CHAPTER VI
THE DEMAND SIDE OF THE MARKET

The market place is a social-economic context in which suppliers and demanders face each other in repeated instances o£ exchange—actual and potential. The rates at which they exchange their goods and services and money constitute the "prices" of the market. As we shall see in Chapter VIII, it is the free and spontaneous interplay of demand and supply forces which determines the prices that tend to prevail in the market. Having already discussed the basic aspects of production and supply in Chapter IV, and the ramifications of wants in Chapter V, we now examine the demand side of the market in all of its relevance to the firm.

Demand vs. Wants

Our first task is to clarify the distinction between natural *wants* (i.e., desires, wishes, needs, appetites, etc.) and the concept of *demand*, a distinction already noted in Chapter II and Figure 5. When we talk about "wants" in economics, we have in mind the natural fact that all human action is broadly *motivated* by one or another desire, wish, or purpose. Furthermore, as we have seen, a want can be satisfied only by the application of *means*—time, effort, or wealth—that is, some expenditure, sacrifice, or cost. In other words, in a world of scarcity, wants *by themselves* do not help us very much; *means* must be acquired and applied to achieving the satisfaction of wants.

Here is where the concept of *demand* comes in: it encompasses not only the fact that a person has *wants* or goals, but that he also has the *means* to satisfy them effectively. Thus, in a barter economy, demand is exercised by means of producing and exchanging one's own product for the products of other producers. By contrast, in the modern market economy, the means used for the purpose of exercising demand typically takes the form of *money*, which, as a means of payment, is exchanged for product. Besides money, other forms of wealth—such as financial assets—also serve as sources of *purchasing power* (albeit not as money proper), which must be converted into money before they can be accepted as a means of payment.

Demand vs. Needs, Consumption

Similarly, demand must be distinguished from the term *needs*, which we saw in Chapter V is a term used to emphasize a want to which one attaches a special degree of importance. "Needs," like wants in general, are also handicapped by the fact that, by themselves, they do not possess the means to be satisfied; and just like wants, needs can only impel people to acquire means to satisfy them. Thus there is no "need" that can be satisfied without some effort or cost.

Before we proceed, we should note another important distinction of terminology—the difference between "demand" and *consumption*. Demand, as has been shown, is related only to the act of *acquiring* goods; in contrast, "consumption" represents that act of actually *satisfying* the want for which the goods were acquired. More precisely, demand is exercised by the use of means, through exchange or purchase transactions; however, the actual *consumption* of the goods thus acquired does not take

place until the person actually uses them for the purpose of directly satisfying the given want or fulfilling the given goal.

More on Consumption

To be sure, a person's ability to consume rests principally on one's ability to exercise demand in the first place. Thus, demand is logically prior to consumption, and consumption is therefore predicated upon the exercise of demand. But this fact in itself does not imply anything as to *when* the final act of consumption will actually take place. For example, consumption may occur virtually *simultaneously* with the act of demand, as in the case of a frankfurter purchased at a hot-dog stand and eaten right there. Alternatively, consumption may occur only after a *deferred* period following the acquisition of the goods, as in the case of frankfurters purchased and stored in the refrigerator, pending a subsequent picnic or other occasion.

Furthermore, in economics, *consumption* has a much broader or general meaning than the narrow, materialistic meaning usually given to it by the layman. For example, economics classifies as *consumers' goods* such things as leisure, music, spiritual worship and other intangible or non-material goods alongside such material goods as food, clothing, or jewelry—and for the same reason: any goods that have the capacity to *directly* or *personally* satisfy a want or purpose, be it material or non-material, must be classified as consumers' goods. Hence, the act of personally using a consumers' good is regarded as "consumption."

Demand is Based on Production

As important as *means* are for the exercise of demand, equally important is the fact that, whether the economy is based on barter (direct) exchange or monetary (indirect) exchange, means must be acquired typically by *productive* effort. This productive activity yields purchasing power to the producer—whether in the form of (a) *goods* produced in the case of Robinson Crusoe and subsistence, direct-use economy, or (b) *money income* earned in the modern monetary economy. It is this productive effort which constitutes the basic sacrifice or cost involved in the acquisition, directly or indirectly, of the means to satisfy one's wants. Since means are required to exercise demand in the market, and means must be acquired by productive effort, it follows that demand must ultimately be based on productive effort. Thus, demand is more than mere wants or needs.

All of this brings us to a fundamental implication. The fact that, on the one hand, wants cannot be satisfied without the use of means, plus the fact, on the other hand, that the means are *scarce*, imply the following: There is an inverse or opposite relationship between the *quantity* or *extent* of wants to be satisfied and the *sacrifice* or *cost* involved in achieving the satisfaction of wants. That is to say, the greater the sacrifice or the more it costs to satisfy a given want, the less of that want will a person seek to satisfy; conversely, the less it costs a person to satisfy the want, the more of it will he be induced to satisfy.

Demand vs. "Quantity Demanded"

Here we have the essence of the economic principle referred to as the *law of demand*. In order to see how economics formulates this law, we must first introduce and define the key, albeit simple, term *quantity demanded*, which is not to be confused with the term "demand." Indeed, the term "demand" itself remains to be defined more precisely, since up to now we have used it superficially.

For convenience, the term "quantity demanded" will be expressed simply as "Qd." Qd stands for the *number of units* of a good or commodity that a person would purchase at any given price. This term acknowledges the fact that, in the market place, goods of whatever class or grade are typically sold and purchased in *units* of numbers (e.g., one, two, or more), weight (e.g., ounces, pounds), or length (e.g., yard goods). Furthermore, *prices* in the market place are typically quoted in terms of such units; for example, the price of hamburger meat would be quoted at $1.50 *per pound*.

Since the term Qd includes the word "demanded," it is evidently associated with the act of acquisition (via purchase or exchange) and not with the act of consumption. As a rule, therefore, Qd refers to the *rate of purchase*—that is, the number of units that a person would purchase at a given price—and not to the rate of consumption. Thus, to paraphrase the implication stated at the end of the previous section, economics asserts: there is an inverse or opposite relationship between the *price* of a given good and the Qd of that good. Specifically, the higher the price asked for a unit of a given good, the smaller will be the Qd; the lower the price, the greater will be the Qd. This proposition brings us pretty much to the heart of the *law of demand*.

Determinants of the Quantity Demanded

In order to fully appreciate the *law of demand*, one more important bridge remains to be crossed. The reason is that while the law of demand assumes that *price* is the only determinant of the Qd of a product, in reality this is not strictly true. As we shall now see, there are several other determinants of Qd—other than price, hereinafter referred to as *non-price* determinants, for convenience—that also exert important influence on the Qd of a given product. So, let us first examine each one of these non-price determinants, and thereby gain a better perspective on the law of demand.

What else does the Qd of a product depend on, other than the *price* of the product itself? We have already seen that the price of the product would be a "negative" or inverse influence on the Qd: a *lower* price would induce an *increase* in Qd, whereas a *higher* price would cause a *decrease* in Qd.... However, to be more precise, we should add an important proviso: *provided* that other (non-price) determinants of Qd are *assumed* to be passive and uninfluential. Why is this proviso necessary? Because these *other*, non-price determinants can influence Qd even when the price of the product has not been changed by the firm; that is, changes in one or more of the non-price elements could cause Qd to change even when the price of the product itself remains unchanged. The following examples help us to understand this.

Income and Population

The first non-price determinant of Qd that comes to mind is a fairly obvious one: the consumer's income or other *purchasing power* or *wealth*. Thus it would follow that,

other things being equal, the greater a person's purchasing power, the greater would be his Qd of a given product. In other words, the rate at which we buy things depends on how "rich" we are. A person's purchasing power depends primarily on his *income* as well as on accumulated savings from past income; the latter may take the form of financial investments or assets (e.g., securities, deposits) that are readily convertible into money (i.e., are "liquid").

Another important determinant of Qd, also fairly obvious, is the *size of the household* unit, or of the total *population*. Other things being equal, we would expect that the greater the number of people in the household, or in the population as a whole, the greater would be the Qd of the given product, and vice versa.

Subjective Value: Tastes or Preferences

Another important determinant of Qd is something we discussed at length in Chapter V: *subjective value*, or the degree of importance attached to a unit of a given product. Thus, other things being equal, the greater the subjective value, the higher the price one would be willing to pay; conversely, the less important the product, the lower the price one would be willing to pay. If we recall, subjective value depends on two things: the character of taste, or the *preference-scale* ranking attached to the product; and the *amount of stock* of the given product already possessed by the consumer (the law of marginal utility). Thus, with reference to the preference-scale, the higher the rank of the product on a person's preference-scale, the higher the price one would be willing to pay; conversely, the lower the rank held by the product, the lower must the seller's price be in order to induce a purchase.

A few examples will suffice to illustrate this aspect of subjective value. Advertising by firms, one of the most familiar institutions in the market place, serves two important functions: the one is to inform consumers about the product—its price, quality, location of sellers, etc.; the other is to persuade consumers that they cannot live without the given product, hoping that the consumer will then place the given product on a higher rank of his preference-scale. Medical reports on the link between tobacco smoking and lung cancer have caused cigarettes to drop to a lower rank or disappear altogether from many people's preferences. Studies on the relationship between diet and health have played havoc with the position of eggs, butter, and processed foods in our preferences. Finally, changes in fashion play similar havoc with the position of older models or styles in cars and clothing, as well as living patterns in general.

The Law of Marginal Utility

Similar effects on subjective value can be exerted by variations in the amount of stock already possessed by the consumer of a given product. This is the aspect of subjective value where the *law of marginal utility* becomes relevant. If we recall, the law asserts the following: the smaller the stock, the higher is the marginal utility (MU) or subjective value attached to a unit of the product; conversely, the larger the stock on hand, the lower is the MU attached to each unit.

Now, applying this law to prices, we come up with the following: the smaller the *quantity supplied* by sellers and the higher the MU therefore attached by the consumer to

each of the fewer units, the higher is the *price* that the consumer is willing to pay for any unit of the product; conversely, the greater the *quantity supplied* by sellers and the lower the MU therefore attached by the consumer to each unit of the available supply, the lower must the *price* asked by the seller be in order to induce consumers to buy more units.

A clear example of the relevance of the law of MU was the gasoline shortage in late 1973. At the time of the oil embargo, in the fall of 19 73, the supply of refined gasoline reaching the market had dropped significantly. When car drivers realized that considerably less gasoline would be available, it did not take long for them to adjust and begin to attach a higher MU to each gallon of gas obtained after much search and waiting in line at the gas pump. Simultaneously, they also adjusted upward the price they were willing to pay for each of the more precious gallons.

Complementary Products

Another important set of influences on the Qd of a given product involves the effect of changes in the price of *other related* products. Many products are "related" to each other in one of two possible ways—as *complementary* products or as *substitute* products. *Complementary* products typically go together; that is, they are usually jointly consumed. Good examples are bread and butter, beer and pretzels, cars and gasoline. As a consequence, a change in the *price* of one of the pair would be expected to exert an opposite effect on the Qd of the other. For example, a rise in the price of gasoline would be expected to cause a drop in car-driving—more precisely, a drop in the Qd of transportation mileage by automobile; conversely, a drop in the price of gasoline would be expected to induce an increase in car-driving—that is, an increase in the Qd of transportation by automobile.

Substitute vs. Complementary Products

Similar considerations apply to *substitute* products, that is, products that are regarded as "rivals" or "competitors" to each other with respect to a given use or purpose. Good examples are butter and margarine (for cooking); paper and cellophane (for wrapping); natural fibers like silk, cotton, and wool as against nylon, dacron, orlon, and other synthetic fibers (for clothing and textiles). Since these commodities are substitutable for each other in specific applications, it stands to reason that a rise in the *price* of the one (say, butter) relative to the price of the other (i.e., margarine) would induce a rise in the *Qd* for margarine, as people are induced to shift from butter to margarine. Conversely, a drop in the price of butter would be expected to induce a drop in the Qd for margarine, as people are induced to shift from margarine to butter.

In the case of *complementary* products, *price* changes in one of the pair are expected to induce opposite changes in the *Qd* of the other complementary product. Thus, a *rise* in the price of gasoline is expected to induce a *drop* in the Qd for transportation by car. On the other hand, in the case of *substitute* or rival products, *price* changes in the one are expected to induce *Qd* changes in its rival products in the same direction. Thus, a *rise* in the price of paper relative to its rivals (say, cellophane wrap) is expected to induce a rise in the *Qd* for cellophane. In general, therefore, changes in the *price* of one of the

"related" products would be expected to induce *Qd* changes in the other of the related products.

Before proceeding, we should note that the preceding, *non-price* determinants of the Qd—such as income, subjective tastes or valuations, and size of households—were truly "non-price" in character. However, in the present case we were dealing with the possible effects of *price* changes in related products, so that, strictly speaking, the subject is not "non-price." For convenience, however, the effects of price changes in related products are treated as a "non-price" determinant.

Expectations of Future Price Change

A final, but nevertheless important set of determinants involves *expectations* about the future. This dimension of influence is made relevant by the fact that, so long as such determinants of Qd as *price* and *income* are subject to change, the future becomes uncertain. That is to say, tomorrow's price will not necessarily be the same as today's price, since it may be higher or lower than today's price; nor will tomorrow's personal income necessarily remain the same as today's. As a consequence, today's Qd will depend not only on *today's* price and income, but also on *tomorrow's* price and income.

For example, assume a situation in which *prices* have been *falling*, as during periods of price "deflation." A consumer therefore has grounds to expect that tomorrow's price (say, of clothing) may be still lower than today's price. Given such expectations it would be reasonable for the consumer to postpone his planned purchase of clothing until tomorrow, since he would prefer to buy at tomorrow's expected lower price rather than at today's relatively higher price. Conversely, assume that prices have been *rising*, as during periods of price "inflation." The consumer would therefore reasonably expect that tomorrow's price could be higher than today's price, and consequently decide to hasten his purchase and buy today rather than delay his purchase until tomorrow, since today's price appears relatively lower compared to tomorrow's expected higher price.

In sum, therefore, expectations of a change in *tomorrow's* price compared to today's price would reasonably influence the consumer's rate of purchase (Qd) *today*: an expected higher price would induce a hastening in the rate of purchase (i.e., an increase in the Qd today), whereas an expected lower price would induce a postponement of purchases (i.e., a decrease in today's Qd). So long as prices are not stable or constant, but are either rising or falling, it is clear that tomorrow's price will not be the same as today's. Therefore, at any given time, the consumer is faced with not one price but two prices: *today's* price and *tomorrow's* possible price. As a consequence, he is prompted to decide which of the two prices will be the relatively *lower*, and decide his Qd accordingly, that is, at the relatively *lower* price, according to the law of demand.

Expectations of Future Income Changes

Similar considerations apply to expectations of change in one's *future income*. For example, an expected increase in salary or wages due to an expected promotion would obviously herald an increase in future income; conversely, an expected reduction in working hours or loss of one's job, due to a slackening of business, would lead one to

expect a drop in tomorrow's income. In either case, the expected change in tomorrow's income would induce a reasonable adjustment in today's rate of purchase (Qd).

For example, if a worker expects to receive a *wage increase* in the nearby future, it would not be unreasonable for him to spend that money now, in anticipation of his increased future income and on the assumption that "the money is as good as in the bank," so to speak. Similarly, if Congress announced a *cut in tax rates* effective within a few months, it would not be unreasonable for taxpayers to spend that money now. (Economists attribute the stepped-up rate of spending in the latter half of 1963 to the anticipated Kennedy tax-cut scheduled for 1964.) In both cases, the effect of the anticipated increase in *future* income is an inducement to increase the *current* rate of spending (Qd). The opposite would happen in the case of anticipated *decreases* in income. That is, wage-earners would be expected to reduce their current Qd if faced with layoffs or curtailed working hours; taxpayers, too, would be expected to spend less today if faced with a tax increase tomorrow.

What About Changes in Supply?

Have we left anything out? Well, what about the *supply* of the product—that is, couldn't changes in supply conditions cause changes in Qd? For instance, couldn't increased supply cause an increase in Qd, and vice versa? Economics would answer as follows: changes in supply can affect Qd only *indirectly,* through the *prior* effects on the *price* of the product. Thus, other things being equal, an increase in supply would first have to cause a drop in price before it could induce a larger Qd; conversely, a decrease in supply would first have to cause a rise in price before it could induce a smaller Qd.

Restatement of the Law of Demand

Thus, we see that the *quantity demanded* (Qd) of a product in the present can be influenced not only by the *price* of the given product but also by a variety of *non-price* determinants. As a consequence, it would be reasonable to conclude that, even if the *current price* of a product remained *unchanged,* the current Qd could nevertheless be induced to change due to a change in one or more of the non-price determinants. In any event, the firm faces a difficult task in assessing which of the several non-price determinants is influencing the Qd for its product and to what degree. It is one of the primary functions of *market research* to study the importance of each of these determinants of market demand.

All of this enables us to state the *law of demand* with greater precision than before. First comes the *general* statement of the law of demand: there is an inverse, opposite, or negative relationship between the current price of a good and the quantity demanded (Qd) of this good, *provided* other things (i.e., the non-price determinants) remain the same. From this general principle are derived the two important corollaries: (1) other things remaining the same, at a sufficiently *higher* price the Qd will be expected to decrease; (2) other things remaining the same, at a sufficiently *lower* price the Qd will be expected to increase.

Before we proceed, it is important to note that the law of demand applies only to the case where the price of the given product is changed *relatively* to, or *comparatively*

to, the prices of other products. Thus, a decrease in the price of product X can be regarded as a "lower" price only when compared to what happens to *other* product prices, especially substitute or similar products. Thus, a decrease in the price of product X can be regarded as a "lower" price only when compared to what happens to *other* product prices, especially substitute or similar products. If prices of other similar products are decreased in the same *proportion* as product X, then the drop in X's price is not a comparatively lower price. The price of X is truly "lower" only when *it* is decreased while *other* prices remain the same, or decrease less than X's price, or even increase. Conversely, X's price cannot be regarded as a "higher" price unless it is increased more than in proportion to the prices of other similar products, that is, only if other prices do not increase, or increase less than X's, or even drop.

The "Ceteris Paribus" Proviso

We can now see more clearly why the *law of demand* is based on the special assumption that "other things remain the same," and that the price of the given product is the *only* determinant of its Qd. The proviso "other things remaining the same" has become known in its latin form as the *ceteris paribus* clause (which literally means: other things being equal). In the real world, of course, it is more reasonable to assume that the *non-price* or "ceteris" determinants do not remain fixed or unchanged, and that any given change in Qd could be a result of a non-price change as well as of a price change by the firm. However, for the purpose of economic analysis, which seeks to intellectually *isolate* the effect on Qd of the *price* alone, it is logically necessary to abstract from the *non-price* determinants and assume that they are, for the moment, passive or dormant.

In other words, the law of demand assumes that at any given moment it is reasonable to assert that the Qd of a given product X is influenced *only* by the *price* of X—that is, market exchange involves only P's and Q's, so to speak. This special assumption of *ceteris paribus* is a kind of "mental experiment." It is the closest that economic analysis comes to duplicating a controlled laboratory experiment, as in the physical sciences, where it is possible to isolate and exclude all variables or determinants except one. In the human sciences, including economics, it is impossible to conduct such physically controlled experiments; the only intellectual recourse left, then, is the method of "partial analysis," which uses the logical device of the *ceteris paribus* proviso.

Law of Demand Is Not "Automatic"

One additional explanation is needed. We have deliberately used the word "sufficiently" in the phrases "at a *sufficiently* higher price" (corollary 1) and "at a *sufficiently* lower price" (corollary 2). This is to exclude the case of very *small* or *minute* changes in price which, in practice, may not induce any significant change in Qd. Realistically, it would not be reasonable to expect that just *any* size of price increase (or decrease) would *necessarily* induce a decrease (or increase) in Qd; indeed, it is very possible that a very small or insignificant change in price would have practically no impact on Qd.

For example, it is possible that during the early stages of the gasoline shortage in the fall and winter of 1973-74, the relatively small initial increases in gasoline price did

not in themselves cause any significant drop in Qd of gasoline. However, such unresponsive changes in Qd to the rise in prices would not constitute a contradiction of the law of demand, since, properly stated, the law pertains only to relatively *significant* of "sufficiently" large changes in price. Thus, whereas a rise in gasoline price from, say, 40 cents to 50 cents a gallon might not in itself cause any significant drop in Qd, a "sufficiently" great increase from 40 cents to 80 cents, say, could be expected to cause a significant drop in Qd.

In other words, the law of demand does not assume that people react automatically or mechanically (i.e., immediately) in response to just *any* size of stimulus (e.g., a price increase). Indeed, it is rather usual for people not to react significantly to small or tiny stimuli, and it is only when stimuli are "sufficiently" large that they will react and adjust in reasonable ways.

Furthermore, even when the stimulus is substantial, people will respond only after they are able to discover the best way of *adjusting* to the stimulus—all of which will take some time. In the case of a *price* stimulus—for example, an *increase* in price—it will take some time at least before the consumer can adjust (a) by switching to a *substitute* product, or (b) by deciding to do with *less* of the given product, which involves a distinct change in taste or preference.

Graphic Presentation of Law of Demand

We are now at the point where the law of demand can be illustrated *graphically*. The graph shown in Figure 8 is based on the fact that the law of demand involves only "P's and Q's," that is, prices and quantity demanded; hence, only a two-dimensional graph is required. The *vertical* scale or "axis" on the left represents the various *prices* that could be charged per gallon of gasoline, rising up from lower to higher prices. The *horizontal* axis represents the *quantities* that would be demanded at various prices, showing increased quantities as you move from left to right.

Of course, Figure 8 is not based on actual market data, which could be obtained only by a market research survey. It is merely an illustration of what an economist might expect to find if he undertook a market survey by asking car drivers the simple question: "How many gallons of gasoline would you purchase at various prices, say, from 30 cents up to $1.20?" The resulting sample data represent aggregation of the data gleaned from the survey responses.

Each dot in the graph represents two bits of information: a given, potential *price* that could prevail in the market, and the corresponding *number of gallons* that would be demanded by each car driver. That is, each dot represents a given "P and Q," so to speak: a given price (P) and the corresponding quantity demanded (Qd). Thus, at $1.20 a gallon, very few gallons would be demanded, but, at successively lower prices, more and more gasoline would be purchased.

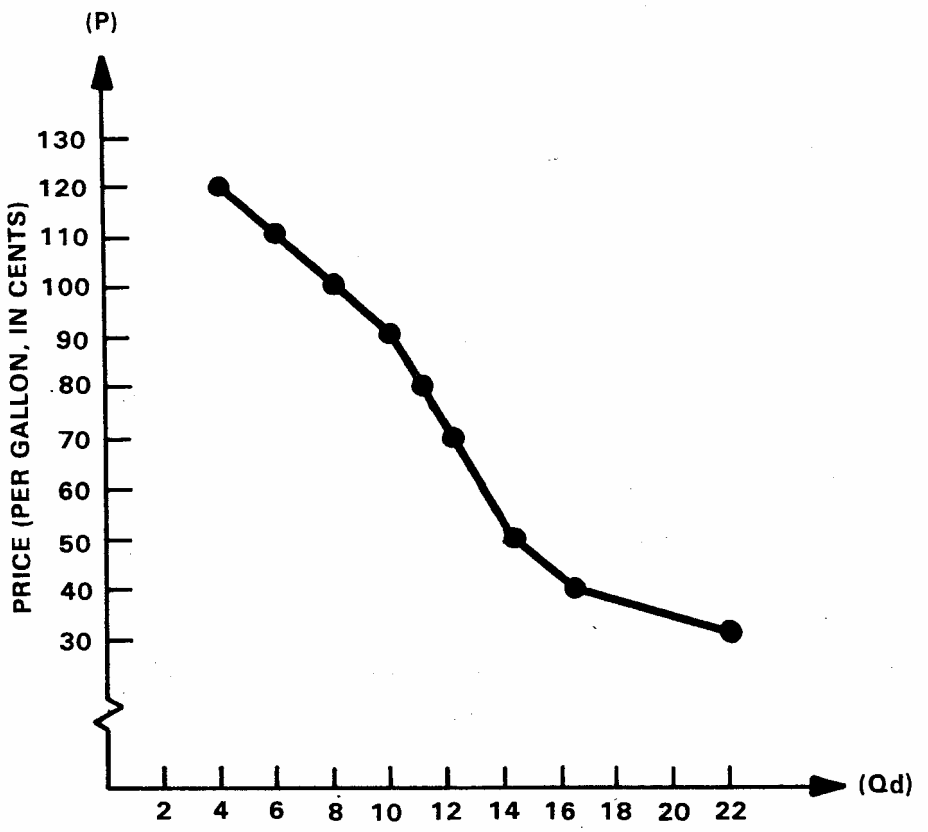

FIGURE 8:
DEMAND FOR GASOLINE BY PASSENGER CAR DRIVERS.

The Demand "Schedule"

Notice that the dots are linked to each other in sequence by straight lines, and form what is known as the demand *curve*. Ideally, the demand curve would be derived from data collected by a market survey, with the series of dots representing a discrete array of pairs of prices and Qd's. Indeed, the original statistical data obtained in such market surveys might very well assume the *tabular* form presented below in Table I. Notice therein the inverse relation between the prices and Qd's, with the P's going from high to low while the corresponding Qd's go from low to high. Together, this array of pairs of P's and Qd's, presented in tabular form, constitutes the demand *schedule*.

Table I

DEMAND FOR GASOLINE
BY PASSENGER-CAR DRIVERS
(in gallons)

Price (per gallon)	Weekly Quantity Demanded (per driver)
$1.20	4
1.10	6
1.00	8
.90	10
.80	11
.70	12
.60	13
.50	14
.40	16
.30	22

An "Instantaneous Snapshot"

Thus, Figure 8 is an *illustration* of the law of demand by means of the demand curve. Here the Qd's are shown to vary *only* in response to the different possible prices—on the *ceteris paribus* assumption, of course, that personal tastes, incomes, and other non-price determinants of Qd are dormant. In this sense, therefore, the curve gives us, in effect, an *instantaneous snapshot* of how people "feel" about gasoline prices when expressed in terms of gallons demanded. It is this *overall* view of the various possible pairs of P's and Qd's which is designated as the total "demand" schedule, in contradistinction to the *specific* "quantity demanded" which is related to a given price.

Thus, even if we had no precise idea of the specific magnitudes that the market survey would reveal, the law of demand would lead us to expect that the demand curve would have this overall characteristic *slope*: downward from left to right. So, assuming the present price was 50 cents a gallon, a *price increase* to 60 cents a gallon would be

expected to cause a drop in Qd to 13 gallons a week, whereas a *price decrease* to 40 cents would be expected to induce an increase in Qd to 16 gallons.

The "Elasticity" of Demand

In this connection it should be noted that, while all demand curves possess the characteristically general slope downward (from left to right), not every demand curve necessarily has the same *degree* of slope, technically referred to as *elasticity* of demand. The following Figure 9 illustrates three different schedules, each having a different degree of slope or elasticity. Curve D1 on the left would be classified as "inelastic," curve D2 in the middle displays "unitary" elasticity, while curve D3 on the right would be regarded as "elastic." Notice that the "curves" have been drawn, for convenience, as *straight lines* in order to emphasize the general degree of slope of the entire schedule. A more detailed analysis of demand elasticity, and the critical importance of the concept, will be the subject of the next chapter.

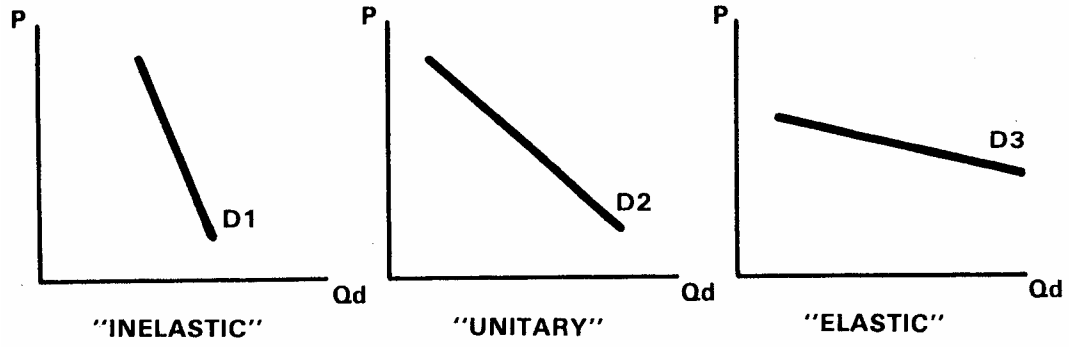

FIGURE 9:
DIFFERENT DEGREES OF ELASTICITY OF DEMAND

As a final note, it should be stressed that the demand schedule does not constitute an *actual* rate of purchase, but merely an indication of people's *readiness* to buy, based on their wants and modified by their economic ability, that is, their purchasing power. In other words, the use herein of the term *demand*, by itself, will connote not a sense of actuality but rather of potentiality.

"Shifts" of the Demand Schedule

We come now to an important question: What happens to the demand schedule when the basic *ceteris paribus* assumption of the law of demand—that *non-price* determinants are dormant or unchanging—is relaxed, and these determinants are allowed to change, as they do in the normal course of events? That is to say, what is the effect on demand of a *change* in one or more of the non-price determinants? For example, what

happens to the demand for product X when people's *incomes* or *tastes and preferences* change? Well, it all depends on whether these determinants increase or decrease.

For example, if there is a general *increase in income* in the community—of wages, say—then we could expect that people would be able to purchase more units at *each* possible price. This can be seen in Table II, where the quantity of gallons that would be purchased at each possible price (from $1.20 down to 30 cents) would be expected to increase in varying degree as shown for Period 2. Graphically, the resulting change in the state of demand is shown in part A of Figure 10. That is to say, the entire schedule or curve of D would be expected to *shift* from position D1 to D2, from left to right, indicating that, at all possible prices, people would be willing and able to buy more. A similar graphic effect would be expected if, instead of an income increase, there occurred an increased taste or preference for a given product.

The same reasoning applies to the case of a *decrease* in incomes in the community. Here we would expect that people, with reduced purchasing power, would be induced to buy less at *each* possible price, and the demand schedule would correspondingly undergo a "shift" to left, as in part B of Figure 10.

Table II

AN INCREASE IN DEMAND FOR GASOLINE
BY PASSENGER-CAR DRIVERS

Price (per gallon)	Weekly Quantity Demanded (per driver)	
	Period 1	Period 2
$1.20	4	5
1.10	6	7
1.00	8	9
.90	10	11
.80	11	12
.70	12	13
.60	13	14
.50	14	15
.40	16	19
.30	22	27

Some Comments on Demand Shifts

It should be noted that in all such instances of change in *non-price determinants*—and in the corresponding *shifts* of demand curves—it is not possible to predict exactly the extent or degree of change; only the general direction of shift is predictable.

Finally, it should be stressed that a shift in the entire demand schedule cannot be caused by a *price* change—only by a non-price change. True, laymen customarily say such things as, "rising prices cause a drop in *demand*," or "falling prices cause an increase in *demand*." For economics, this language is not sufficiently precise: in each statement the underlined word "demand" should be replaced by "quantity demanded" to make the statement correct. *Price* changes can only cause specific changes in Qd along a *given* unchanged demand schedule ("a movement along the curve," so to speak); on the other hand, only *non-price* changes can induce "shifts" of entire demand schedules.

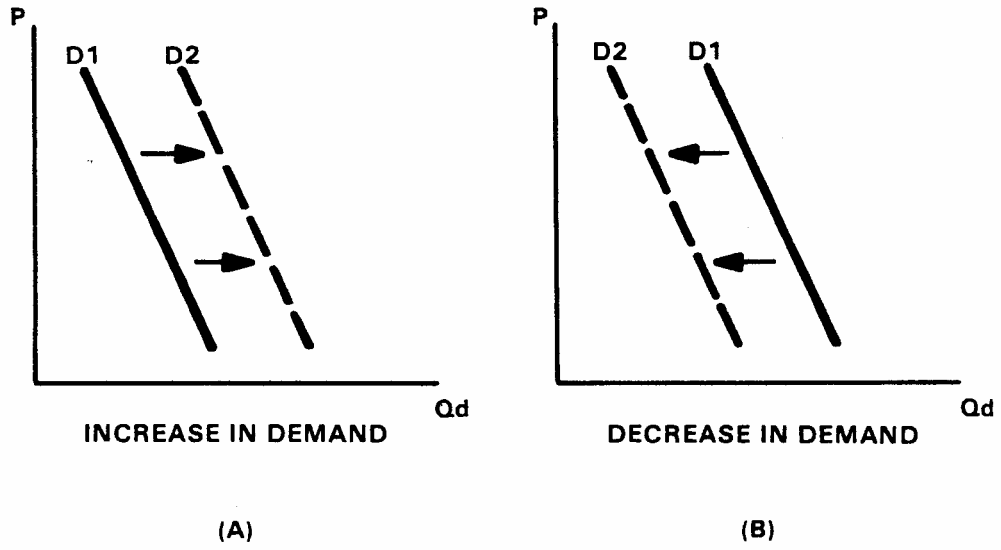

FIGURE 10:
"SHIFTS" IN THE DEMAND SCHEDULE.

The Role of Market Research

How would the firm become *aware* of such a shift in demand? First of all, we must be sure that the change in Qd's was not caused by a change in *price* by the firm; that is, the selling prices of firms must be assumed to have remained unchanged, so that any change in Qd cannot be attributed to a price change but rather to a change in one of the *non-price* elements. Thus, if a firm has not changed its price, and yet the Qd for its product has either increased or decreased, then it is certain that one or more of the *non-price* determinants were at work.

This raises the question: How can the firm discover *which* one or more of the non-price determinants of demand is at work, and to what extent? In this connection, *market research* projects become very relevant. The firm may have to undertake market research studies on each of the possible non-price determinants. Such studies, even though very costly, may be worthwhile if the firm believes that knowledge of demand determinants would improve its ability to plan future production and marketing, and leave it better off than otherwise.

Explaining the Law of Demand

We have now reached a crucial point in the analysis. So far we have presented mainly a description of the law of demand, without really giving the *rationale behind* it, and without explaining *why* we would expect the demand curve to slope generally the way it does. Although the law of demand makes a lot of common sense, it is nevertheless important to explain precisely why this is so. Some writers have attempted to explain the "why" of the demand curve, and it is useful to briefly examine their efforts.

Substitution Effects

One explanation of the law of demand is based on the notion of the *substitution effect*, which assumes that all products have "substitutes," either in the form of rival brands or rival products, as in the case of butter vs. margarine. Thus, when the price of a given product X is *decreased*, potential buyers are supposed to be induced to *switch* their buying from other products to product X, and thereby cause an increase in the Qd of X. However, the trouble with this theory is that it does not necessarily follow.

This can be seen in the case of a price *decrease*. For one thing, there is no certainty that product X has any substitutes at all from which loyalty can be switched to it. Nor is it necessary that the savings resulting from the lower price of X will inevitably be used to buy more of X itself rather than more of some other unrelated product.

What about an *increase* in the price of product X? The substitution effect would be expected to work as follows: a higher price for X would induce purchasers of it to buy less of it, and thereby cause a decrease in Qd of X. Thus far, then, the "substitution" theory is still consistent with the law of demand. Beyond this, however, it falls down: substitution effects do not necessarily follow.

First of all, unless we know something about the *price-elasticity* of demand for X (to be discussed in Chapter VII), it is not even certain that a reduced Qd will yield any savings at all. Indeed, in the case where few or no substitutes are available, it is possible to get the curious result that the smaller Qd is associated with an *increase in total expenditures* on X (as would be expected in a product like gasoline, which people cannot easily cut back if they are heavily dependent on automotive transportation). Hence, if there are no savings to start with, there can be no increment of money, at least in the short run, with which to do any switching to substitutes.

To be sure, if substitutes *are* sufficiently available, the substitution effects could easily occur, as the higher price of X induces people to switch to the substitute brand or product and causes a decrease in the Qd of X. Furthermore, if product X is of the type that simply does not command any strong preference or attachment among its customers,

and people find they can easily do without it, (i.e., the demand for it is very "elastic"), then its Qd could be expected to decrease as a result of its higher price; however, in this case there need not ensue any substitution effects.

Income Effects

Thus, the substitution effect is not a sufficient explanation o£ the law of demand. Another explanation offered by some writers is based on the notion of the *income effect*, which correctly assumes that changes in the price of products affect the purchasing power of one's income. That is to say, a lower price for product X makes buyers of X "feel richer," whereas an increase in price makes them "feel poorer." However, this does not necessarily follow.

Let us first take the case of a *decrease* in the price of X. The fact that the lower price yields a kind of savings to buyers of X does not necessarily imply that this increment will be devoted to increased Qd of X itself. Indeed, it could just as well be devoted to some other unrelated products. But, for argument's sake, let us suppose the savings *are* used for buying more of X: unless we know something about the *price-elasticity* of demand for X (to be analyzed in Chapter VII), it is possible to come upon the curious result seen in Table I: for example, the *drop* in price from 40 cents to 30 cents could be associated with an increase in *total expenditures*—from $6.40 (40 cents x 16 gallons) to $6.60 (30 cents x 22 gallons)—that is, an increase in total spending of 20 cents that could be attributed as much to a strong *subjective preference* for additional travel as to any income effect *per se*.

How would the income effect occur in the opposite case of a price *increase*? The assumption is that, at the higher price, the decrease in Qd is induced by the feeling of being made "poorer" by the price raise. However, here too it is not entirely true that the reduced Qd is induced *only* by the impoverishment effect. Again, in Table I, we see a case where a price raise, say from 40 cents to 50 cents, would be associated with an *increase in total expenditures*—from $6.40 (40 cents x 16 gallons) to $7.00 (50 cents x 14 gallons). That is to say, even though the price raise caused a drop in Qd, the fact is that total spending *increased* by 60 cents, revealing not an income effect but rather a lingering strong preference for car driving, such that drivers are willing to pay *more* money (in total) for *fewer* gallons of gasoline.

People Prefer Lower Prices

In summary, then, neither the substitution effect nor the income effect is sufficient to explain *why* the demand curve slopes the way it does. In this connection, it should be noted, there is a third type of explanation: the idea that the law of demand is merely a description of how demanders in general and consumers in particular "feel" about prices. Thus there follows this proposition: *people prefer lower prices to higher prices*. That is to say, in terms of the law of demand, this can be expressed as follows: preference for lower prices is reflected in the greater quantities demanded, whereas rejection of higher prices is reflected in the fewer units purchased. This proposition, that people prefer lower prices, turns out to be, in effect, a reverse way of expressing the law of demand: for any given

quantity to be purchased, a person would prefer to buy it at a lower price rather than at a higher price; indeed, the lower the price, the better.

The Least-Cost Principle

Let us pursue this line a bit. The money price asked by the seller of a good in the market place represents a kind of *cost* or *sacrifice* that the demander must make in order to acquire the good. The element of sacrifice lies in the fact that the demander must give up leisure and go to work in order to earn the money with which to pay for the desired good. We can now restate the preceding proposition: for any given want or goal, the lower the *cost* or *sacrifice* involved, the better—other things being equal. Logically, this leads us to conclude that the *least cost* or sacrifice is the best.

Indeed, this leads us to yet another proposition: in order to achieve any given purpose or goal, man prefers the *least-cost* method, other things being equal. This would be thoroughly consistent with the *maximizing principle* (see Chapter V). As we recall, the maximizing principle asserted that man chooses to do that which he expects will leave him better off than otherwise. Since, in our present case, lower money prices, lower costs, or lesser sacrifices clearly leave man better off than otherwise, it is reasonable to assert that man would prefer not only the *lesser* cost (to the higher cost) but, indeed, the *least* cost.

When all is said and done, however, the fact remains that the least-cost principle is merely *consistent with* the law of demand (and the maximizing principle), but cannot serve as a *sufficient explanation* of why the demand schedule slopes downward from left to right. The reason is that it, too, can be criticized on the same ground as the income-effect explanation. The income effect operates on the premise that lower prices make us feel "richer;" the least-cost principle is relevant primarily to the case of a price decrease. In either case, the increased purchasing-power effect caused by a price reduction does *not necessarily* imply an increase in Qd of product X itself: the "income" increment could just as well be devoted to other, non-X products.

Again, The Law of Marginal Utility

This writer believes that the best all-around explanation of the law of demand is the *law of marginal utility* (Chapter V). The best way to see this is to raise the question: For whom does the law of demand have the greatest practical significance? Clearly, for the firm or *the seller* in general. As a first approximation, what the law of demand says to the seller is simply this: if you want to sell *more* (i.e., induce a greater Qd), you will have to *reduce* your price sufficiently; conversely, if you want to withhold supply from the market and offer fewer units for sale, then you can *raise* your price and this will reduce the Qd. But this still is begging the question; we have to invoke the law of MU, especially its corollaries.

First let us apply the law of MU to the case of a price *reduction*. Relevant here is the corollary on *diminishing* MU, which asserts that, other things being equal, an increased stock of a given good X is associated with a diminished subjective value attached to any one unit. How does this tie in with the law of demand? In this way: if the seller wants to sell more units of a given good X to people for whom each unit of this

good is subject to a *diminishing* subjective value (i.e., because more units are available), then the seller must *reduce* his per-unit price sufficiently in order to induce people to buy more.

In other words, the buyer could not be expected to be willing to pay the *same* price for additional units of good X since, for him, acquisition of additional units is subject to the law of *diminishing* MU. Only a *lower* price per unit will induce him to buy more units. A very familiar example is the "economy-size" approach used in retail selling of detergents, coffee, and other consumers1 goods: compared to the smaller-size package, the larger (economy) size package is priced so that each ounce or pound of the good costs less than in the smaller package.

Similar reasoning applies to the case of a price *increase*. Relevant here is the corollary on *increasing* MU, which asserts that, other things being equal, a decreased stock of a given good X is associated with an increased subjective value attached to each unit. This ties in with the law of demand as follows: if the seller makes fewer units available for sale to buyers, for whom each unit of this good would be subject to an *increasing* subjective value (i.e., because fewer units are available), then the seller could raise his price and expect to get it.

In other words, people would be willing to pay a higher price for each unit, albeit in fewer units than before, since each unit is now subject to the law of *increasing* MU. Here, too, the economy-size approach is relevant, although in reverse: compared to the larger-size package, each unit (e.g., ounce) of the smaller-size package is priced higher than in the larger package.

Are There Exceptions to Law of Demand?

One problem remains: people sometimes object that the law of demand does not apply as a *general rule*—indeed, they claim there are exceptions to the law of demand which destroy its general validity. We shall examine a few of these alleged "exceptions" and see why they fail to prove their case against the law of demand.

Before we proceed, however, we should remember that the law of demand is concerned *only* with the relation between prices and quantities demanded (Qd's). It follows therefore that each alleged exception to the law of demand—in order to prove its case—must be framed strictly in terms of this exclusive relationship between prices and Qd's, albeit in the *opposite* sense; that is, an alleged exception must be able to show that (a) a lower price will induce a *decrease* in Qd, or (b) a higher price will induce an *increase* in Qd.

Selling More at Higher Prices

Let us first take up a familiar general case: The drug store which, after noticing that its bottles of aspirin did not sell very well at the discount price of 19 cents for 100 tablets, decided to *raise* the price to 49 cents! To its pleasant surprise, the aspirin sold much better at the *higher* price. This example is often given as an illustration of how a lower price induced people to buy *less* of the product, not more, thus contradicting the law of demand.

Is this really an exception to the law of demand? The first thing to notice is that: Was it *only* the lower price that had first induced a smaller Qd? Was it only the higher price that induced the increased Qd? It is well to recall that an exceedingly low price — such as the 19-cent price—may connote a product of lower *quality* as well, such that the lower price might induce a decrease rather than an increase in Qd! In the same vein, it is also well-known that a higher price for a given product often connotes to people a product of higher *quality* as well, such that the higher price could, not surprisingly, induce a greater desire to buy and an increase in Qd. Both of these cases appear to be clear contradictions of the law of demand.

Aspirins Fail the Test

To return to our aspirin case, it is relevant to ask again: Was it the lower 19-cent price *itself* that deterred purchases, or was it rather the fact that the low price also connoted inferior quality, therefore making the product not worth buying at all? Conversely, was it the higher 49-cent price *itself* that induced increased Qd, or was it rather the fact that the higher price connoted superior quality and therefore made the product more attractive?

To put this another way, in order to make the aspirin example a proper test case of the law of demand the following procedure would have to occur: at the same time that the seller raises his aspirin price from 19 cents to 49 cents he informs the customer that the 49-cent price is for the very *same* bottle that he could still buy at 19 cents—and then asks the customer: "Do you prefer to pay the 49-cent price or the 19-cent price for the identical commodity?" The outcome is predictable: For any given product, people would prefer to pay lower prices to higher prices, and the law of demand would still prevail.

In fact, of course, the drug store did not do this, and consumers were unaware that the aspirin quality was the same even at the higher price. Indeed, it was this *ignorance* of quality which explains why the Qd was greater at the higher price than at the lower price. Furthermore, the persistent tendency of sellers to resort to "sales" and "slashed prices," in order to sell out goods at a faster rate than at the former higher prices, is testimony to our contention that the law of demand remains intact.

Prestige Goods

Another alleged exception to the law of demand involves the class of products known as *prestige* goods. Familiar examples include mink coats and Rolls Royce cars, whose prices are characteristically very high. The allegation claims that it is the higher price of these goods that induces a greater Qd than otherwise. In rebuttal, however, it is not the higher price *itself* that induces the greater Qd, but rather the *status* or *prestige* attached to the higher quality of the product. That is, people are willing to pay a higher price for the added prestige or status.

Furthermore, the fact that a mink coat, for example, *is* of a higher quality than, say, a silver fox coat, means that it must be classified as a *different* type or grade of product, and therefore does not belong on the same demand curve as silver foxes or other lower-grade furs. That is, a *separate* demand schedule must be drawn for each different type or grade of product. Thus, the demand schedule for a *given* grade of mink coat

would be expected to reveal the familiar downward slope, left to right, associated with the law of demand; in this case, people would certainly not pay a higher price if they knew they could get the very *same* coat at a lower price.

Price Expectations

A final set of alleged exceptions involves *price expectations*. Let us first take the case of expectations of *rising* prices, as during a period of price inflation. As we saw above, expectations of higher prices tomorrow would be expected to induce a greater Qd today. Hence, it is alleged that this is an example of how higher prices can induce a greater Qd, thereby contradicting the law o£ demand. Actually, this allegation involves a distortion: it is not tomorrow's higher prices that induce the greater Qd, but rather the realization that today's prices are *relatively lower* than tomorrow's expected higher prices; it is this realization that induces us to buy *more* today than usual. Hence, the law of demand remains intact.

The opposite case involves expectations of *falling* prices, as during a depression period marked by price deflation. As we saw above, expectations of lower prices tomorrow would be expected to induce a smaller Qd today. Again, the allegation claims that this contradicts the law of demand, since it shows that lower prices cause a drop in Qd and not an increase. This, too, is a distortion: it is not tomorrow's lower prices that reduce today's rate of purchase, but rather the realization that today's prices are *relatively higher* than tomorrow's lower prices. That is, at today's relatively higher prices it pays to postpone purchases until tomorrow, when prices will actually be lower. Once again, the law of demand comes through unscathed.

Conclusion

A careful review of the alleged exceptions to the law of demand reveals a common characteristic: each basically involves a *non-price* determinant of Qd. This includes the case of price expectations, which we have classified among the "non-price" determinants. Since the law of demand involves *only* the relation between prices and Qd, it cannot be contradicted by cases that hinge on *non-price* determinants.

CHAPTER VII
PRICE-ELASTICITY OF MARKET DEMAND

After all is said and done, the law of demand is not enough. The reason: demand schedules come in a variety of *slopes* or price—elasticity—which makes all the difference in the world for the firm. Hence this chapter.

In the preceding chapter we visually alluded to the concept of price-elasticity of demand (Figure 9) by showing how market demand schedules, even though they all slope downwards from left to right, will in practice vary in their *degree* of slope or elasticity. We also noted that, technically speaking, demand schedules fall into three categories: *elastic*, *inelastic*, and *unitary*. In the present chapter we will not only explain the meaning of these categorical terms but will also show their extreme *practical importance* for the firm, as well as the special factors—social, technical, and economic—that help determine the category into which a given demand schedule would be expected to fall.

I. The Anatomy of Demand-Elasticity

The concept of *elasticity* of demand reflects the fact that, while the quantities demanded (Qd) by buyers are affected by the price of the product—as under the law of demand—*the degree of responsiveness* of buyers to a *change* in the price may vary from product to product, from person to person, and from time to time. That is to say, while a lower (higher) price set by sellers will be expected to increase (decrease) the Qd by buyers, the *sensitivity* of response of buyers to the given change in price will vary in degree. These different degrees of sensitivity or *elasticity* in Qd, in response to a given change in price by the seller, necessarily make the elasticity concept of greatest practical importance to the seller.

The Law of Demand Is Not Enough

The best way to get into the concept of price-elasticity of demand—"elasticity," for short—is to realize that it is directly related to a situation often faced by the firm: the firm seeks to increase its total dollar sales receipts (hereinafter noted simply as TR for total receipts) by means of a *change in its selling price*, that is, by cutting it or raising it. Thus, in its quest for increased TR, the firm wants to determine the following: should it *reduce* its price, or *increase* it?

At first glance, this would seem a fairly simple decision: in order to increase TR, the firm should try to sell more units of its product. To accomplish this, the firm should reduce its price, according to the law of demand (see Chapter VI). So the decision seems obvious: cut the price. Right? No—wrong! It does not follow that selling more *units* at a lower price will necessarily increase the *TR* as well. True, the lower price will enable the firm to sell more *units*—according to the law of demand—but it does not necessarily follow that the quantity demanded (Qd) will increase sufficiently to offset the *dollar* loss due to the lower price received for each unit sold. It all depends on the *elasticity* of demand. Clearly, in such a pricing decision, the law of demand is not enough as far as the firm is concerned. So, without further ado, let us pursue this matter of elasticity.

How To Increase Total Receipts

Imagine a firm that wants to increase its TR because, say, it is confronted by a union demand for wage increases. Other things being equal, a wage increase would cause an increase in the firm's total dollar costs (hereafter referred to simply as TC). Such an increase in TC, unaccompanied by a proportionate increase in TR, would in itself reduce the profit margin between TR and TC. (Note: total profits = TR - TC.) Now, one of the things the firm could try to do to offset the profit squeeze is to increase its TR sufficiently to cover the increase in TC.

Of course, the firm could try two other things in order to offset the wage increase and restore its former profit margin. Instead of increasing its TR, the firm could try to reduce its TC. On the one hand, the firm could lay off some workers and reduce its total wage bill enough to keep the TC at its former level. Or, it could install more efficient methods of production; this, too, would enable the firm to reduce its TC sufficiently to restore its former profit margin. In the present case, however, we assume that instead of reducing its TC, the firm seeks to increase its TR by selling a larger quantity of its product.

Quantity Demanded vs. Total Receipts

Now, according to the law of demand (Chapter VI), the firm would have to *reduce* its price in order to increase the quantity-demand (Qd) of its product. Since the law of demand is a matter of common knowledge, we would expect the firm to do the obvious and *cut* its price (P) in order to sell the larger quantity (Q) of its product. So far, so good—or so it would seem. But, as we have been intimating, the law of demand is not enough—not as long as the lower P fails to increase the Qd enough to *offset* the cut in price required to induce the increased Qd.

Let us *illustrate graphically* the problem of demand-elasticity now facing the firm. Figure 11 reveals a firm that has been selling 10,000 units at a price of $8 (see the dot 0). If the firm now decides to reduce the price to $5 in order to sell more units, it has no way of forecasting precisely *how much* the Qd will increase. This much, however, it does know: it would like the Qd to increase enough to *offset* the drop in P of $3 per unit sold; that is, it would like the *TR* to increase despite the lower price received. Only after it has actually cut its price will the firm be able to determine whether its TR has increased, that is, whether the Qd is sufficiently "elastic" to offset the price cut.

Selling More But Enjoying It Less

If after the price cut from $8 to $5 the Qd increases from the current 10,000 units to 24,000 units (see dot E in Figure 11), it is visually apparent that the response in Qd was comparatively great. More important, simple calculation reveals that the *TR increases* from the previous total of $80,000 (derived from P = $8 multiplied by Qd = 10,000) to a total of $120,000 (derived from $5 times 24,000 units)—despite the cut in P of $3 per unit! That is to say, the Qd proved to be sufficiently responsive to the price cut, and therefore able to offset the drastic price cut. Whether or not the increase of $40,000 in TR is actually enough to satisfy the firm's goal, the fact remains that such a sensitive

response in Qd is technically referred to as *elastic*. Elastic responses are precisely what the doctor should order if ever the firm has to *cut* its price, for only in such cases would the TR be expected to increase despite the price cut.

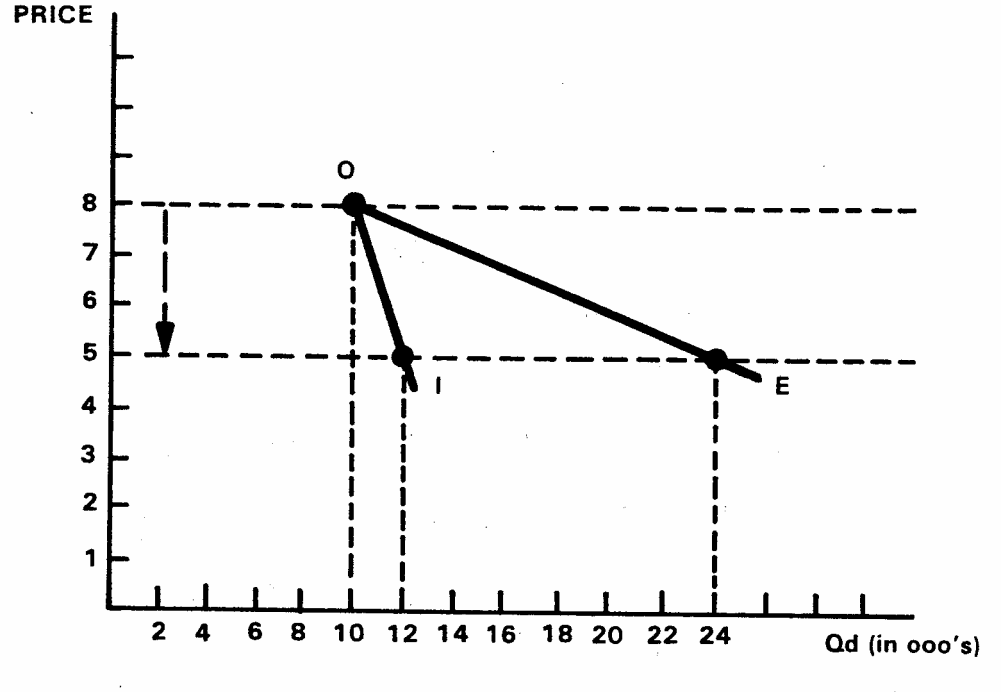

FIGURE 11:
ELASTICITY OF DEMAND IN THE CASE OF A PRICE-CUT.

Things could have worked out just the reverse! If the Qd, instead of increasing to 24,000 units, increased only *slightly*—to only 12,000 units, say—the TR would show a *decrease* from its previous $80,000 to $60,000! (This is the result of the lower P of $5 times the 12,000 units sold, shown by dot I in Figure 11). Clearly the increase in Qd here is relatively small compared to the sizable price cut—it does not increase sufficiently to offset the hefty price cut—so that on balance, the TR *decreased* from its former level. The relatively insensitive response in Qd, indicated by the demand segment 01, is technically referred to as an *inelastic* response. Inelastic responses are precisely what the firm does not want to encounter if it ever has to cut its price, for in all such cases the TR would decrease in spite of the increase in Qd. This amounts to selling more but enjoying it less, so to speak.

The Unknown Demand Schedule

At this point we should note some additional properties of the demand schedule that are practically important to the firm. First of all, only after the firm *changes* its selling price can it get some idea of the *slope* of demand for its product. More precisely,

at best it could discover no more than the segment of the demand that lies in the range of prices around its current price (e.g., the segments OI and OE in Figure 11). Indeed, so long as the firm continues to sell a given quantity at a given (unchanged) price—e.g., 10,000 units at $8, in Figure 11—the only thing it really knows about the demand schedule is a single "dot"—the dot O in Figure 11, which represents the current selling P of $8 and the Qd of 10,000 units. Only by a trial-and-error process of *changing* its P can the firm discover the slope of the demand *segment* nearest to its previous position or "dot."

The second noteworthy thing is that the *slopes* of the demand segment in Figure 11 are basically different: the *inelastic* segment OI slopes more to the vertical, while the *elastic* OE segment slopes more to the horizontal. And this is generally the case: whenever the demand schedule assumes a relatively vertical posture, it is technically identified as "inelastic," whereas the demand schedule that slopes toward the horizontal is identified as "elastic."

Elastic, Inelastic and Unitary

Omitted from Figure 11 is the oddball in-between case where the degree of elasticity is technically categorized as *unitary*—neither elastic nor inelastic. This is the extremely peculiar case where the TR remains the *same as before*—TR neither increases nor decreases—even though both the price and Qd have changed. In the case of a price cut, as shown in Figure 11, the unitary case would be represented by an increase in Qd to 16,000 units, which at $5 a piece yields a TR of $80,000, precisely the same amount as the original TR. Such a result can occur only in the very unlikely event that the Qd responds just enough to compensate for or offset the extent of the price change, as a consequence of which the TR remains virtually the same as before.

Third, it should be noted that the demand schedule (D), which consists of an array of possible "*dots*"—each of which represents a given P and the Qd at that price—for that very reason also consists of an array of *potential TR's* which can be calculated from the respective P's and Q's. In other words, the D schedule may also be interpreted as a *TR schedule*. As the firm moves from one selling price to another, it encounters not only a change in Qd but also a change in TR.

Elasticity of Demand and Uncertainty

This brings us to the fourth and probably most important aspect of the demand schedule—at least as far as the firm is concerned: the *TR* does not necessarily change in the *same* direction as does the *Qd* under the law of demand. That is to say, under the law of demand it is always true that a significant price *decrease* will cause Qd to increase, but it does not necessarily follow that TR will also increase. (Similarly, a significant price *increase* will cause Qd to decrease, but it will not necessarily cause TR to drop, too. More on this below.) It all depends on the slope, or degree of elasticity of demand. As we saw in Figure 11, in the case of a price cut, TR will actually decrease when the D schedule is *inelastic*, even though the Qd is increased. Only when the D schedule is *elastic* will a price cut increase TR as well as increase Qd.

The direct implication of this possible discrepancy between changes in Qd and changes in TR is the *uncertainty* that it causes for the firm whenever it wants to change its price and increase its TR. Will a price *cut*, for example, increase its TR or decrease it? The same question, we will see, applies to a price *increase*. The firm cannot know for certain which of the two TR outcomes will occur unless it knows the degree of elasticity of demand—that is, unless it knows whether the D for its product is "elastic" or "inelastic" in response to a price change. How can the firm acquire such practical knowledge of the elasticity of D for its product? Before we answer this question, we must resume our graphic analysis of elasticity to include the case of a price *increase*.

A Note on Statistical Procedures

Before proceeding, we should note the technical problem posed by the fact that the raw sales data showing the TR change cannot be accepted at face value. The reason: in practice, some part of the TR change may be due not only to the given *price* change (e.g., the price cut) but also to changes in *non-price* determinants, such as tastes or income. As we saw in Chapter VI, the law of demand *abstracts* from the impact of the various *non-price* influences on Qd. In the present chapter, for the purpose of illustrating the elasticity concept, we are similarly abstracting from possible non-price influences on TR, in order to be able to focus only on the relation between *price* changes and TR changes.

As a consequence of this technical problem, posed by the complex nature of the raw TR data, a variety of statistical procedures have been required to enable, at least approximately, the elimination of possible *non-price* influences on TR and the calculation of an "adjusted" TR figure which is related purely to *price*. A similar statistical chore is required in order to compute the *coefficient of elasticity*, which is the traditional method of explaining the concept of demand-elasticity (see Appendix to this chapter).

The Hazards of Price-Raising

Virtually everything we have said concerning the case of a price *cut* applies with equal force to the case of a price *increase*. Assume, now, that our firm has tried the price cut as a means of increasing its TR and discovered to its dismay that market demand was inelastic, so that its TR was now lower than before! The firm, being guided purely by the law of demand, might believe that its salvation lies only in a price cut—not a price increase—reasoning that only an increase in Qd could bring the desired increase in TR. Let us assume, however, that in sheer desperation it tries the price *increase* route to its goal.

In Figure 12, our firm has decided to *raise* its price from $8 to $10. Being ignorant of the degree of slope or elasticity of the demand schedule, it has no way of forecasting whether the extent of drop in Qd caused by the price increase will be dot E or dot I. As a starter, suppose the price-raise caused a drastic drop in Qd from the original 10,000 units (dot 0 in Figure 12) to a mere 4,000 units (dot E). Just by looking at the slope of the demand segment OE, it is apparent that the drop in Qd has been relatively drastic. It is clear that the price increase of $2 per unit was more than offset by the sharp decrease in Qd. It is no surprise, therefore, to find that TR, too, undergoes a drastic drop

from the original $80,000 to only $40,000. The firm's worst fears have been confirmed: the price-raise did scare off too many customers.

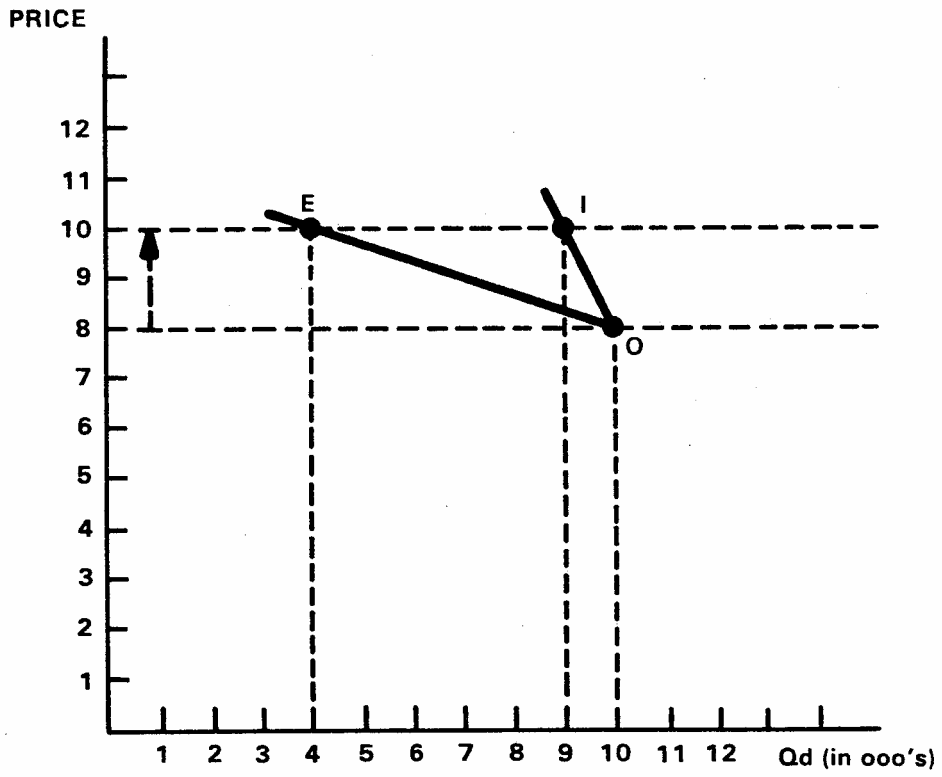

FIGURE 12:
ELASTICITY OF DEMAND IN THE CASE OF A PRICE-INCREASE.

Technically speaking, the demand segment OE revealed by the price increase in Figure 12 is regarded as *elastic*. Not only does Qd decrease in response to the price increase (and the law of demand), but more importantly, so does TR decrease, which is contrary to what the firm had desired. If ever the firm thinks that it must raise its price in order to increase its TR, it will learn at least one thing: to keep its fingers crossed lest demand turns out to be *elastic*.

Selling Less But Enjoying It More

In contrast to the dour outcome associated with Dot E in Figure 12, there is the totally opposite and happier possibility shown by dot I. Although here, too, Qd has dropped in response to the $2 price increase, it is apparent that the drop in Qd was relatively *slight*, and not nearly as much as the dot E. Indeed, when we check out the result in TR terms, we see that TR has *increased* from $80,000 to $90,000—despite the

drop in Qd! Clearly, the drop in Qd proved to be sufficiently small that it did not offset the $2 raise in price.

Whether or not the $10,000 increase in TR is, in practice, enough to satisfy the firm, the fact remains that, technically speaking, the demand segment OI is regarded as *inelastic*. Such "inelastic" responses are exactly what the firm would like to experience if and when it ever wants to *raise* its price, for only in such cases could TR be expected to increase in spite of the drop in Qd. In other words, the firm may be selling less but it is enjoying it more.

A Tableau of Our Results

Again omitted from our Figure 12 is the curious in-between category of elasticity technically referred to as *unitary*. As noted above, a "unitary" degree of elasticity is indicated only in those special instances where the price change somehow does not affect total TR even though the Qd changes; that is, TR remains virtually constant. In Figure 12 this unitary response would be indicated by a third dot placed right at the point joining the new $10 price and the reduced Qd of 8,000 units, which together make for a TR totaling $80,000— exactly the *same* as the original TR. Since the unitary response remains a relatively transitory case in practice, we will neglect it and devote our attention mainly to the more practically significant elastic and inelastic cases.
It is now possible to summarize the results of our analysis by the following tableau:

Type of Price Change	Change in Qd under the Law of Demand	Change in TR as Indicator of Degree of Elasticity of Demand
Price Cut	+	+ Elastic degree of elasticity - Inelastic degree of elasticity = Unitary degree of elasticity
Price Raise	-	- Elastic degree of elasticity + Inelastic degree of elasticity = Unitary degree of elasticity

Elastic vs. Inelastic: Which Is Better?

Before we proceed, we should explain some of the entries in the tableau: the "plus" sign indicates an increase in the Qd or TR, the "minus" sign stands for a decrease, while the "equals" sign stands for no-change. Now, the first thing to note is that *elastic* cases emerge only where the TR changes in the *same* direction as the Qd—that is, when TR increases while Qd increases, or when TR decreases while Qd decreases. On the other hand, the *inelastic* cases occur only when TR changes in a direction *opposite* to that of the Qd—that is, when TR decreases while Qd increases, or when TR increases while Qd decreases.

The next thing to note is that an "elastic" or "inelastic" demand does not always have the *same* practical significance for the firm. Thus, as illustrated by Figure 13, if the firm is considering a *reduction* of price, it would clearly prefer an elastic to an inelastic

demand segment, since only an elastic demand will bring with it the desired increase in TR despite the price cut. Conversely, when the firm is considering a price *increase*, it would clearly prefer an inelastic demand segment, for only in this case will the TR increase despite the drop in Qd. Put another way, an *elastic* demand would be "good news" to the firm only when considering a price cut, while an *inelastic* demand is "good news" only when a price increase is being considered.

The Practical Importance of Demand-Elasticity

Once again, then, we see why knowledge of the law of demand is not enough as far as the firm is concerned. Of great practical importance is an awareness of the price-elasticity dimension of demand, especially as it operates through changes in TR. More precisely, only from its market experience can the firm learn, sooner or later, that elastic and inelastic demand segments will exert significantly different effects on TR when it undertakes a price change. Only through constant effort to adapt to changes in market demand, via adjustments in selling price and/or quantities supplied, can the firm learn anything about the elasticity of demand for its product.

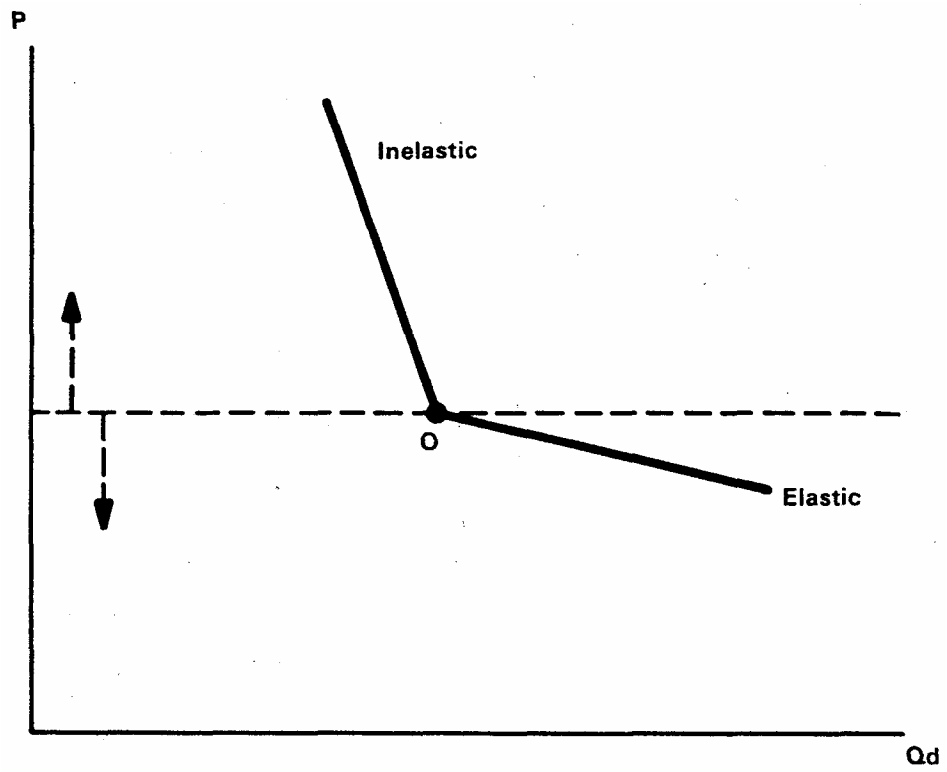

FIGURE 13:

DEGREES OF ELASTICITY PREFERRED BY THE FIRM.

By now, the preceding analysis must have raised at least two questions in the reader's mind: (1) What are the various social, technical, and economic forces that help determine whether market demand will be elastic or inelastic? (2) In what ways can the firm acquire knowledge of the elasticity of demand, which can guide it in forecasting the possible effects of a price change? It is these two practical questions to which we devote the next part of this chapter.

II. The Determinants of Elasticity

In the following analysis of the determinants of elasticity, we enumerate and analyze several basic *dimensions* through which the forces influencing the degree of elasticity of demand exert their effects. These determinants of elasticity ultimately boil down to but a few basic dimensions having to do with the product itself, the nature of the competitive environment, and the subjective conditions of the consumer. Our analysis will help us learn the nature of those conditions which tend to make demand elastic or inelastic, and which are therefore of direct practical relevance to the pricing policies of firms. As we will see, there is nothing in this common-sense analysis that the firm cannot, and does not, learn from its own trial-and-error experience in the market place.

(1) Availability of Close Substitutes

For virtually any given product X offered for exchange or sale in the market place, there can be found one or more *close substitutes*—other products that can serve the same purpose or provide the same utility (usefulness) as the given product X. One example already familiar to the reader involves butter and margarine (see Chapter VI). Substitutes need not be identical in physical properties. That is to say, the degree of substitutability or similarity of product is determined not only by the physical/technical properties of the interchangeable commodities, but also by the judgment of the consumer. Substitutability lies in the eyes of the beholder, so to speak.

If, for example, people use newspapers as well as wax paper for wrapping purposes, then this practice effectively makes them substitutes for each other with respect to the given purpose (wrapping), even though the two products are not physically identical. So long as the different products can be used to serve the same purpose, more or less, they are to that extent substitutable for each other—indeed, as far as the consumer is concerned, they may be viewed as rivals, in competition with each other.

Substitutes and Competition

Another equally important dimension of substitutability is the extent of competition provided by rival *brands* or *firms* producing the given product X. The larger the number of competing firms producing product X, the greater the degree of substitutability as far as the consumer is concerned. For example, if the consumer does not like Schlitz beer, for reasons of price or quality, he can find a half-dozen or more substitute beers produced by rival firms, all of whom offer a similar product that effectively serves as a close substitute for Schlitz.

We thus have not one but two dimensions of substitutability, both of consequence to the competition among products and firms. In effect, therefore, the availability of close substitutes is a reflection of the *competitive* environment facing the firm and its product. Hence, the greater the competition among both products and firms, the greater the availability of close substitutes—and vice versa. We now must ask: What is the effect of availability of substitutes on the degree of slope or elasticity of market demand? First, we will analyze the case of a price raise, and then the case of a price cut.

Substitutes and Elasticity

Assume, now, that a given firm has *raised* the price of its product, while other firms producing a similar product have not raised theirs, or have not raised theirs as much. It would be reasonable to assert: other things being equal, the greater the availability of substitutes, the more likely that the demand for the product will be elastic (see segment OE in Figure 14, part A); conversely, the smaller the availability of substitutes, the more likely that demand will prove to be inelastic (see segment 01 in Figure 14, part A). The reasoning here is straightforward: the greater the competition, the better able are buyers to locate relatively cheaper substitutes and to shift their purchases to those alternatives. They would rather switch than fight, to re-coin a phrase. Conversely, the smaller the extent of competition, the fewer the alternatives available to buyers.

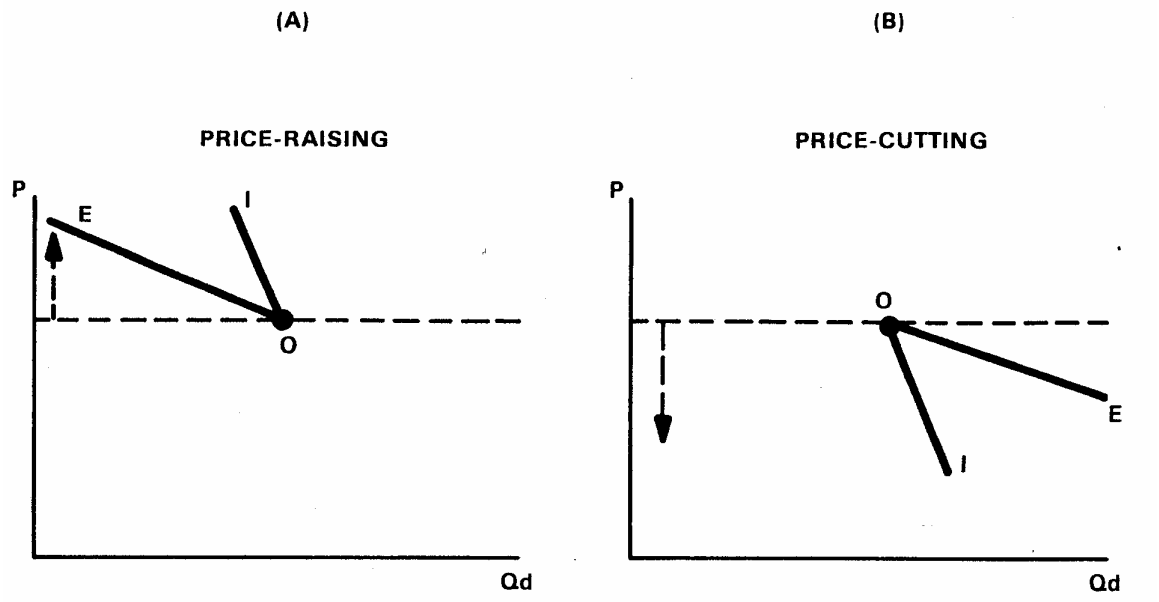

FIGURE 14:
PRICE-CHANGES AND PRICE-ELASTICITY OF DEMAND.

What about the case of a price *reduction*? Here it would be reasonable to assert the same propositions as in the case of a price increase: other things being equal, the greater the availability of substitutes, the more likely that demand will be elastic (see segment OE in Figure 14, part B), while conversely, the less the availability of substitutes, the more likely that demand will be inelastic (see segment OI in Figure 14, part B). Here the reasoning would be as follows: if the ABC Company cuts its price while all other firms fail to follow suit, then the greater the extent of competition from rival brands and products, and the greater the number of customers that can be won over from competitors in favor of ABC's lower price. Conversely, the smaller the extent of the competition, the fewer the customers to be won away from competitors.

Notice that in *both* cases of price raising and price cutting, the same conditions of substitutability result in the same degree of elasticity. Thus, the greater the availability of substitutes, the more likely that demand will be elastic in *both* the case of a price raise and a price cut. The same proposition applies to the situation where substitutes are not very available. As a consequence, the *overall* slope of market demand would be expected to be elastic (E) when numerous substitutes are available, and inelastic (I) when substitutes are not very available (see Figure 15).

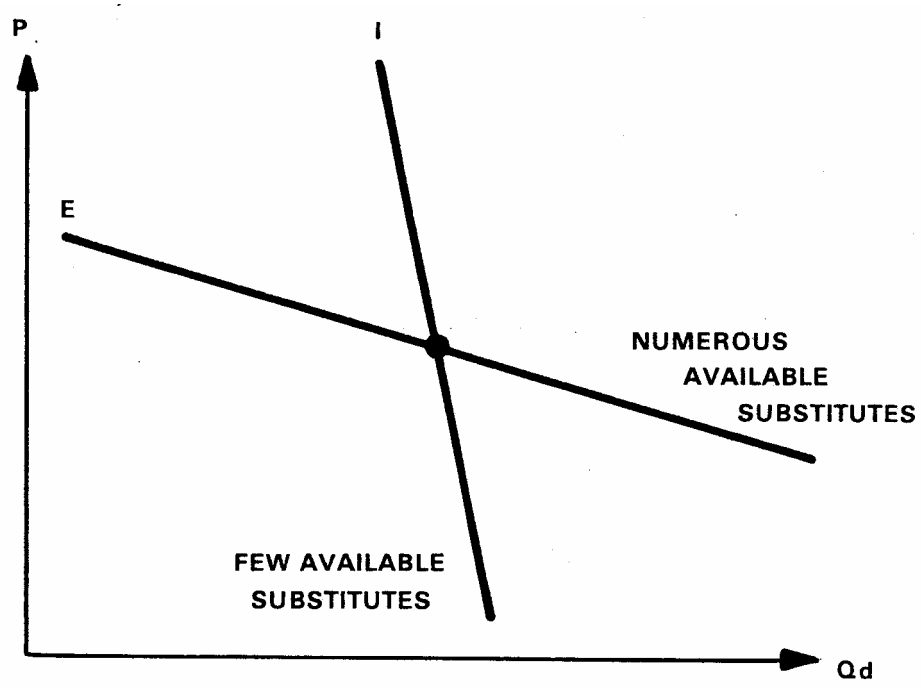

FIGURE 15:
AVAILABILITY OF SUBSTITUTES AND ELASTICITY OF DEMAND.

Subway Fares and Oil Cartels

How does all this apply to the practical pricing policies of firms? A couple of important examples will suffice, although numerous others can be recounted. Officials of New York City's subway system have been periodically faced with the need to increase

their total subway receipts (TR), especially to finance increased wage demands by union workers. Which way should they go—reduce the subway fare or raise it?
History tells us that the subway authorities have repeatedly resorted to an increase in the fare instead of a decrease. Why? Presumably, officials ruled out fare *cuts* on the belief that demand would be inelastic for a lower fare: they were probably skeptical that they could attract enough additional subway riders by the lower fare. So they turned instead to the fare *increase*, implying a belief that they had an *inelastic* demand for transportation. Clearly, the millions of workers going to jobs every day in Manhattan and other boroughs have little alternative to the subway. The comparative absence of any serious competition from alternative systems of transportation—taxis and owner-driven autos—would make for low substitutability and inelastic demand. Since the subway TR was increased as a consequence, the hunch about inelastic demand proved correct.

Another important example occurs in connection with the recent efforts of the oil cartel to increase total receipts (TR) by reducing supplies and charging higher prices. Intimately connected with this well-planned and orchestrated program were the gasoline "shortages" of the 1970's and the accompanying significant increases in gasoline prices. The oil producers must have been very confident that their Western customers were not only heavily dependent on oil, but also had few available substitutes, at least in the short run. Economic studies confirm their judgment: they show, for instance, that the demand for gasoline in the U.S.A. is very inelastic.

Before we proceed to the next determinant of elasticity, it is important to remember the *proviso* in our propositions: "other things being equal," i.e., *ceteris paribus*. This proviso reflects the fact that, in practice, there may be two or more determinants—not merely one—exerting their influence *simultaneously* on the demand for a given product. What makes this significant is the fact that the full array of determinants may not be exerting their influence all in the *same* direction, but rather in *opposite* directions. That is to say, one of the determinants may be imparting an inelastic thrust while another determinant may be imparting an elastic thrust. How does this affect our analysis of determinants? This will become clearer as we discuss other determinants.

(2) Relative Price of the Product

It is no secret that the various items we purchase in the market place have different price tags attached to them, and that some of these prices are relatively low or insignificant—such as the prices of newspapers, bottles of coke, or cigarettes—while other prices are relatively steep or expensive, such as the prices of automobiles or refrigerators. Even though automobiles and other durables may be bought on an installment basis, involving lower monthly payments, the fact remains that such payments constitute relatively large-size items in one's budget. In any event, how would the relative dollar—size of the item affect the elasticity of demand?

The Case of a Price Increase

First, take the case of a price *increase*. For purposes of illustration, let us assume a price increase of 50 percent and compare the effects in the case of two differently priced products—say, a newspaper and an automobile. If the newspaper was selling for 20 cents,

the new price would be 30 cents; if the car was selling for $6,000, the new price would be $9,000. Clearly, the impact on the elasticity of demand of the given 50-percent price increase would be vastly different in each case; the 10-cent price hike for the newspaper is virtually infinitesimal compared to the $3,000 boost on the car. As a consequence, a 10-cent boost would have virtually no deterrent effect on the rate of purchase compared to the deterrent effect of a $3,000 boost. Hence, it is reasonable to assert the following proposition: other things being equal, the smaller the relative price of the item, the more inelastic is the demand likely to be; conversely, the more expensive the item, the more elastic is demand likely to be—*ceteris paribus*.

This proposition can be confirmed by a variety of cases, but one important instance should suffice. A widespread practice among the governments of the world is the levying of *excise taxes*, particularly on low-priced items, such as cigarettes, cosmetics, movies, and liquor. This "nickel-and-dime" method of public finance has been a successful revenue raiser mainly because the low-priced items involved show inelastic demand against price increases. This means that the price hike caused by the tax has relatively slight deterrent impact on the rate of purchase.

The Case of a Price Cut

What about the case of a price reduction? Here, too, it would be plausible to assert the same proposition as above, and for similar reasons. A price cut on a low-priced item will spare the buyer only small amounts, and hence constitutes a relatively weak inducement to buy more. On the other hand, a similar percentage cut on a high-priced item will mean a relatively huge saving to the purchaser, and therefore constitute a very great inducement to buy. Hence, an inelastic response in Qd would be associated with the low-priced item while an elastic response would be expected in the case of a high-priced item, *ceteris paribus*.

Finally, we should note that, since our propositions are the *same* for both cases of price raising and price cutting, the *overall* conclusion is that elastic (E) demand will emerge in the case of high-priced items, and inelastic (I) demand will emerge in the case of low-priced items (see the slopes E and I in Figure 15).

The Meaning of "Ceteris Paribus"

Before we proceed to a third determinant of elasticity, it is pertinent to recall our earlier comment on the "other things being equal" proviso. There we noted that, in practice, we are likely to find not one but possibly two or more determinants of elasticity at work, and in opposite directions. Now, with the automobile, at least in areas where people have few alternative means of transportation (such as Los Angeles), we have an excellent example of this case.

In the Los Angeles area, for instance, automobiles are not only expensive in price (like everywhere else in the country) and in upkeep (because of the great mileage traveled by each driver), but they remain virtually the only means of transportation. (About the only substitutability is in switching from "gas-guzzler" models to "economy" models.) This heavy dependence on the automobile not only makes for inelastic demand, but also accounts for families tending to own two or more cars—depending on the size of family,

etc.,—which further adds to the purchase expense. Thus, we have determinants of *opposite* influence on elasticity: on the one hand, the lack of available substitutes causes *inelasticity* of demand, while on the other hand, the great expense of acquiring cars makes for *elasticity* of demand. This makes it more difficult for producing firms to predict the overall effects of an increase in the price of new cars as well as an increase in the price of gasoline.

(3) Subjective Preference Ranking

At least twice before—in Chapters V and VI—we have met the subjective preference—scale on which, at any given moment, we rank our wants and the means to satisfy them. The specific forces that shape and influence these subjective preference rankings—the importance we attach to things—are as numerous and varied as the human mind can imagine. They include such widely ranging factors as individual nutritional requirements, aesthetic tastes, and lifestyle—on to advertising, fashion, and professional/technical requirements.

Price Increases vs. Price Cuts

Before we examine some noteworthy aspects, let us first state the following propositions. If the firm is contemplating a *price increase*, it would be reasonable to assert: other things being equal, the higher the subjective preference-ranking for the particular product or want, the more likely that the demand will be inelastic in the face of a price raise. (In this connection, see Figure 14, part A, segment OI.) Conversely, the lower the subjective ranking for the item, the more likely that demand will be elastic in the face of the price raise. (See Figure 14, part A, segment OE.)

The reasoning here is straightforward. The more important the item is for the consumer, the less resistant will the consumer be to a price increase—*ceteris paribus*. The example of gasoline readily comes to mind. The inelastic demand attributed to gasoline in the face of price increases is as much due to the importance attached to the automobile as to the lack of available substitutes for automobile power. Conversely, the less important the item is for the consumer, the more likely that he will be deterred from buying at the higher price—other things remaining the same.

What about subjective preferences and *price reduction*? Here the propositions would run as follows: other things being equal, the stronger the subjective preference, the more will demand tend to be elastic, while the weaker the subjective preference, the more likely that demand will be inelastic. (See Figure 14, part B, segments OE and OI, respectively.) And the reasoning here is also straightforward: the more important the item is to consumers, the more likely are they to take advantage of the price cut; the less important the item, the less likely are consumers to be induced to buy by the price cut.

Practical Implications

A further significant proposition follows from these considerations. On the assumption that firms prefer larger total receipts (TR) to smaller TR's, they will tend to

produce goods of *higher*-valued preference, or cater to wants of *higher* rank, rather than produce goods or cater to wants of lower-valued rank.

In this connection, an examination of Figure 16 readily tells us why: *higher*-ranked goods or wants (see part A of Figure 16) are associated with demand segments whose degree of elasticity implies *increased* TR's if and when the firm wants to either increase its price (see segment OI) or cut its price (see segment OE); conversely, *lower*-ranked goods or wants (see part B of Figure 16) are associated with demand segments whose degree of elasticity implies *decreased* TR's when the firm raises its price (see segment OE) or cuts its price (see segment OI). To put it another way: if ever the firm is faced with the decision to change its price in order to increase its TR, it would clearly be better off producing goods of higher value than goods of lower value.

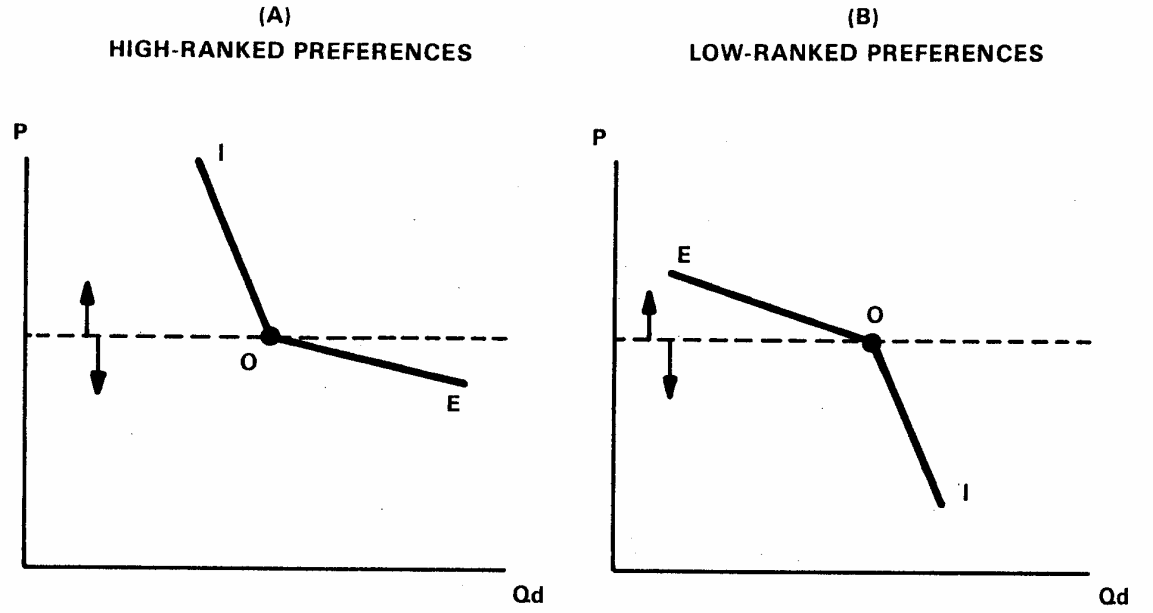

FIGURE 16:
PREFERENCE-RANKING AND ELASTICITY OF DEMAND.

The Case of Agricultural Products

All of this has great relevance to government policy on agricultural products—their supply and pricing. Here it suffices to note that the demand for agricultural products and foodstuffs as a whole is overall *inelastic*. This means that farmers face two alternatives. They could, on the one hand, *increase* their TR's by producing less and charging higher prices. On the other hand, they could increase production and reduce prices in order to increase the Qd; but in so doing their TR's would decrease due to the inelastic demand!

At least two interesting implications emerge from the agricultural case. One is the implication, just noted, that farmers can be induced to increase their TR's by producing less and increasing prices. The other is an implication that applies to other goods that

share a similar characteristic: while these goods possess great importance for people, they are nevertheless needed in only *minimum quantities*, such that the demand for them is inelastic *both* for a price raise *and* for a price cut.

Minimum Requirements

For example, in the case of foodstuffs, people generally desire certain minimum quantities for nutritional purposes (causing demand to be inelastic against a *price hike*). For this reason, they are not sufficiently attracted to opportunities to acquire more foodstuffs at lower prices, in preference to other goods (hence the inelastic demand to a *price cut*). Similar is the case of special technical instruments or equipment, such a slide-rules, pocket computers, or stethoscopes. For these items, people have only a limited professional or technical requirement—that is, they need but one unit, not more. Therefore, the firm would have to cut its price steeply in order to induce buyers to acquire a second unit or more. It may be noted, however, that at the greatly reduced price, additional customers can be picked up from two other groups of purchasers: people who have a relatively low-ranked preference for such items, and can be induced to buy only by a much-reduced price; and people in lower-income classes who can now afford to buy at the much lower price. This latter dimension of elasticity-determination will be examined in more detail in the next section.

(4) The Structure of Social Income

This dimension of demand-elasticity is relevant primarily to two cases. One involves a given product that has significant markets in *each* of the layers of the social income structure—from the higher-income strata, down through the middle-income, and into the lower-income strata—such that the problem facing the firm involves a judgment as to which price or price range will maximize its total receipts (TR).

Other things being equal, a relatively high price caters primarily to *upper-income* people, but because their number is comparatively small, the quantity demanded by them will be relatively small (see the relevant inelastic segment of the demand schedule in Figure 17). On the other hand, a relatively low price caters primarily to *lower-income* groups, but since they exist in greater numbers, their Qd may be considerably large (see the *elastic* segment of demand in Figure 17). As a consequence, the firm must decide which of the two attractive segments of the market offers the comparatively greater TR, assuming the costs of producing the two different quantities does not significantly affect the pricing decision.

Closely related to this type of decision—which involves the question: Which level of *price* will maximize the firm's TR?—is another practical question: Which level of *quality* or *grade* of product will tap the most lucrative markets? Generally speaking, people associate higher prices with higher-quality products, and lower prices with lower-quality goods. Thus, assume an automobile producer who is able to turn out either a very expensive, high-quality, deluxe car (with a relatively inelastic demand) or a relatively inexpensive, lower-quality, mass-produced car (with a very elastic demand). The one car would cater to a select group of rich people or car enthusiasts; the other car would tap the untold riches of the mass market. If an entrepreneur were motivated primarily by the

vision of a potential mass market, he would clearly undertake production of the inexpensive, mass-market car. Could this have been the paradigm for Henry Ford and his Model T car?

(5) Supplies On Hand in the Pantry

In pursuing this catalogue of elasticity determinants, we should also note a factor that must be presumed to be an important influence on elasticity, but its significance cannot be easily ascertained by the firm. It involves a wide variety of storable commodities (from canned goods and linens to gasoline for the car), which are kept in consumers' refrigerators, freezers, pantries, closets, tanks, attics, or wherever. Typically, the quantity or stock in possession of the consumer can vary from zero or low to full or ample, so that the firm cannot gauge the state of consumer inventories of consumables with sufficient precision. Nevertheless, the *law of marginal utility* (Chapter V) enables us to assert the following propositions.

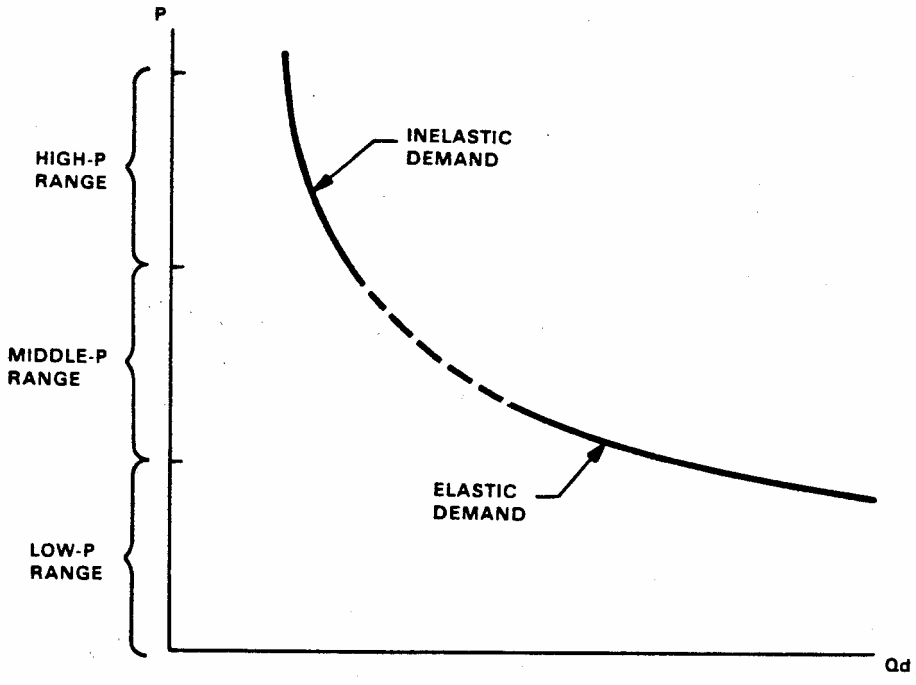

FIGURE 17:
SOCIAL INCOME-STRUCTURE AND ELASTICITY OF DEMAND.

First, the case of a price *increase*. Other things being equal, the greater the quantity of goods already in consumers' stocks, the more likely that consumers' demand will be elastic in response to the price-hike; conversely, the smaller the stocks on hand, the more likely that consumers' demand will be *inelastic* rather than elastic. The reasoning, based on the law of marginal utility, would run as follows: with ample or bulging stocks on hand (and the law of *diminishing* MU therefore becoming relevant), consumers would be less inclined than otherwise to pay a higher price; with small or

meager supplies on hand (and the law of *increasing* MU therefore becoming relevant), consumers would be less deterred than otherwise from buying at the higher price.

A parallel line of reasoning applies to a price *reduction*. Other things being equal, the greater the quantity in consumers' stocks, the more likely that consumers' demand will be inelastic in response to the price cut; conversely, the smaller the stocks on hand, the more likely that demand will be elastic. Why? In the case of ample stocks on hand, the law of *diminishing* MU becomes relevant: the lower price is less of an inducement to buy than otherwise. However, when stocks are very low, and the law of *increasing* MU becomes relevant, the consumer finds the lower price a greater inducement to buy than otherwise.

Complexity of Determinants

As a concluding note to this analysis of elasticity determinants, it is necessary to stress again that, in the real world, these determinants may exert their influence in *combinations* of two or more simultaneously, but with mutually *opposite* impacts on Qd. What we have done in this part of the chapter is a "partial analysis"—a study of the effects of *isolated* or particular forces at work, on the *ceteris paribus* assumption that other influences are not simultaneously at work. This enables us to explore theoretically the full workings of any single factor. Then, equipped with this knowledge of the workings of *individual* determinants, we should be better able to forecast the effects on elasticity that may be exerted by the *complex*, real-world conditions facing the firm in a given market.

In this connection it is important to recall (from Chapter VI) that the firm knows little, if anything, about the demand schedule for its product— other than its current "dot," that is, its current selling price (P) and the quantity demanded (Qd) at that price. The only other thing the firm knows is that there *is* a demand schedule out there in the market—albeit unknown—and that if the firm raised (or lowered) its price, the Qd would decrease (or increase).

Demand—The Unknown

But surely this is not enough. The firm could still not know in advance by *how much* the Qd would decrease (or increase) when it raises (or lowers) its price. Indeed, such information about the effect of a price change cannot be known until the firm actually institutes the price change. Even then, the firm would discover the degree of elasticity pertaining to only *one* segment of a potentially more complete demand schedule. Logically, the only way the firm could discover the full array of "dots" constituting the demand schedule would be to conduct a kind of experiment: It could post a series of price changes over a wide range in order to uncover the full array of the respective P and Qd dots that comprise the demand schedule—assuming, of course, that the demand schedule does not shift throughout the entire experiment!

In practice, however, firms cannot and do not play such games. They do not change prices unless provoked by special circumstances. For instance, they have in the past raised prices mainly in response to rising costs rather than to take advantage of increased demand; from the public relations viewpoint, they prefer not to be accused of

"charging what the traffic will bear." Conversely, they reduce prices mainly under the pressure of increased competition or the need to dispose of overpriced goods.

III. Some Important Questions

Can firms charge just any high price they want, and still prosper? Do firms always charge the highest price consistent with maximum profits? Do firms actually have complete knowledge of market demand so that they know exactly which price will maximize their profits? These and related questions can be answered, at least partly, with the help of the demand-elasticity concept. Let us see how.

The Firm as "Profiteer"

There is a widespread notion that, if left alone, the firm would automatically charge the "highest possible price" simply out of rapacious greed, and that only fear of government reprisal (e.g., anti-trust action by the Justice Department) keeps it from resorting to price "extortion" or "profiteering." Whether or not it is true that fear of public reprisal keeps the firm in check is strictly an empirical question, which may or may not be open to investigation. As far as economics is concerned, the market alone suffices to keep prices of firms in check (as we will see especially in the next chapter); it would be a waste of valuable resources to set up a public agency merely to police prices in the market place when, all along, the market itself can serve this function.

It should be noted here, however, that no firm in its right mind would blindly and steadily raise prices *regardless of the elasticity* of demand for its product. As we have amply seen, the only time it pays the firm to raise its price is when market demand is *inelastic* (not elastic!), for only inelastic demand will yield an increase in total receipts (TR) and an increase in total profits. (This assumes that cost-changes are not a factor—that the smaller production rate due to the drop in quantity demanded (Qd) does not affect total costs in a way that affects the profit rate.) However, if, following the price raise, demand proves to be *elastic*, the result would be a drop in TR and (assuming no cost-effects) a drop in profit rate, too, which should suffice to check the price-raising! In other words, the firm would go for a price raise only as long as demand is inelastic; if demand turns out to be elastic, the price-raising will stop.

Ex-Ante Ignorance

This brings us to a related question. Assume a firm that, in quest of increased TR and believing market demand to be inelastic, decides to raise its price. And lo and behold, it discovers it guessed correctly—its TR actually increases. This prompts the question: How come the firm had up to now been asleep at the wheel—selling at a lower price and TR—when all along it could have been selling at a higher price and a larger TR? Assuming costs of production were not a factor, it looks like the firm had up to this point foregone higher profits. Why would it do so?

One possible answer is that the firm was more or less *ignorant* of the degree of elasticity of market demand when it had made its original *ex-ante* decision—when it set the price at, say, $10 in the belief that this represented its most profitable price for the quantity produced. Had it known originally that a higher price of $12, say—and a smaller

quantity of production—would have brought a higher TR, it would undoubtedly have opted for that combination of P and Q. But in view of its ignorance—its incomplete knowledge of the actual demand situation—it could not know in the *ex-ante* what it could know only in the *ex-post*, after trial-and-error. (See Chapter V on maximizing and the *ex-ante/ex-post* aspects of decision-making.) In other words, had the firm at the start possessed perfect knowledge of the market demand, it would have opened up with a $12 price—it would never have had to raise its price from $10 to $12, and consumers would not have any grounds to complain of "profiteering"!

"Social Pressures," Competition, and Income Changes

Another possible reason why a firm might only belatedly discover that its initial price had been set too low—in the sense that it was less profitable than the higher price it set later—is the widespread reluctance of firms to raise prices in the face of various "social pressures." One such pressure stems from the taboo, already mentioned, against "charging what the traffic will bear." In terms of elasticity this means: do not raise prices even though demand is inelastic and TR would increase! Another form of pressure stems from the fear of prosecution by the Justice Department under the anti-trust laws, on the grounds of "monopoly" or "market power."

A third possible reason is the firm's fear of competition from rival firms and rival products, such that a price raise might leave it out on the limb—losing customers to rivals that had not raised their prices. In such cases it might occur to the firm that the best way to achieve higher profits is through collusion with its rivals. Such concerted action would involve a basic agreement among firms to restrict supply, rig prices, and bolster profits by means of pools, mergers, or cartels. In other words, the firm may overcome its fear of competition by, in effect, outlawing it in concert with its rivals. But history tells us that such cartel-like arrangements have never worked without the backing and legal sanction of government.

A Note on Cartels

In this connection, history also reveals that cartels organized by commodity-producing nations—in order to restrict supply and maintain the price of copper, coffee, oil, etc.—have tended to underestimate the degree of elastic response in consumers' demand as a consequence of consumers' ability to find *substitutes* in the long run. Indeed, all demand schedules possess some degree of elasticity due to the availability, more or less, of substitutes.

History reveals that in the long run there is no such thing as a totally vertical (totally inelastic) demand schedule. Man has not let himself be crucified by a price hike. He has had the ingenuity to use science and technology to find those substitutes that enable him to reduce reliance on higher-priced resources. And this is probably the most productive as well as the most effective way of bringing any cartel to heel.

Rising Incomes and Price-Increases

Also worth mentioning is the following peculiar situation. Imagine a case in which TR increases at the same time that the firm raises its price—but not as a result of inelastic demand. This is the case where *market demand* had increased at the same time that the firm had raised its price. In this case, the firm may not have realized that demand had increased because personal incomes of households had increased, thereby causing a "shift to the right" in the demand schedule (see Chapter VI). In this case the TR is increased not because of inelastic demand but because, despite the higher price, the increase in the demand schedule was sufficiently large so that the Qd remains undiminished or even increases!

Why Not Blame the Consumer?

The fact that the firm can raise its price and increase its TR raises another issue. There have always been people who regard price-raising by the firm as "reprehensible" or "gouging." Since it is usually *inelastic* demand that enables the firm to earn a larger TR when it raises its price, two further questions become very relevant: (1) Why blame the *firm* for inelastic demand, when only the consumers are ultimately responsible for that? (2) Does not the firm have the right to take advantage of a market situation which reveals an inelastic demand for a given product?

As to the first question, it should be noted that whereas *consumers*—not firms—should be blamed for creating the inelastic demand, these same consumers have it in their power to reverse the situation and create an *elastic* demand—simply by sitting on their hands and curtailing their spending! Therefore, if consumers think a firm's price and TR are "too high," and really want to bring them down, nothing stands in their way but their resolve to buy less.

A Question of Human Rights

As to the second question—concerning the firm's *right* to maximize its profit by increasing its TR—it suffices to note that it involves a moral issue. Virtually all attacks on the firm that concern their pricing and production policies—e.g., the firm's price is alternatively "too high" ("extortion"!), "too low" ("price warfare"!), or the firm is alternatively producing "too much" (beware of "growth" and "affluence!"), or "too little" ("monopolistic restriction"!)—these attacks are not only self-contradictory but also boil down to questions of fundamental human rights. Does a person have the right to ask any price he wishes for his goods and services? Does he have the right to produce as much or as little as he desires? These fundamental questions will turn up again in Chapter X, wherein we analyze the nature of a free-market economy.

Appendix
THE COEFFICIENT OF ELASTICITY

It is not usual to give the concept of demand-elasticity a whole chapter all to itself as we have just done. Nor is it usual to treat elasticity in "TR" terms, although textbooks are tending more and more to do so. More usual, because it is traditional, is to describe elasticity in "percentage" terms—that is, to compare the *percentage* change in quantity-demanded with the given *percentage* change in price. The purpose of this appendix is merely to alert the reader to the existence of this alternative concept, which he can pursue in greater detail in any introductory or intermediate textbook.

Theoretically, there is no basic conflict between the TR approach and the percentage approach; they are two different ways of looking at the same thing. In the percentage approach, the criterion of elasticity is referred to as the "coefficient of elasticity," which is derived as follows:

$$\text{Coefficient Of Elasticity (COE)} = \frac{\text{Percentage Change in Qd}}{\text{Percentage Change in P}}$$

Thus, the COE turns out to be a number that reflects the numerical relation or ratio between the *rate* of change in P and the *rate* of change in Qd. The plus or minus signs that are involved mathematically can be conveniently disregarded for the purpose of calculating the COE.

Let us take a simple example. Suppose a price cut of 15 percent results in a 20 percent increase in Qd. The resulting ratio is 20/15, equivalent to 1-1/3, or 1.333. Since any COE that is numerically *greater* than 1.0 is classified as *elastic*, the above case reveals elastic demand. Another simple example: suppose a price raise of 20 percent results in Qd dropping only 10 percent. Calculation yields a ratio of 10/20, equivalent to 1/2 or .5. Since any COE that is numerically *less* than 1.0 is classified as *inelastic*, we have here a case of inelastic demand. Finally, the *unitary* case arises where the percent changes in Qd and P are exactly *equal*, yielding a COE of 1.0, the standard for unitary elasticity.

Notice that both the TR and percentage criteria involve the same basic elements: P and Qd. But the TR figure , compared to the COE, has the advantage of not requiring any further calculation once the raw TR data have been statistically adjusted to eliminate the effect of *non-price* influences on TR—a statistical procedure that is also required in calculating the COE. In contrast, the COE requires the further calculation of the respective percentage changes in P and Qd, and then the ratio of these percentage changes.