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DEMAND UNDER CONDITIONS OF OLIGOPOLY

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IT IS pretty well agreed among economists that the ordinary concept of a demand curve is inapplicable to the study of oligopoly. What would be sold at various prices if everything else remained unchanged does not concern an entrepreneur when he knows that everything else, and in particular the prices charged by his rivals, is most unlikely to remain unchanged. What does concern him is his own estimate of what can be sold at various prices, making the best allowance he can for the probable reactions of his rivals. These estimates can conveniently be arranged in the form of a demand schedule, but the result must not, of course, be confused with the type of demand schedule which is commonly used in economic discussion. Mr. Nicholas Kaldor has suggested the name "imagined demand curve" for the concept which is applicable to the oligopoly case, and in this article I propose to follow this usage.[1]

So far as I know no attempt has yet been made to investigate the characteristics of imagined demand curves, though it should be obvious that such an investigation is desirable. Oligopoly is probably the typical case throughout a large part of the modern economy, and yet the theory of oligopoly can scarcely be said to be in a very advanced state, consisting as it does of a number of special cases which allow of little generalization. My purpose in this note is to show that a very considerable degree of clarification might be introduced into the study of this subject by a systematic inquiry into the nature of imagined demand curves.

The most important consideration in this connection seems to me to be the obvious fact that rivals react differently according to whether a price change is upward or downward. If producer A raises his price, his rival producer B will acquire new customers. If, on the other hand, A lowers his price, B will lose customers. Ordinarily the reaction to a gain in business is a pleasurable feeling calling for no particular action; the reaction to a loss in business, however, is likely to be some viewing with

[1] See Mr. Kaldor's review of Mrs. Joan Robinson's *Economics of Imperfect Competition*, in *Economica*, August, 1934, pp. 340–41.

alarm accompanied by measures designed to recoup the loss. If the cause of the loss is obviously a rival's price cut, the natural retaliation is a similar cut. From the point of view of any particular producer this means simply that if he raises his price he must expect to lose business to his rivals (his demand curve tends to be elastic going up), while if he cuts his price he has no reason to believe he will succeed in taking business away from his rivals (his demand-curve tends to be inelastic going down). In other words, the imagined demand curve has a "cor-

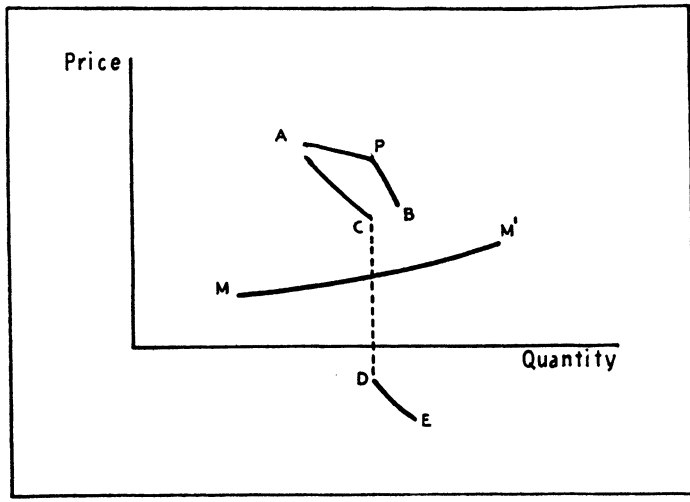

FIG. 1

ner" at the current price. Figure 1 depicts such a curve, APB, where P is the current price.

That many producers do think of their demand curves as having this shape I think will be evident to anyone who sets out to investigate the subject by interviewing businessmen. They frequently explain that they would lose their customers by raising prices but would sell very little more by lowering prices. Economists who are accustomed to thinking in terms of traditional demand-curve analysis are likely to attribute this kind of answer to ignorance or perversity. Actually, it has a sound rational foundation which becomes readily intelligible when the analysis is cast in terms of imagined demand curves.

The marginal revenue curve which is derived from the demand curve in Figure 1 is shown by the broken line $ACDE$. Where the demand

curve has a corner, the marginal revenue curve, of course, has a discontinuity. The marginal cost curve MM' passes between the two parts of the marginal revenue curve.[2] Certain interesting corollaries follow from this. The first is that the conditions for short-run equilibrium are not at all precise. It is not possible to apply the condition that marginal cost must equal marginal revenue; all we can say is that marginal cost must certainly not be greater than marginal revenue. It may, however, be less. Second, it is not permissible to speak of the factors' remunerations' being equal to their marginal value productivities. And, third, any disturbance which affects only the position of the marginal cost curve may leave the short-run equilibrium of price and output entirely unaffected. Thus, for example, a successful strike for higher wages may be without influence on either price or output. Trade-unionists who believe that the only effect of higher wages is lower profits may have more truth on their side than economists have been willing to grant.

The imagined demand curve need not, of course, have the shape depicted in Figure 1. Figure 2 shows the most important variants both for downward and for upward movements of price. The stretch labeled PM indicates the expected reaction to price reductions, assuming that rivals will not retaliate in kind. Such an assumption is ordinarily likely to be justified only if rivals are not aware of the price reduction, that is, if the reduction takes the form of secret concessions from the list price. This consideration allows us to bring within the purview of theory a widely recognized phenomenon of actual business practice, namely, the practice of departing from quoted prices. We should, however, be fully aware of the fact that a full analysis of this practice in theoretical terms would be much more complex than these few remarks might lead one to believe. For example, there is a very high degree of probability that secret price cutting will be accompanied by a certain amount of discrimination between different customers or groups of customers. From a formal point of view it would be more satisfactory to describe the stretch PM in Figure 2 as a discriminating average revenue curve for downward movements in the average price charged all customers.

In Figure 2, LP depicts the expected reaction to price increases, assuming that rivals will also raise their prices. This type of curve for

[2] This does not necessarily mean that profits are being made. Whether they are or not, of course, depends upon the position of the average cost curve, which is not shown in the diagram.

upward movements of price is particularly relevant for producers who occupy the position of price leader.

So far nothing has been said of the effect of shifts in demand, from the point of view of buyers, on the shape of imagined demand curves. It seems clear that any such shift will first make itself felt in a change in the quantity sold at the current price. But ordinarily it will also cause producers to revise their ideas about the probable reactions to alterations in their prices. It may be suggested that an increase in demand

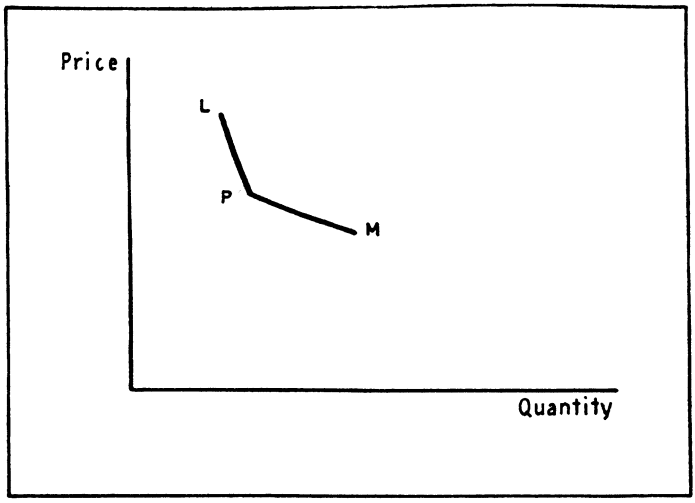

FIG. 2

leading to a fuller use of capacity, more difficulty in getting quick delivery, etc., will make the imagined demand curve less elastic for upward movements in price. For downward movements in price the result is likely to be a more elastic curve, since it may be assumed that rivals are less worried about losses in business and hence less ready to retaliate against a price cut. In terms of the marginal revenue curve the effect is thus to bring the two sections closer together and to decrease the gap between them. This may or may not induce the producer to change his price. Much depends upon the location of the marginal cost curve, as a little experimentation with pencil and paper will show. Since, however, the presumption is that marginal cost curves are likely to be shifting upward in a time of increasing demand, because of higher wage and raw material costs, it is perhaps legitimate to conclude

that an increase in demand is more likely to lead to a price increase than to a price cut.

A decrease in demand, for reasons analogous to those just set forth, can be expected to have the opposite effect on the shape of imagined demand curves, making them more elastic for upward movements in price and less elastic for downward movements. In terms of the marginal revenue curve the two sections will be farther separated than they were before. The result will be that the producer will be more anxious than ever to hold his price where it is.

It is an interesting conclusion from this type of reasoning that an expansion in demand is likely to lead to an increase in oligopoly prices; whereas a contraction in demand sets up strong resistance to any reduction in oligopoly prices. At the same time, however, a contraction puts a premium on successful secret price cutting. As far as the cyclical behavior of oligopoly prices is concerned we might expect to find (1) that prices go up easily and openly in time of upswing; (2) that prices resist downward pressure in times of recession and depression; and (3) that list prices become less trustworthy guides to real prices the longer bad times last. I think this analysis can be developed in such a way as to throw valuable light on the much-debated problem of rigid prices, but to do so would be beyond the scope of this paper.[3]

It should be noted that the analysis suggested here runs in terms of movements in price from a currently existing situation. No attempt is made to explain how the current price and output situation came about except as it may be explained by reference to a previously existing situation. This is unavoidable since imagined demand curves, unlike the ordinary demand curves of economic analysis, can only be thought of with reference to a given starting-point. That starting-point itself cannot, of course, be explained in terms of the expectations to which it gives rise. Once this is realized, it becomes very doubtful whether the traditional search for "the" equilibrium solution to a problem in

[3] There are many relevant considerations which are not even touched upon here. For example, the effects of building up or whittling down inventories, actions which are due to producers' ideas about future demand and cost conditions, are evidently important and may lead to results quite unpredictable by reasoning such as that set forth above. Illustration: an oligopolist caught with large inventory at the beginning of a decline in demand may cut price and drastically curtail output in order to work down his stocks, even though he would maintain price unchanged if he had only current output to think of. This consideration is particularly likely to be important in the case of commodities which take a relatively long time to process but which are not made to special order, e.g., metals such as copper.

oligopoly has very much meaning. Generally speaking, there may be any number of price-output combinations which constitute equilibriums in the sense that, *ceteris paribus*, there is no tendency for the oligopolist to move away from them. But which of these combinations will be actually established in practice depends upon the previous history of the case. Looking at the problem in this way the theorist should attempt to develop an analysis which will enable him to understand the processes of change which characterize the real world rather than waste his time in chasing the will-o'-the-wisp of equilibrium.

The suggestions thrown out in this paper on the problems of oligopoly analysis are, of course, not intended to exhaust the subject. They are rather offered as raw material for further processing by those who, unlike the author, make a business of studying prices and price policies.