

AN ECONOMIC ANALYSIS OF THE
MEAT-PACKING INDUSTRY

by

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INTRODUCTION

In a competitive economy there is a struggle among different-sized firms. In the meat-packing industry three main categories of firms are recognized with regard to size, namely: (1) the local, small packer; (2) the medium, independent packer; (3) the large, national packer. The purpose of this thesis is to make an analysis of the meat-packing industry with respect to the economies and diseconomies of different-sized firms.

Although no attempt has been made to determine the optimum-sized firm, much reference has been made to it for the purpose of comparison and analysis. Each firm attempts to arrive at the optimum, to maintain it if and when it is found, and tries to overcome the disadvantages of not being at the optimum temporarily.

It has been assumed that there is some size, or that there are several sizes, in this industry at which a firm can make most effective use of the various imperfectly divisible productive agents or services.

It is recognized that a perfectly competitive analysis as a basis for this study would not be entirely adequate; therefore, some references are made to imperfectly competitive conditions.

Procedure

The method of treatment requires some clarification in order that it may be understood that the method of research is rather

one of documentation of evidence in the literature than one of testing hypotheses statistically. The four main functions of operation of the three different sized firms are treated rather independently. In all of the four chapters an introduction is given on the general aspects of the particular function in question. Then a critical analysis is made on the advantages and disadvantages of firms of different sizes. At the end of each chapter a summary is given as an attempt to point out some of the outstanding economies and diseconomies of the different sized firms.

Although the four chapters are treated rather independently, some overlapping and restatement of facts was necessary. The thesis as a whole is considered to be a relatively closely related body of information.

Due to the great variety of subject matter in the chapters, no standard procedure has been applied. However, there is, generally speaking, a method used that suited each individual chapter and each method was consistent with an overall method of procedure.

In the last section of conclusions an evaluation is made of the relative advantage of a particular sized firm.

Organization

Certain sections of the thesis are necessarily rather descriptive, because much background needed to be supplied in order to lead up to an evaluation in the final analyses of the different

chapters.

The analyses, being organized in four main chapters, deal with the economies of marketing, management, financing, and technology with regard to the three different sizes of firms. In the evaluation in the final section, some importance has been given to the inter-relationship of these functions.

MARKETING

General Discussion of Buying and Selling

The broad field of production is usually defined as the creation of form, time, place, and possession utilities. Marketing involves the creation of time, place, and possession utilities. Time utilities are created in part by storing the surplus during periods of heavy supplies for the purpose of making them available during periods of scarcity. The storing of cured and canned meats and other processed meats is a relatively simple matter. Fresh meats, however, are highly perishable and must be moved rapidly to the consumer. Methods of refrigeration have greatly improved this situation. Place utilities are created by moving the live animals or the final product from surplus to deficit areas. In this study the creation of place utilities both precedes and follows the slaughtering and processing operations. Possession utility is created as livestock or livestock products are sold at successive stages in the channels of distribution. Marketing services must be performed before the production of consumer goods

is completed. The important and final step in the marketing process is the sale of the finished products to consumers. All other phases of the industry are of no economic value if the final products of that industry are not available to the consumers.

Some definitions are necessary here to state what is meant by industry and market. By "industry" is meant that complex of activities of a group of firms producing consumer goods for markets and supplementary outlets of products. A "market" is a region or area where the same forces of supply and demand are at work and where in a free intercourse the prices of the same standard goods tend toward equality, smoothly and rapidly. This matter of the "same standard goods" is not trivial, as it might seem to be, and will be discussed at length later.

The structure of the industry has been greatly influenced by functions of buying and selling, and it is upon the nation-wide marketing function that the large packer usually claims the justification of his existence. The long distance between productive and consumptive areas caused the rapid growth of nation-wide organizations. The average distance the meat or the animal must be shipped from the farmer via the packing plant to the consumer is a thousand miles or more.¹ Approximately 2/3 of the livestock are raised west of the Mississippi River, and 2/3 of the consumers live east of the Mississippi. Nation-wide organizations in the domestic market require the operation of branch

¹Agricultural Research Bulletin, No. 17, July 1939.
Published by Swift and Company, Chicago, Illinois.

houses, car routes, and specialty selling organizations and in the foreign markets, branches agencies, and brokerage arrangements.

The large packer has certain advantages, such as a more minute division of labor, the purchase of supplies in larger quantities, and other advantages which accrue to large-scale industry. A large packer said once that his strength lies mainly in his ability to sell products in distant markets but that additional operating and overhead expenses may largely counterbalance these advantages.¹

The usual way of expansion by the large packer, by buying out other firms, may increase overhead costs and offset the advantages of increased volume provided no other practices are involved. This type of expansion can easily become chronic. Although it is important to have large manufacturing companies, it is equally important to have large marketing organizations in this business. Since a large marketing organization does not have to depend on outside wholesalers, it can keep in touch with trade conditions from a head office and meet varying demands efficiently. The large packer can afford to do this because of the large volume of business that goes through each branch house reducing unit operating costs to a minimum. In addition to this, an important point which is often overlooked is that a nation-wide marketing system can sell lower-valued and small volume products more readily than can a small firm depending solely upon local markets.

¹Weld, Kearney, and Sidney, Economics of the Packing Industry (Univ. of Chicago Press, 1925), Part I, p. 121.

For instance, a firm with many branch houses in the East has a great variety of demands within a short period of time. A nationwide organization that has numerous sources of supplies and numerous outlets in various consumptive centers can effectively serve these demands. It is almost impossible for a small packer to operate in this setting, because he does not have the volume and the variety of products to meet this demand within a relatively short period. The selling costs of the large packers, including costs of the entire sales and advertising program, freight, and the gross margins of branch houses, amount to almost half and sometimes more than half of the final price.¹

These companies are as important as marketing agencies as they are as manufacturers. The central offices of these nationwide organizations are continually in touch with hundreds of sales outlets. They shift their supplies in accordance with the varying demands, and they probably have more goods on hand at any particular point. Their organization is backed by scientific research in marketing and co-ordination and may be able to give greater benefits to producers and consumers than those organizations that consist individually of small units.

Because of the wide variations of demands for products between sections of the country, the slaughtering of live animals and the dressing and shipping is the easiest part of the business. The big job is marketing of all the products at the place where

¹Swift and Company, Yearly Report, 1923, p. 6-9.

each demand can be met with the least possible cost. Although almost any packer is engaged in marketing, the small, local packer in producing areas sells his products in the surrounding territory of his plant and draws his livestock from the same territory. Relatively small Eastern packers, however, must move their live animals to the Eastern seaboard cities. This probable disadvantage is offset by selling locally-killed meats at a premium, such as "Kosher" meats.

The medium-sized, independent packer is engaged both in local and national marketing. He usually buys his animals from a greater area than local packers do and ships more dressed meat to wholesalers and jobbers in the East. Some export large quantities of lard, canned meat, and tallow.¹

The large, national packers have region-to-region marketing as their main function. This requires large refrigerating facilities in warehouses, plants, and railroad cars with many marketing intermediaries. The large packer tries to overcome these heavier overhead expenses, which the small packer does not have, by large volume and greater turnover. It is often said that the advantage of the small-sized firm is attributed mainly to his lower manufacturing costs; however, this is doubtful. The small and local packer, in general, does not have any lower processing costs, but perhaps he does have a lower per unit marketing cost in his limited area than the large packer engaged in nation-wide marketing. He

¹Weld, Kearney, and Sidney, op. cit., p. 122-123.

sells his products in the surrounding territory and has no intermediaries. Marketing costs involve both transportation and selling. Selling costs are salesmen's commissions or salaries, advertisements, etc. Both of these are probably much lower per unit for the small firm that sells in its immediate surroundings, than for the larger firm.

Purchase of Livestock and Other Supplies

Along with large-scale industry usually goes the advantage of large-scale buying of supplies other than livestock. A large part of the wholesale meat dollar is usually paid for livestock. In 1950 Swift and Company paid 77 cents for livestock plus raw materials.¹

Table 1 shows the value added by manufacture for several firms of different sizes. Fifty-four hundred dollars of value added by manufacture per employee is low in comparison with most other industries. This means that costs of raw materials, particularly livestock, are tremendously important in the operation of a packing plant. With this in mind, it is rather evident that efficient buying is very important.

The purchase of livestock in larger lots or quantities does not lead to price discounts as in other industries. For instance, a firm that buys fifty tons of steel at a time can usually get a better price than a firm buying the same steel in fifty hundred-weight

¹Swift and Company, 1950 Yearbook, p. 5.

Table 1. Average value added by manufacturing per employee.

Number of employees	Value added by manufacturers	Number of employees	Per established value added by manufacturers	Per employee value added by manufacturers	Average value added by manufacturing per employee
1-4	8.921	559	16.0	7.2	
5-9	15.412	379	40.0	6.0	
10-19	30.247	383	79.0	5.5	
20-49	71.213	372	191.0	6.1	
50-99	70.649	187	378.0	5.3	
100-249	115.023	130	885.0	5.3	
250-499	86.795	57	1579.0	4.4	
500-999	119.695	39	3069.0	4.5	
1000-2499	245.878	35	7025.0	<u>4.0</u>	
				<u>48.3</u> 9	= 5.4

Note: The information listed in the first four columns was secured from the U. S. Census of Manufacturers of 1947; the information listed in the last two columns was derived by calculation. All money figures are given in thousands of dollars.

lot orders. In the purchase of livestock no discounts are made for large quantity buying simply because larger total purchases consist of more purchases of the same size of lots. However, large packers probably have and can afford more expert buyers who become more skilled in their jobs because of a higher degree of specialization of the purchase department. Also, scientific research facilities, grading, and classification may be to their advantage.

Trends in the packing industry show that in the last thirty years an enormous shift away from central slaughtering places has occurred. This decentralization definitely has increased the long-term unit cost of the centrally located large plants because of much lower operating levels and higher costs per unit in the buying of livestock in the country (if no other practices are involved). Because of the huge investments in the big central markets, the large packer probably did not voluntarily enter into country buying. The large packers undoubtedly preferred to maintain the large plants in the big centers, because they had owned and operated the stockyards for years and their established buying practices probably made it rather easy for them. The large packers had to establish country concentration yards in order to obtain adequate supplies. A substantial amount of business of interior plants bought up by the large packers gives them a share also in the possible advantages of the favorable location of these plants. This review indicates that there is not much advantage to the

large packer in buying livestock in comparison with the small packer apart from monopolistic practice. If so, it is the more specific and detailed information and better skilled expert buyers that the larger packers have at their disposal.

Although only a small percentage of the wholesale dollar is spent on supplies (other than livestock), they are nevertheless obtained at lower prices when bought in large quantities. The 1950 Yearbook of Swift and Company shows that only 4.6 percent of the wholesale dollar was spent on supplies. The larger a buyer becomes in relation to the seller, the stronger is the bargaining position of the buyer. The large packers buy supplies and equip- on the basis of efficiency ratings of the goods. Coal is pur- chased on the basis of its moisture content and heat value.¹ Also, the greater the required supplies are, the more savings can be made on purchases if bought in larger quantities. Here again, it can be seen that the large firm probably has relatively little advantage over the medium-sized firm, apart from monopolistic practices, but probably does have an advantage over the small firm.

Distribution of Meat Products and Other Consumers' Goods

It is evident that the marketing function of the large packers is important to them, especially the branch houses and car routes. The following statement illustrates the detailed

¹Arthur Cushman, The Packing Industry (University of Chicago Press, 1927), p. 119.

and specific information which large packers have available. This information is to the advantage of the large packer in comparison with the small packer. Mr. G. E. Putnam, economist of Swift and Company, stated:

We have a man in our Chicago office who does nothing all day long except making up composite hogs. At every hour of the day we know how pork loins are selling, hams, lard and so forth. On the strength of what we are getting for each of these products, this man makes up the composite hog, simply assembles all of these products together and their values. He immediately knows what the live hog is worth, and it is on that basis that we buy live hogs.¹

When we see the market being flooded with hogs we know that we are going to have more pork on our hands than we have had for a long time. We know that pork is perishable and must be moved into consumption within 10 days. We know that we are not going to be able to move that increased supply of pork into consumption except at lower prices.²

Competitive forces may raise the prices of livestock and lower the prices of meat products, thus constantly threatening the packer's margin. The large packers have to be continually in touch with all the outlets, sales, and buyers to make the analysis at any time. This illustrates the importance of the selling phase of the packing industry.

The large packers have been pioneers in many fields of the packing industry with the result that they got the upper hand in some phases of the industry almost simultaneously. The large packers started the movement of dressed meats to the East Coast in refrigerator cars. At first the railroads resented it; later

¹Dean W. Malott and Boyce F. Martin, Livestock and Meat in the Packing Industry (McGraw-Hill Company, Inc., 1946), p. 32-53.

²Ibid., p. 53.

on they gave the large packers preferential freight rates. In addition, the large packers owned, in 1917, more than 90 percent of all the refrigerator cars in the country.¹ The smaller independent packers naturally could not afford a large capital outlay for expensive refrigerator cars; they limited their business to pork packing, for which much cheaper ventilator cars could be used, and to cattle slaughter for local consumption. The independent packers had, in 1930, a substantial number of refrigerator cars, probably partly because of the fact that the large packers began to dispose of a considerable number of these cars. The large packers must have foreseen long ago the rising use of motor truck routes and the increasing competition of the chain stores taking over part of their business.

The use of trucks has increased the trading area of the branch houses considerably and reduced the number of branch houses needed. The number of branch houses has also declined substantially since 1930 because of the chain stores. These chain stores buy fresh meat in larload lots at the packing plants, ship it to their processing plants, and do their own processing. This movement caused the branch houses of the large packers to be by-passed. The decline in the use of their processing facilities, which had always been very profitable and had helped many firms to carry the extra expenses of expanding, caused a larger unit overhead cost in their branch houses. Operations that used to be done only by packing firms, such as smoking and boiling hams and curring and making sausage,

¹Federal Trade Commission, Part I (Washington, D. C.: U. S. Printing Office), p. 40-136.

were partly taken over by the chain stores. "F. Edson White testified that a very large part of their profits were denied to them by this development."¹

Probably the large packers have been depending for too long a period upon large profits from this phase of their operations and have not been preparing themselves for the time when other businesses would also enter into this area of work. The attitude of not expecting to be challenged on this profitable processing is probably an example of one of the disadvantages of the hugeness of a packing firm.

The development of the use of ready-to-serve and ready-to-slice meats tends to decentralize processing, and the increased radius of the branch houses caused by the use of trucks has decreased the number of branch houses but increased the number of truck routes through small towns and rural areas. "The large packers have not given much attention to this system of marketing because of their inclination to protect investments represented by excess capacity in both plants and branches!"² Some of the larger interior packers market large quantities of dressed meat to their few branch houses in the East. Chain stores mainly buy these meats in carload lots and thereby perform a relatively large part of the final phases of marketing by retail business. Thus, not only in a part of the processing, but also in the retail

¹Supreme Court of District of Columbia, Defendant's Statement of the Case (Washington, D. C.: Press of Byron S. Adams, 1932), p. 130.

²Interview with an economist from Swift and Company, September 3, 1951.

business, the chain stores are challenging the packer's large marketing system; undoubtedly this competition in the future is going to become more intense. As mentioned before, the chain stores buy from the packing plant and they distribute from their processing facilities to their local stores. In this way, the branch houses are by-passed and are doing a smaller volume of business which, of course, increases their overhead costs per unit of product.

It is evident that with the branch houses, car routes, or peddler cars a tendency toward monopoly was almost inevitable. But monopoly tends to be short-lived. There is no one optimum marketing unit in the long run but a changing unit. Beyond the average optimum there might be another size which is also preferable, although the cost of attaining this larger optimum might outweigh normal profits. The large packers may operate branch houses on the large volumes, thereby keeping the operating costs to a minimum. In general, the medium, independent firms operate very few branch houses because of lack of volume, and they rely largely on brokers and jobbers in distant markets.

Growth requires an increase in funds, and the optimum marketing unit might be reached before the technical and managerial optimum have been attained. However, when a firm that used to market its products through brokers and jobbers has to rely on marketing its own growing production, the optimum marketing unit will probably be increased.

It might be true that under post World War I conditions,

the size which was considered to be optimum is much too large now for the volume of products flowing through existing marketing facilities, resulting in high unit marketing costs. The disadvantages of having over-expanded marketing facilities might be overcome by increasing the diversity of products handled. It is thus clear that as far as selling in distant markets is concerned, the large packer has a decided advantage over the small and medium-sized packer as long as a large volume of sales can be maintained in relation to the existing facilities.

"The branch houses, peddler cars, and trucks are a bulwark of monopoly. The Big Five had in 1919, 1,003 branch houses, 1,297 routes, and Swift and Armour both reached more than 23,000 towns in the United States."¹ The packing industry, which originally only slaughtered livestock and marketed meat products and by-products, rapidly extended its business to the substitutes of these products such as fish, poultry, eggs, milk, butter, cheese, vegetable-oil products, and many others. The Packers' Consent Decree of 1920 forced the large packers to give up the marketing of some foods not related to meat. This decree definitely put a check on the packers' expansion. Several attempts were made to modify the decree by Swift, Armour, and others on the grounds that conditions had changed to the extent that monopoly dangers were negligible. Chain stores and post war depression developments on the branch houses were given as arguments.

¹Federal Trade Commission, Part I (Washington, D. C.: Government Printing Office), p. 41-42.

Armour's branch house volume declined during nine years following 1920 from 3 billion pounds, for which 19.1 million tickets were written, to 2.8 billion pounds, for which 21.9 million tickets were written.¹ This decline from 156 to 126 pounds per ticket undoubtedly caused an increase in selling costs per unit. From 1923 to 1930 a decline from 117 to 93 pounds per ticket was recorded for Swift. These branch houses still serve large numbers of independent dealers; but, it is evident that as their volume decreases, by changing marketing methods, their importance will decline.

The large packer who deals in enormous volumes of butter, cheese, eggs, and many other products, is an important purchasing agent for the independent retailer. A large share of the large packer's meats and other products is sold to independent retailers rather than to chain stores.² Armour and Swift sold 88.2 and 91.2 percent respectively of their food products to independents in 1930. A further development of chain stores will lower the optimum market unit for the large packers. A number of the now independent, unorganized retailers may be forced to join chains, form chains, or face increased difficulty in obtaining adequate supplies of meats and other products. Legislation to curtail the operation of chain stores may reduce the competitive pressure on the branch house-independent retailer channel of meat distribution. From 1925 to 1939 the amount of meats moving through the wholesale

¹Supreme Court of District of Columbia, Brief (Washington, D. C.: Press of Byron S. Adams, 1932) p. 131-132.

²William H. Nichols, Post-war Developments in the Marketing of Butter and Cheese (Ames, Iowa: Iowa State College Bulletin), p19-24.

branch houses of the packing firms decreased from 46.9 to 37.4 percent. The percentage moving directly from plant to retailers increased from 30.6 to 40.3 percent. Chain stores probably caused the larger part of this shift.¹

Vertical integration from the packing plant to the branch house has kept waste to a minimum, and the large packing firm which kept in touch with many outlets may have served the public more effectively and efficiently in some respects than have the small and medium-sized packers. The large variety of products going through the large packer's marketing channels gives many economies of operation.

The large packers having practiced for more than fifty years some sort of price fixing saw in being able to restrict the use of substitutes a wonderful chance to render the demand for meats somewhat inelastic.²

Besides, the supply of meat was regulated. It was thus a matter of creating scarcity of food products. The large packers buying more than 55 percent of all the livestock taken to market did some sort of cooperation in the purchasing of livestock, thereby following a certain rotation system.³

A certain number of animals were bought at lower prices; this meant fewer animals, less dressed meat, lower operating costs, and higher meat prices.⁴

These policies and others very well documented by the U. S. Federal Trade Commission are an outgrowth of the packers giving up their independence, which they carried in the eighties, for cooperation among each other. They misused the freedom of the

¹Information received by mail from Swift and Company, Chicago, Ill.

²Federal Trade Commission, Part I, p. 32-41.

³Ibid, Part II, p. 52-58.

⁴Ibid, p. 150-158.

American enterprise system by practicing less desirable manipulations in the disinterest of the public.

Epstean's law appears to operate also in the heart of business enterprise.¹ Often misused slogans about the free enterprise system amount to an interpretation of freedom in such a way that everything is allowed, without stressing any of the duties and self-discipline that have formerly been incorporated within the word and symbol of freedom.

The U. S. Supreme Court denied any of the petitions to modify the Consent Decree in 1931. There is little doubt that in permitting the large packers to market anything they please, there might be obtained tremendous economies. Their existing facilities would be extremely well suited for this; however, such a concession might lead to another conquest, and it might be possible that by this decree the optimum marketing unit has been decreased for the large packer. This might be counted as advantageous to the small packers, and the economy as a whole might accept this as a substitute rather than a cure for what existed previously.

From this it follows that since the large packers operate and maintain larger marketing units than their present volumes of business require, they are at no advantage in comparison with smaller firms that operate at, or close to, minimum average costs.

The independent packers have had to put up tremendous struggles for survival. Their business has been steadily growing,

¹Epstean's law: "It is a tendency of mankind to satisfy its needs with the least possible effort."

especially in the livestock-producing areas since the large decentralization movement started after the first World War. Their very uprising has been made immensely difficult by the large packers, who had an influence upon railroads, banks, and rendering subsidiaries.¹ Also, their dependence upon the large packers' cold storage facilities, icing stations, and refrigerator cars made their growth extremely hard. The Consent Decree freed the stockyard facilities at the central markets along with the market news, from the ownership of the large packers.²

In 1921 the Packers and Stockyard Act, created by Congress, gave the Secretary of Agriculture power to prosecute illegal discrimination, to create public utilities of all stockyards larger than 20,000 square feet, and to supervise and fix all charges under penalty of law. In 1948 the Department of Justice filed suit against the Big Four, and it was demanded that they be broken up into fourteen different independent companies. It becomes clear that through public policy by Government action, some of the heavy pressure on the independent packers has been relieved. Their scale of operations made it possible to work at minimum average cost, and their position is going to play a more important part in the future. The keen competition undoubtedly has had a remarkable effect upon the efficiency of the independent packers' facilities.

¹Federal Trade Commission, Meat Packing Report, Part II, p. 136-137.

²Federal Trade Commission, Packer Consent Decree (1921), p. 1-17.

Of all the meat products moved from producing to consuming areas in one form or another, pork is moved the shortest distance. The Corn Belt, the greatest livestock feed production area, has seen in the last 25 years an enormous increase in slaughtering and processing capacity. Pork is easier to grade than beef; therefore, it can be sold on car-lot orders to chain stores more easily than beef. Small packers are at a disadvantage as far as pork is concerned because of the lack of large volume, but their disadvantage on beef and lamb is much greater because of the great variability of beef and lamb quality and grading difficulties.

Sheep and lamb move the longest distance, because the mutton-producing areas are in the north and southwestern parts of the country. The greatest amount of sheep and lamb is consumed in the East and West Coast regions.

Fresh meats are kept under refrigeration from the packing plant until they reach the consumer. Chilling of all carcasses right after dressing and freezing for temporary storage is common for pork, lamb, and cured meats. In times of light supplies the turnover is rather slow, and in times of ample supplies the rate of turnover is almost doubled.¹ Cured products are a good medium for absorbing burdensome supplies; but as soon as the season of heavy supplies is over, the stocks of cold storage warehouses are sold as fast as the market can absorb them.

The small, local slaughterers and country butchers commonly

¹F. Edson White, The Packing Industry (Chicago: Institute of the American Meat Packers, 1924), p. 336-337.

slaughter the whole year around. The portion which is slaughtered in the fall and winter is usually consumed by spring, and summer slaughtering is followed by almost immediate consumption. The larger the operations of the packer become in relation to total storage facilities, the greater will be the service performed by this large packer to the consumer as far as storing part of the surplus meats for later consumption is concerned. The frozen-food locker plants and home freezers have contributed considerably to the establishment of year around consumption of meats.

Storage has a stabilizing effect upon prices. In 1919 the Big Five possessed nearly half of all the cold-storage facilities and almost one third of all the freezing space.¹ They have gone far beyond the requirements of their own output and have established huge warehouses in which they are able to store outputs from other companies at times when the conditions of demand and supply make it necessary to use these facilities.² In 1927 one fourth of the nation's total cold-storage space was in Illinois. Chicago, St. Louis, Omaha, Indianapolis, and Kansas City had 20 percent of the cold-storage space.³

During the war times, 1914-1918 and 1941-1945, the large packers were engaged in large scale export trade, which gave the independent packer a chance to secure a large share of the business in domestic trade. Especially since the growth of independent

¹Edward A. Duddy, Cold-Storage Industry In the United States (University of Chicago Press, 1929), p. 28.

²Federal Trade Commission, Part I, p. 41.

³Ibid., Part IV, p. 88.

packers in the center of the corn belt region, these independent packers have become large enough to set up branch houses through which they can market much fresh meat. Year around consumption of cured meats, which have been in the curing process for at least two months, and of fresh meats, have become of increasing importance. The carry-over by storage facilities of oversupplies of meat, performed now mainly by the large packers, will no doubt in the future become a supplementary function of the independent packer, also. Both storage and curing involve large overhead expenses, and it is rather evident that as the chain stores cause the large packers to operate their facilities far above minimum average costs, the independent packers from a marketing standpoint are gaining some advantage. Price fluctuations during the time meats are in storage increase the risks. The cost of carrying meat in storage varies directly with the length of time in storage.

The higher specialization of labor through vocational training and minute division of labor is definitely an advantage to the large packer's marketing organization. Doctor S. L. Louwes, a well-known European economist, said at the opening of the 25th Annual Industrial Fair at Utrecht, Holland in 1948:

Your mind has been on securing raw materials and plant efficiency in the last years; your future will depend on how much you are willing to sacrifice to get your products where they are needed the most.

It is probably true that many of the independent packers have been compelled to pay so much attention to production in their early years that they are still more production-minded than marketing-minded.

Marketing operations must have adequate physical facilities and sufficient volume in order to operate at minimum average unit costs.

There is good reason for thinking that in many industries, whereby the nature of the product a firm must market its own produce through a sales organization which extends far toward the ultimate consumer, that organization will continue to yield economies with further expansions after all the technical economies have been secured, and after the limits of efficient management are reached. Where this is the case, the sales optimum will tend to set a lower limit to the size of the optimum firm, and the equilibrium of the latter may be the result of a balance between the economies of selling a greater output and the diseconomies of managing a larger undertaking.¹

While it might be true that the optimum marketing unit of a firm is exceedingly large, the growth to a large size will only be obtained if the expected gains of being on a larger scale will exceed the costs of growth.

For an individual firm it will finally seem worthwhile that by changing from marketing through specialist merchant firms (as has been done by expanding independent packers) to marketing its own products, the optimum size is probably increased.

The small and local packers have the lowest marketing volume and also have the greatest disadvantage due to selling little-known brands.

Historically, the optimum size marketing unit for the large packer was quite large. In the future the optimum size marketing unit may be reduced due to the following:

¹E. A. G. Robinson, Monopoly (New York: Pittman Publishing Company, 1948), p. 82.

1. The increasing importance of chain stores that buy from the packing plants directly instead of from the branch houses.

2. The curtailment of monopolistic and oligopolistic practices of the large packers which gives the independent packers, especially those in the Corn Belt, a better competitive position in the purchase of livestock and the sale of meat products.

In war time, great tasks have been put upon the shoulders of the large packing plants. During the present rearmament program, much responsibility has again been placed upon the large packing plants in the area of organizing intricate production jobs and turning our needed materials rapidly and in large quantities on short notice. Research laboratories of almost every large company contribute substantially to the nation's military strength. Big business firms are a part of the nation's important stand-by resources in emergency. The big companies that have reached and are trying now to maintain their position in the American system of free enterprise could not have reached this position without individual initiative, resourcefulness, and teamwork. They could not adopt a policy of not growing without losing their vitality, which is the very spark of their existence and progress. Large or small marketing units alike, are subjected to existing and changing conditions, and the degree and swiftness of adaptation to these new circumstances will greatly influence the success of their operations. From this review it follows that although some major advantages accrue to large marketing units, this is not the case in the present circumstances. However, the specialization of

labor and availability of better market information are advantages that large firms have over medium and small-sized firms.

Advertising

Different producers produce different goods. Each producer, large or small, in the meat-packing industry tries to create a separate market and a separate demand for his own products. This is done by brand name or by a slightly different process and by advertising. The producer tries to make the public believe his particular product is entirely different and better. Although there is some competition in obtaining "secret formulas for making sausage," there is a lack of patents that has kept the packer from making a differentiated product upon which he could set an independent price. Stocks of perishable products have to be sold in direct competition with other similar products of other companies which may lead to instability of prices.

There is a strong tendency among producers to break up markets into little tiny markets, for which they by reputation have the sole supply, thus creating a separate demand for their own products. Hereby, a higher price can be charged without losing much demand. The elasticity of the demand is thus decreased and more power obtained over the market. Today more than ever before the products are branded, marked, and identified into separate little markets.¹

One product is a substitute for another, and as soon as the price becomes higher than the product plus its reputation is worth to the consumer, a substitute will be bought in its place.

¹E. A. G. Robinson, The Structure of Competitive Industry (New York: Pittman Publishing Company, 1948), p. 6-13.

Therefore, price fixing is limited as long as no mutual agreement on it has been made. The struggle for power over markets has led to much friction among individual packers to create many small markets and thereby reduce the elasticity of demand. However, the public demands quality with uniformity and low prices.

Advertising has mainly taken the form of institutional copy, stressing quality of the products of the company in general.¹ Advertising done from the central offices of the large packers has been much more effective than that of the local packer who usually cannot afford a similar financial burden for advertising. This is an advantage that large firms have over small and even medium-sized firms. However, the small, local firm that sells its products in a local market may have the lowest per unit marketing costs and may not have any use for advertising at all. This also accounts for its purchasing costs, which might be the lowest per unit if the livestock is bought nearby.

MANAGEMENT

Structure of the Firm and Managerial Responsibilities

The meat-packing industry is subject to violent fluctuations due to the uncontrollable supply of livestock and the uncontrollable demand for meats which have had an influence upon the structure of the firms. The quantity of livestock delivered at any

¹Institute of American Meat Packers, Merchandising Packing-house Products (University of Chicago Press, 1929), p. 3

one market depends in the long run on prices paid for live animals, while demand for meats depends largely upon the consumer's income.

The main functions of management are: buying and selling, bookkeeping or accounting, financing, and manufacturing. Marketing, manufacturing, and financing have been dealt with in other chapters. In a large firm a general administrative department is kept at the central office for co-ordination of scheduling, maintenance of uniform standards of quality and procedure, and centralized control. In small firms the same basic setup prevails; however, many functions performed in the large firm by specialists are done in the small firm by one or a few men.

In private corporations stockholders have the ownership. Although the stock may be owned by just a few members of one family, the stock may be listed in the open market and the number of stockholders may run in the thousands even if a relatively few people own more than half of the common voting stock. The number of shares of stock determines how many votes a stockholder has on the annual election of the board of directors.

The board of directors is responsible to the stockholders for the operation of the business. The board of directors elects a president and selects a chairman in their ranks who may represent the board at large. In large firms usually ten or more different departments are headed by vice-presidents.

Buying. The livestock purchasing department and the supplies purchasing department with their specialist buyers feed the business with the necessary materials for operation.

The livestock purchasing department is composed of a head cattle buyer, head hog buyer, etc. The cattle-buying job in large firms is broken down into various jobs such as fat steer buyer, baby beef buyer, etc. The head cattle buyer at the main plant is in charge of all the cattle bought at all the other plants. In large firms the buying policy is determined each day with the guidance of the forecasting staff. In the livestock market each seller accepts the market price and can dispose of his entire supply without materially affecting the price. But in the packing business there is a definite problem of choosing a price policy, a problem of adaptation of the product more exactly to the buyer's wants, and a problem of advertising the products. Chamberlain states:

...because actual competition, rarely free of monopoly elements, is supposedly explained by the theory of pure competition, familiar results really attributable to monopolistic forces are readily associated with a theory which denies them; this association has obscured them.¹

Chamberlain continues:

One never hears of competition in connection with the great markets and the phrases 'price cutting,' 'underselling,' 'unfair competition,' 'meeting competition,' 'securing a market,' etc. The principles of such a market seem unreal when applied to the 'business world' where these terms have meaning.²

The livestock buyers at all markets are called or wired every morning and given directions in specific detail as to what to buy, (the number, weight, grade, etc.) The degree of specification

¹Chamberlain, The Theory of Monopolistic Competition (Harvard University Press, 1950), p. 3.

²Ibid, p. 10.

depends in part upon the amount of market sharing that is involved. Small and independent packers buy a substantial number of live-stock, especially hogs, in the country instead of through commission firms at the stockyards.

The engineering and construction department commonly buys the other supplies, and purchasing specialists are in all departments of the plant.

Selling. The packing industry has four different ways of selling meat products:

1. Direct sales to the armed forces, hotels, jobbers, chain stores, etc.:

2. Sales to branch houses: Branch houses also may perform processing. They receive products at a "price" from one or more of the company's plants. Branch houses are separate units for accounting purposes, and their managers have to make them "pay."

3. Car Routes: Car routes serve rural areas, towns, and smaller cities. The large companies owning many refrigerator cars and trucks have the larger part of this type of business. The use of peddler trucks has given the small packer a greater opportunity in this type of marketing.

4. Export: Independent and large packers have been engaged in export for many years. Foreign sales agencies and brokerage houses handle the business of independent packers who do not have sales houses such as those owned by the large packers. Lard, tallow, cattle hides, cured pork products, etc. are exported in relatively large volume. All these departments mentioned above

are co-ordinated, and their heads are responsible to one of the high officials of the company. A department for the promotion of sales is usually for the smaller packer and is commonly under the control of the general sales manager.

Bookkeeping and Accounting. The main purpose of the accounting department is to collect, classify, and analyze the statistical facts of the operations and to present both summarized and detailed data at frequent intervals to show the accomplishments and status of the business. It involves the recording of all purchases, all transactions of the process of manufacture, and all transactions of ownership of the manufactured products. Large packers have a very complex structure of accounting.

Financing. This is important for any enterprise. Commonly, one of the directors on the board is elected as treasurer, and he carries the direct responsibility. Funds have to be provided by the treasurer to keep the operations going.

Meat packers commonly have to carry a large amount of cash for transactions. All livestock is paid for in cash, and the labor force is paid weekly. The payment of dividends is also performed by the treasurer. The meat packing industry does a tremendous amount of business with banks for loans. Sometimes bonds are floated on the market for additional capital.

The cost of operating the treasury of a large packing company does not increase proportionally with the size of the firm. A few financial experts and a small clerical staff usually do this job.

Many firms have units in different cities and a number of departments are necessary for co-ordinating some services such as maintaining uniform standards of quality and grades, policies, and research. Some of these departments are transportation, industrial and public relations, commercial research, etc. Most such departments have functionary members located at larger plants of the company.

There are a great many varieties of packing plants from sizable plants that do no slaughtering at all to plants that perform all but the most highly specialized kinds of operations. In order that any one of the following departments, namely, beef, pork, lamb, mutton, and veal, will function successfully, another department operating in all of these above-mentioned departments will have to do important services. These services are:

1. Mechanical services, maintenance and repair
2. Engineering services, water, etc.
3. Loading and shipping
4. Industrial relations, employment, transfer, personnel records, health and accident, and union relationships
5. Labor efficiency

Labor efficiency, as Carver puts it

...in its most highly developed form involves the establishment of standards of performance on almost every type of job involving manual labor. It has an important bearing upon the quantity and quality of productive work performed on the plant. Time and motion studies are made with scientific accuracy. They constitute a means of measuring labor efficiency and are usually the basis of a system of bonus payment for extra productive effort.¹

¹Arthur H. Carver, Personnel and Labor Problems in the Packing Industry (Chicago: Institute of American Meat Packers, 1924), p. 121-208.

The common type of organization for a very small plant is the line or military organization. Plants that have grown fast usually have expanded their organization just by expanding the same old type of organization. Plants that have been established for a long time, as large firms usually have, adopted in one way or another the line and staff organization. One of the great disadvantages of the line organization is the slowness and inaccuracy of transmission of orders as they go down the line. If one of the links of the chain through which the information is supposed to pass is missing, weak, or poorly trained, this system fails. The adoption of some features of the functional organization gives some decisive advantages. The functional organization developed from specialization of labor, whereby special agencies and specialists are in charge of jobs in many different departments of the plant. When the head of a department merely has to apply some sort of formula that has been completely worked out for him by a specialist for the making of certain qualities of products, he is relieved of much responsibility. Overlapping authority and irresponsibility may be used as arguments against this system. This discussion is carried on in greater detail on page 58.

The labor force in the packing industry consists of skilled, semi-skilled, and unskilled labor. There is, in the packing industry, a larger number of semi-skilled and unskilled laborers than in many other manufacturing industries due to the fact that in this industry there is comparatively little machine work.

Although great skill is required for some jobs, the majority of the jobs can be learned within a reasonable period of time.

Swift and Company's organization as a large packer has 55,000 stockholders who are represented by a board of directors consisting of seven members and a chairman.¹ There are eleven vice-presidents, the duties of whom are:

1. Industrial relations and special assignments;
2. Transportation, icing in transit, ice houses, hides, glue and gelatin, wool, tallow and grease, and packing plants;
3. Commercial research, credit, fuel, insurance, law, purchasing, real estate, stockyards, and banking;
4. Fresh pork, provisions, hog buying, branch house provisions, casings, exports, curing and inspection, general superintendent's office, construction, chemical laboratory, and twenty-five packing plants;
5. Soap, produce plants, butter, eggs, cheese, and poultry;
6. General accounting, refinery accounting, foreign accounting, produce accounting, plant accounting, fertilizer accounting, branch house accounting, personnel and methods, casualty insurance, purchasing accounting, personnel efficiency, office employment, office accommodations, printing department, group insurance, fidelity bonds, Chicago office management;

¹Swift and Company, 1934 Yearbook.

7. Fertilizer and animal feed;

8. Branch house sales, branch house operations, general car route sales, specialty sales, hotel and institution department, contract department;

9. Lard, shortening, vegetable oil refineries, cottonseed oil mills, cotton gins, sausage, margarine and salad dressing, public relations, storage, nine packing plants;

10. Beef, veal, and lamb, cattle, calf and lamb buying;

Figure 1 shows this organization. In Fig. 2. is shown the organization of Armour's sales department with the branch house and sales promotion division given in some detail.

Branch House Organization. As a relatively small organization, a branch house is very well adapted to have the line type of authority.

A branch manager is directly and solely responsible to the district manager, who is located in that general district within convenient telephone range and within the range of easy and frequent personal contact.¹

The district manager is usually answerable solely to a general manager of branch houses or to a vice-president in charge of branch houses. The district manager is one of the most responsible and frequently one of the most capable officers in the entire packing organization.

The cashier or general office manager of the branch house is commonly not directly under control of the branch house manager. Most companies consider it advisable to have the cashier answerable to some other department of the company, perhaps one of the financial departments. This system provides a financial and

¹E. L. Rhoades, Merchandising Packing House Products (Chicago: Institute of American Meat Packers, 1929), p. 3-57.

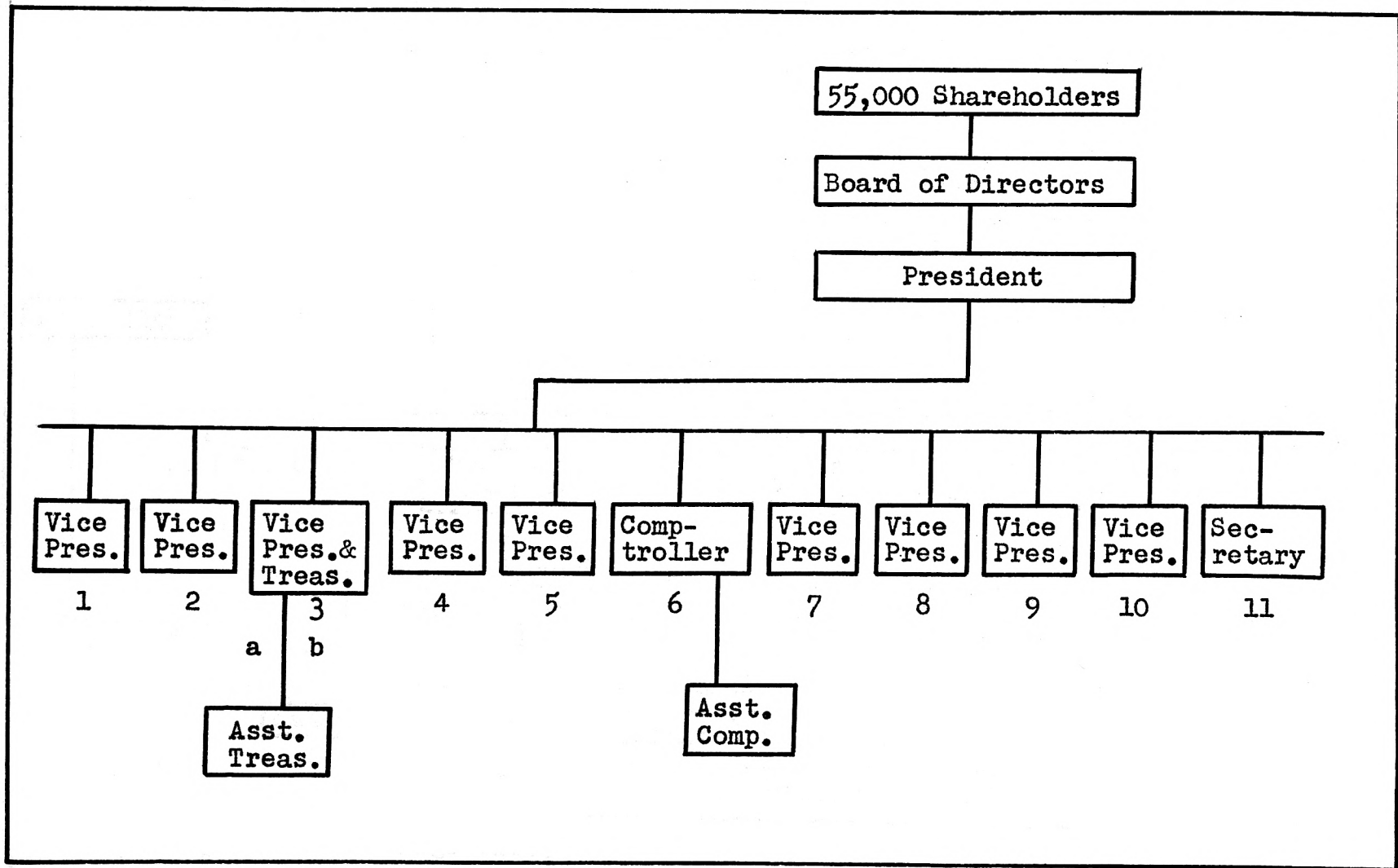


Fig. 1. Management of a large firm.¹

¹Swift and Company, 1934 Yearbook.

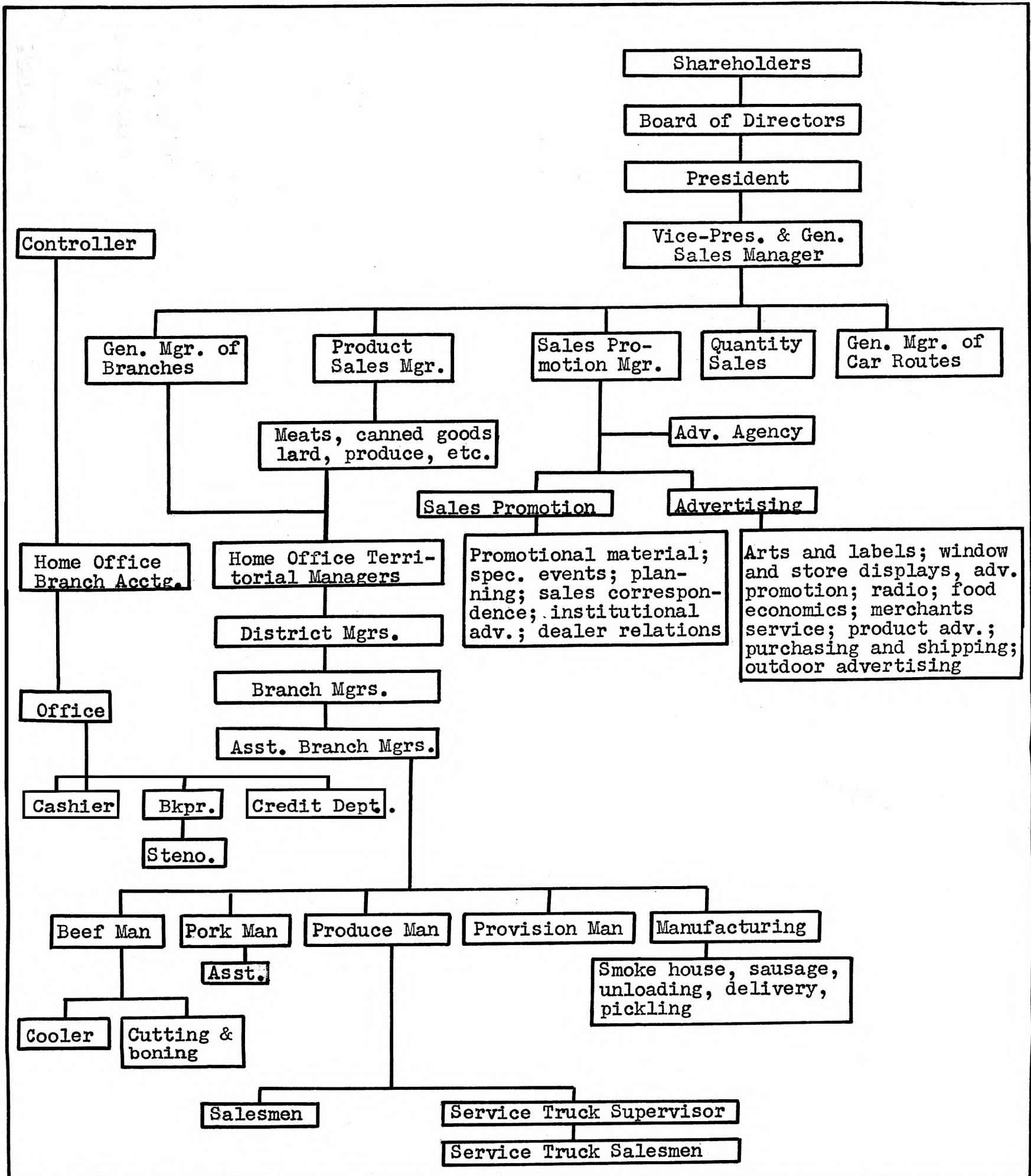


Fig. 2. Management of a large firm.¹

¹E. L. Rhoades, Merchandising Packing House Products, p. 291.

accounting check on the operations of the branch as supervised and carried out by the manager.¹

Many branch houses are located far away from the main office of the company, and direct contact for detailed instruction is thus almost impossible. There is also a highly delicate problem of executive supervision and control of the branch houses. As a unit of the industry a branch house will, as far as making a "loss" or "profit" is concerned, play an important part, being the closest branch to the consumer. Highly perishable and not very well standardized products, having branch houses as major outlets and being subject to changing market conditions, create the very complicated problem of remote control. The task of the managers of branch houses, who usually have been with the company at the home office for many years, requires good judgment. The stability of the important link in the marketing system of a firm between the home office and the branch house via district managers, depends largely upon the intimate confidence between the branch house manager and the district manager and between the district manager and the branch house manager of the home office. It is evident that when this fundamental axiom does not work smoothly, any system of accounting is doomed to be a farce. The various departments offer products and make recommendations to the branch manager as they do to jobbers. The branch houses may sell carcasses on a consignment basis for the departments on a "commission"; however, commonly most of the products are "sold" to the branch house, and

¹Ibid., p 58-60.

the branch house manager has to see that he makes his house "pay" and make a "profit" if possible. The different departments usually keep in close touch with the branch house on the volume it is selling and for what prices. Through modern communication systems perishable products can be regulated rather efficiently. Teletypes, leased wire services, etc. perform an essential purpose in this system. The branch house manager pays very close attention to the "costs" he has to pay for the products from the different departments and his current selling prices. In case he sells beef carcasses on commission, he is especially interested in maintaining his volume if not increasing it. Of course, when one branch house does not come up to the average "profits" that other branch houses make, that branch house manager's volume is likely to be reduced.

There is no doubt that the final selling phase of the products is an important function. Vocational training in this field has become essential for almost everybody who wants to go out and sell for a company. One of the most critical problems that arises every day is the maintenance of a certain volume of business in certain markets. A very close check is kept on every market as to whether it is keeping up its volume. Cut-throat methods are not uncommon among firms. For instance, when one firm tries to gradually increase its volume in a market, greatly reduced prices by other competitors may bring this firm back in line. At the home office of large firms quotas are made for the various districts, branches or car routes. Upon the basis of local demand, profitability of the various products, competitive conditions,

past performance, and future prospects, the quotas are made up. As mentioned above, this determination of what price policy to follow, the making of quotas, and other practices unknown in pure competition are nowadays common terms to those who are acquainted with big business; undoubtedly these imperfectly competitive practices are delicate problems.

The small packer's organization is definitely of the line type of authority. Figure 3 shows the chart of the organization of Winchester and Company, Hutchinson, Kansas.

In general, in small business there is a clearer division between production and marketing. Some of the partners form a committee, and the oldest may be recognized as general manager.

Production functions are under the supervision of a production manager. His job includes: buying, slaughtering, maintaining the plant, storing, processing, and making sausage. The assistant general manager is responsible for sales, advertising, sales promotion, accounting, labor relations, and credit and collections.

This is a simple organization and has some of the advantages of a small firm which are: low selling costs, low transportation costs, few supervisors, and high flexibilities as far as meeting changing economic conditions are concerned. Disadvantages are the lower degree of personnel specialization, inefficient utilization of by-products, if any, and a difficult problem in disposing of lower-valued cuts for reasonable prices on a very limited market.

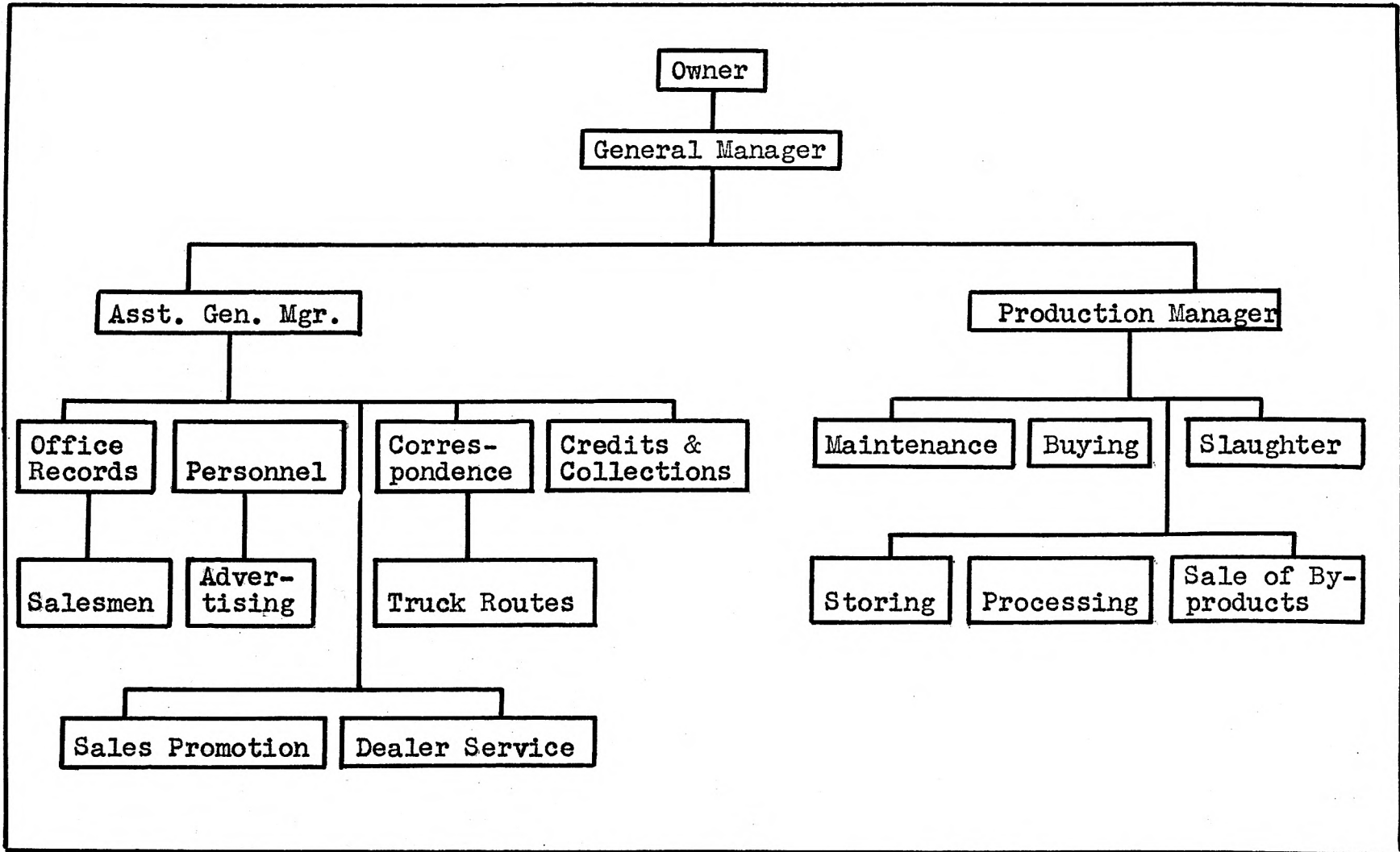


Fig. 3. Management of a small packer.¹

¹Winchester and Company, Hutchinson, Kansas, Information received by interview.

Adaptation of a Firm to Risks and Fluctuations

The meat packing industry is faced with the problem of several changes in demand and supply of its products. These changes may be permanent, cyclical, seasonal, or erratic. Shifts in demand and supply offer a serious difficulty for the industry. Table 2 shows the fluctuations in the consumption of meats in pounds per person per year for a fifty-year period and the fluctuations of wholesale prices of meats for a thirty-eight year period. The consumption of meats in this fifty-year period has not changed much. The price of meats has shown, since 1913, an almost continuous trend upward except for the downfall in 1921 and 1929. Many changes in the different kinds of meat preferred by the public also have had an important bearing upon the meat packing industry. Even though there are many substitutes for meat, there still is reason enough to believe that meat is, and will stay for many years to come, an important part of the diet of the American consumer.

Of all the many factors that influence the demand for meat, the income of the consumer is definitely an important factor. While the population in 1900 was 75,995,000 with an average consumption per capita in the U. S. of 149.9 pounds of meat, in 1951 the population had almost doubled to 150,000,000 and the consumption of 148 pounds per capita in 1951 shows that the American people still consider meat an important part of the diet. If the standard of living, which is at a relatively high level, can be maintained or improved, the demand for meat very likely will go

Table 2. Fluctuations in the amount of meat consumed per capita and fluctuations in the price of meat over a fifty year period.

Period or years	: Average : consumption : in pounds : per person ¹	: Year	: Average : price : of meat : per pound ³	: Year	: Average : price : of meat : per pound
1900-1904	149.9	1913	59.8	1933	50.0
1905-1909	157.	1914	62.6	1934	62.9
1910-1914	146.3	1915	57.6	1935	94.5
1915-1919	139.4	1916	66.4	1936	87.8
1920-1924	140.8	1917	92.9	1937	99.1
1925-1929	135.9	1918	115.2	1938	83.3
1930-1934	131.8	1919	117.6	1939	77.2
1934-1937	126.	1920	108.	1940	73.3
1939-1941	139.1	1921	77.4	1941	90.4
1944	153.5	1922	76.6	1942	111.8
1945	144.4	1923	76.2	1943	110.3
1946	153.4	1924	75.7	1944	106.1
1947	155.	1925	93.9	1945	107.8
1948	145.4	1926	100.	1946	145.9
1949	143.8	1927	92.7	1947	213.2
1950	146.	1928	107.	1948	236.5
1951	148. ²	1929	109.1	1949	209.7
		1930	98.4	1950	194.5 ⁴
		1931	75.4	1951	253.5 ⁵
		1932	58.2		

¹Data compiled from many different publications.

²Estimated.

⁴Econ. Statistics Bureau, Washington, D.C.

³The index is 100 for 1926 ⁵Average for seven months.

along with it, assuming that prices of substitutes for meats will not go out of proportion with regard to meat prices.

The great center of the meat packing industry, which used to be located in Chicago, St. Louis, and other big Midwestern cities, changed to a relatively important degree to the corn belt area, the area of meat production. These firms, established right in the center of the production areas, had a favorable position. The old large companies at the terminal markets, having large investments in their facilities there, suffered from this movement along with a marked increase in the importance of chain stores which hurt the large marketing systems of the large packers.

An example of the problem of adjusting to changing conditions is found in the present situation. In this period of rearmament and full employment there are higher incomes. Due to the cutback in the production of luxury goods and some consumers' goods, undoubtedly a larger proportion of the income of the individual will be spent on food. The probable higher demand for meats - greater than the present production at ceiling prices - puts more emphasis upon supply than on demand in the short run at least.

Where a firm is subject to far-reaching changes in demand, supply, methods of marketing, and location, it either becomes a victim of these circumstances in case it cannot meet changes quickly and adapt itself to them, or it maintains or improves its position by reacting effectively. The more specialized a plant and its equipment are, the greater will be the effect of the change and financial burden to a rapid change in organization.

Cyclical Variations. A good illustration of great cyclical variations is the production of beef cattle. While the production of dairy cattle commonly has steady trends, beef cattle numbers have cyclical variations with peaks about fourteen years apart. In the long run, prices will greatly determine meat production.

Shifts in national income, or rather shifts in business cycles affecting demand and production cycles affecting supply, in reality may occur at the same time; so, shifts in demand and supply tend to offset or exaggerate each other, depending upon which phases of each coincide at a particular time. When there happens to be a peak in the production cycle at the same time as a boom period in the business cycle and thus an increase in demand for meat, a large supply may be offset by a large demand and prices may not change. However, if the increased supply had coincided with a declining demand in a depression, the fall in meat prices would have been accelerated. The violence with which either demand or supply is shifting is of great importance. Pork prices in 1933 were dropping sharply, both because of violently falling demand and because of increased supplies. However, in 1943, the production of 120 million hogs, the largest pork crop in history, did not bring abnormally low prices; in fact, rather steady prices were maintained.

When the thousands of farmers who supply the markets, for some reason happen to decide to ship their animals on certain dates or to cut down on meat animals for some years to come, the firms, respectively, have to be able to take up oversupplied markets or to cut down extensively because of inadequate supplies. These

cyclical movements carry with them the necessity for adapting plant operations to take care of these expansions and contractions. This is called flexibility of plants.¹ A large and fluctuating volume of perishable products causing fluctuations in prices is thus caused by the fluctuating livestock receipts at the markets. These fluctuations in supply require maintenance and establishment of plant and equipment for peak supplies, which remain partially idle during most of the cycle. There are probably not many industries that have a similar dependence upon unstable, perishable product supplies.

It appears that national income, being subject to trade cycles, and production cycles have an important bearing upon the packing industry. Livestock price policies of firms are dependent upon the phase of the production cycle, which has an important bearing on the unit overhead cost. There are times when some firms, because of their relative inefficiency, are eliminated since they are unable to stay in the market as prices are bid up. On the other hand, as excessive profits are made by the existing firms, new firms may come in which will divide these profits over a larger number of firms. As was mentioned above, adjustments need to be made because of cyclical fluctuations in supply. Excessive profits cannot persist at the expense of the farmer, given consumer demand for a fixed supply, since competition, through an entrance or exit of firms, would force the price of livestock to a level which would assure production at the point of lowest unit costs under perfectly competitive conditions. The farmer would

¹G. J. Stigler, The Theory of Price (New York: The Macmillan Company, 1947).

not suffer in that case from the existence of high fixed costs due to excess physical facilities.

This problem of entrance and exit of firms within a cycle is a rather complicated problem. When the prices of pork and hogs are so close that the most efficient firms just make a normal profit, the bidding up of hog prices will steadily raise the average and marginal cost curves. The less efficient firms will not go out of business right away even though their average costs have risen above the price they can obtain for pork, as mentioned above. If the price of hogs leaves total costs low enough so that average variable costs are a little more than covered, it will be worth-while not to quit since a little bit paid on overhead costs is more desirable than having a fully idle plant on which nothing is paid on fixed costs. Less efficient firms may decrease their volume in order to take the least possible loss during periods of temporary high hog prices. The inefficient firms do not quit the business without a struggle; therefore, well organized firms that are in a position to achieve greater economies by expanding their volume in prospect of greater profits will not, in fact, get the full benefit of the increased volume which otherwise would have been theirs since the total supply is fixed and the less efficient firms continue to bid in spite of an increasingly unfavorable relation of the cost to the price of the products. Those less efficient firms, whose total costs of production may be greater than the total price of hog products will try to keep going as long as their reserves and borrowing powers will permit them.

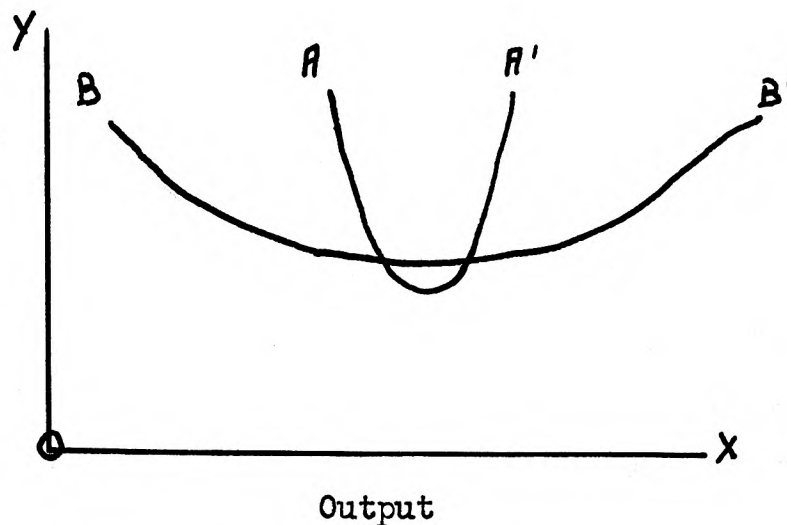
The extent to which a firm will borrow depends much upon the percentage of variable costs compared to total costs. If it is a low percentage such a firm may be producing for quite a long time under loss conditions. In the packing industry variable costs are high, and the range within which the price of hogs can vary without putting prime costs below price is relatively small. The entrance and exit of firms is thus more apt to occur because of the relatively small proportion which fixed costs are of total costs. Under competitive conditions in this complex industry, the possibility of upsetting a profitable hog-pork price relationship is likely to be especially great when an inadequate supply exists. As long as there is an inadequate supply, this bidding up will go on until the price of hogs--the price of pork being given-- is such that at the moment an efficient firm in the industry can buy hogs and just cover its total costs. Less efficient firms would be operating at a loss. A general increase in hog marketing may correct this situation when it is just a seasonal or temporary situation. But, when hog buying and slaughtering shifts from Chicago to Iowa, the industry must adjust to the situation on a long-range basis. This adjustment can be made by either reducing the existing facilities in Chicago, thereby reducing the costs of procurement and manufacture so that higher prices can be paid and the supply be increased, or by drawing supplies away from other markets by bidding prices up locally.

It seems that in a short-supply period an efficient firm would outbid and eliminate a less efficient firm and that the most efficient firm would continue to produce at full capacity.

However, this only happens under perfectly competitive conditions; and the real world has few perfectly competitive conditions. Output is more likely to be reduced by almost all firms in the industry. This reduction, although it may not be proportionate, will affect all the firms. A plant that has been designed for large outputs generally requires almost the whole labor force to keep it operating at less than full capacity. This force is larger than it would need to be if the plant had been designed for a smaller output. In other words, operating below full capacity and without regular and steady operation reduces some of the economies.

For these reasons, a plant which is more efficient than others at full capacity may yet have a higher prime cost than the other at an output below its full capacity.¹

This is illustrated as follows:



AA^1 represents the average total cost curve of an inflexible plant.

BB^1 represents a flexible plant.¹

¹Ibid., p. 169-170.

From this follow two conclusions. Firstly, the firm which would be the optimum firm in conditions of constant output may not be the optimum firm in conditions of fluctuating output, for it is likely to be too large and too rigid to possess the necessary flexibility. Secondly, the firm which is likely to be selected by the natural selection of competition during a depression is not necessarily the most efficient firm. It might be argued that the firm that is required is neither the firm that is most efficient at full capacity nor that which is most efficient at half capacity but the firm which over a complete cycle has the lowest average costs of production, taking good times and bad.¹

Even though in times of short supplies costs of a large, efficient firm may run higher than the costs of its competitors, profits in times of large supplies may be greater and reserves built up in this situation will carry it through the former period.

The plant that will survive in the future is not necessarily the plant with the lowest minimum on the average unit cost curve, but the firm that has been adapted the best to the over-all circumstances. The firm that employs part of its profits in times of peaks to buy modern equipment and to build reserves to prepare for any eventuality in the future has the most idealistic management. Firms which were established immediately following a boom period will probably be among the first to be forced to shut down. Another argument for the theory that the firm which is likely to survive is not necessarily the most efficient, is the priority that some firms have in securing financial aid in a depression. The firm which is poorly adapted to any unfavorable growing condition is likely to be the first one to apply for financial assistance at the banks. As the banks' loans are exhausted, the more

¹E. A. G. Robinson, The Structure of Competitive Industry (New York: Pittman Publishing Company, 1948), p. 95-101.

efficient firms are too late or find it difficult to obtain any aid. Robinson states that in "imperfect conditions not the type of firm that consumers like best is selected to remain alive."¹

Seasonal Variations. Great variations exist in the quantities of livestock marketed by farmers, and the demand by consumers varies also with the seasons of the year. The functions and risks of cold storage for meats have been discussed in the marketing optimum.

Irregular changes in demand have been dealt with in the marketing optimum. It has been argued that where output could not be carried on continuously and steadily, small firms could adjust to short time risks and fluctuations to better advantage than larger firms. Also, the limited local marketing possibilities drives producers in smaller and more fluctuation markets to improve the technical development of the small plant. This is not necessarily true in the longer run.

The effects both of cyclical and permanent declines may be less damaging to individual producers if they can agree to act in concert, and in certain cases, the existence of risks may lead, therefore, not to smaller but to considerably larger units of production.²

In general, when a great quantity of meats is marketed suddenly, "dumping," prices will fall. When there becomes a scarcity of meats, prices will rise again under the assumption that the propensity to consume does not fall also. When a packer buys too many hogs and he meets difficulties in disposing of

¹Ibid., p. 98.

²E. A. G. Robinson, Monopoly (New York: Pittman Publishing Company, 1948), p. 215-219.

his products, he will take care the next time and not buy more than his share when the supply is short, by over-bidding the market. Assuming perfect competition, the price of hogs is not determined by the purchase of one packer out of one market, but by the aggregate supply of hogs at all markets and the aggregate demand for meats offered by all respective packers.

Under perfect competitive conditions, each manufacturer tries to buy as much as he profitably can. When there are many independent packers the situation approaches that of pure competition. When there are comparatively few packers, the situation approaches that of imperfect competition in which each packer searches for a method of escaping the hazards of pure competition. A method that eliminates the economic hazard of cut-throat competition is sought. It can be seen readily that when all packers limit their purchases to a certain percentage of the total supply, the price will drop and the profit per unit of output will increase. Therefore, at those large markets where the number of packers is small, the greater will be the chance that limitation arrangements are made, as far as purchasing livestock is concerned. This matter of monopoly and oligopoly, being a study of its own, will be considered here briefly in order to relate it to methods of decreasing risks and to the size of firms. To what extent monopolistic and oligopolistic methods can reduce fluctuations of demand and risk is beyond the limitations of this study. The size of firms has no effect on the risk unless a firm becomes so large that monopolistic practices can be enjoyed. Robinson states that it may be to the

interest of an undertaking to grow to a size greater than that which will secure its greatest efficiency, if by that growth, it can secure monopoly gains which outweigh, as they almost certainly will, the losses due to excessive size.¹

Collaboration among separate firms in monopolistic associations is far easier and far more likely to be successful where the firms whose interest must be harmonized are few.²

Tacit or informal agreements are made and carried out more easily among a small number than among a large number of firms. So monopoly elements will lead to larger units much more easily, and when once established, a still greater output or scale of production seems desirable in order to have more power within the organization and hence more advantages. Although these possibilities may be limited to rare cases, some have had important effects upon prices of food products. In the packing industry risks and fluctuations are great. Supply is beyond the packer's control regardless of demand conditions in the short run. Through a directed distribution from large-scale firms, adjustment of supply and demand are more easily made by co-operation in both buying livestock and selling livestock products. The necessary profit, often only a fraction of one percent of total sales, to carry a large firm through the peaks and dips of the economic cycles probably means little on one farmer's sales of livestock. However, in the aggregate this might amount to huge sums of money. While it is true that monopoly elements may make the size of firms larger

¹Ibid., p. 104.

²Ibid., p. 105.

than they otherwise would have grown, only a few firms have been able to take advantage of this situation.

An Analysis of the Optimum Managerial Unit

Economics of Managerial Optimum. The economies of division of labor are not limited to technical methods of production by an increased scale, but are also present in the management of large firms. In small plants the manager has very many different functions and responsibilities. He is supposed to know how to operate nearly all the functions of the firm: the production, the marketing, and the finances. There are few men of that stature who can do all these jobs successfully. Large firms hire specially trained men for all the specialized positions, and the functions of management are thus divided up into many parts.

Financial control, estimating, and costing are separated from buying and selling on the one side, from manufacturing and the control of production on the other. The planning of the detailed organization of production, the keeping of the statistics of output and sales, the forecasting of future sales and the exploration of possible markets are all likely to be entrusted to special officers whose sole concern is with these problems.¹

Transportation, advertising, labor relations, accounting, maintenance of machinery, etc. are all phases which are to be performed by specialists. No expensive talents of personnel are wasted on routine jobs, and routine workers are not asked to do jobs for which they are unqualified. Therefore, specialists are

¹E. A. G. Robinson, The Structure of Competitive Industry (New York: Pittman Publishing Company, 1948), p. 38.

able to achieve a high degree of skill in their jobs, and their talents are used to the utmost. Thus, there is, in large modern firms, a high degree of division of labor in production and administration. For example, an expert baby beef buyer of a large plant is likely to have had more experience and training than a buyer of a small plant who buys all kinds of livestock. Probably the buyer for the small plant buys livestock only a few days a week, while the buyer of the large plant buys baby beef every day in the week. The large plants usually can afford to hire expert buyers, top rated efficiency experts, etc., which gives them a decided advantage. These experts may save the large firm only a fraction of a penny per pound, but these savings figured over the tremendous volume that may go through such a plant may be highly profitable. An officer of a tractor factory in Germany once said, "Könnten wir nur alle Vernunft kaufen dass wir brauchen," which means that there is an unsatisfied demand for highly trained men.

There are more economies that can be obtained by increased size of a plant which are those services that do not have to be increased in the same ratio as the growth of the firm. This comes out clearly by considering a sales forecasting office. A firm of reasonable size has a well-established office to forecast sales. If the size of the firm is greatly increased, the sales forecasting costs are not likely to be increased, and these costs per unit of product fall as the firm increases the business. Sales costs of a nationally organized firm that doubles its volume of business are not likely to be doubled.

Another direction in which economies can be expected is in research and experimental work. Swift and Armour carry on this kind of work on a scale which is absolutely beyond the reach of the smaller packers and which is very profitable. Swift's 1950 Yearbook states:

The larger company is best able to maintain a group of scientists working together on common problems, to support pilot plants (of which Swift has several) and to take risk of developing a new product or process.¹

These engineers and specialists study continuously processes that could be speeded up by use of machinery or devices or process changes that could increase the quality of the products. Large laboratories are maintained to do research and experimental work.

The installation of a power plant to supply the large plant with all needed electricity requires specially trained personnel to keep it going. Small plants can neither afford nor justify such an investment and cannot share many of these advantages.

Also, a substantial saving is made by the large firms in the fast expanding use of calculating, bookkeeping, and statistical equipment.

If the management of a large firm plans carefully and the production process can go on uninterrupted, the large firm might be more efficient. In general, the production specialists of large firms cannot do much about regulating the supply of raw materials in the meat packing industry. In planned production, changes in work from one task to another are reduced to a minimum. The large packers have a greater turnover of labor than the

¹Swift and Company, 1950 Yearbook, p. 17.

independent packer.¹ This undoubtedly increases labor costs and decreases efficiency. A change always involves waste.

Although a large firm might have facilities to test a prospective employee in advance so as to determine his abilities, it is true that a larger turnover of labor partly counterbalances this advantage.

In some ways the large firm may have an efficiency which the small firm cannot attain. While the large firm may have greater administrative expenses per unit of product, the production process may be more efficient because of better trained specialists.

According to this review, it seems as if a firm which is ever increasing in size has proportional advantages from the managerial standpoint. However, this is not always true. The limits of a large firm are very definite. There is a management optimum as well as a technical optimum. Beyond a certain scale the division of labor becomes unprofitable and non-workable.

The problem of co-ordination is the main reason these limits appear for the managerial optimum. This accounts for the great diversity of sizes of firms in the meat packing industry. Every time that a job formerly done by one man or by a group of men is divided up into several parts, there arises the problem of co-ordinating the work. It becomes clear that the breakdown or division of one or more jobs requires cooperation between the new parties. To be more efficient as a large firm than as a small one, it is necessary that the individual parts of the large firm co-operate with each other in order to reach high efficiency. It

¹U. S. Department of Commerce, Report on Labor Force (Yearly Report of Bureau of Census, 1948), p. 6.

takes time and organization to co-ordinate the newly divided parts. The better trained labor force and more specialists in key positions in a large firm might be more efficient than those of a small firm, but the loss of efficiency due to the lack of good co-ordination might offset this factor. The increased efficiency of the division of labor and the use of experts or specialists is an advantage, then, only if the "know how" of co-ordination is met successfully. This problem of co-ordination of the divided jobs or departments and specialists is a determinant of the size to which a firm will grow. If this problem could be solved perfectly, the managerial optimum would be unlimited. There are several forms in which the matter of co-ordination has been organized. The common form in the packing industry is the line organization in a somewhat changed form. This organization allows the department heads, their foremen, and clerical staff to pay attention only to the product or process. Qualities, sale of products, allocation of raw materials, etc. are not their responsibilities. Central planning is conducted by a department especially created for the purpose to co-ordinate the work of the different departments. Costs figuring, wage policies, and hiring and firing of employees is commonly done in this central-planning department also. For a higher degree of division of labor, the "functional" type of organization gives one department the responsibility of one particular phase of the firm. For instance, one department takes care of maintenance and repair work of machinery and thereby serves a large number of other departments. Specialists can be employed

who do nothing else but maintenance and repair, while in the line organization these men might have been employed only part-time in this type of work. A further degree of division of labor can be attained. It becomes evident that as departments become subject to operations performed by specialists outside the department, some important decisions over which the head of the department has little or nothing to say, may be made by these specialists. A higher degree of teamwork and sound judgment is more important here than in the line organization.

A third type of organization, which is more or less a combination of the two types mentioned above, tries to organize current production and plan improved future production and organization. This type of organization is known as "line and staff"; and while it is a compromise between pure line organization and complete functional, the "streamlining" is the important part. In the last twenty years enormous progress undoubtedly has been made in the co-ordination process of the large firms. Vocational training of personnel, statistical analyses, forecasting facilities for timely adjustments of production to fluctuation, teletype machines, leased wire services, etc. have greatly assisted in solving the co-ordination problem. Robinson states:

If the managerial optimum is exceeded, costs through declining efficiency and the need for additional co-ordination begin to rise; and the managerial optimum sets, therefore, not only a lower limit but also an upper limit to the scale of operations. Despite the great advances made, there must come a point at which the machine is too unwieldy to be managed, a point at which the gains of increasing costs of co-ordination

are likely to exceed them.¹

There is no doubt that the co-ordination problem increases in importance as the size of the firm increases, but there is also no doubt that advances made in the last twenty years are able to carry the managerial optimum much farther than formerly expected. Especially in the United States and Germany, it has been proved that huge firms still are able to co-ordinate their work efficiently by breaking down the production process into many operations performed in different plants. The large unit of production necessary in a meat packing plant, due to perishability and the typical disassembly process, does not allow a similar breakdown of the operations as in many other industries. General Motors and the I. G. Farben Industry are examples of the hugeness to which firms can grow, and the reasons why they do not expand any more aggressively are manifold:

1. They still may expand but in a more consolidatory manner, whereby the following objectives may be considered:

(a) The firm attempts to secure its position by using discriminatory practices to obtain its raw materials whereby the supplier may have been made solely dependent upon the large firm.

(b) The firm may attempt to increase its volume by increasing the number and variety of products for which it is unnecessary to erect new facilities immediately.

¹E. A. G. Robinson, The Structure of Competitive Industry (New York: Pittman Publishing Company, 1948), p. 248.

(c) The firm may try to secure its "good will" reputation by manufacturing higher quality and more uniform products for which purpose inside technical changes of the existing facilities may be necessary.

2. A much larger firm is really planned and worked for, but the accusation of the public of "big trust" may put the government into action to prevent this.

3. The problem of co-ordination or scheduling becomes such a task that it can no longer be handled efficiently and effectively.

4. The hugeness of the firm may have reached a point whereby with further expansion the costs of co-ordination, thus of management, may increase with an accelerated rate per unit of output.

5. Many large industries assemble from different plants the necessary parts to put the final product together. In the meat packing industry it is a matter of disassembly of highly perishable products.

The small firms do not have to battle the co-ordination problem, as it is rather easy to make fast decisions. One man doing several different jobs in a small firm not only has many more decisions to make, but also carries many more responsibilities. In industries where decisions have to be made rapidly and orders have to be carried out quickly, the smaller firm has definite advantages. The meat packing industry shows that an extensive number of small firms are able to meet the competition of the large ones. To a certain extent this is due to the relative

ease with which decisions can be made within short periods of time. However, to some extent, the relatively greater vulnerability to the longer-term business cycles has put many small firms out of business during depressions. The large packers have eliminated to a certain degree, the disadvantages of their large size as far as making many decisions within short intervals is concerned, by the practice of control over markets which brought more stability into their ranks. In many firms where the small size is a disadvantage, the tremendous energy of managing owners or other operators to keep the business going is a task not easily overestimated. Some of the present large packers, Swift and Cudahy, for instance, have benefited greatly from the energetic management of their founders and manager. However, Armour suffered because of the inefficient management of the owners in the second generation. A similar situation was detrimental to Wilson. Many independent firms in the corn belt region have benefited from flexibility and good management under the more favorable circumstances since 1921. Considering the economies of the managerial optimum in the meat packing industry, it probably is not managerial difficulties that determine mainly the size of the optimum firm. The reason why large firms do not make more profits in the long run is a matter of maturation. Unlike a small company, a large firm tends to stabilize its profits and it carries its own insurance. The profits of years are lessened by the costs of new experimental processes and products, but the large firm's entity is more likely to continue from year to year. The rate of profit may be

somewhat lower, but the certainly of profits will compensate for this.

When the more rapidly expanding medium-sized firms, which are more profitable in part because they are still growing, come to the end of that process, their profits likewise will be at a lower rate.¹

At maturity state a large firm commonly adopts a policy of consolidation and conservatism. Stability becomes essential, and special risks are not taken any more. Thus, there may be a limit on the growth of a firm as far as management is concerned, and this may be the factor of co-ordination or scheduling. The optimum managerial unit is that unit in which the advantages of growth are fully utilized and where the disadvantages of co-ordination are met in the most economical and effective manner. The future optimum may become larger through technological advances of communication and personnel training; however, it is still to be seen whether this will be accepted by the public. The medium-sized firm probably has an advantage over the large firm because of being more flexible and because it has fewer co-ordination difficulties; it has an advantage over the small firm because of its use of a higher degree of personnel specialization. From the managerial optimum point of view, it is probably the medium-sized firm which is to be selected.

¹Richard C. Osborn, "Efficiency and Profitability in Relation to Size," Harvard Business Review, XXIX, No. 2 (March, 1951), p. 93.

FINANCING

General Discussion of Financing

First, consideration will be given to the problems of financing the meat packing industry as a whole. This will be followed by a consideration of the relative advantages of large and small firms in obtaining funds.

A quotation from Edward A. Cudahy summarizes the need for financing in the meat packing industry.

The best way to gain an understanding of the means and methods of financing this industry is, first, to consider the day-to-day operations and, second, the major or long-time operations. The first point shows that the packers' main item of expenditure is payment for livestock. The first concern of the packer is to have funds on hand to pay for his daily purchases of livestock. Most of this money comes from his sales, the proceeds of which are transmitted as quickly as possible to livestock centers so that additional supplies of livestock can be purchased.¹

To carry on various manufacturing processes the packer must be a large purchaser of containers, fuel, ice, salt and sugar. Bills for these articles have to be met, and the packer whose financial position enables him to do so accepts the cash discounts (in most cases 1 percent or 2 percent for payment in ten days or net thirty days or net sixty days) rather than taking the extended time of thirty to sixty days without such discount. This prompt method of payment is of equal advantage to both seller and buyer. One percent ten days, net thirty, is equivalent to an annual rate of 18 percent; 2 percent ten days, net thirty, is equivalent to 36 percent annually.

The payroll is another large item that must be met at regular intervals, in most cases weekly. In order to have funds on hand with which to meet these checks

¹Edward A. Cudahy, Jr., "Financing the Packing Industry" in The Packing Industry (Chicago: Institute of American Meat Packers, 1934), p. 202-209.

a day or two before the checks are issued, the packer deposits with his bank or, if he carries a general account with the bank in question, he will have the bank transfer to his special payroll account sufficient funds to cover the checks to be issued.¹

From the foregoing it can be seen that buying and selling in the packing industry, so far as we have gone, is handled largely on a cash basis. The fact that livestock is paid for the day it is purchased, that payrolls are met weekly, and that purchases of supplies are, in most cases, paid for ten days after the receipt of invoice in order to take advantage of cash discounts, makes it necessary for the packer to turn and sell his goods for cash or on short-time credit.

Selling organization varies with the size and location of the business. Some packers sell in a single state or the city in which they are located. Others, in addition to local business, distribute their goods on one or more car routes. Large packers also maintain branch houses, the largest having as many as three or four hundred branches.

Meat products are sold through branch houses and on car routes almost exclusively to the retail trade. Collections from retailers for fresh meat or mixed sales of fresh meat and provisions are made weekly; in case of straight provision sales, thirty days net is the usual practice except for lard, which is sold on .5 percent ten days, thirty days net. In case of export sales the packer either ships provisions and lard on consignment,

¹Ibid., p. 207-209.

books what are known as open-price orders, or sells on terms, depending on the type of his organization.

As a packer's sales outlets become more diversified, collections become more difficult, especially if a considerable number of branch houses are far from headquarters. Collections are generally accomplished either by the salesman who sold the goods or by collectors. Banks will also make collections, but this method is often objectionable. The good will of customers is an important asset, and most packers exhaust every other means for collection before placing a delinquent account in the hands of an outside collection agency.

The collection department is, of course, closely allied to the credit department, under authorization of which it does its work. The duties of the credit department are to gather information in regard to old customers whose credit limit should be increased or decreased and to adjust this limit, or, in the case of a new customer, to set a credit limit or put the name on the C. O. D. list. The necessary information is obtained principally from credit agencies and banks. A concern that deals directly with retailers finds it much more difficult to get accurate credit information than do manufacturers who sell to wholesalers or jobbers.

To facilitate collections through branch houses, a packer requires the branch to make out and forward to the general office weekly or monthly trial balances. This is a form which shows the name of each customer, how much he owes, when it is due, and his credit limit. These lists are checked over carefully either by the credit man in charge of the territory in which the

branch house is located or in the general office. All delinquencies are followed up directly or through the branch house manager to hasten payment. The desirability of prompt collection is obvious. If collections are slow, it means that the packer has to borrow more money to finance his livestock purchases, his purchases of supplies, and the product he is forced to carry either in process or in cure in his plant. The average length of time during which bills of this nature are outstanding varies with the different packers from 12 to 30 days.¹

Beyond utilizing his own capital, the packer borrows capital. Borrowed funds play an important role owing to the facts that (1) livestock is paid for in cash (2) it is to the advantage of a packer to discount his bills for purchases of supplies and (3) it is necessary for him to finance accumulated supplies of meats in cure and storage. In addition, by-products must be put through manufacturing processes which take considerable time and then often have to be carried for months before sales are effected.

Packers operate to a large extent on borrowed capital obtained principally through bonds, debenture notes, bank loans, and commercial paper. A business never stands still. It either goes forward or backward. Assuming that a packer is aggressive and desirous of expanding his business, he finds that financing himself entirely out of his own earnings is rather slow; and he must go to an investment or banking house to seek funds.

When money is plentiful and rates of interest reasonable, it is sometimes advantageous to do long-time financing by means of bonds or debenture notes. On the other hand, when there is a shortage of working capital, interest rates are unfavorable to long-time financing.

It might seem that when packers, the larger ones in particular, need money they might secure it with

¹Ibid., p. 210-212.

practically no difficulty by any of the four methods mentioned. The packer, however, is subject to the same scrutiny and investigation on the part of bankers of whom he asks credit as is imposed upon the smallest of the retail customers.

A firm will need new funds for some one or more of the following reasons:

1. To expand a business along old lines.
2. To expand an old business in a new direction.
3. To buy out competitors or to combine with them.
4. To provide temporary working capital.
5. To change the type or terms of existing capital liabilities.
6. To refund or provide the means of payment for maturing security issues.
7. To change the ownership or form of organization, or to enable present owners to withdraw their capital, or, in cases of reorganization, to adjust conflicting ownership and creditor interests.

Of the various forms of borrowing that may be employed to meet these needs, the negotiable mortgage bond doubtless gives the best security to the lender. Such a bond . . . (is) a secured promissory note with interest periodically. As a rule, mortgages cover only the fixed assets, that is, plant, equipment, real estate, and the like.

Since the average packer borrows frequently from the bank and the bank must look for security of its loan to the strength of the company's current assets, it is obvious that from the commercial bank's point of view it would not be desirable that there are any prior claims to be based on current assets.

Debenture notes are sometimes issued at a high rate of interest, usually 8 percent, in order to increase the working capital of concerns whose current assets have become frozen. Frequently provisions protecting earlier preferred-stock issues against the creation of any mortgage obligations have cut off all avenues of emergency financing except that of the note issue. Under such circumstances it is expected that protective covenants will be imposed. Such a covenant would provide that while the notes are outstanding the company shall not further mortgage or pledge any of its assets except for the acquisition of additional

property. In case property is acquired, the purchase of money obligations are usually limited to a conservative percentage of the value of the newly acquired property.¹

It is sometimes required that the working capital or net-quick assets shall always be kept equal to, or greater than, the amount of notes outstanding. During the past few years it has sometimes been necessary for a concern to issue mortgage bonds at a high rate of interest in order to secure sufficient working capital and enable the borrower to avoid a technical default on his debenture notes.

If the company defaults in the payment of principal or interest on bonds, a mortgaged property can under certain conditions be foreclosed by the trustee for the benefit of the bondholders. When bonds are secured by collateral, they become due and payable after a certain interval has elapsed following the default on the part of the issuing company. The collateral may then be sold to satisfy the claims of the bondholders. If a company should default in the carrying out of its obligations in connection with a debenture bond, the holders of the notes can presumably throw the concern into receivership which will be operated for the benefit of creditors until such time as the defaults shall be made good.

The better grades of bonds issued by industrial corporations will sell, according to circumstances, from four to five points higher than is received by the borrower. Under very special circumstances the spread may be even greater. For example, an investment house might pay ninety-four or ninety five for this type of security and sell it to members of the syndicate for ninety-six or ninety-seven. The latter in turn might offer them to the public at par. Lower-grade bonds, debentures, and preferred stock are frequently subject to a greater spread; while in the case of common-stock, aggregate commissions to the different distributors may be as high as 10 percent or even 15 percent of par.²

Here may be seen an important advantage the larger firm may have over the smaller in cost of financing, namely, in the cost

¹Ibid., p. 213-216.

²Ibid., p. 217-218.

of floating bonds or stocks. The smaller firm, because it is less well-known and requires greater sales effort per unit for its bonds and stocks, must pay a larger broker's commission, which amounts to a very important proportion of par value at best.

All of the members of the 'Big Four' issued bonds secured by mortgages in 1935, Swift and Cudahy at 3 3/4 percent, Armour and Wilson at 4 percent. Cudahy also issued a convertible sinking fund debenture (not secured by any lien on property) at 4 percent. Gobel, pursuant to reorganization, issued convertible debenture (not secured by lien) at 4 1/2 percent. Miller and Hart issued gold debentures at 6 percent in 1929.¹

Bonds probably require even greater commissions than stocks for the small firm, because up to a certain point the small firm can often find a market for its stocks locally where it is better known. The relative merits of financing by bonds and by stocks according to size of firm will be discussed further, later on in this section.

Commercial paper, with or without endorsement of individuals as well as the issuing corporations, is simply unsecured promissory notes issued by merchants and manufacturers to secure funds with which to finance current transactions. Such notes are sold by commercial-paper houses and note-brokers and are not given directly by the borrower to his bank. Businesses dealing with staples, with a high turnover and in relatively constant demand, and which have demonstrated their stability are best suited for financing by the sale of their paper on the open market.

¹Ibid., p. 219-220.

The packing industry, in general, meets requirements for commercial-paper borrowing, and concerns of established credit use it extensively. Both large and small banks make a practice of buying packers' commercial paper at times when they have surplus funds to loan for a short period of time. The notes are usually turned every three to six months' time.¹

The principal use that the packer makes of commercial paper is during time of accumulation of product, especially in winter when hog receipts are heavy and pork products have been put in cure in large quantities and carried three to six months or longer before they are sold. During such a period a packer may have utilized to the fullest extent the line of credit with the different banks, in which case additional funds may be secured by disposing of commercial paper in the open market.

The packing industry acquires the largest part of its current borrowed funds from bank loans. According to the size of the business, a packer establishes what is called a "line of credit" with one, a few, or many commercial banks. This means that the bank in return for the accommodation will require a deposit, ranging from 10 to 20 percent, on which the borrower receives no interest. Rules concerning the maintenance and amount of the deposit depend, among other things, upon local custom, size of the bank, importance of the business, character of its management, and the type of industry. Here again, then, a large firm is likely to get better terms than a smaller firm, especially where both seek financial aid at the same banks.

¹Ibid., p. 220.

A bank asked to extend a line of credit to a concern will probably consult other banks regarding their experience with this particular firm and will scrutinize it carefully. The bank will also compare the latest balance sheet furnished by the borrower with the balance sheets of several previous years, thereby securing a financial history of the business. After all these precautions, it is a common practice to insist upon an annual cleanup of commercial loans irrespective of the nature, size, or age of the business. This means that all outstanding loans must be paid and that the borrower does not again ask for loans within sixty or ninety days. This indicates that recent financial history, rather than size, is the most important consideration in obtaining a line of credit with a bank.

Another method of borrowing is by warehouse receipt. The procedure is as follows: A packer places his meats or lard in a licensed warehouse, subject to the rules and regulations of the licensing agency. There are concerns in the warehousing business, but a packer may have one of his buildings declared a "regular" warehouse provided it has the approval of the inspector. When packer-owned cold storage has been declared "regular" and dry, salt, shortribs, barreled mess pork, or prime steam lard, which will pass the specifications and inspectors, has been placed in this storage or the products stored with an outside concern which does a warehousing business, a warehouse receipt is issued for the product, showing the packer to be the owner of the goods. He may borrow from the bank on his promissory note secured by the warehouse

receipt. Because of possible fluctuations in price, it may not always be possible to borrow the full face value of the goods. Pending the time of withdrawal, the margin the banker desires for his protection may vary from 10 to 25 percent. There is very little trade credit, also called "dealer credit," in the packing business.

Another method of raising borrowed funds is by mortgage issue. Corporation mortgages constitute the simplest means of borrowing long-time funds. This form of credit, in which an ordinary mortgage is given on the company's real property, is used principally by small firms. The common practice for larger firms is to offer mortgage bonds to the public.

Some businesses can be run without encountering the necessity of borrowing much, if any, money. The original capital and past earnings in the form of surplus may be sufficient, with an occasional bank loan, to meet all financial needs. Most packers, however, are large borrowers of money in almost every form in which it is available. This is due to the fact that the industry is one of cash payment and frequent small sales to retailers and also to the necessity for accumulating cured and stored supplies of meats on account of seasonal marketing of livestock. It may be necessary, also, to supply funds for the processes of manufacture involved in the handling of by-products.

There are several ways of floating a loan. Capital is frequently obtained by issuing and selling to the public what is called a "prospectus," which is advertised in the daily newspapers and sent out in personal and circular letters to prospective purchasers. Salesmen are also often employed to dispose of stock in this manner

to the public. Another method is to place the stock on the market by listing it on the various exchanges, of which New York is foremost. The method most generally employed for floating corporation securities is through an agency of well-established brokers or banking houses. A corporation usually has no facilities for marketing stocks or bonds, and many employ a reputable firm which is engaged solely in this kind of business.

Financial statements of many enterprises, including some packing concerns, show millions of dollars in the surplus account which has been accumulated from past earnings.¹

Surplus or earnings left in the business may be disposed of in any of the following ways:

1. To provide against years of small profits or losses and possibly to continue dividends during such periods.
2. To maintain a strong cash position.
3. To improve the property.
4. To develop the business in new directions, such as the operation of by-products industries.

A great problem which confronts the packer, or for that matter any other business man, is to keep capital profitably employed. A successful concern at the end of the year must either reinvest the profit in the form of improvements such as added manufacturing or selling facilities, add it to working capital in the form of surplus, or invest it outside the business. In a large and growing packing business, sound judgment and good management

¹Ibid., p. 225-229.

are required to keep capital profitably employed and at the same time not to expand to the point where tight money or poor business will mean financial embarrassment.

The amount of surplus which it is desirable to accumulate through the accumulation of earnings depends on the needs of the particular business. A strong cash position is desirable for any business but particularly so in the packing business which operates largely on borrowed money and, therefore, must have good credit. It is an industry that is handled with extension of short periods of credit, both in buying raw materials and selling finished products, and because of the relatively high ratio of volume of business to capital employed, it is an industry that utilizes every avenue of borrowing money to finance itself.

When a corporation has met its operating expenses, possibly established reserves against obligations maturing in the future, and provided for a surplus, any earnings that remain are distributed to stockholders as cash on their investment and some return for the risks they assume beyond those assumed by bondholders or other lenders. Well-managed corporations try as far as practicable to establish a reputation for stability and dependability of dividends. It is this rather than the amount of a particular dividend that determines the investment rating of different stocks.¹ Adequate surplus makes for the stability of dividends.¹

¹Ibid., p. 234-238.

Cost of Financing and the Financial Optimum Firm

The cost of production of a firm will depend not only upon the efficiency of management and sales, but also upon the ability of the firm to borrow the capital necessary for its activities. If opportunities for borrowing depend in any sense upon size, the problems of finance will influence the optimum scale of production. In practice, we find that the task of raising capital exerts important influences both upon the size and structure of firms. It does this in two ways, firstly through the rates at which firms can borrow, secondly, through the amounts that firms of different types of organization can borrow at any given rate.¹

In the United States, where a large amount of capital is necessary in many industries, the corporation with limited liability has become common, since it greatly extended the limits to the amounts firms can borrow. The corporate form of organization

...enables the promoters or controllers of business to pass on to the general public any part of the task of financing a business which they do not themselves want to undertake. The shareholders of a company perform two separate functions. (1) They provide the capital, and (2) they take the risks. The promoters of the company may hand over the performance of both these functions to the general public, themselves becoming no more than leading shareholders or even withdrawing entirely, or they may retain in their own hands most of the risks and opportunities and apply to the public only for the provision of capital at fixed rates of interest.²

This is the fundamental difference between stocks and bonds.

The financial structure of firms is influenced largely by one aspect of technical methods of the particular industry. In some industries firms must start at almost their full stature; in other industries they normally start small and grow up to their full stature. The former type of industry requires to be corporate, because the initial capital is too large for one person

¹E. A. G. Robinson, The Structure of Competitive Industry (New York: Pittman Publishing Company, 1948), p. 54.

²Ibid., p. 55.

to supply. The later may, and usually does, start as an individual enterprise and grows later, if at all, into a corporation. The moment at which a firm will find it desirable to change its financial structure will depend mainly on the profits which it is earning. In many American and British industries a common method of growth has been to depend upon profits as a source of capital. Thus the normal method of obtaining capital is to divide between shareholders less than the whole of the profits made in any year. But to grow in this manner means that a financial limit is set upon the rate of expansion. There is no reason to think that the most efficient rate of growth is that set by the available profits. What is the maximum efficient rate of growth? This rate varies widely between industries and even in the views of individuals in the same industry. A firm, it must be remembered, is an organism in itself. Its parts depend upon each other. Smooth working arises from the most perfect co-ordination of many individuals. A too rapid expansion will introduce so many disharmonious elements that efficiency will be destroyed. In some industries, a rate of growth greater than some 10 percent per annum appears to lead to confusion; in other industries, a firm would seem able to multiply its output several times a year without detriment. The most efficient rate of growth would appear to be lower in those industries where a high degree of planning and co-ordination is necessary, higher in those where the technical processes of production are fairly straightforward, and the different departments not closely interdependent.

Where the efficient rate of growth is higher than can be secured by expansion out of profits, recourse must be had to one or other of the methods of raising capital from the public. So long as the firm is owned and run by a single individual, he may regard the protection of limited liability as unnecessary. If, however, he wishes to expand faster than his savings permit, and to give the undertaking an existence independent of lives of its owners, he must incorporate.¹

The technical side of the packing industry, we have seen, is fairly simple. Hence the technical limitations on necessary original investment and the rate of growth are relatively slight. Rath at Waterloo, for example, was able to expand its output very

¹Ibid., p. 56-58.

successfully from 180 thousand hogs in 1920-21 to 329 thousand in 1921-22, and had reached nearly 700 thousand hogs by 1924-25. In five more years Rath's hog slaughter was around the million mark.¹

In the packing industry the chief impediment to growth, once local markets are satisfied, is the physical aspects of an economical distribution system rather than the technical conditions of manufacture.

During the period of rise to a position of dominance the members of the 'Big Five' were pretty much family affairs. In 1917 all of Armour's capital stock was held by nine members of the Armour family. Members of the Swift family held a large amount of Swift's capital stock; although there were a great number of other stockholders. Morris (purchased by Armour in 1923) was a closed corporation, and all stock was in the hands of the Morris family. The principal holders of Cudahy stock were members of the Cudahy family and trustees for members of that family. The Cudahy family had a controlling interest, although there were many other stockholders. Only Wilson & Company was no longer in the hands of the original (Sulzberger) family. After its reorganization in 1916 it was largely under the control of bankers.²

All these companies had grown to great size through financing out of profits. By 1917 the Morris Company had accumulated a very large surplus so that the \$3,000,000 stock by no means represented the net worth of the company.³

In 1914 Moody's reported that

...in recent years (Swift) has paid 7 percent on its large stock issue and has generally earned considerably more than this. The result is that the profit and loss surplus has accumulated very rapidly.⁴

While self-financing entirely out of surplus has been common in many American industries, it may be pointed out that this may not be the most desirable means of financing from a social point

¹McCarty and Thompson, Meat Packing in Iowa (Iowa State College Press), p. 126.

²Federal Trade Commission, Part I, p. 86-88.

³Ibid., p. 87.

⁴Moody's Manual of Investments (Industrials, 1914), Published by Moody's Investment Service, 65 Broadway, New York.

of view. Funds from this source are obtained outside of the competitive market for capital so that private capital resources should find their way into the investment markets. In this way industrial expansion may be expedited.

From 1917 or 1918 on, the "Big Five" (later "Four") depended more and more upon the public as a source of financial resources. Even today, however, members of the Armour, Swift, and Cudahy families still hold important positions as officers or directors of their respective companies.

Between 1919 and 1929 a number of independent packers showed marked growth. Between these two years the percentage of total meat packing establishments with an annual volume of business of \$100,000 to \$500,000 increased from 30.0 to 32.4 percent; of \$500,000 to \$1,000,000 from 9.4 to 14.3 percent; and of \$1,000,000 and over from 24.2 to 29.2 percent. Between 1921-1929 establishments doing a volume of business of \$5,000 to \$20,000 declined from 11.9 to 5.0 percent.¹

In line with this growth in size, the percentage of meat-packing establishments which were corporations increased from 44.6 to 57.2 percent, while the percentage which were owned by individuals or partnerships declined from 55.4 to 42.8 percent between 1919 and 1929.²

Among the important independents, few listed their stock on the New York or Chicago stock or curb exchanges until recent years, indicating that during their previous history as corporations they at least depended on local capital. The common occurrence whereby these companies reincorporated just before listing their offerings of stock probably represents the transition from a closely held

¹Census of Manufacture, 1919, 1921, and 1929.

²Census of Manufacturers, 1929, Vol. I, Table 3, p. 100.

or locally held organization, the articles of corporation of which were of much less importance, to a public-financed organization, where incorporation under the most favorable state laws became desirable.

There is one big difference in the method of financing of the national packers and the leading interior packers, namely, the importance of bonds in the capital structure.¹ The best way of measuring the relative load of bonded indebtedness is the ratio of bonded debt to total assets.²

For the entire period 1914-36, Cudahy, Wilson, and Armour have all shown an average funded debt of 25-26 percent of total assets, with Swift well below with an average of 17 percent. The interior packers, on the other hand, have had little or no bonded debt. Morrell, Rath, and Mayer have never had any bonded debt, nor has Hormel since sometime before 1928. Decker had a small volume of bonds outstanding during the period 1922-26, and the value of these bonds showed a steady decline relative to total assets up to 1935 when Armour took over this company. For the period 1932-36 the four national packers had an average funded debt ratio of 21.8 percent, while the five interior packers had one of only 2.8 percent (Table 2).

When the 15 largest companies are grouped according to size (in net sales) during 1932-36 rather than according to type of business, the five largest had an average funded debt ratio of 17.4 percent; the sixth-to-tenth largest, one of 15.7 percent; and the eleventh-to-fifteenth largest, 5.3 percent. (Table 1). Of these three groups one firm in the first group, two of the second group, and three of the third group had no funded debt.

¹T. D. Letbetter, Unpublished and incompletd manuscript, Kansas State College.

²This ratio shows the extent to which the mortgages and other bonded debts are secured. If the ratio is low, the security is greater since more ample allowance is thereby made for over-evaluation of assets and losses in case of forced liquidation or sale.

Table 1. Average funded debt to total assets by size of company.

	1922-36	1922-26	1927-31	1932-36
5 Largest	20.3	23.5	19.9	17.4
6th-10th Largest	16.1	30.5(a)	14.1	15.7
11th-15th Largest	7.4	9.4	8.3	5.3
16th-18th Largest	21.7	-	23.5	22.2

(a) Three companies only

Table 2. Average funded debt to total assets by type of company.

	1922-36	1922-26	1927-31	1932-36
4 National packers	25.4	29.3	24.9	23.5
5 Interior packers	4.6	8.5	5.0	2.8
3 Regional packers	17.7	14.6	17.9	16.2
5 City slaughterers	16.5	9.5(a)	17.3	14.7

(a) Three companies only

Since bonds were retired gradually after 1920, there was a common tendency in all three groups for the ratio to decline at the end of the war-time expansions in bond issues.¹

¹Ibid.

At the present time Wilson and Swift have a funded debt ratio far below those of Cudahy and Armour.¹

Since funded debts have greater security of principal and regularity of income, they bear the lowest interest of corporation securities, including stocks. Because of their relatively low rate of interest, funded debts are of a relative advantage to companies so financed in times of prosperity when interest rates are high. In times of depression, however, funded debts are a considerable burden because of their characteristic of regularity of payment which then becomes a heavy fixed charge which companies are required to meet regardless of earnings. This is unlike stock upon which dividends may be passed if earnings warrant. Hence, the interior packers were in a much more satisfactory position to withstand the depression in so far as fixed charges were concerned than the members of the "Big Five."

So far the effects have been considered of the ease or difficulty in different conditions of borrowing the amounts of money a firm may require. The other side of the problem, the difference of the rates at which large and small firms can borrow, also needs to be considered. In general, the large firm possesses, of course, an advantage. A large firm may be able to borrow more than its present circumstances warrant, while a small firm of better real standing may go short. The greater ease with which large firms can borrow money may be one factor leading to the

¹T. D. Letbetter, op. cit.

vertical integration of large undertakings.

The large firm may be able to borrow so much more easily and cheaply the funds required to exploit a new source of raw materials, or to take advantage of new processes of manufacture of some subsidiary product, that though it may be technically less well fitted to control these further processes, there may be economies to be secured by it doing so.¹

There are not enough data available for identical periods of issue to determine any actual advantage which the largest packers have over the medium-sized firms in the rate at which they may borrow. It is necessary to have identical periods of issue since the rates on stocks and bonds depend upon the relative level of interest rates and the general price level at any given time. Furthermore, the technical provisions of any financial issue are so important that a difference in interest rates may be much more justified than appears on the surface. Rates do not vary a great deal according to size of company, although there may be a slight tendency for the smaller, more speculative companies to pay a higher rate on stocks.

For example, during 1919-21 Mayer preferred stock was issued at 7 and 8 percent, Kahn preferred stock at 7 percent, and Hunter preferred stock at 8 percent. In 1935 Rath preferred stock was issued at 6 percent, the same rate as Wilson preferred.

As to bonds, Hygrade, Miller and Hart, and Roberts and Oake bonds were all issued at 6 percent in 1920-29. In 1935 Swift bonds were issued at 3 3/4 percent, Cudahy at 3 3/4 and 4 percent, and both Armour and Wilson at 4 percent.²

¹E. A. G. Robinson, The Structure of Competitive Industry, (New York: Pittman Publishing Company, 1948), p. 62.

²T. D. Letbetter, op. cit.

It is probable that earning records are more important in determining the rates than is mere size, although size may mean stability and hence a better risk for a bond issue. A smaller company also may have its disadvantage in size and fame offset somewhat by the ability to obtain local capital because of better knowledge and perhaps because of greater faith and sentiment. The most difficult time is probably that period during which the firm is seeking financial resources from a wider and less friendly market, its local sources of capital having been exhausted.

Many of the interior firms have had no funded debt. A partial explanation may be that they cannot issue bonds to as great an advantage, either as to amount or as to rate, as the larger firms. Smaller local companies may be able to command local share capital at a cost in average dividends no greater than the cost to the large firms of bond capital, so there is no reason to prefer bonds to stock because of lower rates. The leading officials in the smaller firms may have had large personal fortunes which they invested in the company in preference to issuing bonds, while larger firms could not longer expect proportionate financing from such sources.

Because of the advantage which a large firm possesses in financing combined with the growing size of efficient units in many industries, the task of growing up to the optimum scale may become more and more difficult. The financial structure of the joint stock company has given it a continuity of life greater than that of the individuals who control it.

A firm is built up, usually as a private company. It reaches maturity, it declines, but it does not die. It is reorganized, new blood is brought in, and the

firm may return to the strength of its maturity. In the older industries new firms are rare. Growth is impossible or too slow, and capital can be better applied to the re-equipment of existing undertakings. In such industries, the risks of a new enterprise must be great, the influence of finance be on the side of the large firm, and on the side of stability rather than change.¹

These observations may, to a considerable extent, be applied to the meat-packing industry.

As a summary, it might be argued that from the financial point of view, the small firm is at a disadvantage with regard to obtaining capital. However, as long as a small firm can obtain all the necessary capital within a "friendly" market it can be considered to be at no disadvantage. Often a small firm has to go into a non-local or "unfriendly" market to obtain all it needs. It is less well-known and requires greater sales effort for its bonds and stocks and must pay a larger broker's commission. The line of credit which a large or interior firm can establish with one or more commercial banks is usually out of the range for the small firm. Although recent financial history is the most important consideration in obtaining a line of credit with a bank, size and stability are essential, also. Many large and interior firms have substantial holdings in banks and thus acquire capital more easily.

The number of experts in charge of the financing in large or interior firms is not increased in proportion to an increase in size of firm. Even the largest firms usually have only a few

¹E. A. G. Robinson, The Structure of Competitive Industry, (New York: Pittman Publishing Company, 1948), p. 62-63.

financial experts who are in charge of the finances of the firm.

It may be concluded probably that the interior and large firms have an advantage over the small firms, while the interior firms, due to their low funded debts, might be able to acquire capital as well as the large firms if both good and bad times are taken into consideration. The four national packers offer stability to the investor since earnings fluctuate much less widely than for the interior and small firms. This is very important from the standpoint of raising financial capital. However, the level of earnings has been much more favorable for the interior packers than for the national and small packers from 1922 to 1936. Stability probably is the determining factor in selecting the optimum financial firm with regard to borrowing.

TECHNOLOGICAL ASPECTS

Discussion of Large Packing Plants

In 1917 Swift and Company, in reply to a question directed to it by the Federal Trade Commission, attributed the development of large companies in the packing industry to

...fundamental economic advantages which accompany large-scale production. These advantages are as follows: (1) minute division of labor and specialization of the manufacturing department of the business; (2) utilization of by-products; (3) efficient marketing organization and methods; as a result of these three advantages there is a surprisingly low cost of production and distribution, and finally the production of the highest possible quality of meats and the standardization of grades.¹

¹Federal Trade Commission, Report of Meat Packing Industry, Part I, Exhibit IV, p. 418.

In answering the same question, Thomas E. Wilson stated the following "economic principles" involved in large centralized markets and large packing houses:

In the first place, in order to operate packing houses on a thorough economic basis, volume is absolutely necessary. Volume can not be handled unless a sufficient amount of raw material, consisting of the various grades and kinds of livestock, is available at one centralized point; therefore two principal things must be considered in locating a packing house. First, the ability of the surrounding country to produce all kinds of livestock in sufficient quantities to operate economically. Second, sufficient population nearby to consume a fair portion of the offal, and fresh and cured meats, as well as a supply of sufficient labor.

To make myself probably better understood on the question of the absolute necessity for large volume in the operation of packing houses, I would point out that the great progress in the packing industry has been brought about almost wholly by operations on a large scale, permitting the application of scientific methods of utilizing the many by-products, which not many years past were considered worthless, or nearly so.

The utilization of these by-products has been a large factor in increasing the value of the animal and proportionately decreasing the cost of the meat portion, which of the average steer is about 55 percent.

Operations of the packing industry on a large scale have made the business profitable on a small margin of profit per head, or on the turnover of the amount of business done by the average packer, approximately 3 percent of the gross sales. To do business on such a narrow margin would not be profitable on a small volume.

Regarding the question of distribution of products to the retailer, I believe that the present method is an economical one; products are made available for the retail trade in practically as good a shape as if delivery were taken direct from the packing house, and the losses on products which are ultimately destroyed through deterioration are practically none as compared with the total volume.¹

¹Ibid., p. 468-469.

These quotations bring out two important considerations in an examination of the optimum size of a firm in the industry:

(1) the economical utilization of by-products, and (2) an economical distribution system. The division of labor and the utilization of by-products will be considered in the following sections.

Utilization of By-products

A study of the technical aspects requires a careful distinction between the plant and the firm. Most of the technical economies in the packing industry can be realized by the individual plant and do not require any horizontal association of the number of plants under one management. The one exception is found in the benefits which become available through a research staff of chemists, engineers, and efficiency experts such as only the largest companies are able to maintain. Therefore, the technical optimum size plant will be considered first followed by a consideration of the research advantages of a multiple-plant organization.

It must first be recognized that the individual packing plant may be engaged in the slaughter of one or several classes of livestock. Some firms specialize in the slaughter of hogs, while others specialize in the slaughter of cattle, calves, and even some in sheep and lambs. The slaughter of these various animals differs somewhat in technical detail. A second important factor is that the several classes of animals vary in the importance of the by-products derived from them. Although the slaughter of

different classes of livestock in the same plant might have certain important advantages in the use of managerial and marketing "overhead," the technical side is such that the three classes of livestock (in plants of any significant size) are really three separate businesses or operations with different requirements and different techniques so that each requires separate treatment. Of course, if the plant is quite small, all killing may be done on the same floor and labor, as a regular operation, may be transferred from one type of slaughter to another. The technical optimum for hog operations will be considered in the following three chapters for the purpose of investigating which factors are chiefly responsible for efficient operations.

The yield of hogs depends in large measure on their quality and finish. For example, a 250 pound hog may be a well-finished butcher hog which will give a good yield, or it may be a long, rangy, raw-boned animal showing a considerably smaller yield.

The following average yields of different weights of hogs are the averages of a great number of hogs so that individuals of this weight may vary considerably from the figures shown. The yield is for chilled hogs, head off and leaf out, based on live weight.¹

<u>Live Weight, Lbs.</u>	<u>Percentage Yield</u>
300 - 400	74
200 - 300	72
150 - 200	69
100 - 150	65
75 - 100	60
50 - 75	59

¹A. W. Joedert and S. K. Maddux, Pork Packing, The Packers' Encyclopedia, National Provisioner (Chicago, 1932) p. 24.

Although the physical yield in by-products from hogs averages for the most part from 25 to 30 percent, the money return from by-products is only about 3.5 percent compared with the 96.5 percent return from pork and lard, the main products of the hog. However, due to the immense number of hogs slaughtered, the total returns on the by-products of hogs is considerable. Lard was included here as a by-product so that the remainder of hog by-products accounts for a very small share of the money return. However, the research laboratories of the large packing companies have contributed immensely in the last twenty years to finding new and better ways to utilize by-products. Since the beginning of the new rearmament program in July, 1950, the prices of valuable by-products have risen and have reached a level that exceeds, relatively, the price of pork. The utilization of by-products, mainly performed efficiently on a large scale by the large packers, is undoubtedly now a much more powerful force in the earning power of the large packers than it used to be. The detail to which any manufacturer may go in developing the manufacture of by-products depends upon his local conditions such as the volume available, the labor supply, and the market for by-products.

The high degree of utilization of by-products at the present time has been attributed to four influences which successively became chronologically effective: Firstly, the necessity of disposal of vast quantities of wastes; secondly, an effort to recover enough in the value of the crude products to defray the costs of handling; thirdly, the desire to make it a profit-producing enterprise; fourthly, the readjustment of the packing industry to meet the changed economic conditions. Large packers handle more and various animal

parts entering the process of rendering lard than the small packers because the separating of fats in the large plant is carried on to a greater extent.¹

Hog casings (intestine) are used principally for sausage containers and for the miscellaneous edible products coming from the offal floor, such as cheek meat, pig snouts, lips, ears, gibleet meat, jowl meat, hearts, weasands and tripe. Saving casings is not always practicable for small packers, this being handled by contract with some one of the casing companies who will furnish their own men for the work of cleaning and salting.

One of the most important adjuncts to a packing plant is the tank house where tankage, which is used for fertilizer and feeding purposes, is made and grease is rendered. It was estimated in 1922 that 60 to 70 percent of the tankage produced in the large packing plants was used for feeding purposes.²

In all except very small packing plants the evaporation of the tank water has been found to be a profitable source of income, provided exhaust steam and water are plentiful. Therefore, many tank houses are equipped with evaporators.³

Grease refining is practiced in only a few of the larger plants.⁴

The manufacture of glue is rather a new development in many packing plants. In 1922 only a few of the small packers had found ways and means of manufacturing glue in a practical way.⁵

¹Federal Trade Commission, p. 370-380.

²Packers' Encyclopedia, p. 139.

³Ibid., p. 127.

⁴Ibid., p. 139.

⁵Ibid., p. 141.

In the manufacture of inedible by-products, there are certain operations in which the parts of different classes of livestock can be reduced to a common by-product. This is at least one technical advantage of having several classes of livestock killed in a single plant.

In small packing plants where sufficient machinery has not been installed to thoroughly disintegrate and wash the raw products before putting them into the tanks, the method of parboiling is an especially important preliminary step to the rendering process. The purpose of parboiling is to wash away the manure and coloring matter, thereby reducing the acid and producing a product that bleaches better.¹

Whether it will pay a packer to manufacture glue depends very largely upon his local conditions and his market outlet figuring the yield of glue against the kill, and the difference in the value of glue and concentrated tankage, taking into consideration the increased cost due to equipment and labor required, are the determining factors.²

Hog hair is a by-product which, when handled properly, is a source of considerable revenue. The amount in dollars and cents which can be recovered per hog depends upon the condition of the hair market, the season of the year, and the number of hogs killed; and the process consists of curing, drying, and curling. The smaller packer, however, does not produce hair in large enough quantities to justify expensive methods, and usually bales his hair in a regular baling press after it has been washed and dried in a hair dryer. When the market for hog hair does not justify its treatment as described, it is usually mixed with tankage. If advantageous to sell hog hair for the price of tankage, the operator will of course only secure an additional small percentage of ammonia units; whereas, if he handles the hog hair separately, it is very

¹Ibid., p. 134.

²Ibid., p. 143.

probable that he can secure a higher price for it.¹

Generally, hog blood is not used for edible products since the blood from each hog must be kept identifiable until the post-mortem government inspection passes upon the animal. Catching blood slows up the killing gang. While some sausage manufacturers prefer hog blood for use in products containing sausage, beef blood is used in practically all government inspected houses, as it can be saved at a minimum cost.² Otherwise, hog blood goes into inedible uses.

Hogs, finally, are the source of a number of medicinal products, especially the parathyroid and thyroid glands, the stomach (for pepsin), the spleen, the pancreas, the ovaries, the liver, the duodenum, and the leaf fat (medicated ointment). The manufacture of pharmaceutical products of animal origin is a highly technical process. Speed is absolutely essential in order to guard against deterioration or decomposition which would destroy the active principle in many glands. Therefore, the glands are thoroughly chilled, trimmed of fat, minced and desiccated. They are carefully tested and standardized for medical use. The glands of a very large number of animals are necessary in order to obtain so much as a pound of any gland product. For example, one ton of testes from hogs is required to produce one gram of testosterone.³

Demand for glands of various kinds is uncertain, but if the plant is located where glands can be delivered to chemical manufacturers in first class condition, they can be saved, chilled, and held for future demand. Very

¹Ibid., p. 145-146.

²Ibid., p. 27.

³Lecture notes taken from Dr. E. H. Herrick, Kansas State College.

often saving of glands can be combined with other jobs and saving accomplished at little added cost.¹

Production of by-products, including glands of various kinds for which a market can be found, are checked regularly to make certain full production is maintained. Disposition of these products requires constant attention and effort from the sales force, but inasmuch as the tank value is very low in most cases, any margin realized over the extra handling and costs of packing is profit.

This does not apply to fancy meats such as hearts, head meat, cheek meat, and tongues; these items are disposed of through the sausage room where possible.

While the direct expansion system works to advantage in plants where no great amount of refrigeration is required, and the distances are not great, that is in smaller plants, the brine system is used almost exclusively for the refrigeration of hog coolers, cellars, etc. in larger plants.²

The preceding quotations have been chosen with an eye to the technical advantages in the utilization of hog by-products which larger plants may have over smaller plants. The advantages of the larger plants in this regard may well be summarized at this point:

1. The larger packer can make a more complete separation of fats in the trimming process (especially of the offal) than can the smaller packer and thereby obtain a higher yield of lard and grease.
2. The larger packer can better afford to prepare high-quality hog casings.
3. The very small packer may not find it economical to evaporate the tank water as can larger plants.

¹Pork Packing, p. 37.

²Ibid., p. 42.

4. The larger packer is better equipped to refine grease products.

5. The smaller packer has greater difficulty in finding the manufacture of glue practicable.

6. The small packer may not find it economical to provide the most efficient equipment in rendering high-quality tannage.

7. The smaller packer does not produce hog hair in large enough quantities to justify expensive methods of utilization and may more often be forced to mix it with tannage which gives a lower return.

8. The larger packer has enough volume to provide the proper laboratories and research staff for saving glands and obtaining an effective and standard product for medicinal purposes.

Since a great deal of space has been given to hog by-products, it should be remembered that these by-products make up a small part of the money return from hogs. With this by-products picture in mind, the technical processes involved in the killing and cutting operations of a packing plant will be considered.

It is often said that a peculiarity of the meat industry is the scale upon which slaughtering and meat selling may be done. Despite the large capital investment in most packing enterprises which is necessary if the by-products are to be fully utilized, the enterprises may be so small as to be owned and operated by only one man. Obviously, there is no similar possibility in the automobile or iron and steel industries. Meat manufacture is the only leading industry in America that has a commonplace

feature for the most primitive, smallest-scale manual methods in active operation along with the newest, largest, most capitalistic, mechanistic procedure.¹

This statement raises the possibility that perhaps there might be several different optimum sizes of firms in the packing industry, depending on location, the type of management, and the extent of the market.² However, even the largest plants in the packing industry depend to an unusually great degree upon the labor force so that the division of labor may be a more important economy of large scale than the possibility of substituting machines for men. Since, in the short-period, men are much more divisible than expensive machines, the wide range in sizes of firms in the meat industry is quite understandable.

The slaughtering of hogs is interesting as the first manufacturing process to be carried out on the principle of moving the material past the operative at controllable speed. This results in a degree of control and efficiency in operating large groups of men never before attained in industry, a principle of which other industries have since made good use.³

It has been said that Henry Ford conceived the idea of the automobile assembly line while watching a meat packer's "disassembly" line. While division of labor has been carried equally far in the automobile industry, the mechanical tools and equipment which the automobile worker uses are far more capitalistic than the relatively simple tools of the packing house worker even in a large plant.

¹Malcolm Keir, Editor, Manufacturing, A Volume of Industries of America (New York: Ronald Press, 1928), p. 287.

²E. A. G. Robinson, The Structure of Competitive Industry (New York: Pittman Publishing Corporation, 1948), p. 122-124.

³Oscar G. Mayer, "Pork Operations," In the Packing Industry (University of Chicago Press, 1924), p. 182-183.

This is clearly brought out by the following statement by the general superintendent of a leading company:

The hog-scraping machine is the key machine in the pork department; and as there is little special machinery in the beef department, it might be said that it is the most important machine in any of the major departments of the entire plant, exclusive, of course, of the motive power and refrigeration. With the exception of the specialty and by-products departments, there is a surprising scarcity of automatic equipment in the packing plant. The very nature of the raw material, as well as its construction and size, makes treatment with automatic or special machinery difficult.¹

Economies in Killing, Dressing, and Cutting Operations

Killing and Dressing. The most important operation in the hog killing process is the scraping machine which removes the hair. One leading packing house equipment company advertises hog dehairing machines which are "adapted to small, medium, and large killing requirements and most efficiently handle small, medium, and large hogs." Another company claims that its dehairing machine has been adopted in more than 700 plants, which represent about 50 percent of all hog slaughtering establishments in this industry. This dehairer is made in various sizes suitable for plant capacities ranging from 30 to 1,000 hogs per hour. These machines are available in capacities to suit almost any particular requirements. The cleaning efficiency of the smaller capacity machines is practically equal to that of the larger machines. The cost of cleaning eight million hogs in fifteen plants for a

¹ Arthur Cushman, op. cit.

period of three years averaged approximately one-half cent per hog. The low maintenance cost is accounted for by reason of the simplicity and durability in design and construction.¹ Assuming that these claims are fully correct and complete, this key machine is relatively high in divisibility and can be adapted to a widely varying volume of slaughter with little or no loss of efficiency.

A hog dehairer has not yet been invented that does a perfect enough job so that a final clean-up of scattered hairs which the machine misses is not required. This process requires either shaving or singeing followed by final removal of all loose hair and scurf.

Shaving is minimized where a singeing chamber is provided through which all hogs are run. This saves labor of shaving and is regarded as economical wherever the cost of gas is less than the labor cost involved. In some plants shaving is further reduced by painting the hogs with rosin and oil and then putting them through a polisher.²

Hogs that are used for Wiltshire sides are singed on the killing floor after they have gone through the scraper. In plants producing a large number of Wiltshires, a hog singeing machine is used. It is continuous in operation and uses either crude oil or gas. Some packers, however, prefer hand torches, believing that better results are obtained and costs are lower. In smaller plants singeing is done with either a gas or kerosene torch³

This example shows a borderline case of man vs. machine, the use of the singeing machine being dependent upon the relative costs of fuel and labor and the intensity of the use to which even this relatively simple machine will be put (for example, for

¹From miscellaneous advertisements.

²A. W. Goedert and S. K. Maddux, Op. Cit., p. 15-16.

³Ibid., p. 340-342.

Wiltshire sides, since they specifically require singeing.

This brief discussion shows the importance of studying the relation of division of labor to volume of output.

Where departments are not arranged to handle products in the most efficient manner, the labor requirement will be relatively greater. Undoubtedly an increased number of animals per hour will decrease the labor required per animal up to a certain limit. This may be due to the fact that at slow speeds it is necessary to have one man who is not busy do certain jobs, but due to position is unable to handle other work.

There may be certain speeds that are more efficient than others, and this depends on the layout of the equipment and the ease with which certain jobs can be combined with others. The ease and convenience of handling, for example, viscera, leaf lard, etc., has a bearing on speed and efficiency. Mechanical equipment for washing and singeing heads and feet, etc., cuts down labor expense. The work done by the scraper if not well done will slow the gang and increase hand labor cost.

The maximum rate of speed on a single chain allowed by the Bureau of Animal Industry for Federal inspection is 600 hogs per hour. Some of the larger plants have been able to surmount this difficulty, however, by having a double chain at the points where inspection is carried on. The single chain divides for inspection with an appropriate increase in the number of inspectors, after which the two chains again become one. The upper limit of speed is set by that rate at which the cost of accidents and a

less efficient job is greater than the savings which increased speed makes possible.

The trimming of the heads takes place on the killing floor. The eyelashes are trimmed off, the tongues and ears are removed. Head fat is inspected for hair and sent to the lard tank. Ears are saved only when the value of lard warrants the cost of saving them. The trimming of the snouts depends upon the purpose for which they are intended and the market value of the snouts as compared to the lard tank value.

The upper or pate end of the snout has a greater tank value than the lower end. Therefore, short cut snouts are made where the tank value is sufficient to warrant, except where making export snouts which must be long cut. After the snout is removed, regardless of the trim, the surplus fat on the inner surface of the pate end should be removed as this has a high enough tank value at all times, as compared with the snout, to make it profitable. Temple and cheek meat are then removed.

Ear drums are unsuitable for edible products and are sent to the grease tank. Care should be taken to remove all the fat surrounding the drums as this is suitable for the lard tank and the value is higher than the grease tank.

After the brains are removed (and the pituitary gland if desired), skulls are carefully retrimmed to remove all lean meat, as lean meat has no tank value. After the teeth are removed, the skull is sent to the lard tank.¹

The great detail given here concerning the head operations is for the purpose of illustrating the constant importance of comparing returns from alternative uses for the most minute parts of an animal where volume makes it worthwhile.

¹Pork Packing, p. 34-37.

From the killing floor the hog carcasses move into the coolers. The proper chilling of the hog is a matter of cardinal importance. The spray system of refrigeration is best for accomplishing the task of removing, as quickly as possible, not only the animal heat but about 3 percent of the moisture from the carcass. The drying of the meat is just as important as refrigerating it, since excess moisture will give pork a flabbiness which greatly hastens deterioration. The standard time for chilling is between 36 and 42 hours; that is, the hogs are cut up on the second day after dressing.

After being properly chilled, the carcass moves into the cutting room. This has been called the "critical operation in the hog business" and the department where most precision is necessary. The reason for this is that there are twenty or thirty different ways in which a hog may be cut up and it depends upon the marketing division of the business to determine which mode of cutting will yield the largest return on the animal. This is a very subtle problem, because decision, one way or another, on account of the great volume involved, means thousands of dollars of loss or gain to the packer. With most packers, detailed cutting instructions are issued weekly by their provision departments. Constant and close supervision is required to see that the instructions are carried out and the cuts are properly made with as little waste as possible. There is always, at any one time, one best way to cut up a hog which can be determined only through practiced study of the markets and eternal vigilance on the cutting floor. The

large packers may be able to obtain greater economies in these hog operations than the small packers, when all the possible labor saving devices are applied on a large volume.

Cutting Operations. In the cutting operation, carcasses are fed from a moving table onto a chain and speeded up to get the maximum speed without neglecting the quality of workmanship. The ham is first removed, and then the shoulder is separated from the middle of the hog and the latter two are sent down separate gravity chutes to rooms below where they are further processed. The shoulder is cut up according to instructions from the provision department. The hog middle then gives up its loin, leaving the fat back and belly. Then the spare ribs are removed, and the boneless belly is rolled flat to permit proper cutting up into bellies and fat backs.

All parts of the hog destined for sale as fresh meat are immediately packed and are ready for distribution to the nearby or distant retailer for final sale to the consumer. The remaining primal parts, such as the hams, bellies, fat backs, and shoulder ("picnic") hams, aggregating fully 35 percent of the live weight of the hog, are generally dropped by means of gravity chutes to the grading rooms of the curing department where they are inspected and sorted according to grade and weight.

The small pieces of muscle and fat trimmed off in making the various cuts are carefully retrimmed, the meat being separated as far as possible from the fat. The meat trimmings are used in the manufacture of sausage, and the fat goes to the lard tank.

Primarily the work of the trimming floor is the handling of the trimmings from the cutting floor, doing this in the most advantageous basis figuring the market value of all the products. First, in nearly all cases, it is profitable to save all extra trimmings that can be made without a great deal of knife work since lean meat has no value in the tank for lard and the tankage value is so slight that all cuts and trimmings going to the tank should be carefully inspected to make certain they contain no lean meat.¹

One equipment manufacturer claims that

...efficiency in the cutting room undoubtedly has been increased more than the efficiency of any other department in the packing plant by modern equipment installation and properly-planned layout.²

Yet, here again one observes the lack of machinery and the primary importance of labor. The equipment and tools which are used are of relatively simple design. Unusually shaped knives and cleavers, automatic delivery of the carcass onto the moving table, the belly-rolling machine, and sometimes a portable electric saw just about complete the list. The simplicity of the equipment is indicated by the fact that the "landing" table, cutting table, and belly-roller are all driven from a single 7½ H. P., 4-speed, transmission-type motor for a cutting capacity of 300-350 hogs an hour.³

The importance of layout and combination of operations at different speeds is also of importance here. In pork cutting the movement of products from one butcher to another, the disposition of trimmings, and the movement of finished cuts all have an influence on the amount of labor required. For example, if

¹Ibid., p. 70-71.

²Not willing to be identified.

³Pork Packing, p. 70-71.

all cuts can be pushed down a chute in front of the trimmer instead of the butcher being forced to turn and place cuts on a truck behind him, efficiency is increased.

The gang being properly balanced insures an even speed at all points. If a butcher is getting ahead of the next job due to insufficient speed of the next operator, it is necessary for the butcher to pile up finished cuts. This piling not only delays the butcher but there is also a tendency for all preceding operations to let down or decrease in speed.

Improper work on the killing floor also delays cutting. For example, the removal of scrap lard from flanks of bellies, around the bones of hams and trimming diaphragms and blood clots from loins and shoulder cuts should be done on the killing floor. When they are not done there, this work slows up pork-cutting operations. The handling of trimmings, the ease with which fats and trimmings can be kept away from the trimmers, and the convenience of delivery to tank and cellar or sausage room all have an influence on labor requirements. Arrangement of the packing unit on fresh cuts and the delivery from the cutting floor must also be considered.¹

The number of foremen usually is kept constant so that this "overhead" labor item becomes progressively smaller with increased output.

In combining rates of output in the killing and cutting departments, nothing definite can be said about what rate of killing should be combined with what rate of cutting. They do not necessarily need to be the same since the carcasses are held in the coolers for a couple of days or so between killing and cutting

¹Ibid., p. 340-341.

operations. The chief factor relating the two rates is that the coolers must be emptied rapidly enough to make room for incoming carcasses from the killing floors at times when cooler space is used to capacity.

Since cutting operators as a whole are paid higher wages than killing operators, there is a greater incentive for a higher rate of speed in the cutting department than in the killing department because inefficiency costs more. The general level of wages in the vicinity of the plant also will be an important factor in determining the amount of inefficiency which can be overlooked. The incentive to speed up operations may be greater, for instance, in Chicago than in Des Moines or Waterloo.

The most important problem in reaching an optimum combination is the tremendous variation in day-to-day receipts. In Chicago, for example, 25-35 percent of weekly hog receipts arrive on Monday while 30-35 percent of interior packers' receipts arrive on Saturday.¹ As a result, it is very common in the packing industry for the same gang to kill half a day and then cut half a day in order that the workers receive the minimum number of hours of work necessary to give a sufficient income to retain them for the packing industry. A minimum of 40 hours a week is frequently guaranteed the workers.

When volume is not sufficient or regular enough to keep separate killing and cutting gangs busy this necessary number of hours, the most complete division of labor is not possible because

¹Bureau of Agricultural Economics, Misc. Pub. 222, Direct Marketing of Hogs, p. 179-180.

the men of more and less skill cannot be confined solely to the cutting or killing floors where their respective capacities are best adapted. Yet, the use of the same men for both operations is found not only in such interior plants as Iowa Packing Company, at Des Moines, but also in the Armour plant at Chicago. There is apparently some room for flexibility within the gang of cutters, however, so far as parts of the trimming operations are concerned. Certain trimming of fat from lean is a somewhat less skilled operation, and men can be used for this type of operation except on days or during periods when the pressure of volume forces their transfer to a more skilled operation which they can perform but for which they are less suited. Of course, a lower quality of work will be brought about with an increased speed, forcing the use of less qualified workers in the cutting department and to some extent in the trimming department where the old trimmers must be replaced and supplemented. This is a very important limiting factor to increasing volume and the increased speed which the volume makes necessary.

Up to a certain point, at least, wages are an overhead cost in the sense that a certain minimum income is necessary to maintain a labor force. This depends on the alternative opportunities of employment in other industries nearby. It may sometimes be necessary to use the same men for both killing and cutting operations if the volume does not justify the maintenance of two separate forces.

There are certain efficiencies possible for the same plant, layout, and equipment, but there may be new efficiencies introduced

by setting up a different plant, layout, and equipment. There may be two technical optima, however, as far as hog killing and hog cutting are concerned, and a different layout may be required to get the optimum combination of these two operations.

To summarize the foregoing discussion, it might be argued that with regard to the utilization of by-products, the larger the volume, the more efficient the utilization can be. One should keep in mind that although the money return from by-products is low in comparison with the money return from the main product, it has been constantly increasing and will probably increase further in the future. With respect to the division of labor, it can be stated that the nature of the production process makes the application of large-scale machinery very difficult. The large firms can undoubtedly obtain some economies in the specialization of labor which the small firms cannot obtain. The medium-sized firms are probably equally, if not farther, advanced in this specialization than the large firms. Those large firms that have depended upon monopolistic practices, either in purchasing livestock, marketing food products, or otherwise, probably have not devoted as much attention to their production efficiency as they might have and probably have retained obsolete equipment and methods. It is, therefore, not impossible that medium-sized firms, which have had to meet a keen competition from the very start, have done more to obtain production economies than the large firms. It is not unlikely that some of the over-extended large firms have higher overhead labor costs than the medium-sized firms in order to

The small firms may have a non-unionized labor force, and a better labor-management relationship may make it easier to lay off and hire workers as the output changes. This advantage for a small firm obtaining labor in a local market may reduce the "overhead" labor costs considerably.

EVALUATION OF THE PROBLEM AND SUMMARY

The Large National Firm

Marketing. The comparatively small value added by manufacture showed the importance of buying and selling in the meat-packing industry. Apart from monopolistic elements, the purchase of livestock in larger lots or quantities does not lead to price discounts as in many other industries. It is simply that larger total purchases consist of more purchases of the same size lots.

The higher degree of specialization in the purchasing department, with more specific and detailed information at the disposal of the large firms, gives them quite an advantage over both the medium and small sized firms. Also with respect to the purchase of supplies other than livestock, like power and water, definite economies are affected up to a certain point. However, since these supplies amount to perhaps only 3 to 6 percent of the wholesale dollar spent, these discounts should not be overestimated.

The decentralization movement in this industry and public interference with monopolistic practices have undoubtedly increased competition and have thereby given a greater opportunity for

rival firms to enter and others to expand.

The marketing of meat products and other food products has undergone considerable changes in the last twenty-five years. The increased trade area of the branch houses, due to the use of motor trucks, and the increased competition from chain stores, has called for some drastic adjustments in the organizational setup of the large firms.

Chain stores have been buying carcasses in carload lots from the main plants and have been processing the carcasses themselves, thereby taking away probably the most profitable operations of the entire business of the packers. It is not unlikely that the large firms depended for too long a period upon large profits from this particular operation and were not prepared for this competitive move from rivals. This attitude probably is one of the disadvantages of the hugeness of a firm.

The number of branch houses dropped and the shift in marketing of livestock from terminal public markets to direct marketing, caused excess capacity in the branch houses and at the central plants of the large firms. The large firms, for protection of their large investments in the centrally located plant, were forced to go into the country for livestock. A request for handling a greater variety of food products to be handled by the large firms, as required by the Packers Consent Decree, was declined.

A further increase in the development of competition from the chain stores will render a higher per unit cost in the operation

of large marketing units of the large firm. Assuming then, that if the large firms operate and maintain, for the time being at least, larger marketing units than the present volume requires, their competitive position has decreased in comparison with the medium sized firms which operate at or close to minimum average costs.

The advantage that a large firm has with respect to a greater possibility in marketing lower valued products, in comparison with the small firm, is a distinct advantage of a nationally organized marketing system.

The use of trade marks along with an effective advertising program is still an advantage that the smaller firms cannot possibly meet.

Management. The economies of division of labor are also obtained in the management of large firms. Specially trained men hold key positions through the whole firm, such as in transportation, advertising, labor relations, accounting, and maintenance of machinery, etc. No expensive talents are wasted on routine jobs. A fraction of a penny per pound of beef bought by an expert buyer may give, figured over a large volume, considerable savings.

Although it might seem that a large firm, backed up by large research facilities that experiment and do research in all the phases of the operations, may obtain ever increasing economies as the output increases with regard to management, this is not necessarily true. In fact, there is a limit beyond which the degree of division of labor becomes unprofitable and unworkable

due to the difficulties of co-ordinating and scheduling the many specialized jobs and this limit is probably the most difficult to cope with in a large firm. Large firms that have adopted the functional type of organization, that are able to obtain a higher degree of team work and sound judgment, are solving indirectly the problem of co-ordination. A large firm probably is inherently slow in its adaptation to changing economic conditions.

Another difficult problem is the breakdown of the production process, as is done frequently in other industries. The economical unit of the production process, including killing, refrigerating and cutting, is large and even if many operations like the utilization of by-products can be carried on in subsidiary plants, the main operations of this perishable product have to be done in one and the same plant. The automobile industry probably avoids the managerial limits set by co-ordination and scheduling, by breaking the production process down to twenty or more units and assembling the parts in an assembly plant. The meat packing industry is faced with a disassembly process of a highly perishable product. The smallest unit always has to include killing, dressing, and refrigerating.

The large firms probably have, in times past at least, eliminated to a certain degree the disadvantage of large size, as far as flexibility is concerned, by the practice of market sharing and other devices, which brought more stability into their ranks. Reasons why large firms do not make more profits in the long run are perhaps related to maturation. A large firm, unlike a small

firm, tends to emphasize stability of profits and carries its own insurance. Profits are lessened by the costs of new experimental processes and products, but the entity of the large firm is more likely to continue from year to year. The certainty of profits compensates for a lower average rate of profits.

Financing. The line of credit which a large firm can establish with one or more commercial banks is usually out of the range for the small firm. Although recent financial history is the most important consideration in obtaining a line of credit with a bank, size and stability are important too, and these factors greatly favor the large firm. Many large firms have substantial holdings in banks and thus acquire capital more easily.

The number of experts in charge of the financing in a large firm is not increased in proportion to an increase in size of the firm. Even the largest firms usually have only a few financial experts.

Technology. The firm undoubtedly receives a better and more efficient utilization of by-products, if it is large. Generally speaking, little capital equipment is used in this industry except refrigeration and buildings. Also, the two operations of killing and cutting require very little equipment. However, it is likely that large firms can obtain more economies by job specialization than smaller firms if volume is kept relatively constant. An example is the number of foremen, which usually does not increase proportionally to the number of men. It was pointed out that there is no optimum combination of the rates of killing and of cutting, since carcasses are held in the coolers for a few days

between these two operations. The only factor relating these two rates is that the coolers must be emptied rapidly enough to make room for new carcasses. This factor is thus the space in the coolers.

Due to tremendous variations in the supply of livestock and due to varying demands for meat products, the production operations are subject to many fluctuations which require high flexibility of plant or cause labor inefficiencies. Large firms perhaps have depended for too long a period upon monopolistic practices, either in the purchase of livestock or in the marketing of food products, so that perhaps they have not devoted as much attention to plant efficiency as they should have. Medium sized firms entered the industry with more efficient plants than the old plants owned by the large firms.

The Medium Sized Interior Firm

Marketing. The medium sized firms have been characterized as being production minded. The very nature of the keen competition they had to meet and the lack of their own marketing agencies probably accounted for the fact that they have first sought plant efficiency. The medium sized firms that are located in the corn belt region obtain their supplies largely from nearby markets and sell much of their output through independent agencies in big cities, especially in the East. During the last war when some of the large firms were engaged to a large extent in export trade and government business, several of the interior firms established

themselves in markets where they hereto had not been able to. Government interference with monopolistic practices and the decentralization movement in the marketing of livestock has undoubtedly increased the rate of growth of the interior firms. The medium sized firms probably cannot match the large marketing systems of the large firms. However, the chain stores, by by-passing the branch houses of the large firms may work to the advantage of the medium sized firms. With regard to the purchase of livestock supplies, the medium sized firms probably are in at least an equally favorable position with the large firms. The medium sized firms have probably larger per unit buying and selling costs than a smaller firm that buys livestock in its immediate surroundings and sells meat products in the local market.

Management. It is very likely that the medium sized plants, although not having met the difficulties of co-ordination and scheduling to the same degree as the large firms, can maintain a greater plant flexibility than the large firms. It, of course, depends upon whether the type of organization adopted has kept pace with the growing firm. There is here probably a somewhat lesser degree of labor specialization and a substantially smaller amount of research facilities. The medium sized firm probably has less flexibility but more stability than the small firm.

Financing. There is not very likely to be much difference between the medium sized and large firms with regard to cost of borrowing. However, the medium sized firms probably have considerably less holdings in commercial banks than the large firms

and this gives them a slight disadvantage with respect to borrowing. The small firm may be able to obtain capital at the same rates if it does not have to go beyond the local, friendly market.

Technology. The medium sized firms probably have devoted the most attention to the production process, operating as they probably do, close to the minimum point on the average cost curve. In this phase of their operations they are probably the most efficient. However, the utilization of by-products which depends so much on volume, is developed to a lesser degree than for the large firms. There seems to be keen competition between subsidiary plants of the medium sized firms and subsidiary plants of the large firms, although the large firms have control over a larger number of plants and also over more markets. The medium sized firm obtains many more economies in plant operations and the utilization of by-products than the small firm.

The Small, Local Firm

Marketing. The purchase of livestock supplies for the small firm in the immediate territory of the plant may offer some economies. Personal contact with local farmers, lower transportation costs, and less shrinkage probably enable small, local firms to offer bids comparable to those of buyers representing larger, more distant firms.

With regard to the marketing of meat products, if the small firm is located in a city where it can dispose of its entire output,

a tremendous saving can be made on marketing costs compared to plants located at some distance. Unless there is a nearby branch house or truck route from a large firm, such a small firm could maintain its position probably rather well assuming other conditions to be constant. However, the sale of lower valued products is, in a limited market, very difficult for the small plant. It is remarkable to see that large firms can come to smaller cities from some distance with a branch house or truck route and give a small firm such keen competition. Whether there are unethical practices applied or not it shows that the continuity of business for small firms is not very strong. A small firm usually sells little known brands and trade marks and advertising is commonly negligible. This is a decided disadvantage for the small firm.

The meat-packing industry shows an extensive number of small firms that are able to meet the competition of the larger ones. It is to be kept in mind, however, that in the course of a business cycle the entry and exit of firms is high and it is often overlooked that many small firms go out of business. This often is not taken into account when the continuity of firms is discussed.

Management. Many small firms have benefited greatly by the energetic management of their owners or operators. The reason why small firms are able to meet competition successfully in many cases is the great flexibility with which they operate. There is a low degree of labor specialization and the line or military type of organization works effectively here, which

accounts for the flexibility. Local and non-unionized labor may give quite an advantage, and a closer relationship between management and labor may also be a factor in explaining why a small firm can take care of fluctuating production more effectively.

Financing. As long as a small firm can obtain capital in its immediate territory, what was called a friendly market, there are probably no distinct differences between a small and larger firms. However, when it must go into an unfriendly market it finds itself confronted with some definite disadvantages. First, it requires greater sales efforts to sell its bonds and stock because it is less well-known and it must pay a higher broker's commission. Second, the mere small size is a definite disadvantage in obtaining capital, due to shorter continuity of life and instability of earnings.

Technology. Although little capital equipment is used in the meat-packing industry, comparatively, there are some vitally important machines that, if they were available in a miniature size, would give some economies like, for example, a hog dehairer, scraping machine, etc. The utilization of by-products by the small firms suffers from a similar lack of efficient small type machinery. The co-ordination of several small firms in utilizing their by-products in a joint stock organization or in a co-operatively organized setup might increase the revenues from the by-products. Also, the manufacture of some few standardized products along with a single program for advertising these few products on the merits of their uniform quality might improve the competitive position of a number of small firms.

Several small firms that do not have enough volume to justify processing their own by-products are probably gravely underpaid by desiccating companies that come and get these products by truck. These desiccating companies often have little competition. Small packers are in a weak bargaining position.

Small firms that have to go beyond the state lines to market their products usually find it extremely difficult to meet the requirements for Federal meat inspection laws. However, often when small firms do alter the plant facilities for modernization, they keep in mind the sanitary regulations set forth by law, in case they want to go into interstate commerce in the future.

In the production process the small firm does not have much higher costs per unit of production. It is the utilization of by-products that stands out here as a disadvantage to the small firm.

The outstanding advantages and disadvantages that were found of the three different sizes of firms might be summarized as follows:

1. The large firm:
 - a. Has economies in the purchase of supplies other than livestock.
 - b. Has a national marketing system which offers economies if operated at minimum average costs. However, a slow adjustment to changed economic conditions such as chain stores buying whole-sale carcasses at the plants rather than through branch houses, reduces these economies considerably.

c. Uses monopolistic practices and techniques such as trade marks and brands to advantage.

d. Can afford a large outlay on an effective advertising program.

e. Employs experienced research workers to give many economies in all phases of the firm in the long run.

f. Has low borrowing costs, due to stability, size, and holdings in many commercial banks.

g. Makes efficient use of by-products.

2. The interior, medium-sized firm:

a. Has fewer economies in the purchase of supplies other than livestock than the large firm and more than the small firm.

b. Probably has, at least temporarily, lower per unit marketing costs than the large firm, and higher than the small firm.

c. Has a more easily managed business with respect to co-ordination and scheduling than the large firm and less than the small firm.

d. Has a lesser degree of experience and scope in research and experimentation in all phases of the business than the large firm, and more than the small firm.

e. Has perhaps a slightly less advantageous position with regard to borrowing costs than the large firm, and perhaps equal to or a slightly better position than the small firm.

f. Has higher plant efficiency but smaller volume and therefore less efficient utilization of by-products than the large firm. Has higher plant efficiency than the small firm and larger volume and therefore more efficient utilization of by-products.

3. The small, local firm:

a. Has probably the lowest per unit purchasing and marketing costs if supplies are bought nearby and products are sold in the local market, but the least advantage in the purchase of supplies other than livestock.

b. Has greatest difficulties in selling lower-valued products.

c. Has low advertising costs.

d. Has practically no research facilities.

e. Has fewer management problems and greater flexibility than larger firms; however, it has less continuity of business than the medium and large sized firms. It probably has better management-labor relations and lower labor turnover than the medium and large sized firms.

f. Has equal position with regard to borrowing costs as long as the local market can supply all that is required.

g. Has the lowest efficiency from the standpoint of the utilization of by-products.

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AN ECONOMIC ANALYSIS OF THE
MEAT-PACKING INDUSTRY

by

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AN ECONOMIC ANALYSIS OF THE MEAT-PACKING INDUSTRY

The objective of this study was to state the economies and diseconomies of three different sized firms; namely the small, local firm, the medium sized, interior firm, and the large, national firm, with respect to marketing, management, financing and technology.

The general procedure followed was to study background information from the literature in order to find out the advantages and disadvantages that accrue from different scales of operation, with regard to the four main functions mentioned above in a rather independent manner.

Buying and Selling

The comparatively small amount of value added to the product by manufacture showed the importance of buying and selling in this particular industry. The purchase of livestock, apart from monopolistic elements, in larger quantities does not lead to price discounts as is the case in many other industries. Simply, larger total purchases consisted of more purchases of the same size lots. A higher degree of specialization in the purchase department and more specific and detailed information at the disposal of the large firm, offered them possibly quite an advantage over the medium and small sized firms. The purchase of supplies other than livestock, like water and power, amounting to about 4 to 6 percent of the wholesale dollar spent on supplies, also is to the advantage

of the large firms.

The marketing of food products carried out by the large firms on a nation-wide basis underwent, in the past twenty-five years, considerable changes. The decentralization movement of the industry to the corn belt region forced the large firms into the purchasing of livestock in the country. The large firms had huge investments in their centrally located plants and they went into the buying of livestock in the country to protect their large investments. This movement tended to cause the appearance of excess capacity at the large plants and extra expenses were required to do country buying.

Public interference with monopolistic practices forced the large firms to give up many of the privileges they had enjoyed. The large firms had to give up many food products they handled that were unrelated to meat products, for example, canned foods. This curtailment and the increased action of chain stores buying whole carcasses from the central plants decreased the volume of operations of the branch houses. The chain stores doing the processing, like the smoking of hams, manufacture and curing of sausage, themselves took away some of the most profitable operations from the large firms. The use of trucks increased the radius of the branch houses considerably, which caused a substantial reduction in the number of branch houses. It is not unlikely that the large firms probably depended for too long a period upon large profits on this processing and they were not prepared for other businesses to come into competition with them. This attitude of not expecting

to be challenged is probably an example of one of the disadvantages of the hugeness of a firm.

The large packers complained in court that their branch houses had been subject to higher overhead costs, and that a large part of their profits had been denied to them due to the actions of the chain stores. They requested to be allowed to handle a greater variety of food products for which their nation-wide marketing systems were undoubtedly ideally suited. However, it was denied to them. It might be stated then, assuming it to be true that the decentralization movement caused higher per unit marketing costs and that the decreased volume of the branch houses caused higher overhead costs, that the large firms have lost considerable advantages they used to have. Along with the large export trade in which the large firms were engaged during the war, the medium sized firms moved into a greater expansion movement and got into markets where they hereto were not able to.

Many of the medium sized firms that had only a few selling agencies which they owned and operated, started recently to develop their own marketing systems to a greater degree, which showed that they had gained a more favorable position.

With respect to advertising, the large firms have a decided advantage, along with their use of well-known trade marks and brands, over the medium sized and small firms.

Also in disposing of lower valued products, the large firms with their nation-wide marketing system, had an advantage that no smaller firm could equally match. Medium sized firms had probably

higher per unit selling costs, while small firms had probably lower per unit selling costs.

The economies of division of labor were not limited to technological methods of production by an increased output, but were also present in the management of large firms. In small firms many responsibilities and functions are carried out by a few men. Large firms have specially trained men for nearly all key positions, like being in charge of transportation, advertising, labor relations, accounting, maintenance of machinery, etc. No expensive talents are wasted on routine jobs. A fraction of a penny per pound of beef saved by an expert beef buyer might give, figured over a large volume, considerable savings.

The small firm that buys livestock in the country or nearby the plant may have the lowest per unit purchasing costs. If the small firm sells its products in the local market where the plant is located it may have also the lowest per unit marketing costs. Probably little or no use is to be found, then, in advertising outlays. These few factors are probably important reasons why so many small firms do exist in this industry.

Management

Although it might seem that a large firm backed by large research facilities may obtain ever increasing economies as the output increases, it was found that there was a limit beyond which the degree of the division of labor became unprofitable and unworkable due to the managerial difficulties arising from co-ordinating and

scheduling the divided up jobs. Large firms, that adapted the functional type of organization and gave vocational training, could obtain a higher degree of teamwork and better sound judgment. However, the problem was only solved indirectly in this way, since in large firms, even if the co-ordination "know-how" was obtained, the adaptation of a large firm to changing economic conditions was probably inherently slow. Another difficulty was shown by breaking down the production process into several separated operations as is frequently done in other industries. The necessary unit of production always had to include killing, dressing, and refrigerating.

The very nature of the production process being a disassembly operation of a highly perishable product, it cannot be broken down any further. Many industries avoid the managerial limits set in their industries by breaking down the production operations into sometimes more than twenty operations and assemble all the parts from these subsidiary plants in an assembly plant. A large number of carcasses are shipped from the central plants to branch houses or are sold directly; however, these large plants being located nearby or in big cities, also usually do considerable cutting and processing. A future adjustment to the changed economic conditions, with regard to the decentralization movement and to changing technological conditions and with regard to refrigeration and transportation, will be forthcoming.

Reasons, then, why large firms do not make more profits in the long run are perhaps related to maturation. A large firm, unlike a small firm, tends to emphasize stability of profits and

carries its own insurance. Profits are lessened by the costs of new experimental methods of processing and products, but the large firm's entity is more likely to continue from year to year. The certainty of profits may compensate for a lower average rate of profits.

It has been said that the medium sized firms are production minded, and it is probably their organization that has a reasonable degree of labor specialization. It does not have the unusual difficulties in co-ordination and scheduling and probably has a reasonably high degree of flexibility. Small firms are present in large numbers in the meat-packing industry. This is probably due to the great flexibility with which a small firm operates. The line type or the line and staff type of organization works best here. However, the great vulnerability of the small firm to business cycles has put many small firms out of business during depressions and this is often overlooked. The great flexibility with which a small firm can make decisions gives it advantages in prosperous times; however, the continuity of the small firm is relatively short. Small firms may have a better relationship between management and labor. Labor may be non-unionized, which may make the layoff and hiring of labor much easier. Small firms that obtain labor in a local market probably also have lower labor turnover.

Financing

Large and medium sized firms can establish a line of credit with one or more commercial banks, which is usually out of the

range of the small firms. Small firms that have to go into an unfriendly market in order to obtain capital have to pay a larger broker's commission. If a small firm can obtain all the required capital in the local or friendly market it might not be at any disadvantage at all.

Although recent financial history is the most important consideration in obtaining a line of credit with a bank, size and stability are essential also and these factors favor the large firms. The number of employees in charge of the financing in a firm does not increase proportionally with an increase in the size of the firm. In fact, a large firm usually has only a few financial experts.

The large and medium sized firms have probably, in general, an advantage over the small firms in obtaining capital, while the medium sized firms, due to their low funded debts, might be able to acquire capital nearly as well as the large firms, taking both good and bad times into account. The four national firms offer stability to the investor, since earnings fluctuate less widely than for the medium sized and small firms.

The large firms have substantial holdings in commercial banks which might give them an extra advantage in obtaining funds.

Technology

The large firms probably have depended for too long a period upon monopolistic practices in securing livestock by market sharing and other devices on the one hand, and on monopolistic practices,

with regard to the marketing of meat products by means of cars and trucks and trade marks on the other hand. This might be an important reason why some of the plants of the large firms are not more efficient than some of the plants of the medium sized firms.

However, it should be emphasized again that comparatively little capital equipment is used in this particular industry, except for refrigeration and equipment for the utilization of by-products.

The medium sized firms that obtained their livestock nearby their plants and operate few of their own selling agencies have probably devoted more attention to plant efficiency than the large firms. Also, the keen competition that the medium sized firms encountered since their establishment, probably required the utmost alertness in plant efficiency. The large firms were at that time already well established and tried to stem the uprising of the interior firms.

However, the large firms realize, from their large scale operations, the necessary volume and research laboratories to utilize the by-products to such a degree that no smaller sized firms can possibly match. In the manufacturing and marketing of by-products the large firms still have a substantial degree of control. Many new products have been invented and many new processing methods have been applied. Large subsidiary plants producing only a few products have been established by the large firms and some of these products can barely be called by-products.

Small firms cannot obtain any similar economies from by-products

like the medium and large sized firms are able to. This is due to the lack of volume and due to the lack of miniature equipment.

With regard to the killing and cutting operations, the large firms probably do obtain more economies than the small firms. However, the few key machines that are used in killing are available in smaller sizes, for example, the hog dehairer, and are nearly as efficient as the larger sizes. It is probably not in these operations that the large firms have any definite advantage due to scale of operations. The uncontrollable supplies of livestock probably give the large firms more trouble than the small firms that may be in a position to lay off and hire labor more easily than the large firms. This slight advantage may balance the economies that large firms obtain from the killing and cutting operations.