CHAPTER 5

Business Strategy and Market Institutions

5.1 MARKETS IN A THEORY OF BUSINESS STRATEGY

No discussion of business strategy can be complete without an analysis of market forces. If one is concerned with investment strategies, market forces are important because of inducement effects - those investment objectives which are forced upon management teams by the 'market'. Competition strategies specify aspects of competitive acts which by definition are undertaken in 'markets'. Meaningful analyses of inducement effects and competitive strategies are not possible unless we can identify the 'market' with precision, since without knowing what the market is, we surely cannot analyse the market forces which give rise to inducement effects, and we cannot know what will be the consequences of various competitive strategies.

In this chapter I shall identify the institutions which might comprise various markets and the broad economic conditions in which markets for particular commodities will be composed of particular institutions. In chapter 6 I shall extend this analysis in order to identify the sources of inducement effects which lead to investment strategies of vertical integration in exchange. These are strategies which limit the scope of market institutions. Then in chapter 7 I shall consider inducement effects leading to vertical integration in production, that is, to investment strategies which eliminate markets altogether. Chapter 8, will be concerned with the effects of these investment strategies on firms' competitive strategies.

Altogether, the analysis of market institutions and market forces will take up very nearly half of this book. The reason for this emphasis on markets is that, by and large, economic theorists have ignored the market, so that there is little prior literature on which to rely. To be sure, economists often appeal to market forces and the 'invisible hand' as a source of efficiency and maximum social welfare. Recently, economists have considered in some detail the effects of income levels on market clearing. The principal writers on this topic are Clower (1965), Leijonhufvud (1968), Barro and Grossman (1971, 1976) and Malinvaud (1977, 1980). But in neither this new approach nor in the older approaches have economic theorists given serious consideration to what actual markets might be in fact. It is not sufficient for the present purpose to suppose nothing more than that the market is an auctioneer or a place where buyers and sellers meet.

The closest which any modern economists have come to analysing what market forces might be (rather than simply assuming them to have desirable consequences) has been their consideration of the optimal range of production activities which firms can undertake. The seminal work in this field is by Coase (1937).

Coase argued that a firm would internalize all those activities which had the effect of minimizing the total transactions costs incurred by the firm. It would buy in goods and services if the costs of so doing were less than the costs of purchasing the inputs required to produce those goods and services within the firm. However, in producing its own goods and services, the firm would require to engage in a larger number of transactions than would be the case if it were to purchase the goods and services directly. For in extending its range of production activities, the firm would require to purchase separately the labour time, materials and any plant and equipment required to produce the desired items instead of engaging in a single transaction to obtain such items directly. Coase assumed that the costs per transaction increased as the number of transactions increased and was able thereby to apply the principle of diminishing marginal returns to the analysis of transactions. It is then an elementary step to show that firms will integrate vertically
until the marginal cost of integrating (which is rising because of increasing transactions costs) is equal to the marginal cost of the required direct inputs. That is to say, in equilibrium the additional cost incurred by integrating backward or forward will be equal to the cost of purchasing the inputs from other firms or selling the outputs to other firms or households.

This approach has been further developed, notably by Alchian and Demsetz (1972) and Williamson (1975). The authors of these two works argued that the dominating element in transactions costs stems from a lack of candour on the part of transactors. Their analyses rest on the explicit assumption that, in effect, buyers will conceal information in order to get me to sell my wares at a price which is lower than they would in fact be prepared to pay or at a price which is lower than that prevailing in the market, while sellers will conceal information to make me think that their wares are better than they are or to get me to pay a price above that prevailing in the market. Alchian and Demsetz and Williamson agree that the firm will integrate to the extent necessary to minimize these information-cost-dominated transactions costs and, within the firm, the administrative structure will be designed to minimize the effect of this lack of candour.

The only substantive disagreement between Alchian and Demsetz on the one hand and Williamson on the other turns on the importance of technology in determining the scope of this lack of candour. Alchian and Demsetz believe it to be important, while Williamson, accepting that technology has an effect, believes it to be unimportant. This is obviously an empirical question, although there has been a curious absence of empirical evidence.

A far more general reliance on technology in the determination of the relative efficiencies of managerial and market co-ordination is to be found in the more recent work of Alfred Chandler, Jr (1977; in Chandler and Daems, 1980). Unlike the proponents of the transactions-cost approach, Chandler’s argument is derived inductively from extensive and detailed histories of actual businesses. Although the evidence upon which Chandler relies relates almost exclusively to successful American firms and markets, his conclusions have been broadly confirmed by British and Continental studies (Chandler and Daems, 1980).

Without by any means doing justice to Chandler’s work, the essence of his analysis can be summarized in the following way. The establishment of the railway and telegraph systems in nineteenth-century America opened up populous and geographically dispersed markets to the distributors of commodities and created opportunities for mass distribution. Whereas before retailers could buy and sell only in local markets, the reduced costs of determining the nature and prices of available goods over a wide area, as well as cheaper and far more reliable all-weather access to distant and rapidly growing urban markets, enabled retailers to become mass distributors by establishing departmental stores, chains of retail outlets and mail-order sales organizations. The increased cheapness and reliability of the sources of supplies over very wide areas of the continental United States enabled producers who used raw materials to purchase them directly from the raw material producers and, in some cases, to undertake the extraction processes themselves, thereby eliminating the brokers and commission agents who had traditionally arranged such transactions.

Furthermore, the development of new sources of energy (coal, steam and later electricity) made mass-production techniques possible for the first time. However, the resulting investment in mass-production technology was far more expensive than had previously been the case, and fixed costs per unit of output were higher than had been known in the past. In order to maintain large volumes of throughput and thereby to minimize average fixed costs, mass producers required to maintain large and steady flows of inputs as well as a high and steady volume of demand. In consequence, mass producers integrated backwards into the extraction of raw materials and the production of other inputs in order to assure their supplies, and they integrated forward into wholesaling and, occasionally, retailing in an attempt to control the marketing of their outputs with a view to high-volume sales.
The Coase school versus the Chandler school

The difference between the transactions-cost theories and the Chandler thesis evidently depends on the role which each accords to technology. For Coase, Alchian and Demsetz and Williamson all take the technology of production as a datum. Endogenous technical change has no part in their analysis, and in this they are well within the neo-classical tradition in the theory of the firm. Chandler and his followers (for example, Porter and Livesay, 1971), however, do see technical change as an endogenous economic activity of the firm. The opening up of widespread markets following the development of the telegraph and railway, together with the increased availability of cheap energy sources, led some firms to develop and employ energy-intensive production processes requiring high-volume throughput. The requirements of technology, in Chandler's view, led to changes in the nature of markets and the institutions which comprise markets.

I suspect that one reason why Chandler is able to analyse the relationship between technology and market organization, including the importance of commission agents, wholesalers, retailers, producers' goods stockists and the like, is that he is deeply concerned with the history of vertical integration, both by retailers who integrated their functions in exchange between the producers and the users of a commodity when previously there had been several exchanges between them, and also by producers who integrated forward in exchange and backward in production. Such backward integration, of course, eliminates exchange altogether. The neo-classical theorists, however, appear never to describe or even to define the market. This is itself a curious lapse for those who are concerned with the determination of those activities which will be undertaken within firms and those which will be left to the market. In particular, without any explicit consideration of what markets are, it is not obvious that one could analyse the effect of technology (or anything else) on the way markets work and, in particular, the efficiency of market as against managerial co-ordination.

The effect on economic analyses of the market of the absence of any clear and explicit discussion of what markets are and how they work is perhaps particularly clear in Williamson's view (1975, pp. 49-50) that technology is not an important — and certainly not a dominating — determinant of transactions costs. What can this view amount to? For exchange must involve the producer of a commodity and the user. If the producer sells directly to the user, we have a case of direct exchange. Several middlemen or intermediaries might be involved in the exchange of a commodity. It is hardly uncommon for producers of commodities to sell their outputs to wholesalers, who sell them to retailers, who in turn sell them to consumers. This is a case of intermediated exchange. In direct exchange the market is the collection of producers and users of the commodity, while the market in intermediated exchange includes, in addition to the producers and users, all of the intermediaries (the middlemen) who neither produce nor use the commodity. Now, all producers are firms and, apart from households or governmental authorities purchasing final consumption goods, so are the users of commodities. So too are the intermediaries.

There are two sorts of intermediary. One sort actually buys commodities in order to sell them at a later date or in another place. In an older parlance, which persists on some financial and commodity markets, such intermediaries are called 'jobbers'. Other intermediaries arrange transactions but do not take ownership of the commodities involved in those transactions. Such intermediaries are brokers. In practice, both jobbers and brokers often provide services in addition to the arrangement of transactions. They often provide or arrange for the transportation of commodities; they provide or arrange finance for their customers and suppliers, as well as finding the goods and services their customers want and buyers for their suppliers' goods and services. But even if we ignore the ancillary services provided by intermediaries, they clearly require to employ the services of productive resources in order to intermediate in exchange.

The jobber, for example, will require to store the commodities that he buys and sells. It is obvious that jobbers in
different markets will require different resources in order to provide storage. The jobber in financial markets will require a strong-box in which to keep negotiable securities safe, while the retail butcher will require a cold store to keep his meat from putrefaction. Retail shops, which are jobbers par excellence, require premises in which to display their wares. All jobbers will require the resources necessary to organize the purchase of the commodities in which they trade, as well as to arrange for their sale. Brokers, while they might never actually see the commodities in which they trade, also require resources. At the very least, the broker will require to communicate with two transactors, the buyer and seller, in every transaction which he arranges. To this end, he will need a telephone or a typewriter and paper. He is also likely to require to maintain records of prospective and current clients.

Evidently, then, both jobbers and brokers will require some productive resources in order to produce their services in exchange. Moreover, there will be some quantitative relationship between the services provided and the productive resources required to provide those services. Such relationships are neither more nor less technological than the relationships between inputs and outputs in any other line of productive economic activity. Even in markets characterized by direct exchange, the producers and users will require to devote some resources to transactions. Surely the relationship between these required resources and the nature and scale of transactions is technological in any meaningful sense of that word? If so, then technology will be an important determinant of the costs of exchange — contrary to Williamson’s (1975) view.

It should be noted that in a recent review of Chandler’s (1977) book, Williamson (1980, pp. 187–93) has acknowledged the importance of the technology of exchange. What is left now appears to be a difference of emphasis between Williamson and Chandler. But I suspect that even this difference of emphasis stems from Williamson’s allegiance to neo-classical theory which, I have argued at length in chapters 1 and 2, is essentially incompatible with a theory of the firm which is actually about firms. It remains to develop the analysis of exchange in a manner which is compatible with the analysis of the growth and diversification of firms pioneered by Andrews (1949), Penrose (1959), Chandler (1962, 1977) and others. The fundamental issue here is the extent of vertical integration of individual firms, that is, the range of activities which firms internalize — and so is subject to managerial co-ordination — and the range of activities which it is left to the market to provide.

The issue is complex. We shall require to analyse the various conditions which lead to particular institutional organizations of markets and, given the institutional settings, the ways in which suppliers allocate their outputs among their customers and the conditions in which firms choose to utilize those outputs themselves and to produce their own inputs to various production processes. These are all aspects of vertical integration which are closely connected. Moreover, all of them will be seen to turn importantly on the technologies of the production and the use of commodities, the technology of exchange and the physical characteristics of commodities.

The first of these aspects of vertical integration to be considered below is integration in exchange. If a market is composed of intermediaries as well as commodity producers and users, then the nature of market co-ordination and the workings of market forces will be determined by those focusing and inducement effects which determine the business strategies of the intermediaries. If there are no intermediaries in the market, then spheres of market co-ordination will be determined by the strategies of the producers and users of the commodity.

5.2 TRANSACTIONS COSTS AND INTERMEDIATED VERSUS DIRECT EXCHANGE

In this section I shall consider the conditions which make intermediation possible and the absence of which makes intermediation impossible. Clearly, the conditions favouring intermediation in the market will allow the intermediating firm to generate a positive cash flow from the arrangement of
transactions and from buying and selling commodities on its own account. Moreover, commodity producers and users are unlikely to trade through intermediaries unless there is some advantage to be gained from so doing. In the light of the weak assumption of managerial motivation, the most obvious advantages are higher cash flows and less uncertainty for producer and user firms engaging in intermediated rather than direct exchange.

Now, there are no doubt markets in which intermediaries have an absolute advantage in exchange, in the sense that producers and users can trade through intermediaries at lower cost than they can trade directly with one another. In other markets, however, the costs incurred by producers and users in intermediated exchange might be no lower than the costs which would be incurred in direct exchange, while the intermediary none the less enjoys a comparative advantage in exchange. This situation occurs when producing and using firms require to devote resources to direct exchange that are in excess of the resources required in intermediated exchange and when the excess resources could be used to generate a higher rate of return in other employments. For the intermediary to maintain a comparative advantage in these circumstances, however, the commodity producers and users must be subject to some limitation on the scale of the resources available to them. In the short run such limitations are entirely plausible. In the long run, however, there would need to be either some exogenous constraint on the size of the firm, some lack of ambition on the part of management teams or such keen and inventive ambition on the part of management teams and the other personnel of the firms in the market that their attention is continually being focused on investment projects promising higher rates of return than can be expected from investment in vertical integration.

In the present analysis I shall concentrate for the most part on the conditions required for intermediaries to have an absolute advantage in exchange. This procedure will be sufficient for our needs partly because the analysis is inherently concerned with the possibilities for institutional evolution and is, therefore, an analysis of long-run phenomena, and partly because intermediaries will be more likely to have a comparative advantage in exchange the smaller is their absolute disadvantage. Whether they do in fact have a comparative advantage will depend on the prospective rates of return available to commodity-producing and -using firms from alternative strategies of growth and diversification. There is very little that can be said about these alternative rates of return in general, so that if we are to reach any general conclusions at all, we shall do best to concentrate on the conditions required for there to be an absolute advantage in intermediation.

**Necessary conditions for intermediation:**
**some simple algebra**

The trading income of jobbers is derived from the sale of commodities at prices which are higher than the prices at which they buy the same commodities. The trading income of brokers is derived largely from percentage commissions on the values of the transactions they arrange.

Following the terminology of the financial markets, it will be convenient to call the price at which the jobber buys commodities, or the price net of broker's commission which a seller receives, the 'bid price'. The price at which a jobber sells, or the price at which a firm or household buys through a broker, including any commission paid by the purchaser, is the 'offer price'. The costs incurred by the broker are entirely costs of arranging transactions. The costs incurred by the jobber include costs of storage and perhaps transportation, as well as the costs of arranging transactions. In order for intermediaries to survive in any market, they will require to realize a positive cash flow which, in this case, implies that the offer–bid price spread is on average greater than the unit transactions costs incurred by the intermediary, including any costs of transportation, storage and the like.

If we denote the intermediary's offer price as \( p_o \) and the bid price as \( p_b \), then if the transactions costs for each unit of the commodity in which the intermediary trades is \( c_i \) the intermediary will generate a positive cash flow from engaging in transactions if, and only if,
\[ p_o - p_b > t_e \]  \hspace{1cm} (5.1)

Of course, a positive cash flow from transactions is not enough to enable the intermediary to function in a market. Commodity producers and users must also find that their cash flows are larger in intermediated than in direct exchange.

For the producer, this latter condition will be met if, and only if, the receipts from sales to intermediaries after deducting the associated transactions costs are greater than the receipts from sales to the users of the commodity after deducting the transactions costs associated with direct exchange. If the producing firm sells to the intermediary, that firm’s gross receipts for each unit sold will be the intermediary’s bid price, \( p_b \). Denoting the transactions costs incurred by the producer in selling one unit of output to an intermediary as \( t_e^{(0)} \), the producer’s revenue from intermediated exchange net of transactions costs will be \( p_b - t_e^{(0)} \) for every unit sold. If \( p_d \) is the price received by the producer in direct exchange (that is, the price paid directly by the commodity user), and if \( t_e^{(d)} \) is the unit transactions costs incurred by the producer in direct exchange, then that firm’s receipts from each unit sold net of transactions costs in direct exchange will be \( p_d - t_e^{(d)} \). In order for it to be worthwhile for the producing firm to sell to an intermediary rather than directly to the users of its products, the receipts net of transactions costs in intermediated exchange must be greater than in direct exchange. This is,

\[ p_d - t_e^{(d)} < p_b - t_e^{(0)}. \]  \hspace{1cm} (5.2)

The commodity user will trade through intermediaries only when the costs of purchasing the commodity including the transactions costs of intermediated exchange are less than the costs in direct exchange. The total cost of the commodity in intermediated exchange is the intermediary’s offer price \( p_o \) plus the unit transactions costs incurred by the user in buying from the intermediary, denoted by \( t_u^{(0)} \). Thus, the total cost to the commodity user in purchasing the commodity from an intermediary will be \( p_o + t_u^{(0)} \). In purchasing directly from a producer, the user will pay the direct exchange price \( p_d \) plus the unit transactions cost in direct exchange \( t_u^{(d)} \). If intermediated exchange reduces the commodity user’s costs,

\[ p_d + t_u^{(d)} > p_o + t_u^{(0)}. \]  \hspace{1cm} (5.3)

Inequalities (5.1), (5.2) and (5.3) represent the transactions-costs conditions required if intermediaries are to have an absolute advantage in exchange. By rearranging these inequalities and combining them in various ways, it becomes easy to determine the conditions of exchange which are necessary for intermediation to be economic. I start by solving these inequalities for the minimum bid and maximum offer prices. The minimum bid price is found by solving for \( p_b \) in inequality (5.2), yielding

\[ p_b > p_d - (t_e^{(d)} - t_e^{(0)}). \]  \hspace{1cm} (5.4)

The right-hand side of this expression is the minimum price which the intermediary must pay to induce commodity producers to sell to him rather than directly to commodity users. What is of most interest here is the term in parentheses on the right. It is the difference in unit transactions costs between direct and intermediated exchange. If that difference is positive, it represents the savings in the producer’s unit transactions costs made possible by trading through the intermediary rather than directly with the users. If it is negative, its magnitude is the unit transactions costs which could be saved by engaging in direct rather than intermediated exchange. Clearly, the greater the savings which intermediated trade affords to commodity producers, the lower can be the intermediary’s bid price.

The maximum offer price is found by solving for \( p_o \) in expression (5.3). This yields

\[ p_o < p_d + (t_u^{(d)} - t_u^{(0)}). \]  \hspace{1cm} (5.5)

The term in parentheses on the right-hand side represents the unit transactions-cost savings which intermediaries afford to commodity users. If the difference in the parentheses is negative, the magnitude of that difference is the cost of engaging in intermediated rather than direct exchange. Evidently, the greater the savings in transactions costs which
intermediaries make possible for commodity users, the higher can be their offer prices.

The maximum bid–offer price spread (that is, the maximum gross trading earnings of intermediaries per unit of commodity traded, on average) is found by subtracting inequality (5.4) from inequality (5.5) to yield

\[ p_o - p_b < (s^{(d)}_s + t^{(d)}_u) - (s^{(i)}_s + t^{(i)}_u). \]  

(5.6)

The maximum offer–bid price spread (that is, the maximum receipts which the intermediary can realize on average from every unit of a commodity in which he trades) is the value of the unit savings on transactions costs afforded to both producers and users as a direct result of the intermediary's activities. It follows a fortiori from inequality (5.1) that the intermediary's unit transactions costs must on average be less than the savings in producers' and users' unit transactions costs. That is,

\[ t_i < (s^{(d)}_s + t^{(d)}_u) - (s^{(i)}_s + t^{(i)}_u) \]  

(5.7)

and, by rearranging this last expression,

\[ t_i + s^{(i)}_s + t^{(i)}_u < s^{(d)}_s + t^{(d)}_u. \]  

(5.8)

The left-hand side of inequality (5.8) is the value of all transactions costs per unit of commodity traded in intermediated exchange and the value of the right-hand side is total unit transactions costs incurred by both parties to direct exchange. It follows that intermediation must result in a reduction in social transactions costs and that some part of this saving must be enjoyed by producers and users as well as intermediaries.

Although the foregoing discussion has been conducted in relation to transactions between producers and intermediaries and between users and intermediaries, it applies equally to transactions among intermediaries. A retailer, for example, would purchase goods from a wholesaler only if that afforded him some net savings over purchasing directly from the producers of those goods. Similarly, a producer will sell to wholesalers only if the resulting revenues net of transactions costs are greater than would result from selling to the retailer. In general, the conditions and inequalities established above apply both to vertically integrated and to disintegrated intermediation.

The line of argument followed here leads directly to two questions.

The first follows from the condition that the unit transactions costs of the intermediary must be less than the unit savings in transactions costs of the intermediary's customers and suppliers. This condition implies that the unit transactions costs of the intermediary must be very much less than the unit transactions costs of these suppliers and customers would be if they were engaged in direct exchange. What are the sources of such savings which would not be available to directly transacting producers and users?

The second question follows from the condition that the customers and suppliers of the intermediary must enjoy significant savings in unit transactions costs as a result of trading through the intermediary. What are the sources of such savings?

The answers to these two questions will occupy the following section.

5.3 MARKET STRUCTURE, THE TECHNOLOGY OF EXCHANGE AND INTERMEDIATION

The intermediary is a firm which is composed of resources devoted to the exchange of commodities and to activities which are ancillary to exchange, but it has no resources employed in either the production or the use of those commodities. The resources of the jobber include storage facilities, facilities for demonstrating to prospective buyers the commodities in which the jobber trades (for example, retail shops, trade showrooms and the like), facilities for maintaining records of sales and purchases and so on. While it is not beyond the wit or technical capacity of producing and using firms to acquire such resources, they would be ill-advised to do so unless their transactions volumes were of some minimum size. For these resources do yield economies of large scale. The sources of these economies have
long been recognized by economists, and they are described in many elementary textbooks. They are economies resulting from the division of labour and from the spreading of fixed costs consequent upon indivisibilities.

Now, any firm which engages in a sufficiently large number of transactions can employ the necessary specialized resources. But the volume of transactions in which any firm is engaged will be limited either by the scale of its production capacities or by the extent of its markets. The intermediary, however, concentrates his resources in transactions and, having no production capacity, is limited only by the extent of the markets in which he buys and sells. If he can buy from many small producers, or indeed from other intermediaries whose volumes of transactions prohibit them from realizing the same economies of specialization in exchange, and if he can sell to many small commodity users or small intermediaries, then his volume of transactions will far exceed those of any of his suppliers or customers. In such a case, unit transactions costs of the intermediary will be lower than those which can be achieved by either 'side' of the transactions in which the intermediary is the 'middle'.

The division of labour is limited by the extent of the market, to be sure. But the division of labour can be increased by increasing the extent of the market only up to a point. In any state of technology, the plant and equipment and the organization of production yielding the lowest unit costs of production will have a finite output capacity. Any increases in output can then be achieved without increases in unit costs only by duplicating the lowest-cost plant. The scale of production at which economies of scale are exhausted is the minimum efficient scale of production. Because the technological factors which yield economies of scale in production are entirely analogous to the technological factors yielding economies of scale in exchange, it is certain that there will be some minimum efficient scale of transactions. This scale, as will be seen below, depends upon the physical characteristics of the commodity in question, as well as upon the technology of exchange.

Provided that such a minimum efficient scale in transactions exists, the intermediary will have a cost advantage over his customers and suppliers only as long as the volume of transactions in which he engages comes closer to that scale than do the transactions volumes of his customers and suppliers. If in any market the minimum efficient scale in transactions is small in relation to the outputs of individual producers or the demands of individual users, then specialization economies will offer no scope at all for intermediation. In those markets where there is a wide size distribution of firms, those firms which can achieve or come close to minimum efficient scale in exchange could economically engage in direct exchange, while those firms which cannot achieve minimum efficient scale in exchange could economically engage only in intermediated exchange.

The historical evidence confirms this analysis. In their excellent history of nineteenth-century developments in American marketing, Porter and Livesay (1971) have considered the effect of changing market concentration due to the rise of the city. When cities were small and the American population was scattered thinly over the continent, intermediaries were crucial to the arrangement of transactions, transportation and storage. It did not pay individual manufacturers to employ full-time sales forces to sell their outputs in any local market. For the wholesaler could sell the outputs of many producers in several local markets more cheaply by combining the various producers' products. In part, these economies in transactions costs were achieved simply by enabling each salesman to sell a larger volume of goods than could be supplied by any one producer. In addition, however, the wholesaler and commission agent was able economically to devote substantial resources to exchange. As described by Porter and Livesay (1971):

Wholesalers knew who produced what, how quickly and at what price. Equally important, they understood the transportation system and its relation (both in time and money) to their ability to bring buyer and seller together efficiently. They knew the current status of transportation routes, and they knew of forwarding merchants and storage facilities. All the various kinds of expertise and services represented by the mercantile community made the independent middleman a virtually indispensable element in the [American] economy throughout the nineteenth century. (p. 163)
Vertical integration was undertaken by two kinds of producers to eliminate the independent intermediary. One was the large firm with a sufficient throughput to warrant the devotion of specialized resources to transactions — including the employment of personnel with the very knowledge, expertise and experience which, according to Porter and Livesay, had made the independent wholesaler indispensable in an earlier age. The other firm which eliminated the intermediary was the small firm which produced commodities for which the minimum efficient scale in exchange was small even in relation to the scale of outputs of such firms.

One of the best examples of forward integration into exchange by a large firm is the case of Standard Oil. From the drilling of the first American oil well in 1859 until the introduction of the motor car, petroleum was refined mostly into paraffin (or kerosene) for use in lighting and, to a lesser extent, into lubricants. The oil refined by firms such as Standard Oil was distributed by specialist commission merchants to wholesale grocery and drug merchants, who sold them in turn to retail grocers and dispensing chemists (or drugstores). There were, therefore, three levels of intermediation between the oil refiner and the final consumer. In the 1870s and increasingly in the 1880s, Standard Oil acquired control of specialist wholesalers in the larger urban centres and then began using these wholesaling affiliates to distribute the firm’s products directly to retailers. Standard Oil was able economically to acquire the specialist wholesalers because its control of oil-refining capacity in the United States became so extensive that no independent merchant could provide broking or jobbing services for a greater volume of illuminating oil than Standard was able to sell in any single local market. The output of that one firm was sufficient to achieve minimum efficient scale in exchange.

The economic feasibility of distributing the oil directly to retailers, thereby eliminating another layer of intermediation, was made possible by the increasing concentration and affluence of the population. When enough retail outlets and such large users of illuminating oil as hotels, office blocks and factories became sufficiently concentrated in the urban centres, the wholesaling affiliates of Standard Oil found that they could distribute to them directly, since bulk deliveries could be made to several points in a small area. This point will be considered in some detail presently, but for the moment it is sufficient to note that it is far cheaper to deliver large lorry-loads of a commodity to a single place or several places which are close together than to widely scattered points. The concentration of the markets and the demand for illuminating oil enabled Standard Oil to effect its own deliveries to large-volume purchasers and so enabled the firm to bypass all intermediaries but the retailer who sold the illuminating oil as one of many products (Porter and Livesay, 1971, pp. 158–9).

Of course, petroleum products are now sold through specialist retailers (petrol stations) as well as through non-specialist retailers such as supermarkets and firms specializing in servicing and sale of parts for cars. Although specialization is not complete in this field, the very considerable increase in specialization since the nineteenth century is evidently a result of the larger volume of sales which can be expected by each retailer of petroleum products. In many cases the large oil companies either own the retail outlets for their products or control them through franchising arrangements. The oil producers and refiners have been able to integrate forward completely to eliminate the independent intermediary because the volume of sales has enabled these firms to achieve minimum efficient scale in exchange, or at least to come so close to that scale at every level of intermediation that the independent middleman no longer has even a comparative advantage in exchange.

An example of vertical integration into exchange by a smaller producer is the early experience of the Parker Pen Company. Because the fountain pen is small and light and its quality makes its value high in relation to its bulk, the cost of transporting these pens is small in relation to their value. For this reason, the Parker Pen Company was able to distribute its products to retailers by post at very little cost. Moreover, since the Parker pen was a well-known product, the retailers were able to order the pens by post
with confidence. Parker did maintain a sales force, so that the retailers could be visited and orders taken, but because the market for the pens was characterized by differentiated oligopoly, the bulk of the demands for the pens was generated by advertising directly to consumers through the mass media. Thus, the consumers made their demands known to the retailers who were thereby induced to maintain stocks of Parker and other pens (Porter and Livesay, 1971, pp. 161-2).

Clearly, the minimum efficient scale in exchange was small because of the efficiency and reliability of the rail network and, therefore, the parcel post. Product differentiation enabled the producers to generate demands for their products without relying on intermediaries for assistance in this regard. Forwarding agents and storage facilities were not important in the distribution of pens, and the knowledge of transportation routes and rates had ceased to be specialized knowledge because they were settled and well-publicized by the railways. In these conditions, the independent wholesaler had nothing to offer to the producer and was unable to reduce transaction costs in commodities such as fountain pens.

Economies of joint exchange

The economies of specialization which arise from the division of labour are not the only economies of scale to be found either in production or in exchange. A second category of economies of scale is the spreading of fixed costs over a larger volume of output, thereby reducing the fixed costs per unit of output. Such fixed costs are, of course, typically said to result from indivisibilities in plant and equipment.

One way of spreading the costs of indivisible production capacity over more output is to use the plant and equipment to produce additional kinds of commodities. That is to say, indivisibilities are overcome equally by increasing the output of a single commodity and by engaging in joint production. As I argued in chapters 2 and 3, the existence of indivisibilities together with less than full utilization of the indivisible plant and equipment will focus the attention of the management team on ways of utilizing the excess capacities. The focusing effect will lead the management team to diversify in a way which utilizes under-utilized capacities — that is, which involves the joint production of several commodities — if the prospects for growth in the firm's existing markets are limited.

The incentive to engage in joint production because of the existence of indivisible resources is true not only of the production of goods but also of the production of services, including services in exchange and distribution.

Consider, for example, the commercial traveller. It costs much the same for him to call on a potential customer with literature about, or samples of, one commodity or several commodities. Similarly, for many commodities (those which are not excessively bulky) the costs of delivery of a consignment composed entirely of one commodity or several commodities do not vary much, and certainly do not vary in proportion to the number of distinct commodities delivered — provided, of course, that the several commodities are delivered to the same or very nearly the same place.

Or consider again the history of Standard Oil's forward integration from refining into wholesaling and, eventually, retailing. When that firm was relatively small, it left the distribution of its outputs to specialized commission merchants, who in turn sold the petroleum products to grocery and drug wholesalers. These latter intermediaries sold a full range of goods to retail outlets by purchasing in bulk and then breaking bulk for the retailers. A large production capacity enabled Standard Oil and its producing affiliates to take over the specialized wholesalers simply because the producers reached minimum efficient scale in exchange. But size of production capacity alone was insufficient to enable Standard Oil to bypass the more general wholesaler, who provided all or a substantial part of the range of commodities sold by the retailer. For unless Standard Oil was prepared to intermediate in the sale of drugs, biscuits, cheese, canned goods and other grocery products, the drug and grocery wholesalers were able to sell and deliver relatively small amounts of illuminating oil as part of larger deliveries of many goods more cheaply than Standard could deliver small quantities of oil alone to each of many retailers. Only
when the retailers and other purchasers of their product came to be geographically concentrated and to require relatively large amounts of illuminating oil could the producer profitably take over the delivery of its products to them.

Even then, Standard Oil and the other refiners did not integrate forward into retail sales. That step — and it has never been complete — came with the increasing use of the car and, with it, the increase in demand for petrol. But even the petrol station was not a specialized retailer of petroleum products. Rather, it became a specialized provider of services for the car, including the sale of petrol and lubricating oils as well as spare parts, repairs and servicing. In summary, the oil refiners were able to take over or franchise retail outlets for their products only when the demands faced by each outlet were sufficient to enable the refiners to deliver their products to the petrol stations in bulk.

Much the same story could be told about other commodities. The general point is that indivisibilities in exchange give intermediaries a cost advantage in those conditions in which they can break bulk and sell a range of commodities to other intermediaries or to users while their suppliers cannot economically integrate forward and their customers cannot economically integrate backwards to bypass them.

These conditions are often found in the market for consumption goods. For in order to achieve economies of scale in production, consumption-goods producers often seek to create the necessary scale of demand by advertising their products directly to the final consumers. But the cost to each producer of, for example, a range of toiletries which would be incurred in the establishment of many small shops selling nothing but that producer’s own brand would be far greater for the volume of sales which could be expected than would result from making deliveries of large lots to a few wholesalers who broke bulk and distributed the appropriate amounts of several competing brands of toiletries to supermarkets, departmental stores and chemists’ shops. It might be economic to bypass the wholesaler when retailers purchase lorry-loads of toiletries. Either the producer can arrange a large delivery to the large shop, thereby integrating forward to take on the role of the wholesaler, or the large

chain can take centralized delivery of large consignments from each producer and then break bulk itself in order to deliver appropriate compositions of commodities produced by several firms to each of its retail outlets. In such cases, the retailer integrates backwards into wholesaling.

The principle involved here is not limited to consumption good markets. Plumbers’ merchants, builders’ merchants and steel stockists all break bulk for producers in order to sell a wide range of commodities in lot sizes which the smaller firms in the construction trades require. The largest firms, however, purchase much larger quantities of each commodity directly from the producers.

Customers’ and suppliers’ savings in intermediated exchange

It emerges from the foregoing discussion that there are clear and identifiable conditions in which intermediaries reduce transactions costs in ways which their customers and suppliers cannot. These conditions exist when the customers and suppliers cannot achieve minimum efficient scale in exchange but the intermediaries can do so, and when the intermediaries can, but their suppliers and customers cannot, overcome indivisibilities in sales and distribution. The first of these conditions evidently requires there to be many customers and many suppliers for every intermediary in the commodity. The second condition requires the customers of the intermediary to purchase small amounts of many commodities — amounts which are well below the minimum efficient scale in exchange — so that it would not be economic to deliver any one of these commodities individually to each of many buyers.

But, as was seen in section 5.2, these conditions are necessary but not sufficient. The necessary and sufficient condition for the intermediary to have an absolute advantage in exchange is that the total transactions costs in intermediated exchange must be less than the total transactions costs in direct exchange. This condition will be met when the unit transactions costs of the intermediary are less than the savings on transactions costs which intermediated
exchange affords to the middleman’s customers and suppliers. The question now to be answered is: what are the sources of such savings?

There are two undoubted sources of savings in the transactions costs of the customers and suppliers of any intermediary. One is economies of bulk transactions, and the other is information economies. Economies of bulk transactions are the savings made available to the customers and suppliers of intermediaries who achieve economies of joint exchange, while information economies are very largely a result of the specialization economies of intermediaries.

Both of the economies of large-scale exchange which can be achieved by intermediaries entail a reduction in the number of transactions in which their suppliers and customers are involved. To achieve specialization economies, the intermediary purchases or arranges the purchase of the outputs of many producers and sells them to many buyers. The intermediary’s suppliers, therefore, sell to one or a few intermediaries instead of to many customers, and the intermediary’s customers buy from a few sources instead of many producers or other suppliers. Economies of joint exchange involve the same concentration of transactions upon a few intermediaries, who combine the outputs of different commodities produced by many small firms into appropriate lots for each of many buyers. In these cases, intermediated exchange involves many fewer transactions for the suppliers and customers of the intermediary than would be involved in direct exchange.

By reducing the number of transactions in which firms and households are engaged, intermediated exchange denies economies of specialization to those firms. None the less, this inability to secure economies of specialization does not result in higher unit transaction costs because the intermediaries’ suppliers and customers engage in fewer activities in order to complete their transactions.

The intermediary who engages in transactions involving only one commodity or a narrow range of closely related commodities can develop specialized knowledge of the suppliers of, and customers for, the commodity in which he trades, as well as information about transporting the commodity and perhaps even financing the purchase of it. The intermediary effectively takes over the activity of searching for suppliers of particular commodities which his customers require and for customers requiring his suppliers’ commodities. The intermediary’s customers and suppliers, therefore, need devote resources only to searching for, and acquiring information about, a relatively small number of accessible intermediaries rather than a relatively large number of agents on the other side of the market who might not be readily accessible. Such savings are clear economies of search or information economies.

The intermediary who secures economies of joint exchange thereby enables his suppliers and customers to achieve economies of bulk transactions. Suppliers require only to trade with a single intermediary in order ultimately to have their outputs purchased by a large number of users of those outputs, while the intermediary’s customers require to trade only with a single seller in order to purchase a wide range of the commodities they require. The suppliers, therefore, can sell large lots of their outputs to the intermediary, and the customers can purchase in a single lot smaller amounts of several commodities. Thus, intermediated exchange involves few movements of individual commodities in bulk to the intermediaries instead of many movements of small amounts of the commodity from each supplier, and few movements of small amounts of many commodities from intermediaries to customers. Intermediated exchange enables both suppliers and customers to sell and buy in bulk. In consequence, they will require to devote fewer resources to exchange because the breaking of bulk is undertaken by the intermediary rather than by the supplier or customer.
Technology and Vertical Integration in Exchange

6.1 TECHNOLOGY AND THE PHYSICAL AND ECONOMIC CHARACTERISTICS OF COMMODITIES

In order for there to be transactions in any commodity, it must in general be possible to store the commodity over some period of time and to move it from place to place. If a good can neither be moved nor stored, it can be used only at the place and time of its production, and it is hard to imagine two independent firms operating in such close harmony and propinquity. There are, however, some services which exist only at the time and place of their production. Labour services are the most obvious example here. But even in these cases, it must be possible for one firm to hire the resource (perhaps a worker) to provide the service at the time and place required. Thus, any commodity must have some measure of storability and portability.

Moreover, the user of a commodity will, in general, want to know that it will satisfy particular needs and desires. At least some of the properties of the commodity must, therefore, be known to the user before he will undertake to purchase any of it. In other words, commodities must be cognizable to some degree.

Goods and services which lack storability, or portability, or cognizability can be produced within integrated production processes and therefore within a firm, but they cannot enter into exchange. The greater the degrees of storability, portability and cognizability, the more suitable are commodities for exchange and, in particular, for intermediated exchange.

While these three characteristics of commodities are in themselves sufficiently straightforward, their economic relevance and importance in the determination of business strategies requires further explanation.

A commodity is cognizable if its physical specifications will be known and understood with precision by prospective purchasers, who will not have seen the units they purchase prior to assuming ownership and taking delivery of them. If a particular type of commodity is cognizable, then every unit produced will conform to known specifications. In some cases the properties of a commodity will be understood because the commodity is branded, while in other cases the name of the producer is irrelevant.

The effect of standardization is to eliminate the necessity to inspect each unit of every commodity. It is standardization which renders commodities cognizable; that is, cognizability is an economic property which follows from the physical property of standardization.

Much the same point can be made with respect to portability and storability. The physical characteristics of commodities which render it possible to move them or to keep them for any length of time are that they should be durable and compact. Clearly, a commodity cannot be stored unless it is durable. Since transportation often takes some time, substantial portability will also require the commodity to be durable, although this property may be less important than for storability. Moreover, portability and storability require that the commodity should not be excessively bulky. For a commodity to be portable, it must be possible to move it from one place to another by road, rail, water or air. The bulkier the commodity is, the more difficult it will be to move it. Although bulk is a less important consideration for storability, it seems sufficiently obvious that the difficulty of storing a commodity is less as the commodity is more compact.

Like standardization, durability and compactness are physical characteristics of commodities, but the words have
no absolute meaning. By compact, we evidently mean small and without long projections. But what are the physical dimensions within which a commodity would be considered compact rather than bulky? Similarly, how long must a commodity last before we would say that it is durable rather than perishable? How similar must the various units of a commodity be in order for us to judge them to be standardized?

The answers to the questions turn on the technology of storage, transportation and use of the commodity under consideration. Consider, for example, the case of ice. Early in the nineteenth century Frederick Tudor, an American, entered the ice trade. Following the standard practice of the time, he purchased lumps of ice from farmers in the northern parts of the United States who, during the winter, had hacked the ice from frozen lakes and rivers. Evidently a man of more vision than foresight, Tudor did not just send his ice to the urban ice-houses in America, but also dispatched a shipment to the tropical island of Martinique in the Caribbean Sea. Alas, much of his cargo melted on its way through the tropics, which led Tudor to consider the practicality of insulating the ice from summer and tropical heat. Having recognized the insulating properties of sawdust, Tudor built insulated ice-houses in the hot southern United States and insulated his ice in transit both within the United States and in the export trade he developed abroad. Thus, Tudor increased the durability of ice and, in so doing, created a very wide market for it (Porter and Livesay, 1971, pp. 167-8).

Further developments in refrigeration technology proceeded with the rise of the dressed-beef industry in America. The refrigerated railway car made it possible to slaughter cattle in the western United States and ship the chilled carcasses to the cities on the east coast. The savings over the previous method of shipping live beef cattle east were enormous for two reasons. The first was that a large percentage of the livestock died on the journey. This loss was avoided by slaughtering them near the places where they had been reared. The second source of savings lay in the shipment of sides of beef but not the parts of the animal which were not wanted by retail butchers. Furthermore, by concentrating the slaughtering at a few points in the West, it was possible to realize large economies of scale both in slaughtering and in the use of by-products such as the hooves, which were used to make glue, and the fats, used to make soap. These were production economies which refrigeration made possible. The extent of the market for dressed beef was increased many-fold by the application of refrigeration technology because of the resulting increase in the durability of the commodity as well as the increased compactness resulting from the shipment of only those parts of the animal which were in demand. One national market for dressed beef and, indeed, other meats, thereby supplanted the many local markets which had previously existed (Porter and Livesay, 1971, pp. 168-73).

It is equally clear that the meaning of compactness will be related to technology. Goods which were too heavy and bulky to transport along the muddy and uneven roads of Britain before the Scottish engineer MacAdam devised the metalized road surface became suitable for transport to those parts of the interior without access to waterways. The development of the railway further extended the limits on bulk beyond which commodities could not be considered portable.

Standardization is another property of commodities which has been changed or even created by technology. Once the railway made possible bulk shipments of wheat from the middle of North America, the railways and, later, grain merchants began building large grain elevators with steam-powered mechanical loading and handling apparatus. It thus became impossible for a miller to arrange the purchase of grain from any particular farmer, even those who had provided wheat of appropriate quality in the past, because the produce of many farmers was stored and shipped in large single lots. At the same time, the commodity exchanges grew up in which it was possible to contract to buy or sell wheat that had not yet been sown, much less harvested. In order to enable buyers to purchase wheat of known quality but unknown provenance, grain exchanges in North America co-operatively established systems of standardized
grading. These had become complete and uniform for all exchanges by 1874. A system of inspection of lots of grain was also established, often by the state authorities, to ensure that the grading system was applied with accuracy. Thus it was that a commodity such as wheat, the quality of which can vary with the strain, the soil on which it is grown, the agricultural techniques employed and the weather during the growing season, was artificially standardized in order that the changing technologies of transportation and communication could be fully exploited (Chandler, 1977, pp. 209–12).

The physical characteristics of produced commodities are presumably more easily subject to human control than are the characteristics of agricultural and mineral produce. If the differences among the units of any particular commodity are smaller than will be noticed by their users, then such a commodity is to all intents and purposes fully standardized. If, however, a new use to which some commodity is put is far more sensitive to variations in strength, dimensions or some other property than had been the case with its previous uses, then from the point of view of the new users the commodity in question ceases to be sufficiently standardized. The classic example here is that of the cylinder for James Watt’s steam engine. The boring of the cylinder for its predecessor, the Newcomen engine, was most imprecise by modern standards. But it was within the tolerance necessary to achieve the degree of vacuum required in the Newcomen engine to pull its piston downwards and so drive the machinery for which it provided the power. These tolerances, however, were too wide for the requirements of the Watt engine. The ability to produce a standard cylinder for the Watt engine was to be found only in John Wilkinson’s new and more accurate methods, which he had developed for the boring of cannon. Whereas previous technology had been unable to provide a standard cylinder for the Watt engine — although it had provided ‘standard’ Newcomen engine cylinders — the new technology was able to meet the closer tolerances which were required for the standardization of the new outputs.

In general, it would appear that the meanings of standardization (hence cognizability), durability and compactness (hence portability and storability) are relative to the technological environment. So too is their economic importance.

The economic effect of compactness and durability is to reduce carrying costs. The more durable a commodity, the smaller will be the losses through deterioration in storage or during transport. The more compact a commodity, the larger is the number of units of that commodity which can be transported in a single lorry, ship or airplane or stored in a warehouse of any given size.

The economic effect of standardization is to increase the feasible extent of the market for the commodity. In the first place, the more distant buyer can purchase a standard-  
ized commodity without having to incur the expense of travelling to the producer to choose the particular items he wants and without having the producer or his agents haul a range of units around the country from which prospective customers may choose. Standardization reduces both the producers’ and the users’ costs of agreeing to transactions. This was the effect of standardization of grain. In the second place, standardization of inputs to production processes facilitates both technical changes — such as that embodied in the Watt steam engine — and mass production and the achievement of economies of scale in assembly processes. It is hard to imagine how an assembly line for cars, for example, could be effective unless all of the parts to be assembled can be confidently expected to fit together, even when the parts are bought in from various producers.

It is these economic effects of the physical characteristics of commodities which determine the feasibility of intermediation in any market and, as we shall see, figure importantly in the focusing and inducement effects which lead to vertical integration in production.

6.2 THE TECHNOLOGICAL BASIS OF EXCHANGE: INTERMEDIARIES’ ECONOMIES

I argued in chapter 5 that firms will have no incentive to integrate either forward or backward in exchange if intermediated
exchange offers them economies of bulk transactions, or information economies, or both. Furthermore, intermediaries will be in no position to make such economies available to their suppliers and customers unless they can achieve economies of large-scale exchange which cannot be secured by the firms with which they trade. It is now a relatively straightforward (if unfortunately longwinded) matter to determine those commodity characteristics and technological conditions of production and exchange which militate for or against vertical integration between production and exchange or between levels of intermediation in exchange. All that is required is to consider, on the one hand, the relationships between the physical characteristics of commodities and technological conditions discussed in the preceding section of this chapter and, on the other hand, the economies in exchange discussed in section 5.3. In this section I shall consider the exchange economies available to intermediaries and, in section 6.3, the economies available to their customers and suppliers.

Specialization, market size and minimum efficient scale

Specialization economies require firms to be able to buy and sell commodities in large volume. The larger the number of buyers and sellers with whom a firm trades, the more extensive and specialized are the resources which it is economic to devote to exchange and so the lower the costs of buying or selling each unit of a commodity. Thus, any physical characteristics of commodities or technological conditions of production and exchange which increase the number of firms or households with which any one firm can trade, and which increases the volume of commodities which the firm has to sell or requires to buy, will increase the opportunities to secure economies of specialization in exchange. This, after all, is nothing other than an application of Adam Smith’s dictum that the division of labour is limited by the extent of the market.

Durability, compactness and the standardization of commodities all increase the economically feasible extent of the market. The effect of durability and compactness is clear. By reducing carrying costs over time and space, these characteristics increase the length of time over which jobbers can economically hold commodities for sale; they increase the distance over which jobbers can look for sources of supply and over which they can deliver their wares; and they increase the geographical dispersion of producers and users who can be brought together by brokers in the market. In summary, compactness and durability increase the feasible dispersions of intermediaries’ suppliers and customers and so, on balance, are likely to increase the numbers of firms from which they can purchase commodities and the numbers of firms and households to which they can sell the same commodities. This was clearly the effect of, for example, advances in refrigeration on the ice and dressed-meat markets considered above.

Standardization, either within brands or among the outputs of several producers, enables the users of a commodity to purchase the outputs of producers located at considerable distances from them without incurring the costs of prior inspection. In such cases of product standardization and brand standardization, the costs of agreeing a transaction are very much lower and do not require direct contact between producer and user. This was the effect of standardized grading systems for grains. Without the necessity of binary relationships between producers and users, the jobber can purchase commodities over wide areas and over long periods of time from many suppliers (either producers or other intermediaries) and sell them to many users who are also dispersed over space and time. For precisely the same reasons, the broker can arrange transactions between sellers and buyers who have no direct contact, thereby increasing the numbers of buyers and sellers for whom he arranges transactions. Clearly, this is the effect of the standardization of futures and spot contracts on the commodity exchanges and the standardization of company reporting procedures and the rules on the stock exchanges. They enable brokers to arrange sales and purchases of highly standardized assets in large volume.

It is not, of course, sufficient that transactions of large
volumes of a commodity between buyers and sellers who are widely dispersed in space and time should be feasible. In order for a market to be extensive, the commodity must be in general demand. The generality of demand, however, depends on the production technology of the firms and the tastes of the households in the economy. In general, mass production requires inputs of large volumes of commodities which are standardized by product, while mass distribution of consumption goods requires standardization either by product or by brand. Both mass production and mass distribution also require the ability to store and transport commodities reliably and at a cost which is small in relation to the production costs, and therefore the selling price, of the commodities. As I demonstrated in chapter 3, the invention of producers’ goods has often led to a search for new and different uses of them. Moreover, Chandler (1977) has demonstrated, on the basis of extensive historical evidence, that mass producers standardize and then advertise their consumption goods in order to create general consumer demand. Given this evidence, one is led to conclude that, in historical fact, focusing effects within firms have often led to the development of products and marketing practices which generate general demands for their outputs. In other words, the supply considerations have dominated the demand considerations in order to create extensive markets in which economies of specialization could be secured in exchange as well as in production. This point will be considered further in chapter 7.

Compactness, durability and standardization not only increase the extent of the market for a commodity, but they also reduce minimum efficient scale in exchange. The case of the Parker Pen Company, discussed in section 5.3, illustrates this point nicely.

Fountain pens are so easily and cheaply transported and so well standardized by brand that the producer could economically distribute his products directly to retailers. In the light of the discussion of section 6.1, it is clear that the cheapness of distribution of the pens is due to their durability and compactness. Evidently, the durability, compactness and brand standardization of fountain pens resulted in a minimum efficient scale in exchange that was less than the minimum efficient scale in production. As a result, no wholesaler could specialize in transactions involving fountain pens in order to secure cost advantages in exchange. If intermediaries are to secure such cost advantages, they will require to do so by achieving economies of joint exchange. The dearth of specialist fountain pen retailers suggests that neither the Parker Pen Company nor any of its competitors has found a strategy of vertical integration into retailing to be an attractive economic proposition. The cost of sending a single pen to each consumer is greater than the unit cost of sending pens in bulk to retailers. The savings to the manufacturer in selling through retailers are evidently sufficient to give the retailer a comparative advantage in this level of exchange.

Joint-exchange economies

Little needs to be said in regard to economies of joint exchange which has not already been discussed.

The essential point here is that compactness, durability and standardization, in increasing the extent of the market for any commodity, enable intermediaries to arrange for the purchase and delivery of the outputs of more producers to each of a larger number of users than would be possible for more bulky and perishable commodities. Furthermore, the cost advantage of the intermediary arising from economies of joint exchange is predicated upon the breaking of bulk by the intermediary. It must be possible for the intermediary to divide up each lot of each commodity so that smaller amounts of each commodity can be combined for sale and delivery to each of the intermediary’s customers. If, however, a commodity were so bulky in relation to transportation technology that only one unit could be delivered at a time, the intermediary could not break bulk. Furthermore, if a commodity is highly perishable, then time will be of the essence in getting the output of the producer to the user, and there simply might be no time for the commodity to be sent first to the intermediary.
In addition to these advantages of compactness and durability, standardization by brand or by product enables a salesman to call on potential customers with literature detailing the specifications of several commodities and, if they are sufficiently compact and durable, with samples of his wares. Brand standardization facilitates the use of advertising space to sell several brands of a number of products if all of them are readily recognizable - a property which, we have seen, entails standardization - so that their properties will require little description and explanation. Supermarkets, departmental stores and mail-order houses typically engage in precisely this sort of advertising.

In general, therefore, standardization results in indivisibilities in resources devoted to sales, while compactness and durability result in indivisibilities in resources devoted to distribution.

6.3 THE TECHNOLOGICAL BASIS OF EXCHANGE: PRODUCERS' AND USERS' ECONOMIES

I argued in section 5.3 that the customers and suppliers of intermediaries would find that intermediated exchange was less costly than direct exchange if some of the activities associated with direct exchange could be transferred to the intermediary. If the intermediary is specialized in one commodity, so that there is no opportunity to secure economies of joint exchange, the only savings which the intermediary can make available to his customers and suppliers will result from reductions in the resources devoted to finding firms and households with which to trade. If the intermediary secures economies of joint exchange, then his customers and suppliers will engage in fewer transactions, although each transaction might be more costly than in direct exchange. However, in providing a single customer for producers and a single supplier for users, intermediaries are likely to provide information economies as an integral aspect of economies of bulk transactions.

The conditions in which these economies can be provided by intermediated exchange can be expressed with greater precision in the light of the discussion of section 6.1. It is well-known from inventory theory that the minimum-cost lot size for each transaction and the minimum-cost number of transactions in any period of time will depend not only upon transactions costs but also upon carrying costs - hence upon the compactness and durability - of a commodity and the costs of shortages. Shortage costs can be treated most conveniently in chapter 7. I shall concentrate here, therefore, upon the effects of transactions and carrying costs in determining whether intermediated or direct exchange is cost-efficient.

I shall begin with a consideration of information economies which have the effect of reducing transactions costs independently of economies of joint exchange. The discussion here is conveniently conducted in relation to the simplest application of inventory theory - the optimal lot problem.

Ignoring for the moment shortage costs, uncertainty and non-constancy of production, the costs incurred by the user of a commodity in having the commodity available as it is needed are the transactions costs, which arise from placing orders for and receiving deliveries of the commodity, and carrying costs, which arise from holding the commodity in stock.

The cost of executing each transaction is denoted \( c_t \). As we have seen, that cost will depend upon the scale and nature of the resources devoted to transactions and the physical characteristics of the commodity. The greater the volume of transactions with appropriate resources devoted to them, the lower is likely to be the value of \( c_t \) until minimum efficient scale is reached. The more durable and compact the commodity, the smaller are transportation costs and consequently the costs of taking delivery. For this reason, compactness and durability will tend to reduce the value of \( c_t \). Since I am here confining my attention to the transactions costs associated with given resources in order to compare the effects of different organizations of exchange, we may treat \( c_t \) as a constant. If the firm places and receives \( n \) orders a week (say), then total weekly transactions costs with respect to that commodity will be \( c_t n \).

The carrying costs incurred by the firm result partly from
any deterioration of stocks if the commodity is at all perishable, partly from the financial charges and maintenance costs of storage capacity if the commodity is at all bulky and partly from the opportunity cost of the finance required to hold stocks from the time of their purchase until the realization of any consequent revenue, as well as the wages of stock controllers and any other running costs associated with stock holding. Some of these are fixed costs and some — particularly those resulting from stock deterioration and stock financing — vary with the volume of stocks in hand. None the less, given the resources which are applied to stockholding, and continuing for the present to ignore variations in the rate of input utilization, we may suppose the weekly carrying costs per unit of the commodity in stock to be a constant, \( c_b \). If each order placed by the firm is for \( q \) units of the commodity, and if orders are only placed and deliveries received as stocks are completely used up, the average stockholding will be \( q/2 \) units of the commodity. The average total weekly carrying costs, then, will be \( c_b q/2 \).

Finally, it is commonly assumed in the context of this problem that the weekly volume of commodity delivered, \( qn \), is equal to the weekly rate of utilization of the commodity, denoted \( u \). That is, it is assumed that \( u = qn \).

The problem facing the firm, then, is to minimize the total number of transactions and the carrying costs. This objective is readily seen to be compatible with the weak assumption of managerial motivation, as well as with any of the usual stronger assumptions. Following the usual form, the problem is stated as

\[
\text{minimize } C = c_b \frac{q}{2} + c_q n
\]

subject to \( u = qn \)

Solving this problem for \( q \), the optimal lot size, and \( n \), the optimal number of transactions per week, we have

\[
q = \left( \frac{2uc_q}{c_b} \right)^{\frac{1}{2}}
\]

and

\[
n = \left( \frac{uc_b}{2c_q} \right)^{\frac{1}{2}}
\]

In words, the optimal lot size varies directly with the square root of transactions costs per transaction and inversely with the square root of unit carrying costs. The optimal number of transactions varies directly with the square root of unit carrying costs and inversely with the square root of the transactions costs per transaction. That is to say, quadrupling the costs of executing a transaction will double the optimal lot size and halve the number of purchases, while quadrupling unit carrying costs will halve the optimal lot size and double the number of transactions.

Although I have introduced the problem here only in relation to the purchaser of a commodity, it applies equally to producers. It is necessary only to reinterpret the meaning of \( q \) as the number of units of the commodity sold in each transaction and the meaning of \( u \) as the rate of production of finished goods. That is, we can suppose that the producer sells his entire stock of finished goods whenever that stock is of size \( q \). This implies that \( qn = u \) as before since \( qn \) is the number of units sold each week and \( u \) is the number of units produced. It follows that the conclusions reached above with respect to the optimal number of transactions and optimal lot size for commodity users apply, \textit{mutatis mutandis}, to the number of transactions and lot size of the seller of the commodity.

It is immediately clear from the solution to the optimal lot problem that anything which reduces the costs of executing a transaction will, other things being equal, reduce the optimal lot size and increase the optimal number of transactions in which buyers and sellers engage. Since the effect of information economies is to reduce the transactions costs of the intermediaries’ customers and suppliers, it follows that information economies work against economies of bulk transactions which entail a smaller number of transactions and, if there is an appreciable minimum efficient scale in exchange, tend to increase the cost of executing a single transaction.
Suppose now, however, that intermediated exchange offers economies of bulk transactions to the customers and suppliers of the intermediary because the latter is able to break bulk. In that case, there are two optimal lot problems to consider. The first involves the commodity user in purchasing each of several commodities in separate transactions. The second involves the user in a single transaction to purchase the several commodities at once. The mathematics of the comparison of these problems is reserved for the appendix to this chapter. But the economics is quite clear.

Joint exchange of several commodities offers savings to transactors, since the number of transactions in which the firm must engage can be very considerably less than the number of transactions when each commodity is bought and sold separately. On the other hand, by reducing the number of transactions, specialization economies might be lost which, unless they are offset by information economies, will render the costs of executing a transaction more expensive than the costs of each of many transactions involving a single commodity. Whether the higher costs of executing a transaction in joint exchange would result in higher overall transactions and carrying costs depends on the magnitude of the carrying costs and utilization (or production) rates of each commodity involved.

As we have seen, higher unit carrying costs in the optimal lot problem reduce the optimal lot size and increase the optimal number of transactions, while higher transactions costs increase the optimal lot size and reduce the optimal number of transactions. This result is intuitively appealing, since carrying costs are reduced by carrying smaller stocks and transactions costs are reduced by engaging in fewer transactions. In order to buy or sell a given quantity of commodities in any time period, the only way to reduce average stock levels is to engage in more transactions involving smaller amounts of commodities, and the only way to engage in fewer transactions is to buy or sell larger amounts of commodities and, therefore, to hold larger average quantities in stock. In simple exchange (that is, when each transaction involves a single commodity), the implications of these principles for the minimization of transactions and carrying costs is straightforward enough. They are slightly more complex when we consider joint exchange.

In comparison with simple exchanges in a number of commodities, joint exchange in the same commodities will be cost-efficient unless the costs of a transaction in joint exchange are higher than the costs of transactions in simple exchanges involving commodities which account for a high proportion of the total carrying costs incurred by the firm. These are likely to be commodities which are extensively used (or produced) by the firm and which engender high unit carrying costs. In such cases, the firm will require to maintain substantial storage capacity if the commodities are bulky and/or to devote resources to minimizing the deterioration of perishable commodities (for example, refrigeration equipment for ice, bananas and meat) and might still suffer some deterioration of these perishables. Should the costs of a transaction in joint exchange substantially exceed the costs of a transaction involving one such commodity, then the optimal number of joint-exchange transactions might well increase the carrying costs of the bulky and perishable commodities by more than joint exchange reduces total transactions costs, even though the total number of transactions in which the firm engages is smaller in joint exchange than in simple exchange. Indeed, it will be the very reduction in the number of transactions which, by raising average stockholdings, increases carrying costs by more than transactions costs are reduced.

This point is important only if joint exchange is likely to involve higher transactions costs than are involved in simple exchange for commodities which dominate the complement of inputs (or outputs) of the firm and which are bulky and/or perishable. Arguably, this is likely.

In so far as firms are prone to give more attention to the purchase of their principal inputs and the sale of their principal outputs than they give to less important commodities, there are unlikely to be major information economies to be secured by engaging in intermediated exchange. Without intermediation, of course, the scope for joint exchange is limited to the production by some firms of a range
of inputs required by each of several other firms. This will be especially true if the commodities are so bulky or perishable that they cannot economically be transported over long distances or stored for any length of time. Such commodities will typically be available only within local markets where producers and users are in close proximity and, in view of the importance of the exchanges in the commodities, where producers and users see an advantage in close relations in order to maintain goodwill.

In summary, if the production technologies of producers and users render a bulky and/or perishable commodity important to the continuing operations of these firms, it is unlikely that they could secure either information economies or economies of bulk transactions involving joint exchange. Without such economies, there is no scope for intermediaries to operate profitably in the market.

6.4 THE ECONOMIES OF INTEGRATION IN EXCHANGE:
A SUMMARY

Before turning to vertical integration in production, let us glance back at the ground we have covered in considering vertical integration between production and exchange.

I have shown that intermediaries will have a role in those markets in which they can incur costs per unit of commodity traded which are smaller than the spread between the offer price and the bid price. This offer-bid price spread must in turn be smaller than the combined savings which the presence of the intermediary makes available to his customers and suppliers who could be either users and producers or other intermediaries. The savings which the intermediary makes available to his customers and suppliers arise from economies of bulk transactions and from any additional returns on investments in activities which could not be undertaken if resources were tied up in direct-exchange activities. In order for the transactions costs of intermediaries to be less than the savings in the costs incurred by their customers and suppliers, the intermediaries will require to reduce total transactions costs of intermediated exchange below the total transactions costs of direct exchange. This is the meaning of inequality (5.8). Moreover, this reduction must be effected despite the increase in the number of transactions which is consequent upon trading through intermediaries. The reduction is achieved as a result of specialization economies and economies of joint exchange — the first being a result of Smithian division of labour, and the second being the result of a fuller utilization of indivisible resources than is possible for individual firms.

All of these economies are facilitated by the compactness, durability and standardization of the commodities traded in the market. But the structure of the market is also important. If firms on either side of the market are large enough to achieve minimum efficient scale in exchange, then the intermediaries cannot reduce total transactions costs by recourse to specialization economies which are not also available to the intermediary’s customers and suppliers. However, economies of joint exchange will be available to intermediaries, but not to producers, as long as the market is characterized by product differentiation and the demands of users differ from the output composition of producers. None the less, if the demands of any of the users of a commodity are of sufficient size, then the users will be able to overcome indivisibilities in exchange and to supplant the intermediary.

Vertical integration from production forward into exchange or from production backward into exchange or vertical integration among intermediaries (for example, wholesalers and retailers) is unlikely in markets which are purely competitive in Chamberlin’s sense (see p. 70 above). That is, if there are many small producers and users of the commodity and no product differentiation, intermediation is likely to be economic, and there will be no inducement effect to vertical integration provided that the commodity is compact and durable. Product differentiation will leave the position of the intermediary intact. Oligopsony, however, will not, since the oligopsonist will be able to overcome indivisibilities and to enjoy economies of joint exchange. In the absence of product differentiation, concentrated oligopsonists and oligopolists will have an incentive to integrate backward
and forward respectively in exchange, since they will be able to achieve the same economies of specialization which are available to intermediaries.

6.5 APPENDIX: JOINT EXCHANGE AND THE OPTIMAL LOT PROBLEM

The purpose of this appendix is to demonstrate formally the conditions in which joint exchange is cheaper than simple exchange in light of the discussion of section 6.3.

In matrix notation the simple optimal lot problem is

\[
\begin{align*}
\text{minimize} & \quad \tilde{C} = c_i \tilde{n} + c_{hi} \frac{1}{2} \tilde{q} \\
\text{subject to} & \quad u - \tilde{n} \tilde{q} = 0
\end{align*}
\]

(6.4)

where \( c_h = [c_{bi}] \) is a column m-vector of unit carrying costs associated with each of m commodities, and \( \tilde{q} \) is the column vector of quantities of each commodity bought or sold in a single transaction. If there is a single transaction involving the m commodities, then \( c_i \) and \( \tilde{n} \) are scalars, interpreted as in section 6.3, while \( u \) is the m-vector of utilization or production rates of each of the m commodities involved.

The optimal order quantities and number of transactions indicated by problem (6.4) are

\[
\begin{align*}
\tilde{q} &= \left( \frac{2c_i}{c_{hi}u_i} \right)^{\frac{1}{2}} u \\
\tilde{n} &= \left( \frac{c_{hi}u_i}{2c_i} \right)^{\frac{1}{2}}
\end{align*}
\]

(6.5)

(6.6)

If \( m = 1 \), these solutions reduce to those of equations (6.2) and (6.3) in section 6.3.

The alternative for the firm is to buy or sell each of the m commodities in separate transactions. If we denote the cost of executing a transaction in the ith commodity by \( c_i \) and the number of transactions in the ith commodity by \( n_i \), then we get m solutions to the simple optimal lot problem which, using the present notation, are

\[
\begin{align*}
\tilde{q}_i &= \left( \frac{2c_i u_i}{c_{bi}} \right)^{\frac{1}{2}} (i = 1, \ldots, m) \\
\tilde{n}_i &= \left( \frac{c_{bi} u_i}{2c_i} \right)^{\frac{1}{2}} (i = 1, \ldots, m)
\end{align*}
\]

(6.7)

(6.8)

The total transactions and carrying costs incurred by the firm in joint exchange is found by substituting equations (6.5) and (6.6) into the objective function of (6.4). This yields

\[
\tilde{C} = (2c_i)^{\frac{1}{2}} \left( \sum c_{hi} u_i \right)^{\frac{1}{2}}
\]

(6.9)

Substituting (6.7) and (6.8) into the m objective functions minimizing transactions and carrying costs in m simple exchanges and summing the result, we have it that total transactions and carrying costs in simple exchange are

\[
\tilde{C} = \sum_i (2c_i c_{hi} u_i)^{\frac{1}{2}}
\]

(6.10)

Our concern here is with the effect of differences in the costs of executing a transaction in joint exchange and in simple exchange. In order to elucidate this relationship, it will be convenient to define \( \delta_i = (c_{hi} - c_i)/c_i \) so that \( c_{hi} = (1 + \delta_i)c_i \), and (6.10) can be written

\[
\tilde{C} = (2c_i)^{\frac{1}{2}} \sum_i [(1 + \delta_i)c_{hi} u_i]^{\frac{1}{2}}
\]

(6.11)

Subtracting expressing (6.9) from (6.11), we have

\[
\tilde{C} - \tilde{C} = (2c_i)^{\frac{1}{2}} \left[ \left( \sum (1 + \delta_i)c_{hi} u_i \right)^{\frac{1}{2}} - \left( \sum c_{hi} u_i \right)^{\frac{1}{2}} \right]
\]

(6.13)

Evidently, if the expression in curly brackets is positive, the whole expression is positive, and simple exchange is more expensive than joint exchange.

Suppose first that all \( \delta_i = 0 \), which means that the costs of executing a transaction in simple exchange are identical to the costs of executing a transaction in joint exchange. Then
expression (6.12) becomes

$$\overline{c} - \bar{c} = (2c_0)^{\frac{1}{2}} \left\{ \frac{1}{2} \left( \frac{\sum (c_0 \delta_i)^{\frac{1}{2}}}{\sum c_0 \delta_i^i} \right)^{\frac{1}{2}} \right\}$$

(6.13)

The term in curly brackets is now the sum of the square roots minus the square root of the sum. This is always positive if \( c_0 \delta_i \) is positive for all \( i \) as, by definition, they must be. Thus, if the costs of executing a transaction is the same no matter how many commodities are involved in the transaction, joint exchange is always cheaper than simple exchange, as we would expect. Since increasing the values of any of the \( \delta_i \) increases the value of the difference in curly brackets, the cost disadvantage of simple exchange is clearly greater as the cost of simple exchange rises relative to joint exchange. Thus, provided that the cost of every simple-exchange transaction is at least as great as the cost of a joint-exchange transaction, joint exchange is cost-efficient.

Moreover, joint exchange can be cost-efficient even if some or all of the simple exchange transactions are less costly than a joint-exchange transaction. For the bracketed difference in expression (6.12) is significantly positive when all \( \delta_i = 0 \). It must therefore be possible to reduce some or all of the \( \delta_i \) by an amount sufficiently small to reduce the positive value of the bracketed difference without reducing it to zero or making it negative. It is therefore possible for all simple-exchange transactions to be less costly than a joint-exchange transaction and for joint exchange to remain cost-efficient relative to simple exchange.

However, the effect on the costs of simple exchange relative to the costs of joint exchange are most sensitive to the transactions costs of commodities with high values of \( c_0 \delta_i \). If a commodity is exceedingly perishable and bulky so that the corresponding \( c_0 \delta_i \) is large, or if it is extensively used or produced by the firm so that the corresponding value of \( u_i \) is large, or both, then any given negative value of \( \delta_i \) will reduce or reverse the cost-efficiency of joint exchange over simple exchange to a greater extent than would the same negative value of \( \delta_i \) corresponding to a small \( c_0 \delta_i \) — that is, a commodity which is used in relatively small amounts and/or which is compact and durable.

In summary, if the cost of a transaction in simple exchange of some commodity is less than the cost of a joint-exchange transaction, this is not likely to render joint exchange un-economic unless the commodity accounts for a sizeable proportion of the total carrying costs incurred by the firm.
CHAPTER 7

Uncertainty, Exchange and Integration

7.1 SHORTAGE COSTS

One of the advantages of goodwill competition, I argued in chapter 4, is that it reduces uncertainty with respect to the availability of supplies and the strength of demands faced by individual firms. For it is in the nature of goodwill competition that a supplying firm will give preference to its steady customers in conditions of short supply, while purchasers of commodities will give their custom to established suppliers in conditions of short demand.

But cultivating the goodwill of suppliers and customers is not the only means at the disposal of firms seeking to mitigate demand and supply shortages and the attendant costs to the firm. For it is possible to hold stocks of required inputs against uncertainties in the conditions of supply, and to hold stocks of goods completed for sale or the resources required to produce services in order to avoid being caught short by unexpected surges in demands. Alternatively, the purchasers of a commodity can place orders with suppliers in order to assure a flow of supplies in the future, while producers can take orders for future outputs in order to avoid unpredictable failures of demand.

The shortages with which I am concerned here are those which arise in conditions of uncertainty. For in a certain world outputs can be tailored to the known future levels of the firm and to the inputs which will be available for their production. In conditions of risk, wherein future events are known subject to a probability distribution which is accepted with certainty, managers will be able to follow strategies which reduce the likelihood of incurring ruinous shortage costs to as low a level as the managers of any firm might wish. These conditions are not of interest in the present analysis because in certain or merely risky worlds actions can be tailored to strategies, whereas in a world with an uncertain future strategies must be chosen to mitigate the effects of uncertainty.

Implications of break-even analysis

Both supply and demand shortages have the effect of constraining the sales of the firm. For a supply shortage to be effective, it must entail some bottleneck in the production activities of the firm so that demands cannot be met. Demand shortages clearly limit sales, since customers cannot be forced to come forward. But what are the costs of these shortages?

One obvious shortage cost to commodity producers is the loss of sales revenue, which cannot be entirely offset by a reduction in costs. Clearly, in so far as direct materials costs are concerned, there will be a cost reduction in direct proportion to the reduction in output levels. However, there are some direct production costs which will not fall with output levels. The most obvious of these are direct labour costs and the costs of materials for the purchase of which producers have entered into long-term contracts. The costs of making workers redundant and then hiring replacements once the shortage has been alleviated could well exceed any savings in wage costs during the period of shortages. And suppliers with long-term contracts are unlikely to take kindly to the unilateral abrogation of agreed terms.

Moreover (and this is the point upon which Chandler (1977) rested much of his historical argument), indirect costs are insensitive to short-run variations in output levels. The effect of indirect costs on the cash flows — and hence survival prospects — of the firm will depend upon the size of the mark-up over costs used to determine prices and
upon the proportion of total unit costs accounted for by indirect costs. As is well-known from break-even analysis, a positive profit (or cash-flow) contribution from the sale of any commodity requires a higher rate of capacity utilization in proportion to the indirect costs of production attributable to that commodity. The higher are indirect costs of production, the closer is the break-even level of output and sales to the production capacity of the firm. As a result, the sensitivity of profits and net cash flow to changes in output levels (so-called operating leverage) is very considerable. The higher the indirect and non-variable direct unit costs of production, therefore, the more costly are shortages faced by the firm (cf. Reekie, 1975, pp. 384–9).

So much is elementary managerial economics. When combined with the concepts developed in relation to optimal modes of exchange, however, the implications are profound, although, as far as I know, they have not previously been explored.

One thing, at least, is clear. The attention of managers of firms which incur high indirect costs of administration and production will be focused upon ways of reducing either the operating leverage by reducing the high indirect cost element or the likelihood of unfavourable variations in supplies or demands. Since the size of the fixed-cost element is determined by the state of technology and input prices, one course of action which the firm might follow is to seek alternative technologies. If, however, the firm can keep demand and supply shortages within tolerable bounds, so that, on average, such shortages do not result in negative cash flows, it will be better advised to find ways of reducing total unit costs while taking advantage of any opportunity better to control unforeseeable shortages. That is to say, by containing shortage costs in other ways, firms allow themselves greater flexibility in their choice of technical changes, since they need not then ignore production processes with break-even outputs which are close to production capacities.

There are two sorts of strategy which a firm might adopt in order to mitigate the effects of any generalized demand or supply shortages. The first sort involves exchange; the second eliminates exchange by vertical integration in production. In the next section I shall consider the exchange strategies and in section 7.3 I shall consider the strategy of vertical integration. In all cases, however, I assume that the strategy chosen conforms with the weak assumption of managerial motivation — that is, that the strategy chosen will be expected to enhance the viability of the firm and so provide consistently positive cash flows.

7.2 UNCERTAINTY AND THE ALLOCATION OF COMMODITIES

At the start of this chapter I suggested that firms could take orders for future outputs or place orders for future inputs, and that they could produce for stock or buy for stock. In this section I consider which of these modes of commodity allocation it would be economic for individual firms to adopt, provided that they do not opt for vertical integration in production.

Producing commodities to order entails higher transactions costs and lower carrying costs than producing commodities for stock. The reasons for this are perfectly obvious. If commodities are produced only to order, the terms of each order must be agreed, but the producing firm will require to hold virtually no stocks of commodities which have been completed for sale. If commodities are produced for stock, then the producing firm will incur the carrying costs of those stocks but can sell from stock to customers as they come along without first agreeing the details of what and how much is to be produced.

Production for stock is more likely, then, in the case of commodities which entail low carrying costs (commodities which are compact and durable). If, moreover, the commodities are highly standardized and in general demand, the firm could expect stock to turn over, establish its production capacity to meet the average demand for the commodity and allow the volume of stocks to vary seasonally or cyclically as the level of demand varies.
If the requirements of the producer’s customers are highly specialized, so that the firm cannot produce standard commodities all of which are in general demand, then the rate of stock turn could not be very high, and the firm would require either to produce specialized outputs to order or to maintain stocks of each of a large variety of commodities. If holding stocks of such commodities were to entail any significant carrying costs over time, the producer would be likely to find that the savings on carrying costs which result from production to order would exceed any increased transactions (or order) costs.

What I am arguing here is that compactness, durability and standardization - the commodity characteristics which favour market intermediation - also favour production for stock rather than production to order.

Of course, it is necessary for firms producing to order to have some means of absorbing demand variations. If the production processes operated by the firm entail substantial fixed and indirect unit costs, then the firm would incur shortage costs if it were to be forced to curtail production during periods of slack demand. For this reason, firms producing to order queue their customers, so that the length of the queue (or order-book length) takes up any seasonal or cyclical variations in demand.

But what about the users of commodities? Will they be prepared to queue for required inputs? The answer depends upon the technological characteristics of the production processes employed by the commodity users.

The technology of production by commodity users will determine the lapse of time between the manifestation of a need for an input to the firm’s production processes and the requirement to meet that need. If the commodity in question is some direct material input to the production of some item, the demand for which has increased, then the firm will require to increase its inputs of that commodity very quickly in order to satisfy its own customers. How quickly the firm will require to increase its production rate will depend on its own stocks of both inputs and outputs completed for sale. But once these stocks are depleted, the firm will begin to incur shortage costs, the size of which will depend upon the firm’s operating leverage. If the indirect and fixed costs of the firm are so high that break-even capacity is very close to capacity output, and therefore operating leverage is high, then the shortage costs will be substantial, and the firm could profitably offer a premium to producers in order to jump the queue for its outputs.

In other circumstances the need for a commodity will be less urgent once it has become manifest. This will be the case with some inputs to capital investment projects. Those inputs which are required early in the construction of new plant and equipment will be the subject of more urgent demands than the later inputs. Builders, for example, might require to purchase bricks and cement from suppliers’ stocks in order to construct a factory, while the machinery, which could not be put in place until the factory building is completed, could more readily be ordered with no loss to the purchaser from taking his place at the end of the queue of machinery customers.

An example: industrial valves

The industrial valves industry is composed both of divisions of a few large firms, such as Guest, Keen and Nettletons, and a large number of small firms specializing in particular kinds of valves. One such firm which is well-known to the author specializes in the production of safety valves and pressure-reducing valves. Until the late 1970s this firm would design a valve for every order it received. After a change in management, however, the new management team decided to standardize its output as much as possible in order to be able to stock a relatively small number of standard parts. The fullest extent of standardization which the management team deemed feasible still left the firm with a product range of several hundred distinct sizes and types of valves.

If stored in reasonably dry conditions, there will be no significant physical deterioration of completed valves, although if they are stored long enough, they might become unsaleable through obsolescence. The larger valves are bulky, however, and to hold them in stock requires substantial
storage space. Moreover, a single valve could cost several thousands of pounds to produce, so that, at rates of interest averaging well over 10 per cent since the late 1970s, the cost of financing a valve could cost several hundreds of pounds a year, in addition to the costs of financing and maintaining storage capacity. Because demands for valves are specialized, the firm might receive orders for any particular size and type of valve very infrequently; the size of the order will depend on the particular project for which it is required, and this is not readily predictable. By producing valves only to order, the manufacturer saves substantial storage and financing costs, while at the same time orders received at the start of the construction project for which the valves are required can be met in good time to meet the needs of the buyer. Although the required delivery lags in some projects are shorter than others and, occasionally, shorter than could be met if orders were invariably filled in the order in which they were received, production scheduling can allow for necessary queue jumping so that all deliveries can be made as required by customers.

The technology of valve production rests on computer-controlled machine tools which entail large indirect costs, while direct production costs (wages and materials) are a small and falling proportion of total unit costs in the industry. In consequence, the firm's operating leverage is sufficiently high for short-time operation over several months to be ruinous to the firm. For this reason, valve producers maintain production capacities which, on average over time, are unlikely to involve output rates in excess of the rate at which new orders are received. Thus, fluctuations in demands are taken up by variations in order-book lengths, although customers' orders can usually be filled as they are needed.

7.3 VERTICAL INTEGRATION IN PRODUCTION

If vertical integration in production is the result of a focusing effect within the firm, then the analysis of the conditions leading to such a strategy need not extend the discussion in chapter 3. In this section I shall be concerned with inducement effects which lead to vertical integration in production.

Arguably, one important class of inducement effect here is that identified by Chandler (1977) in the analysis summarized in section 5.1. It will be convenient to restate Chandler's argument in terms of the framework developed in this book in order to demonstrate its theoretical as well as its descriptive importance.

In those industries in which technical change has led to highly mechanized production, the capital and running costs of the plant and equipment embodying these technologies have resulted in very high operating leverage which, to be profitable, requires that plant and equipment must be operated at, or very close to, full capacity. Chance shortages of either inputs or demands impose considerable cash-flow losses upon the firm, so that any uncertainty about the stability of supplies and demands must render the likelihood of a profitable outcome from investments in such technologies more uncertain. Systematic shortages simply make innovation in such technologies uneconomic.

If the firm which is investing in high-fixed-cost plant and equipment is doing so in order to grow, then its management team would do well to consider incorporating vertical integration in its growth strategy in order to reduce the uncertainties attaching to that strategy and thereby to render less vulnerable the survival of the firm. In a certain world the management team would compare the shortage costs which result from the purchase of inputs from independent suppliers and sales to independent customers with the shortage costs which would be incurred in a vertically integrated firm. If vertical integration were to reduce shortage costs by more than any increases in transactions and carrying costs which might result from vertical integration, then vertical integration would be an obviously economic element in the strategy of the firm.

Unfortunately, shortages of either inputs or demands are not always readily predictable. Input shortages could result from the bankruptcy of a supplier, which the firm could not have foreseen. The state of demand over the lifetime of an investment might result from deflationary
policies of a government, the election of which was unexpected, or in response to some volatile movement on the financial markets. In the face of such uncertainties, a firm might well seek to incur larger transactions costs, carrying costs, production costs and/or administrative costs in order to minimize the worst possible effects of events in an unpredictable future. Even so, the management team of any firm should be more likely to adopt a strategy of vertical integration the smaller are the likely increases in transactions, carrying, production and organizational costs. More to the point, in an integrated economy in which commodities are produced by means of commodities, vertical integration to secure all supplies and all demands would logically result in a firm which produced all, or almost all, of the goods and services which are available in the economy. At the very least, any management team must order the priorities given to any investment in vertical integration, since the firm can grow no faster than its finances and managerial and other resources allow. For this reason, the management team of any firm considering vertical integration would best ensure its continuing viability by integrating vertically first into those activities which hold the promise of greatest reduction in possible shortage costs for the least cost of integration. Let us consider these costs of integration.

Transactions costs If the rate of utilization of a commodity by the firm is sufficiently high to reach minimum efficient scale in exchange, then the costs of arranging transfers of the commodity within a vertically integrated firm are unlikely to be any greater than the costs of arranging transactions with independent customers or suppliers. Indeed, having a captive supplier or customer within the firm will reduce the search and information costs to below the level of which it is necessary to find and keep independent suppliers and customers.

Carrying costs The issue here is whether carrying costs will be increased or diminished by vertical integration in production. Since carrying costs are likely, on average, to be covered by the price at which the commodity is traded, vertical integration will affect total carrying costs principally by affecting the volume of stockholdings. As we have seen, if the commodity is specialized to the needs of the user firm, or if it is bulky or perishable, the economic mode of output allocation is by queuing customers. It is more imperative to adopt this mode of output allocation as the operating leverage in the production of the commodity is higher. Nothing can be done in these conditions to reduce carrying costs further.

If, alternatively, the commodity is sufficiently standardized, compact and durable to be held economically in stock by producers, users and intermediaries, then vertical integration could affect carrying costs. Carrying costs of inputs might be reduced by vertical integration if operating leverage in the production of the commodity is low, so that the rate at which it is produced can be varied in response to demands without incurring sizeable shortage costs. Then if any likely shortage costs are less than the costs of carrying stocks of the commodity, the stocks can be very much reduced, and the savings on carrying costs in a vertically integrated firm will exceed the shortage costs which arise from any fluctuations in outputs.

If forward integration is contemplated, it is difficult to see how there could be any reduction in carrying costs unless concentrating production for captive markets involves smaller fluctuations in demands than is found in independent markets. That is, the firm could integrate forward into the production of goods or services for which the demand is more stable than usual, so that steady production rates are matched by steady rates of utilization of the commodity. In that case, it would be unnecessary for the firm to hold stocks in reserve for unexpected surges in demands or to find itself with very large stocks because of unexpected demand shortages.

Although there are many cases of forward integration in production in order to utilize outputs when traditional demands for them are falling or, indeed, of horizontal integration in order to utilize by-products from traditional production processes, I know of no cases in which a firm has integrated forward in production in order to even out
demand patterns and thereby reduce carrying costs. When firms do integrate forward to stabilize demands or even to create demands, the action appears typically to involve forward integration from production into exchange. That is, mass-producing firms take over independent intermediaries or bypass them by expanding their own sales organizations internally. This is a point to which I shall return presently.

Production costs This is quite a simple point, which is closely analogous to the discussion of transactions costs. If the scale of the demands for an input by the firm can be met by the outputs from one or more plants of minimum efficient scale in production, then the costs of production in a vertically integrated firm will not, on technological grounds, be any greater than production in independent firms. The further below the minimum efficient scale of production is the rate of utilization of a commodity by any one firm, the more costly will be the integration and, therefore, the greater must be the savings in shortage costs if vertical integration is to be a viable strategy.

Administrative costs The focusing effects which result in changes in administrative structure as the productive resources of the firm change in scope and scale were discussed in detail in section 2.3. It is, therefore, sufficient to note here that if vertical integration results in two virtually independent organizations operating under the umbrella of a single firm, there is no reason to expect any increase in administrative efficiency. Even so, vertical integration of ownership without corresponding administrative integration will reduce the prospect of shortage costs if the captive supplier gives the captive customer preference in the allocation of outputs. This preference will be important in the cases of commodities produced subject to high operating leverage either if they are produced to the particular requirements of each customer or if they are bulky or perishable. For in these conditions customers will be required to queue for the commodity. If the producers of that commodity, however, are unwilling to provide sufficient production capacity to meet the needs of the market, it will then be necessary for the users who incur the highest shortage costs from deficient supplies of the commodity to integrate backwards in order to eliminate the market altogether and always to obtain whatever outputs are available from at least one productive establishment.

In effect, vertical integration in these cases provides enterprise in activities which have suffered from entrepreneurial failure and which would be profitable even to independent firms. In such cases, market failure induces firms with high operating leverage to integrate backwards in production. As argued in section 2.3, it is historically indisputable that vertical integration accompanied by administrative integration can yield considerable advantages in co-ordination. For investments in capacity expansion at earlier stages of production will not be undertaken unless there is a clear and known demand for the resulting outputs at the later stages of production. In allocating finance and managerial and other resources to the earlier stages of production, there is far less uncertainty attaching to the investment within the integrated firm than there would be in an independent firm, simply because the integrated firm has a captive customer in itself.

This point occasionally raises the objection that when faced with a captive market for its outputs, a firm might become inefficient in the production of those outputs (see, for example, Reckie, 1975, pp. 283-4). Whether this result is likely depends on the extent and nature of organizational integration which accompanies or follows vertical integration in production. If the firm adopts a multi-divisional form of organization, the central office, as we have seen, will be able to monitor the efficiency of the various divisions and so ensure that the presence of captive markets does not lead to inefficiencies in production.

In summary, provided that the appropriate administrative structure is adopted, one would expect vertical integration in production to reduce some of the uncertainties of investment by rendering more remote the likelihood of substantial shortage costs. For vertical integration creates opportunities for investments in production capacities, the outputs from which have as secure and predictable a market as it is possible
to find. This will be especially important where investments are in production capacities which involve high operating leverage and in which the outputs are themselves employed in production processes involving high operating leverage.

Examples of vertical integration in exchange and production

A classic example of the forces described above is that of James Buchanan Duke, who organized the American Tobacco Company. In 1884 Duke leased and had installed in his factory two automatic cigarette rolling machines, which between them had the capacity to saturate the American market for cigarettes, which was then in its infancy. In order to sell the resulting outputs, Duke established sales offices in the larger American cities and undertook extensive advertising campaigns. At the same time Duke signed marketing agreements with wholesalers around the world. The domestic sales offices looked after local distribution and advertising but did not supplant the intermediaries except in so far as they sold directly to the largest retail establishments. Otherwise Duke's firm continued to sell through the traditional channels: tobacco, grocery, drug and other jobbers (Chandler, 1977, pp. 290–2; Porter and Livesay, 1971, pp. 201–8; Tennant, 1950, ch. 2).

This was a case in which an existing demand deficiency focused the attention of the management team (composed only of Duke) upon the need to create additional demands. The resources of the firm at that time were devoted entirely to the production and sales of cigarettes, so that there was no focusing effect which would lead the firm to diversify horizontally. At the same time even the largest producer could not supplant intermediaries who traded not only in cigarettes but also in a wide range of dry goods. These intermediaries could secure economies of joint exchange which were not available to the specialist producer. The very high operating leverage which resulted from the technology adopted by Duke's firm, however, meant that demand deficiencies would impose very large shortage costs which the firm could not survive. Accordingly, Duke sought to secure his markets by advertising, since he would have been at a serious cost disadvantage had he attempted to supplant either the wholesalers or the retailers by forward integration into specialized cigarette retailing. Indeed, subsequent attempts by the American Tobacco Company to integrate forward into tobacco retailing met with scant success.

Duke's decision to lease the machines for the manufacture of cigarettes was a clear example of the focusing effect in a firm which had adopted growth as its goal. Once having chosen his growth strategy, however, Duke had no choice but to change the characteristics of the market if he were to succeed and his firm were to survive. This was an example of the inducement effect, since market characteristics largely determined the competitive strategy of heavy advertising and the investment strategy of establishing local sales offices. But, as always, the inducement effect here was not independent of the resources of the firm and the motives and ambitions of its management team. For the resources of the firm and the consequent technology it employed determined the desirable characteristics of the market for cigarettes and so led Duke to establish those characteristics in fact.

Examples of backward integration in production which result from inducement effects are not hard to find. Two obvious cases are the backward integration by oil refiners into exploration and production once they adopted large-scale refining technology and the backward integration by Continental and American steel producers into the mining of iron ore and coal. In both cases the processing technologies entailed high fixed costs and, therefore, operating leverages which made ready and secure supplies of inputs crucial to the avoidance of substantial shortage costs. In both cases there was some forward integration into exchange when wholesalers and retailers ceased to be able to obtain any economies in exchange which the producers could not themselves obtain and, in the case of the Carnegie Steel Company, the intermediaries were unwilling to undertake the investment in stock holdings which Carnegie required in order to be able to sell the high volumes of specialist steels he was producing.
While both iron ore and crude oil are durable and relatively standard commodities, both are bulky, and long-term storage was and remains expensive relative to the prices of these commodities. None the less, the high fixed costs of steel production and oil refining appear to have dominated the inducement to backward integration, although if these commodities could be stored at virtually no cost in relation to the value of the processed outputs, it does seem reasonable to suppose that extensive purchasing organizations and storage facilities could have rendered strategies of backward integration unnecessary.

7.4 MANAGERIAL AND MARKET CO-ORDINATION: THE IMPORTANCE OF TECHNOLOGY

It has been a constant theme of this and the preceding two chapters that technology is a dominating determinant of the limits to market co-ordination of production and the ways in which productive activities will be co-ordinated by markets when such co-ordination is economic. Although dominant, technology is not, of course, the sole determinant of the existence of markets, the institutions which comprise them and the mode of allocation of commodities in those markets which do exist. The other main factors are the physical characteristics of commodities and buyer and seller concentration. Since the physical characteristics of commodities which are important in the present analysis can only be defined in relation to the technologies of transportation, storage and communication, it is really only concentration factors which give rise to inducement effects leading to vertical integration or the establishment of institutions of exchange and which are not themselves simply a result of the technology employed in production and exchange.

The only established theoretical alternative to this conclusion is that the limits to the activities of the firm and the co-ordinating role of the market are determined primarily by information costs. This is basic to the work of Coase (1937), Alchian and Demsetz (1972) and Williamson (1975), to which I referred in section 5.1. Now, these authors do not deny that technology is important, any more than I have denied any importance to information costs. What is involved here is a judgement about which factors are dominant.

It will perhaps avoid unnecessary misunderstanding if I distinguish the present approach from theirs. I shall consider first the economic effects of disingenuous deception by parties to transactions. It will be remembered that the school of thought deriving from the work of Coase believes that corporate organization and the extent of vertical integration will be determined primarily by the need to avoid such opportunistic misrepresentation, shirking and deception.

In their book on the development of markets Porter and Livesay (1971) have demonstrated that manufacturers often sell to a few jobbing wholesalers rather than to retailers in order to reduce credit losses and other moral hazards. By way of example, they cite the president of an American firm which mass-produced watches at the turn of the century. He wrote, 'One reason we sell to the jobber is because it is much easier for us to sell to one hundred jobbing houses, who pay us promptly, than to sell to twenty-five thousand jewellers and carry credits and have a very extensive credit department' (Porter and Livesay, 1971, p. 223).

This looks, at first glance, to be precisely the sort of phenomenon which would support the case of the information-cost theorists. The manufacturer in this case chose not to integrate forward in exchange because, in his view, selling to the wholesaler rather than to the retailer reduced his exposure to bad debts and reduced his costs in exchange because he was dealing with a few customers who were well-known and, in his experience, reliable. On investigating this example more closely, however, the support it gives to the information-cost theorists is far less clear.

Watches of the sort sold by this firm are compact, durable and standardized. They are ideal subjects for intermediation. In addition, the watch manufacturer clearly secured information economies by trading with 100 wholesalers instead of 25,000 retailers. But, to hark back to an earlier example, there is little to distinguish the position of the watch manufacturer from that of the manufacturer of fountain pens
who sold his product directly to retailers. The watch manufacturer was unwilling to invest in the resources necessary to trade with many retailers rather than a few wholesalers, while the fountain pen manufacturer in the same historical period did make that very investment. Moreover, both companies have been successful and continue to trade today. And both sell through many of the same retail outlets.

There are two explanations for the different strategies of these otherwise similar firms. One is that the management team of the firm manufacturing fountain pens was composed of better entrepreneurs with the ambition to grow, and this led them to integrate forward in exchange and thereby to reap the wholesalers’ profits. The manufacturer of watches might have lacked this entrepreneurial spirit. The second explanation turns on the doctrine of comparative advantage. Let us consider this possibility in more detail. I shall state the position first as an information-cost theorist might.

Each wholesaler, since he deals with a relatively small number of retailers, might be better able than the manufacturer to put personal pressure on them to pay their bills in good time. In each case there could be an element of goodwill which, because of the smaller numbers involved, could be more strongly developed than in a more impersonal relationship between one manufacturer and 25,000 retailing customers. This sounds plausible enough.

But the question which arises is whether it is really likely to be beyond the wit of a wrist-watch manufacturer to put together a sales organization in which each salesman calls on a small number of retailers and is expected to develop the same strength of goodwill as the wholesaler would have done. Moreover, by keeping track of the credit records of 25,000 retailers, the manufacturer could obviously achieve whatever specialization economies were available to wholesalers, each of whom deals with an average of only 250 retailers in the case under consideration. It seems far more likely that except in the case of entrepreneurial failure or a lack of desire to grow, the manufacturer has better and more profitable ways of using the resources available to him.

In the latter case the intermediary simply has a comparative advantage in exchange because the watch manufacturer could use the resources not devoted to maintaining a larger credit department and sales organization and the finance not devoted to funding the credits for the expansion of production capacity, for backward integration or for horizontal diversification. If such activities hold out the prospect of a greater rate of return than would be expected from forward integration, then the intermediary has a comparative advantage, even if he does not have the absolute advantage which would follow from inequality (5.8) in chapter 5.

The essential difference between the information-cost theories of vertical integration and the theory developed in this book turns on the difference between focusing effects and inducement effects. The information-cost theorists argue, in effect, that information costs which arise from market transactions will induce firms either to integrate vertically or to refrain from so doing. The theory of business strategy developed in this book, however, leads one to accept that the information costs or, better perhaps, misinformation costs which Alchian, Demsetz and Williamson consider to be important might provide a focusing effect, but that there is nothing to render the elimination or continuance of exchange imperative on that account alone. At the very least, the fear of shortage costs in firms with high operating leverage will, to paraphrase Dr Johnson, concentrate the mind even more wonderfully than the costs of misinformation.

Having considered a case in which an information-cost theorist might argue that a strategy of vertical integration was not adopted in order to avoid moral hazard, I shall now consider a case in which one of these theorists has argued that technology is less important than information costs. I would take the opposite view.

The case in question is often cited by writers on the topic of vertical integration in production. It turns on cost savings which are made possible by integrating steel-rolling mills with the blast furnaces in which steel ingots are made. For newly produced steel is hot, and for important steel rolling processes the steel ingots must also be hot. It is obvious that by integrating in a single establishment the furnaces and the rolling
mills the rolled-steel producer is saved the cost of reheating the steel.

Now, Williamson (1975, pp. 83–4) argues that steel production and steel rolling are integrated within the same firm because it would be difficult to agree and enforce contracts between independent furnace operators and rolling-mill operators to ensure that the former would provide the latter with hot steel. In the light of the analysis of this and the two preceding chapters, however, I would argue that hot steel is perishable in respect of its heat. It is also bulky in relation to its value, so that there will be considerable savings in carrying costs — including here the cost of making good any heat loss — by using the steel furnace outputs immediately as inputs to the rolling process. In addition, there are very substantial fixed costs in the maintenance of both the furnaces and the rolling mills, so that the shortage costs of insufficient inputs to the rolling mills or demands for the outputs from the furnaces will be considerable. Both operations entail very considerable operating leverage. Thus, it is the perishability and the bulk of the hot steel, as well as the magnitude of potential shortage costs, which induce the vertical integration of steel production and rolling.

This is not to deny that the costs of contracting for the delivery of hot steel by an independent producer to an independent user will be substantial. However, the technological factors make the cost of any contractual failure very considerable indeed for both parties. Moreover, if it were not for these technological factors, the cost to both the producers and the users of the hot steel could be very much smaller.

In summary, for this case at least the information costs which Williamson deems crucial to his conclusions appear to result from the physical characteristics of the commodity in question and the technical characteristics of the processes in which the commodity is produced and used.

CHAPTER 8

Market Power and Market Price

8.1 THE REASONS FOR AN ANALYSIS OF MARKET POWER

In neo-classical theory prices operate on exogenous conditions of supply and demand to allocate resources both within the firm and in markets. There are compelling reasons to reject this view in the present theoretical analysis.

One reason I have discussed at length in chapters 2 and 3. It is that neo-classical theory rests on the assumption that firms are characterized by exogenous production functions, whereas the aim of business strategy is to change the relationships which the production function describes.

In addition, we have seen in the three preceding chapters that firms will be subject to inducement effects to alter market relationships when the institutional structures of markets adversely affect the survival prospects of the firm, or when they are incompatible with strategies of growth and diversification to which the management team of the firm is committed. The changes in the institutional composition of the market might be effected by vertical integration in production or exchange or by goodwill competition (such as advertising directly to households) which reduces the influence of a firm’s immediate customers (such as wholesalers or retailers) upon the strength and composition of demands for the firm’s outputs. Any of these strategies will, if successful, alter the conditions of demand and supply faced by the firm — conditions which are represented in
theory of price and output determination, we require an independent analysis of market power. But first we require a clear definition of that concept.

8.2 AN ECONOMIC DEFINITION AND ANALYSIS OF MARKET POWER

Market power will be defined here as the ability to inflict unacceptable consequences upon competitors, suppliers and/or customers. Now, consequences which are unacceptable to one management team might be tolerable to another. The threshold of acceptability is likely to depend upon the strategy adopted by each particular management team and its strength of commitment to the strategy it has chosen. It follows from the weak assumption of managerial motivation, however, that consequences which threaten the survival of the firm will be unacceptable to any management team. Since survival requires the maintenance of positive net cash flows on average over time, it will be consistent with the previous analysis of this book to identify market power with the ability systematically to eliminate the positive net cash flows of competitors, suppliers and/or customers in so far as that cash flow derives from, or depends upon, activities in the markets in which the holder of market power trades.

We have already seen several ways in which a firm can exercise market power. One example is the advertising of branded consumption goods directly to households, so that final purchasers specify the outputs of particular manufacturers. If, as a result, consumers give their custom only to retailers who stock the products of the advertising manufacturer, then the retailer who does not stock those products will lose sales. If the loss of sales has an adverse effect on the retailer’s cash flow, then the manufacturer can refuse to sell his outputs to retailers who do not conform to prices established by the manufacturers — both the prices at which the retailer buys those outputs and the prices at which he in turn sells them. If the retailer’s customers give him their custom in order to secure economies of joint exchange, or if
the retailer's sales are made up largely of a commodity or group of commodities the prices of which are set by the same sellers, then the loss of cash flow, should they refuse to supply him, could indeed be devastating. It would in any case reduce the available finance of the retailer, thus limiting the incomes of the owners or the ability of the firm to grow and diversify. To the extent that any of these consequences is unacceptable to the retailer, the manufacturer holds market power over him.

This sort of case is by no means fanciful. Until resale price maintenance was made illegal, to all intents and purposes, by Act of Parliament and decisions of the Restrictive Practices Court, refusal to supply retailers was a principal means by which manufacturers ensured that retailers did indeed maintain the prices set by the manufacturers. And attempts by manufacturers to prevent price competition among retailers by this same means are hardly unknown since the practice has been illegal.

**Technological and financial bases of market power**

One means of curtailing the cash flows of customers, suppliers and/or competitors is by restricting their throughputs. This is done by restricting the availability of inputs required by customers or the rate of sales and hence outputs produced by suppliers, or by restricting competitors' inputs or outputs. It is clear from the discussion in chapter 7 that the effect of any restriction on cash flow will be greater the higher the operating leverage of the firm of which throughputs are reduced. In other words, restricting outputs by any means — including the restriction of necessary inputs — imposes shortage costs which certainly limit the finance available to follow strategies of growth and diversification and which might actually threaten the survival of the firm.

A second means of curtailing cash flows is the raising of input prices and the lowering of output prices. Either of these price changes increases break-even outputs and therefore operating leverage. The greater the initial operating leverage, the larger will be the proportional effect on cash flows from any increase in input prices or reduction in output prices. Of course, it is always possible that one or the other of these price changes could increase direct unit production costs or lower unit revenues to such an extent that direct costs exceed revenues for any feasible output. In such cases, continued production for any appreciable period of time becomes wholly uneconomic.

It follows that market power is more readily acquired by a firm if its suppliers, customers and/or competitors produce subject to considerable operating leverage than if the operating leverage of each of these firms is slight. For the greater the operating leverage of any firm, the greater will be the proportional impact on its cash flow of any curtailment of throughputs or any adverse changes in the prices of inputs and outputs.

Although high degrees of operating leverage encourage concentrations of market power, it by no means follows that there will be concentrations of power in all markets in which traders are subject to such operating leverage. For it is of the essence of power that its holder should be able to exercise it without himself incurring unacceptable consequences.

There are two sets of conditions which are sufficient for there to be a concentration of power in a market. The first is that there should be a concentration of financial strength and, in the long run, differential production and/or selling cost efficiencies. The second condition is that there should be substantial buyer or seller concentration in the market.

Consider the first set of conditions. It will be convenient to take the case of a price leader as an example here.

How does a firm maintain its position as price leader? Surely it is by threatening, perhaps implicitly, to undercut the prices of any other firm in the industry which deviates from the leader's price? Now, such a threat must be credible, and it will be credible only if the leader is known to have the capacity to reduce prices below the production costs of any other firm in the industry for a longer period of time than could the other firms in the industry. At the same time, the price leader must meet all of the demands which its lower prices attract.
If the financial strength of the price leader is far greater than that of any of its competitors, then that firm could hold its prices below its own costs of production if that were necessary to squeeze the demands of its competitors or to reduce the prices they could get for their own outputs below their own costs of production. That is, if the price leader is no more cost-efficient than its competitors, it must have sufficient financial reserves or borrowing capacity to suffer negative cash flows over a longer period of time than the financial strengths of its various competitors would allow them to do.

Alternatively, the price leader might simply be far more efficient than any of its competitors, in the sense that it produces and sells at lower unit cost. In that case the price-leading firm could shade its prices so that they were below its competitors’ unit costs while the price leader continued to generate gross profits, albeit at a reduced rate. However, superior efficiency is not itself sufficient to enable a firm to claim the mantle of price leadership.

It is quite possible, for example, for a new firm to be established in an industry with scant financial resources but with the most advanced and efficient plant and equipment. The unit costs of such a firm could well be the lowest in the industry, since its competitors will require to operate at least some older and less technically advanced equipment in order to meet the level of demands required to maintain goodwill with their customers. If the new, small, poor firm were to set its prices above those of established firms, it could hardly expect to gain a foothold in the market. If it were to set its prices below those of the established firms, they would very probably have the financial reserves to cut their own prices below unit costs for the short period of time necessary to force the new, relatively efficient firm into bankruptcy. A firm which can lead prices neither up nor down is hardly a price leader.

If the foregoing line of argument is right, the market power necessary to exercise price leadership certainly requires some concentration of financial strength in the hands of the price leader and is enhanced by relative efficiency in production and exchange. But while in the short run financial strength is a necessary and sufficient condition for market power, efficiency is neither necessary nor sufficient.

In the long run, however, one would expect the relatively efficient firm to increase its financial strength in relation to that of less efficient firms — provided that it can remain in business. The essential point here is simple mathematics.

In any industry in which all firms set or accept the same prices, any firm with a higher profit margin must incur lower unit costs than a firm with a lower profit margin. In this circumstance, the higher the profit margin, the more efficient the firm. The point to be demonstrated here is that the most efficient firm can generate financial strength faster than any other firm (by financial strength I mean size of liquid reserves relative to normal outputs, together with untapped borrowing capacity). The borrowing capacity of a firm is typically related to the value of its net assets or net worth, since lenders usually impose some limit to financial leverage or gearing. Thus, it will be legitimate to identify untapped borrowing capacity with low financial leverage.

If the net profit margin is \( \pi \), the output price \( p \) and output flow \( Q \), net trading profits in any period are \( \pi pQ \). If net increases in debt are \( F \), the total sources of funds for the firm are \( \pi pQ + F \), ignoring any non-trading income. The uses of funds are profit distributions as interest and dividend payments together with investment expenditures. If the cost of increasing production capacity by one unit is \( v \), the value of net investment is \( v\Delta Q \). If \( s \) is the net retention ratio of the firm, profit distributions are \( (1 - s)\pi pQ \). The firm's uses of funds then will be \( v\Delta Q + (1 - s)\pi pQ \). The net cash flow — the excess of sources over uses of funds — will be

\[
Z = s\pi pQ + F - v\Delta Q \tag{8.1}
\]

In order to consider the effect of efficiency on financial leverage, it will be best to relate net increases in debt to profit retentions. For this reason, I define \( f = F/(s\pi pQ) \) so that \( f \) is the marginal financial leverage of the firm. Substituting this definition into expression (8.1), we have

\[
Z = (1 + f)s\pi pQ - v\Delta Q \tag{8.2}
\]

Dividing through by \( Q \),
\[ z = (1 + f)s_\pi p - vg \quad (8.3) \]

where \( z = Z/Q \), cash flow per unit of output, and \( g \) is the rate of output growth. Solving for the price of output,

\[ p = \frac{z + vg}{(1 + f)s_\pi} \quad (8.4) \]

Now let us compare two firms, labelled 1 and 2, of which one is the price leader and the other a follower. The price \( p \) will therefore be common to both firms. Let firm 1 be the follower but technically more efficient than the price leader, firm 2. There will be an equation such as (8.4) for each of these firms, in which \( p \) takes the same value although no other variable need do so. Eliminating \( p \) from these two equations, we have

\[ \frac{z_1 + v_1 g_1}{(1 + f_1)s_1 \pi_1} = \frac{z_2 + v_2 g_2}{(1 + f_2)s_2 \pi_2} \quad (8.5) \]

Since firm 1 is more efficient by assumption, \( \pi_1 > \pi_2 \), from which it follows that

\[ (1 + f_1)s_1 < (1 + f_2)s_2 \]

\[ z_1 + v_1 g_1 < z_2 + v_2 g_2 \quad (8.6) \]

Apart from the implicit assumption that the cost of the productive equipment of each firm grows at the same rate as its outputs, condition (8.6) is derived entirely from definitions. It therefore specifies nothing other than quantitative relationships and absolutely nothing about behaviour. For this reason, my comments about this inequality are not conclusions but merely a starting-point for the discussion of efficiency and financial strength in the long run.

Provided that firm 1 is more efficient in production than firm 2, inequality (8.6) implies that at least one of the following must be true.

(a) Firm 1 grows faster than firm 2 (\( g_1 > g_2 \)).
(b) The financial leverage of firm 1 is lower at the margin than the financial leverage of firm 2 (\( f_1 < f_2 \)). Thus, the leverage of firm 1 is falling relative to the leverage of firm 2.

(c) Firm 1 holds a rising proportion of its assets in liquid form relative to the proportion of liquid assets held by firm 2 (\( s_1 > s_2 \)).
(d) Firm 1 retains a lower fraction of trading profits than firm 2 (\( s_1 < s_2 \)).
(e) Although more efficient in production (\( \pi_1 > \pi_2 \)), firm 1 is less efficient in investment than firm 2 (\( v_1 > v_2 \)).
(f) None of the above. It is simply that the ratio of internal and external finance to costs (the numerator) divided by the value of liquid and real assets per unit of current output is smaller for firm 1 than for firm 2.

Of these six possibilities, the last seems least likely on economic grounds if firm 1 is seeking security of survival — that is, if the weak assumption of managerial motivation is true. For the firm would have to choose to grow more slowly and to increase its financial leverage more quickly, in effect by choosing to keep its internal finance small and giving away its liquid financial assets. This is mathematically possible but, at the same time, it is strategic lunacy.

Of the remaining five relationships, some are likely to be important and true in some markets and others in other markets. I can see no reason to postulate that one scenario is more likely than any other or to suggest that any will be universally applicable. But, apart from inefficiency in investment, all of the five economically sensible relationships above will increase the power of the efficient firm 1 relative to the inefficient firm 2. Consider one example of what could happen.

It is typical for small but successful firms to grow at a very high rate early in their lives and to do so with high financial leverage and profit margins. As they increase their market shares, however, such firms attract the attention of the management teams of large, established firms. If the established firms do threaten their newer and financially weaker brethren, the latter might well accept whatever market share they have already attained and reduce their growth rates to the same level, on average, as that of the market, thereby to stabilize their market shares. Thereafter, the owners of such firms could take profits out of their firms as profit
distributions or reduce their financial leverage while, at the same time, building up stores of financial reserves. Alternatively, they could diversify into other markets. But as long as the management teams of the more efficient firms are growth-oriented — so that they do not simply seek the quiet life financed by high profit margins — their real and/or financial assets will continue to grow and, therefore, their market power will continue to be enhanced. Once such a firm has the untapped borrowing power resulting from low levels of financial leverage and the liquid resources and production capacity to withstand price cutting by the established industry leader, it can cease to hold its outputs at levels that the established leader dictates or to follow it in setting prices. At that stage, the locus of price leadership, or, more generally, industry leadership, will be uncertain. Eventually, the faster growth of the financial strength of the more efficient firm should enable it to take on the undisputed mantle of the industry leader.

Concentration and market power

I suggested above that, in addition to financial strength and efficiency, buyer or seller concentration is necessary if there is to be a concentration of power in the market. For if a firm accounts for a very small proportion of sales in a market, it can hardly threaten the survival of either its competitors or its customers. The customers of such a firm — no matter how efficient and financially strong it might be — could spread their custom among other suppliers in the event of a price rise or a refusal to supply. The other suppliers would thus face a small proportional increase in demands. Unless the industry is in the midst of a boom in demand, other firms are likely to be able to meet these relatively small increases in demands either by operating plant and equipment more intensively, or by running down stocks, or by re-ordering their customers who are queueing for future outputs, or by allowing the queues to lengthen slightly. Thus, a firm which tried to lead prices upwards would have little power to force its customers to accept price rises unless its market share were so large that its refusal to sell would lead to substantial excess demand at any lower price. Moreover, if a small firm were to reduce its prices, then, even if it had unlimited financial resources and superior cost efficiency, unless it also had substantial production and sales capacity so that it could meet a substantial proportion of the demands previously going to other firms, those other firms would not suffer serious reductions in demands and cash flows in the short run. In the long run, however, the financially strong and cost-efficient firm could grow more quickly than its competitors, thereby obtaining the production and sales capacity required to exercise market power. In other words, the growth of such a firm would be tantamount to the creation of seller concentration.

The effect of buyer concentration is symmetrical to the effect of seller concentration. The firm accounting for a large proportion of demands for a commodity is able to create substantial excess supply in the market either by curtailing its own throughputs for a period of time or by integrating backwards in production. Alternatively, the concentrated buyer can give its custom selectively, refusing to buy from firms that do not accept the buyer's prices. If there is substantial operating leverage in the production of the commodity and/or the buyer has greatly superior financial strength than the sellers, the survival of the sellers will be threatened before that of the buyer. This is the essence of market power. The third tactic, selective allocation of custom by the concentrated buyer, can take several forms.

One of these forms is obvious. The buyer simply engenders price competition among the sellers in the market. Since the reward is clear and can virtually be guaranteed by the buyer, individual sellers will face stronger temptation to cut prices than in less certain circumstances in which each seller tries to undercut the competition without any guarantee of the custom of particular buyers. The additional demand generated by a price cut which is not determined by a concentrated buyer could be lost when competitors meet the lower price.

A second means by which concentrated buyers can secure low prices involves an elaboration of the first. I know of
several cases in which a large buyer has offered a small producer a contract to buy all of the producer's output for an extended period of time at, perhaps, a generous price. In consequence, the producer gives up his goodwill relationships with other buyers in order to satisfy the contract. When the contract expires, the buyer offers a new contract at a price which is well below the prevailing market price. The seller who does not accept this price is left with plant and equipment and no demand, since the buyer can always place his custom elsewhere. If the producer is subject to considerable operating leverage, he will have little choice but to accede to the new and unfavourable terms if the firm is to survive.

**Effects of an absence of market power**

The foregoing arguments imply that industries in which production processes do not typically involve high degrees of operating leverage are not likely to have an undisputed industry or price leader, simply because there will not be much market power to be concentrated in one firm even if one is relatively wealthy. In such markets firms will still seek to avoid price competition because of its uncertainty-creating effects. The means by which price competition is avoided in the absence of a price leader are various. Often, manufacturers' and traders' associations will be the vehicles for price-fixing agreements. Competitors who are members of these associations simply meet and agree upon prices or, if commodities are not highly standardized, they might agree on common mark-ups on costs, or they might notify one another of bids for individual contracts. Often, trade associations act as clearing houses for information which is germane to the pricing decision. Such information includes costs, costing procedures, current mark-ups or prices, information about market conditions and the like. In countries with legislation prohibiting price agreements or other restrictive practices, the activities of trade associations often provide the means for evading the provisions of such legislation. The role of trade associations in price competition avoidance in the United Kingdom has been well and fully discussed by O'Brien and Swann (1968).

With no concentration of market power in an industry, arrangements for the avoidance of price competition are unstable, since no effective policing of arrangements can be entered into by more or less equal competitors. While all producers collectively will be better served if none of them engages in price cutting, every competitor will have an incentive to cut prices secretly — perhaps by giving secret discounts off list prices — in order to increase market shares. As I have pointed out, however, such discounts are unlikely to remain long unsuspected, since a sudden, unexplained increase in the market share of any one firm will lead immediately to suspicion of price cutting.

### 8.3 Market Power and Operating Leverage: Two Examples

It will lend concreteness to these arguments if we consider two industries in similar circumstances at much the same time except that in one of them production involved batch processing with scant operating leverage, and in the other indirect production costs were very substantial in relation to total costs, so that operating leverage was significant.

The batch-processing industry is the British soap industry. In that industry Unilever and Lever Brothers have at one time or another held a market share of up to 60 per cent, but neither one of these, nor any other firm, has ever been able to exercise clear and undisputed leadership in pricing or any other competitive practice. This has not been for want of trying.

In 1867 the Soap Makers' Association was formed with the intention, in part, of regulating prices and of ensuring that no members' prices were changed unless all members acted in concert. By 1893, however, the chairman of the association, W. D. Knight, complained that the 'history of our Association is a history of exploded agreements' (Edwards, 1962, pp. 137–8). Lever entered the industry in 1885, and, by spending large sums on advertising his branded product directly to households (whereas other producers sold effectively unbranded soap through wholesalers),
he quickly became the largest manufacturer of soap products in the United Kingdom. However, after a time other producers began imitating Lever, and competitive selling expenditures took on a momentum of their own. Although they were not ruinous in the way that unbridled price competition might be, it is clear that Lever at least would have liked to get agreement among producers to reduce selling expenditures. He was never able to secure such an agreement to restrict what he considered to be excessive goodwill competition. And, indeed, episodes of competitive price cutting have not been unknown in the soap manufacturing industry.

The early experience of petroleum refiners in America was similar to that of British soap manufacturers. In 1872 they formed the National Refiners' Association, with John D. Rockefeller as its first president. The aim of the association was explicitly to stem falling prices and rising outputs in the industry. It was not long, however, before Rockefeller concluded that such associations were mere 'ropes of sand' and that other means must be found to control prices and outputs.

The means which Rockefeller found arose from the size of his refining operation. Rockefeller was able to obtain rate concessions from the railways which transported his petroleum by promising to ship a large minimum volume of refined oil per day. He then invited other refiners to share in this rate concession as part of a wider agreement including price and output control. As Chandler wrote of this episode, 'The control of transportation provided a weapon to keep out new competitors and a threat to prevent those who joined Standard from dropping out of the cartel' (Chandler, 1972, p. 321). But what made Rockefeller's arrangement a weapon or a threat? It is at least arguable that the very high operating leverage associated with the refining of petroleum rendered it impossible for refiners to survive for very long in the face of restricted inputs of crude oil or the inability to transport and sell refined petroleum products. Thus, by 1876 — within fifteen years of the inception of the American oil refining industry — Rockefeller and his associates controlled prices and outputs for the whole industry. In 1881 they controlled nearly 90 per cent of American refinery capacity. This position was attained in part by pricing some competitors out of the market and in part by instilling fear in remaining competitors of the ability of Rockefeller's Standard Oil group to crush them at will.

If one is to look for differences between Lever's and Rockefeller's experiences in seeking to control competitive pressures in their respective industries, the differences in technology appear to be the most important. For both men entered highly fragmented industries in which individual firms operated in regional markets; both men were entrepreneurs of undoubted brilliance, who radically changed the characteristics of the markets in which they bought and sold. And yet Rockefeller was able to discipline and take over his competitors quickly, so that he came to control prices, production and the competitive practices in the market, a position which Lever and his successors were never able to attain. I suggest that the reason for this difference is that the threat to the survival of firms from a price war or from any action which restricts throughputs is far more immediate when firms produce subject to high operating leverages consequent upon high fixed costs than when they produce using low-fixed-cost plant and equipment. This was precisely the difference between the production technology of petroleum refining and that of soap manufacture.

8.4 MARKET POWER IN INTERMEDIATED MARKETS AND THE NEO-CLASSICAL PARABLE

Production technology is a clear determinant of the magnitude of shortage costs, but it is not the only determinant. The technology of exchange is also important, and for precisely the same reasons. If exchange technology entails substantial indivisibilities in the short run and substantial economies of specialization in the long run, then if any economic agent is able to deny these economies to competitors, suppliers or customers, that agent can, as a result, reduce the cash flows of those firms.
I argued in chapters 5 and 6 that intermediaries will be able to function in a market only if they can enhance the cash flows of their customers and suppliers as a result of economies of scale in exchange. The other side of this coin is that an absolute advantage in exchange deriving from scale economies also gives the intermediary substantial market power. That is, if the intermediary can secure the advantages of scale economies in exchange, but neither his customers nor his suppliers can do so, then the intermediary will have the market power to set both his bid and offer prices and to control the volume of commodities traded in the market. For if the intermediary refuses to buy from or sell to agents who cannot secure economies of scale in exchange, these agents will incur far higher transactions costs than their competitors who buy from or sell to the intermediaries. Unless they can secure higher prices from their customers or pay lower prices to their suppliers in direct exchange — and this is exceedingly improbable in the long run — the firms with which intermediaries refuse to trade will suffer seriously impaired cash flows which, in the fullness of time, will drive them from the market.

The conditions in which intermediaries will have such market power are clear from the analysis of chapters 5 and 6. The commodities in which they trade will be compact, durable and standardized, and there will be a large number of producers and a large number of users of these commodities, none of whom is able to secure economies of large-scale exchange.

If there are producers or users of a commodity who trade on a scale approaching the minimum efficient scale in exchange, the absolute cost advantage of intermediaries will be less than when all producers and users are too small to secure significant scale economies in exchange. Evidently, the closer the customers and suppliers of intermediaries come to minimum efficient scale in exchange, the narrower must be the bid–offer price spread required to satisfy condition (5.6) of chapter 5. This condition ensures that producers and users will find intermediated exchange to have an absolute cost advantage over direct exchange.

As the transactions scale of a producer approaches minimum

efficient scale in exchange, he will be able to specify supply prices which will just fail to induce him to integrate forward in exchange and thereby to bypass the intermediary. This supply price will presumably depend upon the prospective returns from alternative investments but, in any case, will be sufficiently high to maintain the intermediary's comparative advantage in exchange. This is to say, as the scale of production and exchange of a seller increases relative to the exchange scale of the intermediary, the seller will be able to set increasingly higher prices, which the intermediary must accept if he is to continue to trade with such a seller.

Similarly, any commodity user who approaches or achieves minimum efficient scale in the purchase of a commodity will be able to set the intermediary increasingly lower prices, which the intermediary will require to accept in order to maintain his comparative advantage in exchange.

The restricted relevance of the neo-classical parable

One striking aspect of this discussion is that its conclusions regarding the locus of price determination in intermediated markets are identical to the neo-classical parables of price taking and price making, provided that the market is identified with the intermediary. For, according to the neo-classical parable, both buyers and sellers are price takers in competitive markets but, in imperfectly (or monopolistically) competitive markets the imperfectly competitive seller or the imperfectly competitive buyer will be the price maker. But the reasons for reaching this conclusion are quite different. In the neo-classical parable, the price maker is such because he faces supply or demand functions which are imperfectly elastic with respect to price. Whatever else such an economic agent can do, however, he cannot affect the conditions of supply and demand which he faces in the factor and product markets respectively. In the present analysis, firms can affect the conditions of supply and demand by integrating vertically in exchange, or they can eliminate independent supply and demand altogether by integrating vertically in production. Thus, market power in the neo-classical parable, if it can be
said to exist at all, turns on the mathematical representations of conditions of exchange faced in factor and product markets, these conditions being exogenous to the analysis. Market power in the theory of business strategy turns on technological characteristics of production and exchange which are endogenous to the analysis.

There is one further difference to be noted here. The neo-classical parable concerning the locus of price determination includes no clear statement of the conditions in which that parable can be expected to yield correct predictions. In the light of my comments in chapter 1, we must say that the parable does not specify its conditions of application or, therefore, of its generality. In the present theory, however, the same conclusions are deduced on the assumption that the commodities traded are compact, durable and standardized, as these terms were defined in chapter 6. For it is only in such markets that we would expect — or predict — that intermediaries could function and that market power could, therefore, be distributed as required to yield neo-classical conclusions regarding the locus of price determination.

8.5 THE EICHHNER-WOOD THEORY OF PRICE

It is not sufficient for an analysis of price and output determination to know only who will set prices and outputs. One must also know the determinants of the time paths of price levels and output flows. In the present context, it is natural to turn for this to the Eichner-Wood theory of price because, like the present theory of business strategy, it has technology and investment at its centre. Equally important, the Eichner-Wood price theory rests on assumptions which are broadly compatible with those of business-strategy theory, although, we shall see, they are more restrictive.

In this section I shall do little more than to restate the Eichner-Wood theory. In the following section I shall specify the limits of its applicability and consider how prices and outputs are established when the Eichner-Wood theory is inapplicable.

In section 2.6 above, I argued that management teams will always prefer to finance investment internally rather than externally unless the cost of internal finance reduces the long-run cash flow of the firm by more than the cost of external finance. The reason is that, by comparison with external finance, internal finance renders the survival of the firm less vulnerable and makes take-over raids more difficult, thereby protecting the continued employment of the members of the management team. This view underlies the Eichner-Wood theory of price.

The prices with which Eichner and Wood were concerned were supply prices. These are the prices which management teams wish to set in order to cover the costs of production and to provide internal finance for investment. Conditions of demand are not independent of the supply price in this theory. These conditions enter into the determination of supply price in so far as firms’ managers have imaginary demand functions in their minds which represent their expectations of lost sales consequent upon price rises of various magnitudes. The expected conditions of demand are important in this context because they determine the extent to which firms will use output prices to generate internal finance for investment.

The essential idea here is that firms can generate short-run increases in sales revenues by increasing prices because the conditions of demand are typically inelastic in the short run. In the long run, however, conditions of demand are typically elastic. The reasons for this difference between long- and short-run conditions of demand were discussed in chapter 4. The effect is that firms can generate funds for investment now by raising prices, although there will be a cost to these funds through foregone sales revenues in the future.

The points are easily brought together by considering a simple time profile of demands.

In figure 8.1 the horizontal line CC' represents the volume of sales which a firm has achieved at some price \( p_0 \) and, other things being equal, would continue to sell in the future. If, however, the firm were to raise its price by (say) 10 per cent, the sales volume of the firm would fall by (say) 20 per cent in the fullness of time. The likely shape of the
time path by which that lower sales volume is reached is represented by the curve CD.

As curve CD indicates, sales volume will fall slowly in the period immediately after the price rise. The reasons typically given for this are that customers will be bound partly by existing goodwill — if any should survive the price rise — and, perhaps more important, by the need to find alternative sources of supply or substitute commodities.

The length of time required to find lower-priced supplies will depend on the cohesion of the various producers of the commodity. If there is a clear price leader, then all firms in the industry will raise their prices together, so that the only options available to their customers in the short run will be to pay the higher prices or to substitute other commodities. As far as non-durable consumption goods are concerned, substitution could take place quite rapidly — for example, applies for chocolate bars. In the case of consumers’ durables, substitution is more difficult. If, for example, there is a rise in the prices of automatic washing-machines, any substitution by consumers must be from automatic washing in the home to automatic washing in a laundromat or hand washing. If my own experience and that of my acquaintances is anything to go by, the decision to purchase a consumers’ durable such as a washing-machine is undertaken in response to rising discretionary incomes or wealth. A rise in the price of washing-machines might lead to the purchase of a cheaper, slightly inferior machine but it is unlikely to result in a decision to forego automatic washing in the home altogether. Such casual empiricism is reinforced by statistical findings that the variance in demands is explained more by incomes than by relative prices. As far as producers’ goods are concerned, short-run substitution is an unlikely option because the inputs to production processes are determined by the characteristics of the outputs and the plant and equipment employed.

In the longer run, however, producers can alter the technologies they employ, in so far as these are embodied in new plant and equipment, and, as I discussed extensively in chapter 4, price rises can result in entry by additional producers into the market, thereby giving users of the commodity alternative sources of lower-priced supply which previously were lacking.

In summary, the length of time between the price rise and the rapid diminution in the sales volumes of price-raising firms will depend on the nature of the commodity, the adaptability of its users and the conditions of both actual and potential competition.

The effect of a price rise on the finances of a firm will evidently depend on the rate at which demand falls. Given the time profile of demand depicted in figure 8.1, the
immediate effect of a 10 per cent rise in price will be an increase in the trading revenue of the firm of very close to 10 per cent. This increase is represented in figure 8.2. In that figure the horizontal line $EE'$ is the trading revenue the firm might expect, other things again being equal, if its prices were unchanged. With the price rise of 10 per cent, every unit sold generates 10 per cent more revenue, so that curve $FF'$, representing the time path of revenue after the price rise, is simply curve $CD$ from figure 8.1 raised by 10 per cent relative to the line $CC'$.

![Figure 8.2](image)

**Figure 8.2**

Time profiles of sales revenues with and without price rises

It is readily apparent in figure 8.2 that the price rise at time $t = 0$ will increase sales revenue for a while above the revenue which might have been expected in the absence of the price change. The increased revenue will last from the date of the price rise until time $t$ in figure 8.2. Thereafter, sales revenue will be lower than $OE$, the flow of revenue corresponding to the earlier, lower price, and it will continue to fall relative to that revenue. That is, after $t$ the price-raising firm will generate less revenue at each date than it would have done at the price of the *status quo ante*. However, the extra accumulated revenue generated by the price rise until $t$ will be greater than the total revenue lost after $t$ until $t^*$ in figure 8.2.

Provided that the direct unit production and selling costs do not rise as outputs fall, the gross trading profits of the firm will have been increased by the price rise over the interval of time from $O$ until $t^*$. Thereafter, the accumulated gross trading profits will be reduced. In other words, the price rise will have increased the internal finance of the firm until $t^*$ but will have reduced its internal finance thereafter.

Although I have conducted the discussion here in relation to levels of output, it applies *mutatis mutandis* to growing markets, in which case $CC'$ in figure 8.1 may be interpreted as sales volume with the growth trend removed, while $EE'$ in figure 8.2 is sales revenue with the growth trend removed, both in the absence of any price changes. $CD$ in figure 8.1 and $FF'$ in figure 8.2 then become, respectively, sales volume and revenue after a price rise relative to the sales volume and revenue in the absence of price changes. In a growing market the price rise will increase trading profits more quickly than a constant price until $t$, but they will grow more slowly thereafter.

It is unlikely that a price rise will reduce the growth of demands for a firm's outputs forever. If the effect described here is at all general, one firm or a group of firms might raise their prices today and, at some time in the future, firms producing the substitutes to which the price raisers' customers might turn will seek to expand their own production capacities and, therefore, to raise their prices in order to increase available internal finance. Indeed, a significant shift to other commodities might require the producers of those substitutes to invest in capacity expansion in order to meet the increased demands. The extent of such responsive
price rises will depend upon the distribution of any substitution. It is to be expected most when that distribution is concentrated upon the outputs of a few firms. Even apart from such responsive price rises consequent upon any substitution effect, a general upturn in the level of economic activity will lead firms to increase their prices and profit margins in order to provide internal finance for the increased investment which brings about the upturn.

In terms of figures 8.1 and 8.2, rises in the prices of substitute commodities would shift all of the curves upward and, in particular, would reduce the effects of a price rise in diminishing cash flows.

**Implicit rates of interest on internal finance**

It would, of course, be ludicrous to suggest that firms do or should generate all of their investment finance internally. For, as Eichner (1973, 1976) has shown, there is a cost to internal finance which can be compared with the cost of external finance. If the cost of internal finance is much greater than the cost of external finance, any increases in internal finance will diminish the prospective cash flow of the firm, and so, if the weak assumption of managerial motivation is right, investment will be financed externally at the margin. Following Eichner, I define the implicit rate of interest on internal finance as that discount rate which renders the present value of the finance attributable to a price rise equal to zero. The rate of interest on a fixed-interest bond, of course, renders the present value of the interest payments and repayments of the principal equal to the value of the loan, so that the present value of the cash flow attributable to the bond issue is equal to zero if the rate of interest on that bond is the discount rate.

It is arguable that the implicit rate of interest on internal finance generated by price rises is greater as the price rise is greater. For larger price rises give a firm's customers a greater incentive to seek either alternative sources of supply or alternative commodities. The cost in terms of goodwill rises with the extent of the price increase. Moreover, the greater the price increase, the more likely is it that a potential competitor will be induced actually to enter the market. Thus, in terms of figures 8.1 and 8.2, the higher the price rise, the earlier and steeper will be the decline in curves CD and FF' respectively and the lower the level to which they will fall. As a result, the cumulative increase in cash flows resulting from the price rise would be eliminated before time $t^*$ and the subsequent cost in terms of future cash flows foregone would be greater.

The discount rate which will render the changes in cash flows attributable to the price rise equal to zero will be greater as the early benefits are smaller and the later costs are larger. This is in the nature of discounting, since the importance of early costs and revenues relative to later costs and revenues increases with the discount rate. Thus, to reduce the present value of larger but later costs to the present value of smaller but earlier revenues will require a higher discount rate or, in other words, a higher implicit interest rate on internally generated finance.

Eichner has encompassed the relationships involved here in a diagram of considerable elegance, which I reproduce here with minor changes in notation as figure 8.3. The horizontal axis in that diagram represents additions to the flow of finance during the period of time over which the investment projects for which the finance is required is to be implemented. The vertical axis represents the rate of interest on investment funds R and the rate of return r expected on planned investment projects.

Curve $OF_i$ relates the implicit interest rate on internally generated additional finance to the flow of that finance during the investment period. It rises at an increasing rate for the reasons discussed above. The horizontal line $iF_r$ relates the interest rate on external finance to the net increases in debt. Presuming that the firm faces a given interest rate in the financial markets $Or$, the curve $iF_r$ will be a straight, horizontal line. As long as the implicit interest rate on internal finance is less than the market rate of interest, firms will generate internal finance by raising prices. Once the implicit interest rate on internal finance exceeds the market rate, firms will begin to borrow. The implicit internal rate of interest is less than the market rate until the flow
of finance generated internally is $OF^*$ in figure 8.3. Any further finance which might be required will be borrowed.

Eichner determines the financial requirements of the firm from the marginal efficiency of capital schedule. If managerial ambition is weak and expectations pessimistic, then we might expect a marginal efficiency of capital schedule such as $II$ in figure 8.3. With such ambition and expectations held by the management team, the firm will require additional finance $OF'$. This is raised relatively easily by a price rise at an implicit interest rate $OR$, which is less than $OI$, the market rate of interest. A more ambitious and confident management team will have a marginal efficiency of capital schedule such as $I'I$. This firm will raise its prices in order to generate increased finance $OF^*$ internally and will borrow $F^*F''$ at the market rate of interest.

According to this view, it is not the price level that is important to the firm but rather changes in prices. These price changes are determined by the financial requirements of the firm in following its investment strategy while taking competitive effects of such changes into account. Although this view is entirely compatible with the theory developed in this book, it does not go far enough because it takes no explicit account of uncertainty. This, however, is easy enough to do.

For one thing, we note that the implicit rate of interest on internally generated funds is uncertain in much the same way that the rate of return on investments is uncertain. An optimistic management team, which is confident in the strength of its relationships with its customers, will expect the implicit rate of interest on internal funds to be less than will be expected by more diffident and pessimistic managements. The same optimists are more likely than the pessimists to undertake the investments in the first place. In effect, the ‘animal spirits’ of the management team will determine the position in figure 8.3 of both the internal finance curve $OF_1$ and the marginal efficiency of capital schedule. Only the market rate of interest can be determined exogenously and objectively.

The confident and ambitious management team is more likely than the pessimistic team to be willing to increase financial leverage and so will be prepared to formulate business strategies which put the marginal efficiency of capital schedule further to the right. This will have the effect of generating greater financial leverage at the margin. That is, the value of $F^*F''/OF^*$ will obviously be greater as the marginal efficiency of capital schedule is further to the right, indicating thereby a greater desire to invest.

8.6 POWER AND THE EICHHNER-WOOD THEORY

The price theory discussed in the preceding section applies to a wide range of markets independently of the distribution
or concentration of power in those markets. However, it cannot be applied to all markets. In this section I shall consider how the Eichner-Wood theory applies to markets with different power distributions, and then I shall consider the characteristics of markets to which the theory can be applied and those to which it cannot be applied.

It will be useful to begin this discussion by imagining a spectrum of industries with varying concentrations of market power. At one end of this spectrum will be those industries in which a single firm is the most efficient and has not only a preponderance of liquid reserves and untapped borrowing facilities but also a substantial market share. At the other end of the spectrum will be those industries in which no firm has a marked superiority in cost efficiency, none has superior financial strength and none has a substantial market share. Between these extremes will be industries in which some firms share market power while other firms are effectively powerless. The more concentrated is market power, the fewer firms will share it.

Evidently, the Eichner-Wood theory applies without modification to industries at the power-concentrated extreme of this spectrum. But once our consideration moves from that extreme, it becomes clear that those firms which do share market power must compromise on price and perhaps outputs and selling costs. For every firm will have a supply price which can be determined along Eichner-Wood lines. Since each supply price will be determined by different management teams' investment strategies, current production costs and expectations of future conditions of demand, it is hardly likely that all firms in any industry will have identical supply prices. Thus, if they are to avoid price competition, some common set of supply prices must be agreed. The closer the industry is to the power-concentrated end of the spectrum described above, the more closely would we expect the industry supply price to conform to that of the most powerful firm. But, except at that extreme, the management team of even the most powerful firm will avoid giving its competitors any very strong incentive to follow independent pricing policies. To this end the price leader will seek to determine its prices so that they provide some measure of the internal finance required by other firms, even if these prices are in excess of the leader's own financial requirements. Furthermore, if it is the opinion of important price-following firms' managers that a price rise is not warranted by current trading conditions, or if they fear it will induce entry by a potential competitor, the price leader will usually take these views into account even if he does not share them.

One would expect the element of compromise in the establishment of industry supply prices to become increasingly dominant as industries are further from the power-concentrated extreme and closer to the powerless extreme of the spectrum. At the powerless extreme there would be compromise alone.

How are such compromises reached? Even without formal direct discussions of pricing among the managers of competing firms, there is no dearth of channels of communication between them. The trade press, trade associations, public announcements and the publication of audited accounts and annual reports all provide means whereby businessmen can make their views and needs known to one another.

Notwithstanding the incentive to compromise and the existence of clear channels of communication which can be used to reach agreement, it would be naïve to suppose that there is never price competition. In fragmented markets with no centre of market power the sanctions against renegades are blunt, since there is no one firm which can limit the scale and effects of price competition once it has begun. Thus, agreements and implicit compromises will be exploded from time to time — as in the soap industry — as one firm or another, seeks a price or other competitive advantage over other firms in the industry.

The increased likelihood that compromises on price can be broken without warning will increase the uncertainty attaching to expectations of flows of internally generated funds. In consequence, it would be rational for firms in such industries to prefer the more certain flows of investment funds which can be generated externally, since the terms of loan contracts are legally enforceable in the courts. It follows that fragmentation in an industry will result
in demands for greater financial leverage than the Eichner-Wood price theory would otherwise lead us to expect.

The Eichner-Wood price theory can also be applied to markets in which power lies predominantly on the demand side.

Suppose that, for the reasons given in section 8.2, there is a firm on the demand side of the market with a predominance of power. Such a firm will account for a large proportion of purchases in the market; it will be financially strong; and its operating leverage may be less than that of any firm on the supply side of the market. In such a case the attention of the management team of the firm with market power is likely to be focused on backward integration to eliminate the market. Provided, however, that it is able to obtain the supplies it requires in the market and that the management team has identified alternative investment strategies which promise better returns, such a buyer will continue to purchase the commodity in the market. It will have sufficient power to determine the market price — but only subject to a lower limit.

The price which the most monopsonistic firm must offer will cover the costs of current production by suppliers and will yield a profit margin which enables these suppliers to obtain whatever internal finance is required for investments in growth. For if the monopsonist is growing, it will require growing quantities of inputs and so must ensure that independent suppliers of such inputs will be able to meet that growing requirement. For this reason the powerful commodity user will require to set the same price that the independent supplier would set in order to ensure his own survival and growth. And the considerations which lead to this price are no different from those that Eichner assumed in his analysis of supply price determination by a price leader.

**Conditions of application: fixprice and flexprice**

The foregoing discussion indicates that the conditions of applicability of the Eichner-Wood price theory are not bound up with the degree of concentration or the locus of market power on one side or the other. These only determine which economic agent or agents will be able to decide market prices. I turn now to consider the conditions in which this theory is or is not applicable to the analysis of market price determination.

The foregoing considerations which determine the extent of any price changes are long-term in nature. For the essential aspect of Eichner-Wood price theory is that it relates the profit margin on sales to the internal financial needs of firms, where those needs are themselves determined by long-run strategic considerations and expectations. In consequence, one would not expect prices to change in response to short-run fluctuations in supplies and demands in those markets to which the Eichner-Wood price theory is applicable.

In other words, the Eichner-Wood price theory applies to what were called ‘fixprice’ markets by Hicks (1965) but not to those which he called ‘flexprice’ markets. For in fixprice markets, prices do not adjust in the short run to eliminate excess supplies and demands, while in flexprice markets they do. Thus, the conditions in which Eichner-Wood price theory can be applied are the same conditions that give rise to fixprice markets. The conditions in which Eichner-Wood price theory cannot be applied are the same conditions that give rise to flexprice markets.

Let us consider what those conditions are.

It is in the clear interest of any management team to be able to affect prices in a way which will enhance the prospects for the survival of the firm and the success of its investment strategies. These are long-run goals of the firm, and the first at least is paramount in the management team’s priorities. This proposition is essential both to the theory of business strategy developed in this book and to the Eichner-Wood price theory. In these theories, therefore, it is to be supposed that firms will seek, where possible, to give first priority to the meeting of long-run objectives even if this must be at the expense of short-run considerations. It is only when, for one reason or another, the long-run benefits which can be expected from fixprice markets are less than could be
expected in flexprice markets that we would expect the latter to prevail.

The long-run benefits of Eichner-Wood pricing policies depend on the short-run inelasticity of conditions of demand for the commodity. But suppose that the industry is fragmented or that the conditions of demand, or indeed the conditions of supply which enable demands to be met, are themselves highly uncertain. The more uncertain they are, the less certain will be the flow of trading profits which any firm in that market can expect. For at any given price trading profits obviously depend both on price and on sales volume. If demands cannot be predicted with any confidence over the period of time during which increased finance will be required, the effect is the same as when the strength of price agreements is uncertain — the internal finance generated over that period of time will itself be uncertain. In terms of figures 8.1 and 8.2, the curves representing the time profiles of demands will be shifting unpredictably. Since the time pattern of costs associated with any investment project are not easily altered, reliance on internal finance in such markets will increase the uncertainties which are associated with investment. In such circumstances investing firms will be better advised to finance investment strategies externally, so that the flow of available investment funds, and therefore the ability to complete investment projects, will be more certain.

The uncertainty-reducing advantages of external finance are more important as the costs of short-run discrepancies between supply and demand are greater. The costs of such discrepancies arise from sources already discussed in the three preceding chapters of this book. They arise from stockholding, queuing and throughput variations.

It is an important difference between fixprice and flexprice markets that in the former fluctuations in stockholdings, queue lengths and production rates take up short-run discrepancies between supplies and demands, whereas in the latter such discrepancies are eliminated by price movements which bring supplies and demands into equality. Evidently, the greater the costs associated with stockholding and queuing, the greater are the costs incurred by ignoring short-run demand and supply fluctuations. For these are the costs which are avoided by varying prices in order to keep outputs equal to demands.

As we know from the discussion in chapters 6 and 7, the costs of stockholding are carrying costs arising from the bulk, perishability and/or specialization of the commodities held in stock. The costs of queuing are users' shortage costs arising from a high proportion of fixed costs in total production and selling costs at full capacity. While these costs militate against flexprice regimes in markets, they also favour vertical integration in production to eliminate the market altogether. Furthermore, as I argued in section 7.3, uncertainty with respect to supplies of inputs will enhance the inducement effect for the users of these inputs to integrate backwards, especially if they face substantial shortage costs as well. Accordingly, the conditions outlined above that are necessary for there to be a flexprice market in any commodity are not sufficient, since, without other conditions, they are as likely to lead to the elimination of the market. We therefore require the further condition that vertical integration in production must be uneconomic.

I suggested a number of impediments to vertical integration in section 7.3. First, vertical integration might increase the shortage costs faced by the firm. This will happen if the commodity traded in the market is itself produced subject to considerable operating leverage, and especially if no one user requires the flow of outputs generated at minimum efficient scale in production. In the latter case either the transfer price within the integrated firm would far exceed the market price or, if the integrated firm sold any outputs which were surplus to its own requirements, it would face shortage costs in respect of the commodity it had previously purchased on the market. Second, vertical integration might increase carrying costs, administrative and organizational costs or transactions costs by more than any likely reduction in shortage costs.

There is a further impediment to vertical integration, which was not relevant to the argument of chapter 7. It is that forward integration is not possible because the producer
is unable to use the commodity in further production, as in the case of consumption goods.

In summary, we are most likely to find flexprice markets when the short-run discrepancies between supplies of and demands for a commodity are substantial and unpredictable, the carrying costs of the commodity are significant, and either the shortage costs in both its production and use are considerable or the commodity is strictly a consumption good.

Markets which meet this set of conditions \textit{par excellence} are the markets for agricultural and mineral produce.

In the markets for agricultural produce, demands are closely related to population and incomes and do not vary much in the short run, while outputs vary unpredictably with the weather and the incidence of pestilence and disease. Some agricultural produce is perishable, and all of it has sufficient bulk to ensure that there will be some cost to storing it. Thus, if there is a glut, some produce will perish after a time so that even direct costs cannot be recovered, while the more durable produce will continue to incur storage, insurance and other costs until sold or destroyed. The sellers of agricultural products will obviously be well advised to accept any price they can, as long as resulting unit loss is no greater than the expected unit carrying costs until the durable commodities can be sold. As for perishable commodities, the price will economically fall as long as it remains greater than the unit cost of destroying or giving away existing stocks.

Consumers' shortage costs are obviously not a result of the operating leverage associated with any technology but rather result from the inconvenience or possibly deprivation that is contingent on shortage. Consumers, moreover, cannot typically integrate backwards in food production, since they will not be able to consume the minimum efficient scale in agricultural production. It is not impossible to be self-sufficient in food production, but it is less time-consuming to find paid employment and to buy commercially grown agricultural produce.

The outputs of mineral produce do not vary much for technical reasons in the short run, and where they vary for other, perhaps political, reasons the variation is not linked to variations in demand. Demands, on the other hand, vary with the trade cycle, so that the relationship between supplies and demands is volatile in the sense that they do not move systematically with one another. There will sometimes be buyers' markets and at other times sellers' markets, but it is not easy to predict very far into the future which will arise. Since mineral produce is a direct input to the production of many commodities, shortages will result in substantial shortage costs for users with considerable operating leverage. When mines are located far from the plants in which the produce is employed as inputs to manufacturing processes, backward integration would entail the assumption of considerable transportation and organizational costs. These are not warranted unless the use of such produce by the firm is sufficient to overcome the loss of economies of bulk transactions and economies of specialization which can be achieved by a single agent selling to many users. And, since mineral produce is bulky, although usually durable, carrying costs are incurred when there are excess supplies, just as they are incurred in markets for agricultural produce.

Thus, in markets for mineral produce where there are users who cannot achieve minimum efficient scale in production and/or exchange, carrying costs put downward pressure on prices when demand is slack, while shortage costs result in upward pressure when there is excess demand but the volatility in the relationship between supplies and demands renders pricing along Eichner-Wood lines too uncertain to be relied upon in financing long-term investment projects.

This is not to suggest that there is no vertical integration to bypass markets for agricultural and mineral produce. It is to suggest that such integration takes place only when users' demands reach minimum efficient scale in production. Food processors, for example, do integrate backwards in order to grow their own inputs to canning and freezing processes; steel producers integrate backwards into iron-ore mining; and oil refiners integrate backwards into the extraction of crude oil. But as long as there are users with
small demands in relation to minimum efficient scales of production and exchange, and as long as there is no concentration of market power among producers, there will be flexprice markets for mineral produce. And in those markets Eichner-Wood price theory will not apply. Prices will adjust until there are neither queues nor unwanted stocks.

It is important to note in this connection that prices rise as users seek to avoid shortage costs, and they fall as sellers seek both to reduce their own shortage costs and to avoid carrying costs on unsold stocks. There is no mysterious invisible hand to invoke these changes; nor need we rely on propositions of marginal productivity theory or marginal utility theory in its cardinal or ordinal versions.

9.1 THE ECONOMIC THEORY OF BUSINESS STRATEGY AS CLASSICAL POLITICAL ECONOMY

Although this book was inspired largely by the work of Edith Penrose (1959) and Alfred Chandler (1962, 1977), the theory developed here is well within the analytical tradition of the classical political economists. Indeed, much depends on Adam Smith’s dictum that the division of labour is limited by the extent of the market. That is but one reflection of the consonance of the theory of business strategy with classical political economy more generally. It will none the less be convenient to consider the narrower point first.

The focusing effect is a straightforward application of Adam Smith’s dictum to firms which produce more than a single output for several markets. For the focusing effect is a correspondence between the existing resources of a firm and the characteristics of investment projects which will be defined and implemented. The correspondence turns on the effect of new investment projects on the intensity of utilization of all of the firm’s resources. Those investment projects will be defined which enable under-utilized resources to be more fully employed and which eliminate constraints on the scope of the activities of the firm. As a result, new investment projects will be defined and implemented to reduce unit costs of production and sales quite generally.