economy. What is the comparable position of dominance of such firms within their own respective industries?

In Table 9 we have summarized the extent of concentration of control in the assembling, processing, and wholesale distribution of the principal classes of farm products and their primary derivatives. Concentration in the hands of the three largest firms in each given processing-distributing industry was greatest for

livestock (57 per cent), followed by tobacco leaf (46), wheat (38), canned vegetables (30), and milk (21).

In terms of concentration as measured by the size of the largest single processor-distributor in each industry, the order of

TABLE 9

EXTENT OF CONCENTRATION OF CONTROL OF THE ASSEMBLY, PROCESSING, AND WHOLESALE DISTRIBUTION OF THE PRINCIPAL CLASSES OF FARM PRODUCTS AND THEIR PRIMARY DERIVATIVES, 1934*

	Percentage of Total Volume of Domestic Business (1934) Handled by		
	Processor-Distributors		Non-processing Assembling Middlemen
Farm Product	Three Largest	Single Largest	Three Largest
Livestock	57.5	28.4	.....
Cattle and calves	62.4	29.3	6.8
Hogs	48.0	24.0	1.6
Sheep and lambs	79.2	39.7	.....
Milk (all uses)	21.1	9.4	.....
Butter	20.8	8.1	.....
Cheese	62.9	32.2	.....
Canned milk	44.3	18.7	.....
Tobacco leaf	46.2	22.2	24.6 (export)
Cigarettes	80.1	27.3	.....
Smoking tobacco	64.8	23.2	.....
Chewing tobacco	68.7	26.4	.....
Cigars	27.7	.....	.....
Snuff	95.3	42.0	.....
Wheat	38.4	23.3	13.1
Wheat flour	29.0	15.7	.....
Wheat bread	19.4	.....	.....
Cotton (lint)	3.2	1.2	20.1
Canned fruits	13.0	5.0	.....
Canned vegetables	30.0	15.0	.....
Grocery retailing	22.1	13.7	.....

* ED. Sources: Packers and Stockyards Administration, and Federal Trade Commission: *Agricultural Income Inquiry* (1938).

rank of these broad classes of farm products was livestock (28 per cent), wheat, (23), tobacco leaf (22), and canned vegetables (15). The three largest non-processing, assembling agencies handled 25 per cent of the tobacco leaf (mostly for export), 20 per cent of the cotton lint, 13 per cent of the wheat, and 7 per

cent of the cattle and calves and 2 per cent of the hogs slaughtered under federal inspection.

5.1.2 Froker, R. K., Colebank, A. W., and Hoffman, A. C. "Large-scale Organization in the Dairy Industry," *U. S. Dept. Agr. Cir. No. 527*, July, 1939. P. 3.

Dollar sales of the four leading dairy corporations . . . showed a tremendous growth during the decade of the 1920's. In the interval from 1925 to 1930, sales of the National Dairy Products Corporation increased from about $105,000,000 to $375,000,000; sales of The Borden Company from about $123,000,000 to $345,000,000; and of the four reporting companies combined, from about $299,455,000 to $854,378,000. During this period the estimated total sales value of all dairy products increased from about $1,965,000,000 to around $2,200,000,000. Dollar sales of the four leading dairy companies thus nearly trebled during a period in which the total sales value of all dairy products increased only about 12 per cent.

5.1.3 Hoffman, A. C. "Changing Organization of Agricultural Markets," *Jour. Farm Econ.*, Vol. XXII, No. 1, Feb., 1940. Pp. 162–64, 169–70, 165.

It is probably correct to say that the organization of agricultural markets has changed more in the last 25 years than during the preceding century. What has happened is the application of large-scale methods to food distribution. From a system comprised almost wholly of small, functionally-specialized business enterprises there has been a transition to vertically-integrated concerns operating on a regional and even a national basis. Examples of this development are the large corporate chains, the big dairy companies, the flour-milling and baking concerns and organizations such as Standard Brands and the General Foods Corporation, to name only a few of the outstanding ones. The rise of such concerns is the more remarkable because it has occurred in a field of enterprise not hitherto thought well adapted to the application of large-scale methods.

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The most interesting and, in many ways, the most significant development in the food industries has been the growth of mass retailing. I shall devote a considerable part of my paper to this because it best illustrates some of the principles and problems of large-scale marketing. Mass retailing has taken several forms chief of which is the corporate grocery chain. It has also expressed itself in the organization of independent retailers into voluntary and cooperative groups. There are points of resem-

blance in these two developments, but also important points of difference.

The origin of the corporate grocery chain in this country dates back to the founding of the Great Atlantic and Pacific Tea Company in 1857. But not until the 20th century did any of the chains achieve sizable proportions and only since the World War have they risen to their present position. The decade of the 1920's was the period of most rapid expansion for the grocery chains, as well as for most other types of large-scale food concerns. In this short period the combined annual sales of the five leading systems increased from around 400 million dollars to nearly 3 billion dollars. The largest single system, the A. & P., has annual sales approximating a billion dollars, or approximately 10 per cent of all food sales made through grocery and combination stores. The onset of the depression in 1930 brought expansion of chain stores temporarily to a halt, their position with respect to that of the independents having remained relatively unchanged since that time. There are those willing to venture the prediction that further chain store growth is more or less permanently at an end; but I am not so sure about this, assuming, of course, that legislative measures do not intervene.

The organization of independent retailers into voluntary and cooperative chains is a more recent development. The American Institute of Food Distribution estimated that in 1936 about 100,000 independent grocers, or one-third of the total number, were affiliated with organizations of this kind. However, it would be incorrect to infer from these figures that mass retailing methods similar to those of the corporate chains are being applied by one-third of all independent retailers. Some of the cooperative groups do centralized buying and provide their members with services similar to those of the corporate chains, whereas others do little more than provide a common name. The important difference between the cooperative and the corporate chain turns on the degree to which the management of the retail store is centralized. Obviously the corporate chains have more of whatever advantages or disadvantages lie in centralized store control.

Another important and recent development in food retailing is the so-called super market, a retail food unit doing an annual business of at least $250,000, with emphasis on self service and low cost store operation. The super market idea was developed early in the depression by a new set of mass merchandizers, but

some of the older corporate chains were quick to take it up and since have been rapidly converting many of their regular stores into markets of this type. In a sense the super market represents a change in the type of retail store rather than a change in ownership structure. But it probably has done more to change the mechanics of retailing than anything since the emergence of the corporate chains themselves.

The grocery chains are commonly thought of only in connection with the retailing of food products. Their enterprises, however, reach back into nearly all phases of food processing and distribution; and, in many cases, they span the gap between producer and consumer.

Nearly all the chains, including most of the smaller ones, have integrated the function of wholesaling with that of retailing. The big chains have gone much farther than this. Several of them, for example, have subsidiaries for providing their retail units with fruits and vegetables, an increasing proportion of which they are buying direct from growers and shippers at country points rather than from handlers in the terminal wholesale markets. Especially noteworthy has been the entrance of the chains into the field of dairy manufacturing and distribution. A number of the leading systems operate plants in producing sections for the manufacture of condensed and evaporated milk, and purchase a considerable part of their butter and cheese direct from local creameries and cheese factories. Other chain store enterprises include the operation of bakeries, canneries, meat warehouses, and miscellaneous food processing establishments. The trend toward vertical integration on the part of the chains was temporarily arrested by the depression, but this trend seems to be a natural concomitant of mass retailing and we shall probably see more rather than less of it in the future.

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In thinking about the problem of monopolistic control in agricultural marketing we often tend to focus our attention on the size of the leading firms and the percentage of the national supply which they control. But the problem of local competition is fully as important, and in some instances may be even more so because it is here that the number of buyers is more likely to be limited with respect to the market area involved. In the case of canning crops, for example, the grower commonly has only one or two local plants with which he can deal. For certain

crops grown in specialized areas of production, it not infrequently happens that one or two buyers are the dominant factor in the local situation, so that sharp price repercussions are likely to occur if their buying support is temporarily withdrawn. The introduction of the motor truck has tended to prevent abuses in situations of this kind by increasing the number of local outlets available to the individual producer. Further protection along this line can perhaps best be given through the cooperative marketing movement.

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The nearest thing to a retail monopoly we ever had in this country was the village grocery store. It is not always recognized as such because we commonly think of monopoly only in connection with big business. But the village store nevertheless had monopoly elements, and for the simple reason that the shopping choices of its customers were limited by the cruising radius of a horse and buggy or by the legs of little boys whose job it was to fetch the groceries. If we think of retail competition in terms of the number of stores available to the average consumer, then we have far more of competition today than we have ever had in the past simply because of the automobile.

5.1.4 Paul, Allen B. "Some Economic Changes in Food Manufacturing," *Jour. Farm Econ.*, Vol. XXXII, No. 4, Pt. 1, Nov., 1950. Pp. 584–86.

Numbers of plants. The total number of food plants decreased 10 per cent from 1939 to 1947, an experience contrary to that of other manufacturing sectors of the economy. Plant numbers in total manufacturing increased 39 per cent, with increases in individual sectors ranging from 13 per cent in petroleum and coal products to 102 per cent in machinery products.

However, the over-all change in the food sector hides divergent experiences of individual food industries. Plant numbers decreased in 15 food industries and increased in 22 others. Reductions of 100 plants or more occurred in the manufacture of bread, butter, flour, natural cheese, ice cream, dressed poultry, malt liquors, cottonseed oil, and macaroni products. Increases of 100 plants or more occurred in the manufacture of soft drinks, meat, processed cheese, candy, canned fruits and vegetables, pickled fruits and vegetables, frozen foods, and flavorings.

Changes in plant numbers mirror the operation of underlying technical and economic forces. An increase in plants may result from an expansion of relevant markets; but within limits

existing plants might meet such needs. There are environmental factors, independent of general market expansion, that induce new plants to enter; e.g., population shifts, alterations in sources of materials, transportation changes, improved production machinery, governmental regulations, etc. The withdrawal of older or less fortunately situated plants tends to lag. On the other hand, a decrease in plant numbers may result from a contraction of the market. However, in the period studied most markets for manufactured foods expanded. The explanation for the decrease in plant numbers lies in other directions, probably in the triumph of large-scale over small-scale operations. The food industries are quite sensitive to changes in the economic environment through factors such as product bulk and perishability, in-transit privileges, weight loss and weight gain in processing, etc. It would be of interest, for example, to trace the impact of the recent westward migration of population on the location of food manufactures.

Average size of plants. The average size of plant increased about 60 per cent. Behind this average lies a great range: from a decrease of two thirds in processed cheese to a three-fold increase in natural cheese. A large influx of new plants, apparently due to patent expiration, lowered the average size of processed cheese plants. On the other hand, a large number of plants withdrew from natural cheese manufacture, while the output of the industry doubled. This points to favorable conditions in augmenting the milk supplies available to surviving plants.

Both butter and canned milk plants increased in size some 60 to 70 per cent, but for opposite reasons. The butter experience reflects almost solely the withdrawal of plants, whereas canned milk reflects solely the expansion of production.

The preceding excerpts have described the trend toward "big business" in agricultural marketing. Typically, this has led toward some degree of monopoly (more precisely, "oligopoly," since there are usually several, rather than only one, large sellers) on the selling side, or of "monopsony" (or "oligopsony") on the buying side. But large firms may have quite limited monopolistic powers, and small ones may be able to exercise considerable control, depending upon the size and character of the market. Some of the factors that determine this are discussed below.—*Ed.*

5.1.5 Nicholls, William H. *Imperfect Competition Within Agricultural Industries.* The Iowa State College Press, Ames, Iowa, 1941. Pp. 79–81.

Conclusions. We may conclude that many processing-distributing industries exhibit a situation, at one or more stages in

the marketing process, which is akin to oligopoly, oligopsony, or the two in combination. This may be true as a result of the fact that a few firms hold a position of dominance, whether due to large size in a nation-wide market or to the confining nature of the local market. Therefore, each dominant firm will probably have to recognize the circular interdependence between his own price and production policies and those of his principal competitors. Such a firm cannot be analyzed according to the presuppositions of pure competition.

At this point, however, we wish to distinguish carefully between the dominance of a central market and that of a local country market. We can do this very well by pointing out why the extent of control of the nation's product, measured in percentage terms such as we have presented, is in no sense a direct key to the degree of monopoly or monopsony power enjoyed by any firm in a given industry. In fact, we saw in the previous chapter, that such power depends upon the elasticity of the individual firm's sales or purchase curve, respectively.

This is clear if we imagine the extreme case of a firm which purchases 100 per cent of the national supply of a given farm product and sells 100 per cent of the resulting supply of its derivative. Now, if the firm's purchase curve is perfectly elastic because of an equally remunerative and ever-present alternative use of the farm product or of the resources used in its production, complete control of the purchase of the given farm product is absolutely unimportant and has no economic significance. Thus, the question as to whether monopsony profits would be possible, with cheese processing and distribution concentrated in the hands of a single firm, would depend upon the elasticity of supply as determined by the competition of alternative uses to which the raw milk could be put. Frictions of various sorts and a tendency toward concentration of the processing of all dairy products in the same firm would tend to make the supply of milk for cheese less than perfectly elastic and make monopsony profits possible. Analogous arguments would apply if the firm's sales curve were perfectly elastic, in which case there could be not one whit of monopoly power in spite of 100 per cent control of the sale of any given product. It should be noted that, in the central market, oligopoly and oligopsony are usually found in combination, and, since we shall concentrate our attention on the central market in the next five chapters, we shall consider this combination, oligopoly-oligopsony, as our principal case.

Turning to the local country market, on the other hand, it

is easy to see that a firm, while taking a relatively small percentage of the national supply, might be dominant relative to the local market. In such a situation, such a firm might be faced with a somewhat inelastic purchase curve, so that it could lower its buying price by reducing its volume of purchases. This is clearly a more significant case than the first. It may at first appear paradoxical that each firm should purchase only a very small proportion of a farm product and yet have a significant degree of monopsony power. Yet the element of location certainly affords any firm some protection from the competition of other buyers by the additional cost to farmers of transporting the supply of the farm product in his local area to the markets of his competitors. Under these conditions the cost of processing or assembling services to the farmer will be different in different places. The best way of dealing with this is to declare that facilities having the same physical characteristics do not offer the same services if they are in different places. Location is an essential and distinguishing characteristic of economic services, and the only relationship between the costs to the farmer of similar services in different places is that which results from the possibilities of transforming the one service into the other by transporting the farm product from the one place to the other.

The imperfect nature of the substitute services to a particular buyer's local clientele (due to his greater convenience of location) and the increasing cost of transport as he expands the area from which he draws his supply will tend to make his purchase curve less than perfectly elastic, thereby giving him a certain degree of monopsony power. . . .

5.2 Causes of Concentration

The trends toward concentration in agricultural markets appear to be due to a variety of factors which may be grouped under two major headings, economies of scale and monopoly elements. There is little doubt that the possibility of realizing economies of large-scale production and distribution has been an important cause of concentration in some agricultural processing industries, while favoring the development of chain-store distribution and super-markets. On the other hand, certain agricultural processing firms have probably grown beyond the size associated with minimum costs of production and distribution because of their desire to obtain greater control over markets and prices. The latter cause of concentration is essentially monopolistic in nature, being associated with such factors as patents and large-scale advertising of branded products.

Furthermore, the two causes are interrelated. First, concentration resulting from the drive for achieving economies of scale has sometimes resulted in firms too large to conform any longer to a pattern of competitive pricing. Second, beyond some point, the economies of large-scale advertising may become wholly private rather than social in their benefits, simply protecting existing dominant firms against the entry of new competitors. As a result, the two causes are apt to be closely associated and difficult to separate.

In the following three selections we have grouped several studies of essentially technological economies associated with the scale of the individual plant.—*Ed.*

5.2.1 Black, John D. and Guthrie, Edward S. "Economic Aspects of Creamery Organization," Tech. Bull. 26, Univ. of Minn., Dec., 1924. P. 94.

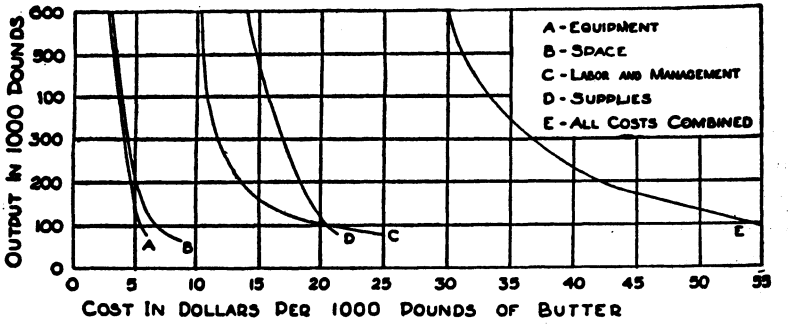

Fig. 24. Relation of output to creamery cost of butter.

Figure 24 shows that creamery costs per unit of output decrease as output increases as far as 600,000 pounds, at least. It is likely that they would continue to decrease above this point, although at a decreasing rate.

5.2.2 Koller, E. Fred and Jesness, O. B. "Organization and Operation of Minnesota Cooperative Creameries," Bull. 333, Univ. of Minn., Aug., 1938. Pp. 78, 79.

Summary and Conclusions. This study is based on data obtained from 175 cooperative creameries located in all parts of the state except the 13 northern counties and the Twin City area. These creameries manufactured an average of 353,000 pounds of butter annually, the output ranging from 45,000 to 1,668,000 pounds.

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The most satisfactory measure of creamery manufacturing efficiency is the cost of manufacture per unit of product. Total costs in 173 creameries varied from 1.209 to 4.796 cents per pound of butter made. Increases in volume up to 500,000 pounds

are accompanied by relatively large decreases in cost. The fact that the largest creamery with an annual output of 1,668,241 pounds had the lowest per unit costs illustrates that highly efficient operations can be attained in plants approaching a 2,000,000-pound production.

5.2.3 Henry, W. F., Bressler, R. G., Jr., and Frick, G. E. "Efficiency of Milk Marketing in Connecticut," *Storrs Agr. Exper. Sta. Bull. 259*, Univ. of Conn., June, 1948. Pp. 51–52.

Conclusions. The results presented in this bulletin indicate that there are important cost advantages for large pasteurizing plants, but that these economies of scale are most pronounced in the capacity ranges below 1,000 quarts per day. Under post war conditions and with an average of five per cent unavoidable excess capacity, plant operating costs including laboratory and bookkeeping expenses would drop from $0.0523 per quart for plants with volumes averaging 228 quarts per day, to $0.0326 per quart for plants with average volumes of 760 quarts. Beyond that volume costs would continue to decrease but at a more gradual rate reaching $0.0218 with volumes averaging 4,560 quarts per day. Evidence from other sources suggests that this decline in costs continues in the volume ranges beyond those covered in this study, but it is impossible to project the economy-of-scale curve into these higher ranges without more detailed study.

The results also serve to emphasize the importance of excess plant capacity as a factor causing high plant costs per quart, especially in the smaller plants. In Plant D, for example, cost per quart would average about $0.105 per quart with volumes of only 200 quarts per day, but these would drop rapidly with increases in volume and fall to $0.029 per quart with volumes in excess of 1,500 quarts per day.

As shown in the preceding three excerpts, economies are often associated with the size of an individual processing plant. But this is not all. Large firms may be able to make economies by operating several plants or by handling several commodities. They may also make economies in distribution. Efficient use of some processes requires large plants, integrated firms, or extensive financing. Such economies may, or may not, be associated with a degree of market control.—*Ed.*

5.2.4 Hoffman, A. C. "Large-scale Organization in the Food Industries," Temporary National Economic Committee, Mono. No. 35, Washington, D.C., 1940. Pp. 2–4, 15, 23.

In the Food Industries. The food industries are among the last fields of enterprise to which corporate mass methods have

been applied. There are several reasons for this, chief of which is the fact that the technological processes necessary for the preparation and marketing of food products have been until recently comparatively simple. With few exceptions these processes did not lend themselves to, or at least did not particularly invite, the application of large-scale methods.

Within the past 25 years, however, new processes and new techniques have been perfected which do so lend themselves. For instance, the canning and preserving of fruits and vegetables, once a household function, is now done mainly in factories on a corporate scale. New methods and new types of machinery for milling wheat, baking bread, manufacturing milk products, and handling fresh fruits and vegetables, have tended to increase the size of the business units in these fields. Often these newer processing techniques have been developed by big corporations, so that it may appear at first glance that the line of causation runs from the size of the business enterprise to the mode of manufacture. In a more fundamental sense, however, these techniques are evolved from the existing social fund of knowledge and scientific discovery, the use and application of which can be made more easily by large enterprises than by small ones.

Technological innovation also has been an important factor in the changes which have taken place in the distribution and retailing of food products. The automobile, for example, has extended the shopping radius of consumers and lessened their need for credit and delivery service, thereby contributing to the growth of cash and carry chain-store systems. Even more important has been the greater ease and facility of communication, which has made it possible to extend the supervision of business enterprise over a wider scope and range of activities.

Largely as a result of this latter factor, the whole concept of business management is being revised from that laid down by most of the older economists. They recognized the principle of the division of labor as applied to the mechanical processes of production, but they did not always see that this principle can be made to apply to the function of management as well. One of the most interesting and important aspects of modern big business is its subdivision of duties associated with the managerial function. It is this specialization of tasks in coordinating and controlling business enterprises which has permitted them to grow beyond what Marshall described as the biological limits to their size.

The greater range of activities over which efficient manage-

ment can now be extended in the field of marketing is due in no small part to the instruments and conveniences provided by modern science and invention. Without the telephone and the telegraph it would obviously be impossible to conduct enterprises as ramified and fast moving as a large chain-store system. Less obvious in their influence but not less important have been the numerous devices — the typewriter, the cash register, the computing machine, etc. — for standardizing and mechanizing the tasks of business management. Without seeking to exaggerate the role of these mechanical aids, it should be emphasized that without them the division of labor and delegation of responsibility which are necessary for the management and control of large-scale enterprise would be difficult, if not impossible.

The Central Thesis. This brief review of commercial history and of the forces back of it leads to the thesis that business patterns are largely determined by material factors such as the prevailing mode of production, the facilities for transportation and communication, and the size of the trade area (itself largely resultive). If this is true, there is at least a strong presumption that recent corporate developments in the food industries as well as elsewhere represent the natural and inevitable adjustment of economic institutions to the basic factors which condition them. It would be an oversimplification to insist that technological forces are all that is involved. In some instances corporate mergers and combinations have been engineered for purposes of financial manipulation and extortive gain and have had no real basis in operating advantages or economic efficiency. The greater error, however, is not to recognize that large-scale organization may have a more fundamental impulse than is sometimes thought to be the case.

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Meat packing probably illustrates better than any other food industry the effect of technological developments on the size of the business unit. The keystone of modern meat packing is artificial refrigeration. This process was introduced in the late 1870's. Before that time, meat animals had to be slaughtered close to the point of ultimate consumption because of the impossibility of shipping fresh meat for any considerable distance. Under these conditions, centralization of the packing industry was clearly out of question. The slaughter of livestock and the processing of meats quite naturally was done by individual butchers and small companies operating on a local basis.

The introduction of artificial refrigeration about 1875 literally revolutionized the packing industry. It now became possible to centralize livestock slaughter in midwestern cities like Chicago where the economies of transportation dictated that it should be located. With geographical centralization came the opportunity to establish large plants and to apply methods of mass production to the slaughtering process itself. Large-scale plant operations not only made possible the greater mechanization and division of labor which are the bases of mass production, but also permitted the development of animal by-products which today are of considerable importance in the industry. The modern technology of meat packing is too well known to require description here. Suffice it to say that the process is such that it never can be decentralized and carried on by small enterprises comparable in size to a local creamery or cheese factory.

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Many of the mergers and consolidations made by the packers were clearly for the purpose of reducing costs of slaughter and distribution. Without such consolidations the unnecessary duplication of packing-house facilities unquestionably would have been much greater than it was, with higher plant costs as the inevitable consequence. An even greater incentive to mergers lay in the reduction of selling and distribution costs. The wholesale distribution of meats requires the operation of district cold-storage warehouses from which deliveries of meat can be made to nearby retail stores. Each packer distributing in any particular city must operate such a district branch and maintain a staff of salesmen to canvass among the retail outlets of the vicinity. It is evident that the consolidation of such branch facilities would result in substantially lower costs for distributing meats. In many instances, if not in most, it was the prospect of such savings rather than the desire for monopoly gains that led the packers into their consolidation programs.

Many observers have never understood why the packers handle products other than meats and have tried persistently to extend their operations into fields seemingly unrelated to meat packing. The common notion is that they hoped in this way to gain certain competitive advantages based on unfair and extortive trade practices. Undoubtedly this was a factor, but not the only one.

The costs of operating branch warehouses and selling meats to the retailer represent a considerable part of the packers' gross

margin. These costs are mainly in the nature of an overhead which can be reduced by the handling of additional products. Dairy and poultry products require refrigeration and must be handled in much the same way as meats. Since little extra expense was involved, the packers naturally began to distribute dairy products through their branch warehouses in an effort to reduce the warehouse overhead.

The desire to reduce overhead costs also led them to extend their business in other ways. It is obvious that the costs of selling meats to the small retailer will be substantially reduced if the packer salesman is in position to sell the retailer additional lines of goods. It was primarily to get such lines that the packers began the handling of dairy products, canned goods, coffee, and eventually a large variety of grocery items. To carry this another step — as the packers tried to do through the operation of retail markets — such selling costs might be still further reduced if the functions of retailing and wholesaling were integrated in such a way that sales solicitation of the retail outlet were no longer necessary.

All of this is not to imply that there may not have been a considerable element of financial manipulation and extortive gain involved in the development of large-scale organization in the packing industry. It would be a mistake, however, to look at this development only from this standpoint. Many of the principles of mass distribution and functional integration which the packers were criticized for trying to effectuate 30 or 40 years ago are now being applied by the corporate grocery chains and are generally accepted as being in the interest of more efficient food distribution.

5.2.5 Nicholls, William H. "Post-War Developments in the Marketing of Butter," *Iowa State College Res. Bull. No. 250*, Feb., 1939. Pp. 370–71, 372–73.

While the chief marketing channel for butter in 1918 included a wholesaler and a jobber, the pressure toward more direct marketing in the '20's frequently brought the consolidation of the wholesaler and jobber into the same organization and the elimination of a considerable number of wholesale houses, either by merger or failure. The merchandising programs of cooperative marketing associations and large centralized companies (including packers) diverted part of the butter formerly sent to terminal markets direct to smaller markets. Many of these organizations established in terminal markets their own

branches for selling direct to retailers. Direct-buying in the country by chain-store organizations which formerly depended upon terminal market wholesalers for their supplies was another important factor. Mergers and consolidations of local concerns resulted in a number of large organizations with highly developed distribution systems within which butter and other products passed direct to the retailer. All these forces have worked to make the direct marketing of butter, through integration from manufacturer to retailer, the dominant channel of distribution today. In spite of the elimination of one link in the more roundabout channel by combination of wholesaler and jobber, the wholesaler-jobber has been relegated to a position of secondary importance, handling only 36 per cent of butter sales in 1935. In the same year about 55 per cent moved direct to retailer or large-scale user, and the remaining 9 per cent was integrated all the way to the ultimate household consumer.

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. . . The general trend toward large-scale production, with its resultant demand for large markets and with relatively keen competition in those markets, began many years ago to force manufacturers to exercise a more direct control over their product. As companies grew in size and financial power, their management turned more and more to market control. Increasing importance of product differentiation and branding brought more and more dissatisfaction with prevailing methods and channels of distribution as carried on by independent jobbers, who were often unable or unwilling — because they handled many different products or brands, including, perhaps, some of their own — to promote the sale of the manufacturers' product in sufficient volume. As a result the function of demand creation was taken over by many large manufacturers. As chain-store organizations developed, offering very large outlets, direct selling became more feasible, such selling having developed earliest in those industries where the unit of sale was large. Direct selling was expected to give better control over quality of service, general policy and prices than could be obtained through the jobber. Once demand creation was taken over, only the work of physical distribution and some phases of risk-bearing and financing were left for the wholesaler. But even these were gradually encroached upon as manufacturers' financial resources grew large and they sought to relieve themselves of dependence

on middlemen for financial assistance, either direct or indirect, by duplicating the jobber's facilities through the establishment of branch houses, sales agencies and the like, thereby assuming responsibility for the other functions previously performed by the jobber, in the hope of either better promotion and service or lower cost.

* * *

. . . The expansion of some of the butter centralizers and other dairy concerns into large dairy corporations was partly, at least, a result of the need of making fuller use of integrated marketing facilities by selling not only increasing volumes of butter but also considerable numbers of related articles. In this way the relatively small units of sale were somewhat offset.

The centralizers were now performing every important marketing function (including financing and even storage) but transportation. The many supplementary and complementary relationships among dairy and poultry products in the use of these distributive facilities were an important factor leading to the rise of these great companies. Apart from this and the promotional urge — about which nothing definite can be said — the factor of increased stability and earning power was probably most important.

5.2.6 Nicholls, William H. "Post-war Concentration in the Cheese Industry," *Jour. Pol. Econ.*, Vol. XLVII, No. 6, Dec., 1939. Pp. 842–44.

The great post-war increase in direct marketing of cheese was largely brought about by the development of still other organizations of size, financial strength, and standardization comparable with those industries in which direct marketing had made early headway. The most important contributing factor was the development of processed cheese. For the first time cheese became a standardized product, easily adaptable to packaging, branding, and advertising, instead of a bulk product notoriously variable in grade, flavor, color, and texture. The result was that the need for the wholesalers' once-vital functions of grading, standardization, and selection was eliminated, in so far as cheese was processed. Large volume made possible scientific laboratory control over processing, which enables processors to use an important amount of off-grade raw material and still turn out a palatable, standardized product. The increasingly large volume of the processors also favored the establishment of their own assembling and buying subsidiaries at the expense of

independent country dealers. The processors continued to use wholesale channels to sell their product for a few years after certain of the wholesalers' functions were no longer needed. Then they began to supplement the sales efforts of their wholesale distributors; and with still larger gains in volume, made possible by acquisitions and mergers and with growing financial strength, they took over the sales promotion functions completely.

The existence and further development of such extensive distributing facilities for cheese during the late twenties made diversification economically desirable. The many supplementary and complementary relationships among dairy and poultry products in production, assembly, and distribution were doubtless one important factor in the growth of the large dairy corporations.

Post-war concentration in the cheese industry, however, was to a large degree due to monopolistic elements, especially to patents, which prevented greater integration by chain stores and producers' co-operatives. Even economies of scale alone — without patent rights — tend to lead to monopoly. The limit to decreasing costs resulting from economics of large-scale marketing is remote. Robinson has said:

"There is good reason for thinking that in many industries, where by the nature of the product a firm must market its own produce through a sales organization which extends far towards the final consumer, that organization will continue to yield economies with further expansion after all the technical economies have been secured, and after the limits of efficient management are approached."

Here we run into the dilemma which brought on the famous "cost controversy" of the twenties: "The persistence of decreasing costs for the individual firm over a wide range of output is . . . one of the forces tending to oligopoly or monopoly when the demand is not large enough to retain a large number of firms in competition at optimum output." The existence of large-scale economies has tended persistently to result in firms in all industries so large that ultimately market control, rather than low cost, becomes the major consideration. In an industry as concentrated as the cheese industry the movement toward integration and more direct marketing did not necessarily come as a result of lower distribution costs. It was only necessary that these costs be not increased by integration so much as to cancel

the advantages from greater control of resale prices and sales promotion. If costs were lowered, so much the better. The standardization of cheese through processing, by eliminating the need for the most important services of the cheese wholesalers, made possible lower costs of integration than if processed cheese had never been introduced. But the monopoly element of price-control increasingly held the center of the stage rather than competitive cost.

While the economies of large-scale distribution probably would have led, over a period of years, to a greater concentration in processed cheese than existed in the period of the early twenties, such concentration was certainly greatly hastened and enhanced by the legal monopolies bestowed upon a few select processors. These patents made high margins possible without fear of the entry of meat-packers, chain stores, co-operatives, or other organizations into processing. The several processors favored by patents could not long be expected to compete. Combination — unless it had been prevented by government action — was inevitable. Kraft and Phenix each was able to acquire a large number of companies who were actual or potential competitors before the courts established the validity of their patents. Then these two large companies combined and formed a "monopoly of monopolies," at least for a decade or more. A decade of extensive advertising and product differentiation — unimpeded by effective competition — can build "good-will" until it becomes a great barrier to the entry and growth of other firms, even after the expiration of the original patents makes such entry legally possible. By 1930 the basic patents were held by the nation's two largest dairy corporations — National Dairy Products and Borden. The marked tendency toward combination in many industries during the twenties — even where patent rights were not involved — was, to an important extent, monopolistic in character. In the cheese industry patent rights assured monopolistic combinations the strength of their positions.

5.2.7 Nicholls, William H. *Price Policies in the Cigarette Industry.* Vanderbilt University, Nashville, 1951. Pp. 199–201.

Advertising and Economies of Scale. In the previous section, we were willing to assume that advertising in the cigarette industry may have made possible the achievement of certain economies of scale. Even so, however, we must now raise the question as to the extent to which such economies are social or private. Apparently, since each of the three major cigarette firms has 3–4

plants, no one of them considers it economical to concentrate all of its huge volume of production in a single large plant. For this reason, even though there are important technical economies in concentrating large volumes of cigarette production in a single plant, the social economies of large-scale production would not appear to require single plants larger than any one of those of the three major firms. What, then, are the economies which a multiple-plant firm in the industry might enjoy which a single-plant firm could not achieve?

Certainly not the social economies of scale in performing necessary selling functions. The major manufacturers have been quite content to let independent wholesalers and retailers perform these functions without any one of them attempting to integrate manufacturing and distribution, presumably because the manufacturer could not perform these functions itself at a lower cost. Furthermore, it is doubtful that these independent distributors' costs would be much higher if their present volumes included a considerably larger number of brands, especially if variations in the relative turnover of individual brands were not so strongly influenced by large differences in scales of advertising. Presumably, social economies of scale in management or research (J. M. Clark's "intellectual overhead") have been of relatively small significance. The principal managerial skill needed in the cigarette industry has been the ability to originate and direct advertising campaigns and to adjust to dynamic changes in tastes, demand, and costs. If the scale of the major firms has enabled them to have a greater division of labor within management and to hire more able and costly executives, the principal advantages gained thereby have been on the side of advertising and salesmanship. Furthermore, cigarettes have been so relatively simple and standardized a product that the opportunities for research directed at new and better products and more efficient technology have probably been very small. Finally, the greater size of the major firms has probably resulted in certain economies of financing, which are of considerable importance because of the necessity of large leaf inventories and the payment of very large excise taxes in advance of sale. Again, however, these economies have probably resulted largely from the relatively low risk assured by their monopolistic position in the cigarette market (primarily the product of large-scale advertising) and the very great risk which new and existing smaller firms face in such a market.

It would therefore appear likely that the principal economies of scale which the major firms have achieved, beyond technical plant economies, have been the private rather than social economies of market control. The function of demand creation, which is the most costly aspect of the cigarette business, has been almost wholly performed by the manufacturers themselves, and has made integration for this purpose unnecessary. Thus, large-scale advertising — at least beyond that required to attain an optimum size of plant — has principally served as a means of achieving control over prices and monopoly profits, while in turn protecting these prices and profits against serious inroads from new firms. Hence, it appears almost certain that any social economies of scale made possible by multiple-plant operations have been more than offset by the private economies of market control — i.e., by non-aggressive price policies resulting from their larger scales of output. We may conclude that the key to the monopoly problem in the cigarette industry is advertising. Therefore, any public policy aimed at improving the social performance of the industry can hardly succeed if it fails to take advertising into account.

Economies associated with size of individual plants are most obvious in processing. They are also important in retail distribution. But they would not in themselves account for the growth of chain systems in retail distribution. Some of the advantages which chains have, both because of possible efficiencies and greater bargaining power, are discussed in the following excerpts.—*Ed.*

5.2.8 Hoffman, A. C. "Large-scale Organization in the Food Industries," Temporary National Economic Committee, Mono. No. 35, Washington, D.C., 1940. Pp. 62, 65–69.

Margins and operating expenses of chains and independents. Other indications of the relative efficiency of chains and independents are to be found in their gross margins and operating expenses. Comparisons of these for the two systems of distribution are not altogether satisfactory, but such studies as have been made show a clear advantage for the chains.

Studies conducted by the Harvard Bureau of Business Research during the 1920's indicated that chain systems typically took a gross margin equal to about 20 per cent of their selling price. Since the chains usually perform the wholesaling function for their stores, their margin must be compared with the combined margins of the average independent and the whole-

saler. The Harvard studies showed these combined margins to be 28.9 per cent of the retail price, the independent retailer taking 19.8 per cent, and the wholesaler, 9.1 per cent. When the average margins taken by the chains were expressed as a percentage of the higher prices at which the independents sold, they averaged only 18 per cent, which indicated a still greater advantage for the chains.

Part of the reduction in margins made by the chains is due to the fact that they do not render credit and delivery service. If it is assumed that the cost of these services is about 4.5 per cent of sale, the advantage of the chains due to lower operating costs is still more than 6 per cent of the retail price.

Numerous factors account for the greater efficiency in retailing which the chains indubitably have. Probably the main one is that their retail units are much larger, which permits them to use labor more efficiently.

* * *

Management as a factor in retailing efficiency. One of the anachronisms still prevailing in the minds of many people is the notion that the management of independent stores is likely to be superior to that of chains because the managers of chain units lack the incentive of ownership. The belief is traditional that to own an enterprise is to know best how to run it. Even economists have been loath to apply to the function of management the principle of specialization and division of labor.

The main elements of successful management in retailing are skill in buying, advertising, and merchandising, together with careful attention to all cost factors. One of the characteristics of mass retailing is that all these elements are centrally planned and carried out in the retail unit on a more or less standardized basis. The purchase of all goods is attended to by buyers located either at the chain headquarters or at the district warehouse. Window displays, advertising copy, store arrangements, etc., are designed by specialists in these matters, their ideas being transmitted to the store managers via the store superintendent. All the larger chains instruct their employees in selling techniques and give their store managers rigid training in store operation. Most important of all, the systems of records and cost accounts kept by the chains enable them to detect and rectify the sources of loss and inefficiency.

Many independent retailers can and do match the chains in

the skill with which they conduct their store enterprises. But it goes without saying that most of them do not. The business of the independent retailer is not large, and his earnings are necessarily small. He is nevertheless confronted with most of the problems of stock selection, merchandising, and expense control confronting the corporate chains. It is inconceivable that any very large percentage of the 300,000 independent grocers should have all the requisite qualities possessed by the chain experts for meeting these problems.

The corporate chains are of course not without their own problems of management and personnel. Among these are lack of incentive on the part of employees, absentee ownership, and corporate bureaucracy. Much progress has been made by the chains in alleviating some of these difficulties, although the causes lie in deep-rooted and inherent characteristics of large-scale organization.

The development of cooperative and voluntary chains undoubtedly has had a great influence in improving the management practices of independent retailers. Many of these cooperatives have gone actively about it to assist their members with store displays, accounting practices, and merchandising methods. There is, however, nothing compulsory about the adoption of practices recommended by the cooperative chains. A member retailer is free to take or not to take these suggestions. An increasing number of retailers are taking them, but human inertia is such that many will not.

There is, after all, a vast difference between a corporate chain which compels its employees to follow certain retail methods and a cooperative chain which only suggests such methods. It may be that when all things are considered, the freedom of choice left to the independent enterpriser is preferable to the economic advantages resulting from centralized management. The best features of the two systems of distribution, however, cannot be combined in either the one or the other. The capabilities of most persons are not such that they can be expected to show much proficiency even in the management of small enterprises. We must therefore either accept the ineptitude of the average person in order to preserve for him some measure of what is called economic individualism, or we must accept the change from enterpriser to employee status in order to achieve the advantages of centralized management.

The Integration of Grocery Wholesaling and Retailing.

Another important aspect of mass distribution from the standpoint of marketing efficiency is the fact that mass distributors have tended to integrate successive marketing functions within a single organization. The number of bargaining transactions and ownership transfers necessary to move goods from producer to consumer is thus greatly reduced as compared with the regular channels.

The importance of this is commonly overlooked. No inconsiderable part of the total cost of distributing food products is incurred for the purpose of bringing about ownership transfers at various stages in the marketing process. Brokers' fees, wholesalers' commissions, salesmen's salaries, advertising expenditures — all are partially chargeable to the efforts of sellers and manufacturers to find retail outlets for their goods. Obviously the greater the number of such buyers and sellers and the more functionally specialized they are, the greater the number of ownership transfers necessary to move the commodity forward toward the consumer.

The purpose served by these ownership transfers is that of apportioning the supply properly with respect to the ultimate demand. Clearly this is a function which must be performed by any type of distributive system, even a completely unified, noncompetitive one. The mechanics by which it is done, however, will be greatly different, depending on the number, size, and character of the marketing agencies. In the regular channels, comprised as they are of many small, specialized handlers, the product moves forward chiefly by means of numerous buying and selling transactions. In contrast, the mass distributor moves it forward on an intracompany basis, with the orders and requirements of its various parts largely supplanting the bargaining transactions of the regular system.

This is the key to much, if not most, of the advantage which the grocery chains have over the independent retailer-wholesaler system. When the function of wholesaling is integrated with that of retailing, it is no longer necessary to "sell" the retail store. The average independent retailer is visited daily by at least a half-dozen salesmen, each trying to sell him a small bill of merchandise which he may or may not need. Those who seek the retailer's business cannot permit him simply to order his merchandise as he needs it; the competition between them is such that they constantly must persuade, cajole, and coax him.

The cost of this sort of thing in time and money is nothing

short of stupendous. Yet it is seldom mentioned when methods for reducing the costs of food distribution are being considered because most people, including a fair share of the economists, are more concerned with the preservation of competition under old institutional forms than with economic efficiency as we have defined the term.

Labor efficiency of chains versus that of the regular channels. The advantages of combining wholesaling and retailing within the same firm are self-evident, but it is not easy to provide a precise measurement of them. One of the few studies made of this is one by the writer, relative to the distribution of fruits and vegetables in the city of Philadelphia. This study compares the labor efficiency of a large chain system of that city in putting fruits and vegetables into its retail stores with that of the regular jobbers and wholesalers who serve the independent retail trade. Admittedly the comparison is not an exact one, and it may not be illustrative of conditions generally, but it constitutes the only study of its kind which has come to the attention of the writer.

The distribution of fresh fruits and vegetables in Philadelphia provides a particularly good place to compare the efficiency of the two systems of distribution because in that city they are largely separate and distinct from each other. The Great Atlantic & Pacific Tea Co. (the chain used in the comparison) operates a produce warehouse which handles all fruits and vegetables sold through its 950 retail stores in the district. The operations performed at this warehouse correspond in a general way to the functions of the produce wholesalers and jobbers in serving the independent grocer, except that the chain delivers all produce to the retail store, whereas the independent grocer usually visits the wholesale market in person and takes home his purchases in his own vehicle.

The relative efficiency of the two systems of distribution so far as the use of labor is concerned is shown in Table 25. With a total working force of 223 people, the chain system bought, assembled, and delivered 5,350 cars of fresh fruits and vegetables for its 950 retail units in 1936. This is an average of, roughly, 24 cars per person per year. Compared with this, the regular channels handled about 40,755 cars of produce with the equivalent of 4,150 full-time employees, or an average of only 10 cars per person per year. The chain system thus required less than half as many labor hours to put a given volume of produce into its stores as were required in the regular channels.

TABLE 25

LABOR EFFICIENCY OF A NATIONAL CHAIN-STORE SYSTEM COMPARED WITH THAT OF THE REGULAR MARKETING CHANNELS IN HANDLING FRUITS AND VEGETABLES UP TO THE RETAIL STORE, PHILADELPHIA, 1936

Dock and Callowhill St. Markets (Estimated Volume Handled, 40,755 Cars)		Cars Handled Per* Person	National Chain-Store System (Estimated Volume Handled, 5,350 Cars)		Cars Handled Per* Person
		No.			*No.*
1. Estimated number of proprietors of wholesale and jobbing stores	275	148	1. Number of buyers for chain system	5	1,070
2. Estimated number of people employed by above stores (not including proprietors)†	1,375	30	2. Number of warehouse employees for handling fruits and vegetables	106	50
3. Estimated time spent by retailers and other buyers in procuring supplies, in terms of equivalent full-time people employed‡	2,500	16	3. Number of men employed to truck produce from warehouse to retail units	112	48
4. Total number full-time people engaged in wholesaling and jobbing operations	4,150	10	4. Total number employed	223	24

* Computed by dividing the number of persons employed in each operation into the total volume handled.

† Assuming an average of 5 employees per firm, which is the average indicated by the 1936 census of business for fruit and vegetable wholesalers in Philadelphia.

‡ Based on interviews with 100 retailers.

(*From* A. C. Hoffman and L. A. Bevan. Chain-Store Distribution of Fruits and Vegetables in the Northeastern States, Bureau of Agricultural Economics, 1937. P. 47.)

Closer examination of Table 25 will indicate the source of the chain's advantage. In the first place, each of its 5 buyers bought an average of over 1,070 cars of produce per year, whereas the average wholesaler handled less than 150. Particularly striking is the tremendous amount of time spent by independent retailers in visiting the market to procure their daily supplies as compared with the chain-store practice of delivering the produce to the store, thereby relieving its store managers of this time-consuming task. (See item 3 of Table 25.) Interviews with 100 independent grocers in Philadelphia revealed that most of them visited the produce market every business day of the year and spent an average of 3 hours per trip.

The elimination of this sort of thing through the integration of the wholesaling and retailing functions represents one of the chief advantages possessed by the mass distributor. Conceivably, the independents might achieve for themselves some of these advantages by means of cooperative organization, but as yet have not done so in the case of fruits and vegetables.

5.2.9 **Artman, Charles E. "Expense Factors in City Distribution of Perishables," *U. S. Dept. Agr. Bull. No. 1411,* Aug., 1926. P. 22.**

TABLE 12

PRICE SPREAD PER CAR FOR EACH COMMODITY IN FIVE STORE TYPES, NEW YORK METROPOLITAN AREA, FEBRUARY, 1923, TO MAY, 1924.

Commodity	Chain Stores	All Unit Stores	Cash-carry Stores	Cash-delivery Stores	Credit-delivery Stores
Northern potatoes.....	$ 210	$ 615	$ 600	$ 580	$ 645
California oranges.....	870	1,465	985	1,260	1,635
Sweet potatoes.....	330	880	470	815	990
Boxed apples.....	1,010	1,575	1,340	1,445	1,685
Barreled apples.....	570	960	830	880	1,045
Eastern lettuce.....	695	940	885	845	990
Yellow onions.....	675	905	745	870	970
Weighted mean.....	$ 570	$ 995	$ 825	$ 905	$1,075

* * *

TABLE 10

ORIGINAL (UNADJUSTED) WHOLESALE AND RETAIL PRICES, AND PRICE SPREAD PER CAR IN FIVE STORE TYPES, SEVEN COMMODITY WEIGHTED AVERAGES, NEW YORK METROPOLITAN AREA, FEBRUARY, 1923, TO MAY, 1924.

Store Type	Wholesale	Retail	Spread
Chain	$1,130	$1,700	$ 570
All unit	1,185	2,180	995
Cash-carry	1,135	1,960	825
Cash-delivery	1,190	2,095	905
Credit-delivery	1,200	2,275	1,075

5.3 Imperfections of Competition and Their Consequences

Concentration in the processing and distribution of farm products has undoubtedly introduced many forms of imperfect competition. This is not to say that the consequences have necessarily been harmful to the farmer or to the consuming public. In some instances, the gains from economies of scale resulting from concentration have probably outweighed any losses attributable to less competitive price policies; in other cases, the opposite may have been true. An appraisal of the social consequences of imperfections of competition is at best difficult and, in any case, will differ considerably from one specific market situation to another. Quite apart from the problem of appraisal of consequences, however, there is little doubt that the development of theoretical models for various concrete types of imperfect competition has gone far in improving our understanding of the nature of the price-making process in agricultural markets.

First, a simple picture of a single seller confronted with a monopolistic market is presented.—*Ed.*

5.3.1 Steinbeck, John. *The Pearl.* Viking Press, New York, 1947. Pp. 58–59.

It was supposed that the pearl buyers were individuals acting alone, bidding against one another for the pearls the fishermen brought in. And once it had been so. But this was a wasteful method, for often, in the excitement of bidding for a fine pearl, too great a price had been paid to the fishermen. This was extravagant and not to be countenanced. Now there was only one pearl buyer with many hands, and the men who sat in their offices and waited for Kino knew what price they would offer,

how high they would bid, and what method each one would use. And although these men would not profit beyond their salaries, there was excitement among the pearl buyers, for there was excitement in the hunt, and if it be a man's function to break down a price, then he must take joy and satisfaction in breaking it as far down as possible. For every man in the world functions to the best of his ability, and no one does less than his best, no matter what he may think about it. Quite apart from any reward they might get, from any word of praise, from any promotion, a pearl buyer was a pearl buyer, and the best and happiest pearl buyer was he who bought for the lowest prices.

The effect of monopoly upon Kino was simple, direct, and easily understood. In agricultural markets there are few, if any, cases of outright monopoly. Rather, there are many cases of substantial departures from competition. The consequences are far-reaching, and difficult to appraise.

Semi-monopolistic situations in agricultural marketing have been analyzed by a number of writers. We present here some of the main observations and conclusions of Nicholls and Hoffman, both of whom made broad surveys of the problem.—*Ed.*

5.3.2 Nicholls, William H. "Imperfect Competition in Agricultural Processing and Distributing Industries," *Canadian Jour. Econ. and Pol. Sci.*, Vol. 10, No. 2, May, 1944. Pp. 150–51, 152–54, 160–63.

Among persons unfamiliar with agricultural markets, it is not uncommonly assumed that here, if in no other area of economic activity, prices are established through the free play of competitive forces in an environment at least approaching the perfect market. To be sure, agricultural production is carried on by atomistic units and, at least prior to the inauguration of government crop-control programmes, there have been few limitations upon competition among farmers for the use of productive resources. And, in the processing and distribution of farm products, the illusion of pure competition has been strengthened by the relatively large number of firms and the fact that they frequently do not have direct control of the short-run supply of their raw material.

But those who are familiar with actual conditions in these markets know how unrealistic it may be to proceed on the assumption of pure competition. It has become increasingly evident to the agricultural economist, for example, that typically — even where the number of processing firms is large — a few firms

dominate a given industry, often aided and abetted by active trade associations. Again, in the local market, where assembling and processing is done by a relatively large number of small independent agencies, differentiation of services — including that of location — may lead to non-aggressive buying policies. Finally, the fact that processor-distributors do not control the short-run supply of farm products does not preclude monopoly elements. For imperfect competition in a processing-distributing industry implies control of the supply of processing-distributing services, hence the price of these services (the margin or spread).

A farm product is rarely sold by the farmer direct to the household consumer. Except for the most perishable farm products, perhaps the most typical marketing channel is farmer-local assembler-central wholesaler-retailer-consumer. Of these middlemen, it is the independent retailer who has been most adequately covered by the general theory of imperfect competition. For, while it is reasonable to assume that the retailer sells under conditions of imperfect competition, he probably buys under conditions approaching pure competition. On the other hand, the central wholesaler, located at the bottleneck of the marketing process, is most likely both to buy and sell under conditions of imperfect competition. A few dominant wholesalers may be, in technical terms, at once oligopolists and oligopsonists. Finally, the country assembling agency, if it is not integrated with later stages of the marketing process, may sell under pure competition but buy under imperfectly competitive conditions because of locational factors or local producers' preferences.

* * *

Let us first examine the behaviour of the few dominant firms among themselves. One would expect that, because of the circular interdependence between their price policies, the dominant firms would come to recognize the value of non-aggressive price policies in both selling and buying. One of the most important market patterns of a non-aggressive nature is that of market-sharing.

Market-sharing: For thirty or forty years, the four largest American meat packers appear to have exhibited a decided market-sharing tendency in buying live-stock. The constancy of their relative shares of hog purchases at selected markets is indicated in Tables III and IV. The large packers have always stoutly maintained that these constant purchase percentages re-

TABLE III

PERCENTAGES OF TOTAL "BIG FOUR" HOG PURCHASES TAKEN BY EACH OF THE FOUR FIRMS BUYING AT SELECTED TERMINAL MARKETS, UNITED STATES, 1931–37, 1913–17, AND 1906-11

Market and Firm	Average Percentage Taken		
	1931–37	1913–17	1906–11
Omaha			
Armour-Morris	44.6	46.6	45
Swift	24.8	24.2	25
Cudahy	30.6	29.2	30
Total "Big Four"	100.0	100.0	100
Sioux City			
Armour	38.8 (50)	(50.3)	.....
Cudahy	38.8 (50)	(49.7)	.....
Swift	22.4 (..)	no plant	.....
Total "Big Four"	100.0 (100)	(100.0)	.....
Oklahoma City			
Armour-Morris	50.4	50.6	.....
Wilson	49.6	49.4	.....
Total "Big Four"	100.0	100.0	.....

TABLE IV

PERCENTAGE OF TOTAL HOG RECEIPTS PURCHASED BY "BIG FOUR" MEAT PACKERS AND OTHER BUYERS, ST. JOSEPH AND OKLAHOMA CITY, 1931–40

Year	St. Joseph			Oklahoma City		
	Armour	Swift	Others	Armour	Wilson	Others
1931	33.82	33.86	32.32	.....	.....	.....
1932	35.65	35.65	28.70	44.53	44.48	10.99
1933	41.03	41.03	17.94	45.01	45.00	9.99
1934	43.21	43.21	13.58	41.34	41.38	17.28
1935	40.44	40.47	19.09	42.83	42.83	14.34
1936	38.99	38.98	22.03	42.73	42.72	14.55
1937	39.76	40.07	20.17	39.33	39.31	21.36
1938	38.46	39.30	22.24	34.13	34.16	35.71
1939	38.54	38.77	22.69	32.11	32.07	35.82
1940	42.36	42.36	15.28	33.61	33.64	32.75

sult from the intense nature of their competition. To quote one of them: "Each company is constantly endeavouring to increase its percentage, but is met at every step by the competition of

other packers. On the other hand, no one of them intends to see any other packer gain on it if it can help it. The result is that with everybody keeping close account of everybody else in an open market place, no single packer can increase his percentage substantially."

This competitive explanation would presumably hold, however, only if each dominant packer ignored its own influence upon the market price of live-stock. Several other packer statements indicate that each does recognize its influence upon price. Thus, a representative of Swift and Company once stated that "A small packer can go out in the market, and if he is killing a hundred hogs a day he can double his killing without affecting the market at all. . . . If we tried to increase our [purchases] one-half of one per cent, immediately we would feel the effect of it." This statement clearly shows that, while its small competitor is faced with a perfectly elastic supply curve of hogs, Swift and Company's supply curve is relatively inelastic.

What are the results when each large packer recognizes that it can influence the market price by its own actions? Apparently there results the phenomenon of market-sharing, whereby each dominant buyer is "entitled to" a certain percentage which it is under no circumstances to exceed. Thus, the chief economist for Swift and Company once testified that "If we try to exceed our customary purchases in any market, we could not get away with it, that is all. To do that, we would have to raise the bid over the market price, and Morris, Armour and Wilson would not stand for that. They would meet our prices and there would be cutthroat competition." Another Swift economist put it as follows: "The general practice among intelligent competitors of respecting one another's position need not be a matter of 'tacit understanding.' In the case of Swift and Company *it is an individual, commonsense policy, arrived at independently, not to invite retaliation and trade wars by using over-aggressive tactics.*"

* * *

A second related problem is that of bilateral oligopoly, where a few dominant buyers face a few dominant sellers — for example, the large packers or condensed milk concerns *versus* the large grocery chains. According to my limited observation, however, there is a tendency for such large buyers and sellers not to deal with each other. As an alternative, they tend either to integrate

backward or forward, as the case may be, or to deal with the smaller independent competitors on the opposite side of the market. Thus, the large chain-store organizations chose to establish their own processing facilities for evaporated milk rather than submit to dictation of price policies from the large manufacturers of the nationally advertised brands. A similar trend toward integration by the chains took place in butter, and doubtless in many other farm products. The chains are probably in a strong bargaining position against large processors, however, for it is probably easier for them to integrate backward than for the processors to take over retailing, since the chains already have a well-established outlet for any products they may choose to process themselves. The very threat of such a step by the chains is doubtless a powerful bargaining weapon. The major meat packers have continued to find a more than proportionate outlet for meat and produce among independent retailers rather than chains. This has been forced upon the packers by chain-store integration in handling produce. For meats, on the other hand, the chains still do relatively little slaughtering, but choose to buy a major proportion of their meats from the medium-sized packers rather than from the dominant firms.

Price Discrimination. In the sale of manufactured agricultural products to consumers, there is undoubtedly some price discrimination. We have already mentioned fluid milk. The frequent result of product differentiation and advertising is to set apart advertised and unadvertised brands, with a price differential between them accepted as normal by all concerned. The most important examples probably are found in canned goods, such as canned fruits, vegetables, and evaporated milk, where an identical product may be sold at different prices according to whether or not its label is advertised. In such a market situation, it is common to find competition on a non-price basis among the advertised brands of the dominant firms, while they use "second labels" to compete on a price basis with non-advertising independents.

* * *

Price discrimination in *buying* farm products is perhaps less common than it once was. For advancements in transportation facilities and market-news service have strongly tended to replace isolated local markets with relatively perfect markets over a considerable area. For example, despite the increasing decentralization of hog buying in the past twenty years, it is prob-

able that the competitive situation has improved so far as hog producers are concerned. Thus, the state of Iowa has tended to become virtually a single market for hogs in recent years, so that it would be more difficult to pay different prices for the same grade of hog. A more common form of price discrimination today probably is that of paying the *same* price for products of different grades or yields. While the buyer can count on such differences averaging out over a large volume of purchases, there is bound to be discrimination among individual producers. Here the Canadian scheme of buying hogs on the more objective and accurate basis of *carcass* grade and weight, determined under public supervision, has pointed the way toward a solution.

* * *

Thus far, in considering elements of imperfect competition on the buying side of the market, we have centered our attention on the central market, where the principal departure from conditions of pure competition is found in the dominant importance of a relatively few buyers. We have tacitly assumed that the services offered to sellers by the various buyers are identical, so that sellers have no preferences as between the alternative outlets for their products. This is probably a fairly reasonable first approximation to reality in the central market, where sellers' preferences would be expected to be less important than in the local country market. For the various buyers are located at the same place, buyers and sellers are more specialized and better informed, and there is a strong tendency toward price sensitiveness.

When we turn to the local country market, however, service differentiation becomes especially important. Buyers' services are differentiated if any significant basis exists in the minds of sellers for preferring the services of one buyer over those of another. As the basis for producers' preferences, one might list such things as convenience of location; the reputation, personality, or other personal characteristics of the buyer or his agent; the "fairness" of grading, weights, and tests; hauling facilities offered; and promptness of payment. In so far as such factors — whether tangible or intangible, real or merely fancied — vary from buyer to buyer, the services in each case are different, and each seller takes them into account in his choice of a particular buyer as the outlet for his product. Given producers' preferences, each buyer has partial independence of action, being able to determine in part his own price policy (he is faced by a rising

rather than horizontal supply curve of the farm product), the services offered, and the extent of outlays for procuring his farm product. Under these circumstances of monopsonistic competition, we can get the whole range of market situations developed by Chamberlin on the selling side.

Service differentiation, especially on the basis of location, may make the phenomenon of oligopsony much more widespread than commonly thought. Thus, it may be supposed that a few local buyers frequently learn by experience to recognize circular interdependence, so that pricing policies become non-aggressive and profits excessive. Once again, however, costs of entry into the local market usually being low, such non-aggressive price policies may ultimately lead to long-run excess capacity, by which high costs and inefficient scale replace abnormal profits. It is the existence of such imperfections of competition in the local market which is the principal economic justification for local producers' co-operatives, such as grain elevators and creameries. Finally, when differentiation is primarily spatial, a radical change in transportation costs — such as we have witnessed in the past twenty years — may bring a shift from non-aggressive to aggressive price behaviour in the local market.

5.3.3 Hoffman, A. C. "Large-scale Organization in the Food Industries," Temporary National Economic Committee, Mono. No. 35, Washington, D. C., 1940. Pp. 79, 81, 82, 83–86.

Competition, Imperfect Competition, and Monopoly: The general principles which govern the determination of price and supply under competition and varying degrees of monopoly are well understood and require no extended elucidation here. The food industries, however, present some special problems for price theory which we shall want to examine.

* * *

The Dominant Firm: Theories of imperfect or monopolistic competition have been developed mainly for small numbers of competing firms. We have seen, however, that in the food industries the situation is more likely to be one in which there are a few large firms and numerous small ones. The presence of numerous small firms obviously precludes a solution based on small numbers, as in ordinary oligopoly. At the same time, the situation is not strictly competitive despite the numerous small firms because of the presence of a few large ones whose price is not independent of their output policies.

* * *

We may suppose first the case of a large firm in competition

with many small ones. Since none of the small firms has any appreciable part of the total supply it may be presumed that they will tend to behave competitively in adjusting themselves to any given situation. The existence of the large firm in no way alters the fact that their individual demand curves are virtually horizontal.

* * *

Several practical conclusions follow from the example which we have described. In the first place it is evident that the price is no longer uncontrolled or automatic in the sense that it results from the blind adjustment of competitive forces. By the very nature of the case the dominant firm appears to assume a position of price leadership. It may reasonably be expected to take the initiative in making price changes as it seeks to maximize its profits under varying market conditions. To each new position taken by the dominant firm the small ones will tend to adjust on the basis of competitive behavior.

Obviously a large firm which controls only 10 per cent of the total supply will be less likely to attempt price enhancement than one which controls 50 per cent. In the former case even a halving of its output would increase its price only a little even if the small firms held their supply virtually constant.

Equally important in determining the policy of the dominant firm is the elasticity of the supply for the small ones. If they respond to an increase in price by the large firm with a sharp increase in output then a restrictive policy on the part of the large firm will result mainly in its losing part of the market. To put the matter a little differently, the more elastic the supply of the small firms the more elastic the demand for the dominant firm, and hence the less incentive the dominant firm has for reducing its supply.

The supply response of the small firms will be affected by several factors. In the short run, a dominant firm conceivably might be able to raise prices quite considerably before the small ones could expand the scale of their operations to take advantage of the higher prices. This the large firm presumably would not do if it felt reasonably sure that the smaller ones subsequently would expand their operations or if new firms would be attracted into the industry. Moreover, most of the food industries are already characterized by unused resources and facilities so that they could quickly step up their output under the stimulus of higher prices.

Ease of entrance into a particular industry would also tend

to influence the nature of the supply response on the part of the small firms. In a sense the very existence of numerous small firms indicates that the entrance of new enterprisers is not difficult. Thus a widening of margins by the grocery chains would quickly attract many new enterprisers into this field, but a widening of margins by the meat packers might not do so immediately because it is not so easy for a new firm to establish plant facilities and market connections in this industry.

For reasons already made clear, one cannot generalize as to the effect of a dominant firm on price and total supply. The existence of such a firm would not necessarily mean that prices would be higher or supplies smaller than under perfect competition. As a matter of fact, the opposite might be true, and probably would be true if the costs of the large firm were substantially below those of its small competitors. It might limit its output to the point of maximum profit for itself and still offer its product at a lower price than its small competitors could do if they were to replace it. If there are advantages in large-scale organization from the standpoint of efficiency, then competition between several large firms able to match each other on this score almost certainly would result in a lower level of prices than under perfect competition. Certainly the existence of large firms and some degree of imperfect competition is not necessarily incompatible with the public interest if cost differentials are significant.

Bilateral or Successive Monopoly: Another special situation more likely to be encountered in the food industries than in most others is that of bilateral or successive monopoly. Such a situation might be defined as that existing when there are two monopolists (or several oligopolists), one above the other in the marketing system. A hypothetical example would be that of a processing monopolist who sold his entire output to another firm which had complete control of its distribution.

Needless to say, no pure examples of this kind are to be found anywhere in the economy. But to the extent that we may have imperfect or monopolistic competition at various points in the marketing system, we do have an element of bilateral monopoly. For example, in the cereal industry we have had the growth of large-scale baking superimposed on large-scale flour milling with a separate set of firms in each field. Another potential example is that of the meat packers and the grocery chains.

In the field of fluid milk distribution, however, the question

of bilateral monopoly appears to be one of immediate and practical importance. The milk producers in most large city markets are organized into cooperative associations through which most of the milk is sold to distributors. The distributors, in turn, are also relatively few in number, three or four of them often controlling as much as three-fourths of the total supply in a given market.

In the ordinary course of bargaining between these two groups, each concentrates its interest primarily on its own price or margin. Not infrequently each group is willing to grant the other certain concessions, provided there is reciprocity in the matter. Thus the distributors will agree to pay the producers' cooperative a high price for its milk, if by so doing they can widen their margin between the price paid the cooperative and that charged the consumer.

It is obvious that this sort of bargaining is not calculated to lower the price to consumers and may actually be carried to the point where the farmers and distributors themselves lose by it. This could almost certainly be true if the demand for fluid milk were elastic. In this case the efforts of each monopolistic group to improve its own position might force prices so high that the combined profits of both groups would be reduced, a situation which would never occur under conditions of horizontal monopoloy or oligopoly.

Indeed, economic theory affords a demonstration of the likelihood of just this outcome. So far as the writer knows, the case of bilateral monopoly has received very little attention from economic theorists. We will not burden the discussion at this point with a proof of the principles which are involved in it. Such a proof can be found, however, in an appendix at the end of the dissertation. It will suffice here to lay down only the conclusions to which the theory leads:

(1) Two successive monopolists, one above the other, would tend always to raise prices and limit supplies more than a single monopolist combining both their functions.

(2) As the number of points of successive monopoly increases in the marketing system, the situation so far as the public is concerned becomes progressively worse.

(3) Paradoxical as it seems at first thought, the public would probably be helped rather than injured by a conspiring between the successive monopolists to increase the amount of their combined profits.

(4) These general principles would be modified in degree but not invalidated by the assumption of monopolistic competition rather than monopoly at the various points.

Measuring the Effects of Monopoly: Criteria. . . .

Monopoly, or some degree of it, in the case of a commodity for which demand is elastic is almost certain to be less serious than in the case of one with an inelastic demand. One might even generalize to the point of saying that complete monopoly under conditions of elastic demand is of less economic consequence than even a small or partial degree of monopoly where demand is inelastic.

A further extension of this principle may be made in terms of substitution and product differentiation. Thus a firm in complete control of the canned-peach industry is much less to be feared than one which would control the entire canned-fruit industry; and even less serious is a monopoly of a particular brand of canned peaches. Concepts of this kind are a part of everyday thinking on the subject of monopoly and require no amplification here.

Somewhat more complicated are the considerations on the supply side. If the nature of the cost function is such that any diminution of supply is likely to be associated with a material reduction in cost, then clearly monopoly control will lead to a greater curtailment of output than where this is not the case. A distinction must also be made from the standpoint of costs between short- and long-run tendencies. If a considerable part of the cost is in the nature of an overhead, then we may expect at least a more stable output and a better sustained one in times of business crises than when most of the costs are variable. This will tend to be true in monopolized as well as competitive industries.

One of the simplest criteria of the degree of competition is "ease of entrance" into a particular industry. Perhaps a better way of putting this is in terms of the divisibility of the productive factors. It can be demonstrated that all economies of scale, both internal and external, arise out of the indivisibility of productive resources. If the factors of production cannot be easily divided and combined into small business units, then long-run average costs tend to be decreasing and perfect competition is impossible. A case in point is the difference between the business of meat packing and grocery retailing.

Greatly complicating the whole problem of monopoly are

the social, philanthropic, and conventional elements which go into the determination of business policy. The policies followed by businessmen do not necessarily conform to what might seem to be their best interest from the standpoint of an immediate maximizing of profit. For philanthropic reasons, they may at times choose to forego pressing the advantage of their position to its utmost. More commonly, however, their motives for foregoing profits probably are ulterior rather than philanthropic; as, for example, when they shape their policies to avoid governmental intervention, or to discourage the entrance of new firms into their particular line of business. But for whatever reason, it will be true that the precise outcome of monopoly cannot be predicated solely on the functional characteristics of the demand-and-costs factors.

Price discrimination is an aspect of monopoly which merits serious study. It has already been mentioned in connection with the economics of location. Some economists are inclined to assume that all forms of price discrimination are "bad," or "anti-social." The editor hopes these economists will study the following example proposed by Dupuit, and will ask themselves whether the single toll, or the discriminative toll, was more nearly in the public interest.—*Ed.*

5.3.4 Dupuit, Jules. *De l'Utilité et de sa Mesure.* (A collection of Dupuit's writings.) La Riforma Sociale, Torino, Italy, 1933. Pp. 139–41.

Une passerelle est établie entre deux quartiers très-populeux d'une grande ville, elle a coûté 150 000 francs; le produit à raison de $0^{fr}.05$ par passage n'est que de 5 000 francs; c'est une mauvaise affaire, l'entrepreneur qui avait emprunté la plus grande partie des 150 000 francs ne pouvant payer les intérêts de cette somme est bientôt ruiné. Le pont est vendu à un homme intelligent qui étudie la fréquentation et cherche à augmenter son revenu. Il lui est défendu d'élever son tarif, et d'ailleurs cette mesure pas plus qu'un abaissement n'accroîtrait suffisamment le produit, il est donc obligé d'avoir recours à de nouvelles ressources. Il remarque que son pont réunit le quartier des manufactures à celui où logent les ouvriers; matin et soir ces derniers sont obligés de faire un long détour pour se rendre à leur destination. Le pont abrège beaucoup la distance à parcourir, mais un sacrifice de 10 centimes par jour est beaucoup trop considérable, eu égard à leur salaire; en ne leur demandant que 2 centimes, pas un n'hésitera à se procurer cette satisfaction, et on obtiendra ainsi mille nouveaux passages quotidiens, qui à raison de 1 cen-

time, produiront une recette journalière de 10 francs et 3 000 francs pour les trois cents jours de travail de l'année. Il s'agit maintenant de faire cette recette supplémentaire sans réduire celle de 5 000 francs que procure le tarif à 0fr.05. C'est ici que l'imagination du spéculateur doit s'exercer, et on trouverait sans doute des combinaisons beaucoup meilleures que celles que je vais proposer et qui sont destinées plutôt à me faire comprendre qu'à servir de modèles.

Le propriétaire du pont pourra insérer dans son tarif une clause ainsi conçue: *Pour le passant en casquette, en blouse ou en veste, le péage est réduit à* 0fr.01. S'il est ainsi parvenu à définir d'une manière suffisante les ouvriers qu'il veut faire jouir de la réduction, il aura nécessairement la recette de 3 000 francs que doivent donner les nouveaux passages; mais il est très-possible que la recette de 5 000 francs soit diminuée d'une certaine somme, parce qu'un certain nombre de passants à 0fr.05 profiteront, grâce à leur costume, de la réduction qui ne leur est pas destinée: cette recette pourra descendre à 3 000 francs. La recette totale se composera ainsi:

	fr.
60 000 passages à 0fr.05.	3 000
40 000 passages à 0fr.01 provenant des anciens passants qui ont échappé au tarif au moyen de leur costume. ..	400
300 000 passages à 0fr.01 provenant des nouveaux passants.	3 000
Total	6 400

On voit que cette réduction partielle du tarif ne donne pas au propriétaire tout ce qu'elle pourrait donner, il perd 1 600 francs sur les anciens passants qui en profitent malgré lui. Or, par de nouveaux artifices, il pourra diminuer cette perte. Ainsi, il pourra stipuler que la réduction n'aura lieu que le matin et le soir aux heures d'ouverture et de fermeture des ateliers, ou qu'elle ne sera accordée qu'aux ouvriers porteurs de leur livret. Quelle que soit la combinaison adoptée, elle aura pour résultat d'augmenter d'autant plus le péage qu'elle distinguera mieux les passants qui attachent une utilité différente à l'usage du pont.

Ainsi le péage à 0fr.05 de ce pont produirait.	5 000 fr.
Id. à 0fr.01.	4 000 fr.
Et une combinaison de péage à 0fr.05 avec le péage à 0fr.01 pourrait en produire près de.	8 000 fr.

Ainsi, suivant que vous adopterez tel ou tel système de péage, le pont pourra se faire ou ne pas se faire, il sera une bonne ou une mauvaise affaire pour le constructeur, il sera utile ou inutile pour le public.

Discriminative pricing is involved in many programs to increase farmers' returns — in classified pricing of fluid milk and diversion programs for fruits and vegetables, in the former food stamp and nickel milk programs, in the "two-price plans" for wheat, in which there is current revival of interest. Some of these are discussed in Subsection 6.3.

We turn here to some further consequences of imperfect competition for the pricing of agricultural commodities. First, Nicholls outlines the situation confronting a dominant firm handling commodities which compete in production and in consumption.—*Ed.*

5.3.5 Nicholls, William H. *Imperfect Competition Within Agricultural Industries.* The Iowa State College Press, Ames, Iowa, 1941. P. 158.

If a dominant firm is selling, under imperfect competition, products (such as beef and pork) which compete in consumption, its beef and pork sales curves will be interdependent. In determining its derived demand for beef cattle, it must then take into account, when fixing the output of beef, not only the reaction of an increased supply of beef upon its own selling price, but also its reaction upon the prices of the other competing products (such as pork). If the same firm is also buying, under imperfect competition, various farm products (such as cattle and hogs) competing for the use of agricultural resources, its cattle and hog purchase curves will be interdependent. It will then have to take into account, when determining its volume of purchases of beef cattle, not only the reaction of increased purchases of cattle upon their buying price, but also the reaction on the prices of competing farm products (such as hogs). The effect of either interdependent demand or interdependent supply is to restrict further the volume of purchases of the given farm product (beef cattle) — the first by lowering its derived demand curve, the second by raising its supply curve. The greater the number of competing products in selling or buying, the greater such a restriction.

Administered prices, or "sticky" prices, are not so common in agriculture as in some other industries. Yet there are some examples in the food field.—*Ed.*

5.3.6 Nicholls, William H. "Post-war Concentration in the Cheese Industry," *Jour. Pol. Econ.*, Vol. XLVII, No. 6, Dec., 1939. Pp. 834-37.

In Figure I the weekly quotations established on the Wiscon-

sin Cheese Exchange for Twins are shown for the three years 1936–38. The considerable stability is apparent. Since the price is established for a week at a time, fifty-two changes a year are possible. The actual numbers of changes in the three years were fifteen, nine, and twenty-one, respectively. There was one period of twenty-four weeks during which a single price ruled, while prices sometimes continued unchanged for twelve to fourteen weeks at a time even in the season of heavy marketing. In the late summer of 1938 new rules of trading on the Wisconsin Cheese Exchange were set up designed to increase the volume sold at the weekly meetings. Prices have been more flexible since then. The very marked concentration in the industry makes it seem unlikely, however, that the results will guarantee a competitive price to the producer.

In order to check whether or not the inflexibility of prices on the Wisconsin Cheese Exchange was a relatively new development, the period 1918–38 was divided into seven three-year periods. Within each of these periods the frequency of occurrence of various periods of unchanged price was tabulated. . . .

Examination of these data reveals clearly the growing inflexibility of prices during the post-war period. The average period during which a single price ruled increased from a low of 1.25 weeks in 1921–23 to a high of 3.25 weeks in 1936–38. In fact, if 1938 is omitted because of the change in exchange procedure, the average period for 1936–37 was 4.0 weeks. Price flexibility increased slightly between 1918–20 and 1921–23, at a time when our previous analysis indicates that the increasing competition of processors and chain stores was first felt. By 1927–29, however, there had been a marked trend toward less flexible prices, during a period in which considerable concentration took place in the cheese industry. The degree of flexibility showed little change between 1930 and 1935 but showed a further sharp decrease during the last three years.

There appears to be a prima facie inference that this marked and growing stability of prices — in light of the conditions under which they are established — has not reflected comparable stability in supply and demand conditions.

While most agricultural prices are flexible, the costs and charges for processing, transporting, and selling are often inflexible. This fact and some of its consequences are pointed out in the two following excerpts.—*Ed.*

5.3.7 Nicholls, William H. "Price Flexibility and Concentration in the Agricultural Processing Industries," *Jour. Pol. Econ.*, Vol. XLVIII, No. 6, Dec., 1940. Pp. 885–87.

. . . Unlike ordinary manufacturers, the processor-distributors of any given agricultural product (such as milk used for cheese) do not have any important degree of short-run control over their volume of operations, since they are "obliged" (for a consideration, of course) to process and distribute whatever volume of product thousands of farmers decide to produce and (after considerable time) offer for sale. The natural reaction (exploited in meat-packer publicity, for example) is that, since there is no control over the supply (hence none over price), there can be no monopoly.

But such an argument is obviously fallacious. The "supply" subject to short-run control in such industries is surely that of processing-distributing services, not the supply of the unprocessed product or (except through storage) its derivatives. Hence, "control" in such industries means "margin" control in the short run. As far as the relationship to concentration of control is concerned, therefore, it is the flexibility of the margin between the prices of the unprocessed product and the processed product (or between the buying price and selling price), which is relevant, not the flexibility of either of these prices taken separately. Thus, the wholesale (selling) price of cheese might fluctuate willy-nilly with changing short-run supplies of milk, and yet — if competition among the processor-distributors were such as to permit the maintenance of relatively inflexible margins — the full effects of these fluctuations would be passed back to producers in the form of similarly flexible buying prices, as any agricultural economist knows they tend to do. Hence, concentration of control might be reflected in inflexibility of margins, even though prices were highly flexible.

I attribute my own failure (and probably that of others) to see this more clearly in previous writings to my preoccupation with long-run analysis. In long-run analysis, since inputs (and outputs) are conceived of as virtually an unchanging flow through time, it is not ordinarily necessary to distinguish between present and future prices. Therefore, control of the supply of processing-distributing services and control of the supply of inputs and outputs (hence, of buying and selling prices, and their difference — the margin) become one and the same thing. This follows

since any departures of price from such a long-run "equilibrium" are assumed to call forth continuous and instantaneous supply or demand responses, so that the margin is but the difference between instantaneously determined buying and selling prices. But, in short-run analysis of the agricultural industries, in particular, one must recognize that, due to the relative discontinuities in farmers' production response to price, current buying prices are related to production at some future date, not to current supplies. Hence, the farmer does not have to be paid the price at any given time which he expected to receive when his decisions on present production were made. The burden of short-run "surpluses" may, therefore, be laid squarely upon the farmer.

5.3.8 Hoffman, A. C. "Large-scale Organization in the Food Industries," Temporary National Economic Committee, Mono. No. 35, Washington, D.C., 1940. Pp. 78–79.

A widening of food margins either because of monopoly or for any other reason, obviously would result either in higher prices to consumers, lower ones to producers, or both.

In the short run (that is, within a crop year or whatever period of time is necessary for farmers to adjust their production), the food supply is relatively fixed. Once the crop is produced, it may be presumed that farmers will be willing to deliver it for any price above the cost of harvesting. The immediate effect of a widening of food margins thus would be reflected mainly in lower prices to farmers rather than in higher ones to consumers.

In the long run, however, the situation would be different, depending on the relative slopes of the curves of consumer demand and farm supply. If farmers responded to lower prices with a sharp curtailment of their production, then the effect of a food monopoly would be mainly to increase prices to consumers rather than to lower the farm price. If the situation were reversed (that is, if farmers tended to maintain their production despite lower prices), then it is the farm price which would be lowered and consumers would not be greatly injured by the monopoly. In either case the effect of the monopoly would be to lower the gross farm income. If farmers tended to maintain their production their price would be lowered; and if they curtailed it, their income would be lowered because they would have less to sell.

The supply of farm products in the aggregate is relatively

inelastic, even for periods of some length. Having made their investment in land and equipment and their own labor being somewhat in the nature of an overhead, farmers tend to go on producing at a point near the capacity of their farms regardless of price. This being the case, the expectation would be that not much of the incidence of a food monopoly would fall on consumers — at least until broad population shifts between agriculture and industry had worked themselves out.

For single products, however, the case might be different. Farmers are reasonably quick to shift production from one product to another in response to changing relative prices. A widening of margins for a single product therefore would be likely to cause a nearly proportionate rise in its price to consumers as farmers shifted away from its production. Beyond this, one hardly can generalize regarding the incidence of food monopoly.

As a final example of imperfect competition and its consequences, we quote from William H. Nicholls, who describes some of the circumstances surrounding the marketing of cigarette tobacco. This is a concrete example of market strategy. The theory of market strategy is parallel to the "theory of games."—*Ed.*

5.3.9 Nicholls, William H. *Price Policies in the Cigarette Industry.* Vanderbilt University, Nashville, 1951. Pp. 172–76, 181–82.

The Process of Revising Incorrect Anticipations Under Oligopoly: Since 1911, the American cigarette market has been characterized by oligopoly. Because the great bulk (68–91 per cent) of the nation's cigarettes has been produced and sold by three successor firms, no one of them could ignore the influence of its own price decisions upon the sales (hence price policies) of the other firms or, in turn, the influence of their resultant price policies upon its own sales. Even the smallest of the three major firms, Liggett & Myers, recognized this circular interdependence clearly in stating that its cigarette prices depend "to a considerable extent upon what its chief competitors are doing and what they are likely to do in respect of price changes." Such recognition did not spring full-blown from the dissolution decree. But during 1917–23 — after the three major brands had been introduced — each of the three firms certainly came to realize that circular interdependence did exist. It then became incumbent upon each firm to try to judge correctly the nature of this interdependence. For, until it knew what assumptions to make as to the extent and timing of any interactions which

it might set in motion by a change in its own policies, it could not correctly assess the probable *ultimate* effects of this change upon its own profits. The simplest way to have eliminated these oligopolistic uncertainties would have been outright merger or formal collusion. But, operating under the shadow of the recent dissolution decree, the successor firms could hardly avail themselves of these alternatives. Hence, a policy of experimentalism — by which the three companies tried out different price differentials and different timings of price changes (and responses to price changes) — was forced upon them.

There is ample evidence in the price history of 1917–23 that the major firms' original anticipations of rival reactions were incorrect. This was especially true during the earlier part of the period when price *increases* were the order of the day. An outstanding example of incorrect anticipations was American's unsuccessful attempt to lead in a price increase in September 1918. It is obvious that American expected its major rivals to follow upward and seriously underestimated the costliness (in loss of sales) of its policy in the event that they failed to do so. Out of this experience, American apparently revised its anticipations of rival reactions, becoming understandably reluctant to initiate price changes thereafter. While Reynolds was less unfortunate in leading price increases during 1918–19 even its success was mixed, with American once following upward all the way, once only in part. In the latter case, Reynolds then cut below American, which (through secret discounts) moved to the same level as Reynolds. Reynolds used similar techniques in following Liggett & Myers' one initial price *increase* only part way, and in following American's single initial price *decrease* by an even larger price cut, in each case thereby establishing the price level to which the original price leader then moved. Obviously, each of these price changes again reflected uncertainty as to what rival reactions would be. But, by its own choice of policies, Reynolds made it clear that a failure to follow its lead completely would result in its returning to lower prices but created a serious doubt as to whether it would itself follow its rivals' leads. While the latter doubts might have led to new conflicts and uncertainties, these were resolved by an increasing willingness of the other firms to concede a position of price leadership to Reynolds.

Uncertainties regarding probable rival reactions to initial price *cuts* were more easily diminished. During the period of price decreases 1921–22, American and Reynolds both discovered

that the other would promptly meet price cuts in full, thereby making it possible for each to anticipate correctly the other's reaction to a price decrease. Although reluctant to conform with this policy, Ligget & Myers' resistance to price cuts during 1921–22 probably revealed the costliness of such a policy and brought it around to the same point of view. Experience with secret rather than open price differentials was apparently found to be an unsatisfactory technique (probably because they did not remain secret) of increasing sales, being little used after 1919.

The market situation of 1917–23 had all the elements which, according to general theory, would result in a highly unstable or even chaotic outcome. Unquestionably, each of the three major firms was originally extremely uncertain as to the extent and timing of its rival's reactions to a price change. Furthermore, the fact that each firm at times tried to initiate price changes (Table 51) implies that each aspired to a position of price leadership in order that it might set that price which would correspond most closely to its own maximum-profit position. Yet, while there were indeed elements of instability during this period, the impressive fact is the pattern of order which rather quickly emerged. Such an outcome — particularly in view of the fact that there was apparently no formal collusion of any kind — is in itself remarkable and stands in sharp contrast with theoretical predictions of extreme instability. This outcome would suggest that anticipations as to rival reactions, while initially incorrect, can be gradually revised with experience until they become both correct and compatible. While it is impossible to predict, on purely theoretical grounds, that such revisions will converge or the paths by which convergence may be reached, the concrete fact in the cigarette industry is that they did so. Although American and Liggett & Myers subordinated their aspirations for price leadership to Reynolds' claims only reluctantly, Reynolds meanwhile enforced its own claims with considerable restraint. As a result of this element of "give and take," price competition (such as there was) was kept within reasonable bounds. And, reluctance and restraint notwithstanding, Reynolds' position of price leadership — particularly in the more uncertain area of price *increases* — was gradually recognized, reinforced by its steadily growing strength in the cigarette market. Once this became true, remaining uncertainties could be (and were in August 1923) easily resolved by standardizing dealer discounts — so that identical list prices automatically produced

the identical net prices to manufacturers which had tended to result anyway — and by making responses to changes in the leader's price, whether upward or downward, complete and immediate.

We may conclude that the crucial step in eliminating oligopolistic uncertainty in the cigarette industry was the mutual recognition that one of the three firms was to act as price leader, particularly on price increases. For this step eliminated the problem of a "kinked" demand curve which would otherwise have faced each of the three firms. Such a discontinuous demand curve would result if each oligopolist believed that "rivals will quickly match price reductions but only hesitatingly and incompletely

TABLE 51

SUMMARY OF PRICE LEADERSHIP AMONG THE THREE MAJOR CIGARETTE COMPANIES, 1917–50

Time Period	Company Initiating Price Change	Number of Successful* Leads			Number of Unsuccessful* Leads		
		Upward	Downward	Total	Upward	Downward	Total
1917–23† . .	Reynolds	2‡	2	4	0	0	0
	American	0	1	1	1	0	1
	Liggett & Myers	1**	0	1**	0	0	0
	Uncertain‡	2	0	2	0	0	0
1924–39 . . .	Reynolds	4	1	5	0	0	0
	American	0	2	2	0	0	0
	Liggett & Myers	0	0	0	0	0	0
1940–50 . . .	Reynolds	2‖	0	2‖	0	0	0
(ex. OPA)§	American	2	0	2	1	0	1
	Liggett & Myers	0	0	0	2‖	0	2‖
1917–50 . . .	Reynolds	8	3	11	0	0	0
(ex. OPA)§	American	2	3	5	2	0	2
	Liggett & Myers	1	0	1	2	0	2
	Uncertain‡	2	0	2	0	0	0

* A "successful" lead is one which the other firms followed, an "unsuccessful" lead one which they did not follow.

† Unlike price leads of the later periods, these price changes were often followed only after some weeks had elapsed, at times with some intermediate price adjustments.

‡ Reynolds' lead of Feb. 1919 was only partially successful, the others following upward only part way. Reynolds responded with a retaliatory price cut which American matched by secret discounts.

§ Exclusive of three price changes due to increases in wartime price ceilings.

‖ One of these unsuccessful leads by Liggett & Myers was made just prior to the tax increases of July 1, 1940, resulting in a price slightly below that of Reynolds but revised to the latter's figure before either price took effect.

** Only partially successful since Reynolds followed upward only part way and ultimately established the price to which the others moved.

(if at all) follow price increases." Under this pattern of expected behavior, the demand curve for the product of each oligopolist would have a kink at the existing price. The part above the kink would be more elastic, indicating the given firm's loss of business if it should raise its price, other prices remaining unchanged at the old level. The lower part would be more inelastic, showing the given firm's gains of business if its price cuts were at all times matched by its rivals.

American's unsuccessful efforts to bring about a general price increase in 1918 and its experience with matched price cuts during 1921–22 were undoubtedly such as to convince it of the reality of the "kinks." Had the other two firms (especially Reynolds) had precisely the same experience, any one of them would have been extremely reluctant to lead in a price increase because of the belief (verified by experience) that the others would not follow upward. Under such circumstances, cigarette prices would have been highly insensitive to changes in cost or demand, hence extremely rigid. Furthermore, unless the existing price was initially at the level which would maximize their joint profits, the final price would also have to be below that level. Thus, the advantages of mutual recognition of one (*any one*) of the oligopolists as price leader become obvious. For, once the price leader (Reynolds) could correctly anticipate that its price increases would be followed, the "kink" in its demand curve disappeared and it could raise prices with impunity. What the other firms lost in initiative was far more than offset by the gains in certainty as to the "rules of the game" on price increases, which made greater joint profits possible.

* * *

The Nature and Effects of the Price-Identity Policy: Between August 1923 and May 1951, there was a total of only 15 days on which the list (and net) prices of the three major brands differed because of a rival's delay in responding to an initial price change on one of the brands. At all other times (except 1923–28 and 1946–49, when minute price differences of 3–5 cents a thousand existed among them), the three major brands had (apart from what was apparently a small amount of price-shading) absolutely identical list prices, dealer discounts and net prices. The fourth major successor-company brand (Old Gold), while probably never important enough to have upset the common price policy had Lorillard shown more independence, also conformed fully

with the policy of price-identity except for a small 10-cent-per-thousand differential during 1928–29. Thus, the prices of the three (or four) brands moved together, either upward or downward, with an almost perfect harmony of amplitude and timing. The same was true for the major standard brands of Philip Morris and Brown & Williamson after 1940, by which time these two independents had successfully established themselves in the standard-brand field.

Between 1923 and 1939, there were seven price changes by the successor companies. Of these, four were *increases,* in every case led by Reynolds. During this period, neither American nor Liggett & Myers ever attempted to lead in a price increase or ever refused to match exactly Reynolds' higher price (including its notorious increase of 1931). Of the three price *decreases,* Reynolds led one, American two. These facts confirm the view that Reynolds was recognized as leader on price increases but that, on price decreases (at least under the drastic conditions of 1933), one of the other firms (always American) might assert itself. During 1940–48 (exclusive of the period of price controls) the earlier pattern was upset somewhat, with American and Liggett & Myers each trying unsuccessfully to lead in a price increase, followed by two successful leads upward by American. While these aberrations were probably due to extenuating circumstances stemming from current antitrust action and price control, they still resulted in essentially the same policy of virtual price identity which had characterized the years 1924–39. For the two unsuccessful leads were consistent with previous recognition of Reynolds as price leader (which it now insisted upon continuing by refusing to follow). And the fact that Reynolds did follow (almost but not exactly) the two price increases led by American in 1946 and 1948 suggests that Reynolds was for a time willing (perhaps even anxious in view of the recent antitrust decision) to concede its place to a new price leader (American), although it resumed its leadership role in 1950. Thus, while two of the leading players now appear to have switched roles upon occasion in recent years, the script of the play itself was hardly altered.

According to familiar theoretical models of oligopoly, the combination of identical price policies and a recognized price leader should serve to eliminate aggressive price behavior because each firm realized its own direct interest in maintaining joint profits at a high level. In the absence of the complicating

factor of advertising (product differentiation) . . . , total cigarette sales would be distributed evenly among the several firms. If their cost functions were also identical, their combined profits would be the same as under monopoly. On the other hand, if their cost functions differed, the price leader would establish that price which would maximize his own profits, resulting in (probably small) departures from the maximum profit position for the other firms so long as the given (equal) division of total sales was maintained. It follows that the high aggregate profits would be divided almost equally among the several firms.

Economists have developed many refinements to theories of duopoly, imperfect competition, and monopolistic competition. We have not attempted to cover them fully in the quotations used in this chapter. An excellent theoretical treatment can be found in George J. Stigler's, *The Theory of Price,* Macmillan, New York, 1947. Stigler also gives many references to books and articles which would be of interest to the student wanting theoretical material.—*Ed.*