Elasticity

We know that when the price of a product rises, people tend to buy less of it. However, it's important to know how much less? If the price of a good increases by 10%, does the amount purchased decline by 1% or 70%? The price elasticity of demand measures the sensitivity of the amount purchased (quantity demanded) to a change in price; more specifically, it's the percent change in quantity demanded divided by the percent change in price. Suppose the price of a specialty pizza was $10 and the amount sold was 100. If the price is raised to $12, sales decline to 90. What is the elasticity of demand?

The elasticity of demand is the ratio of the percent change in amount purchased to the percent change in price. The percent change in quantity is (90-100)/100 = -10%. The percent change in price is ($12-$10)/$10 = +20%. Thus the elasticity of demand is -10%/20% = -0.5 (no, not -0.5%). What does this mean? It means that sales decline at half the rate that prices increase (20% increase in price leads to only a 10% decline in sales). Thus, sales are not that sensitive to a change in price.

Since higher prices lead to less of a good being purchased, the price elasticity of demand will be negative, so we tend to focus on the number itself, sometimes referred to as the absolute value or magnitude (for example, if the elasticity of demand is -3, it's absolute value or magnitude is 3). When the absolute value is greater than one, it indicates that quantity is very sensitive to price and demand is considered to be elastic. For example, if the elasticity of demand is -3, the amount purchased declines by three times as much price increases (30% decline in quantity results from a 10% increase in price). If the elasticity of demand is less than one, the amount purchased declines by a smaller percent than the prices increases, so quantity is not that sensitive to price. In this case, demand is considered to be inelastic. An elasticity of 0.2 indicates that a 10% increase in price leads to a 2% decline in the amount sold. In the special case in which the elasticity of demand is equal to -1, demand is unitary elastic (the amount purchased changes in proportion to the change in price).

Elasticity of Demand and Total Revenue

How can a business make use of the concept of elasticity of demand? It provides insight as to how to change prices in order to increase total revenue (note: total revenue is price x quantity). If a business wants to bring in more revenue, should it raise prices or lower them? The answer depends on the elasticity of demand for its product. If the demand is elastic, a decrease in price will result in a relatively larger increase in amount sold (quantity). As a result, total revenue increases. The more elastic the demand, the larger the increase in revenue as a result of the price reduction. However, if the demand is inelastic, an increase in price may be more beneficial since the higher price will lead to a relatively small decline in the amount sold resulting in higher revenue. As before, the more inelastic the demand, the larger the increase in revenue as a result of the price increase. When demand is unitary elastic, the price hike is offset by a proportionate decline in amount sold resulting in no change in revenue. Thus companies need to consider the elasticity of demand for their product when determining whether and how to change prices.

Building on the example above, before the price change, the pizza place was earning $1000 in revenue ($10 x 100). After raising prices, it's sales declined to 90, but not enough to offset the price increase, so revenue rose to $12 x 90 = $1080.

Here's another example. Suppose a restaurant normally charges $20 for a meal and has 50 customers a night on weekends. However, it notices that it only has 20 customers a night on Mon-Thurs. It offers 20% off during the week and finds that it now averages 30 customers a night on weekdays. What is its elasticity of
demand on Mon-Thurs evenings and what happens to revenue as a result of the price change?

- Elasticity of demand = \frac{(30-20)/20}{-20\%} = 50\%/-20\% = -2.5 (demand is elastic)
- revenue prior to discount: $20 x 20 = $400
- revenue with the discount: $16 x 30 = $480
- Thus, when demand is elastic, lower prices attract many more customers which offset the price reduction, resulting in more revenue.

Here's a story explaining how Microsoft is applying elasticity of demand in setting its prices. An excerpt from the story provides some insight into its strategy:

All of these moves amount to a risky experiment in price elasticity. By lowering prices, the company hopes to increase sales of existing products while making fast headway with new ones. If the company can gain enough market share to cover its massive costs in Web services and Internet search—notably, its vast data centers—every extra dollar will be pure profit. "I'm not saying it will be easy," says Ballmer. "But we have great opportunities to grow total profit dollars."

Factors Affecting Elasticity of Demand

Why do different products have different elasticities of demand? There are certain factors that help to determine how sensitive customers are to changes in prices. A major determinant is the availability of substitutes or alternatives. If there are more substitutes for a good, consumers are going to be more sensitive to price changes since there are many alternatives from which to choose. Thus, the more substitutes that exist for a product, the more elastic the demand. Thus, competition from similar types of products limit the pricing lower of firms.

The reputation or strength of the brand makes a difference. Firms with better reputations distinguish themselves from their competitors (the alternatives are not viewed as being of equal quality); this results in a more inelastic demand resulting in more pricing power.

The portion of one's budget is another determinant of elasticity of demand. If the purchase of a product constitutes a high portion of the average budget, people are going to be quite sensitive to its price. If instead the purchase of an item makes up a small portion of a budget, people are not going to worry about its price. Therefore, the higher the portion of the budget, the higher the elasticity of demand.

Whether the product is considered a luxury or necessity affects its elasticity. Since luxuries are optional, people will be more sensitive to the price of luxuries whereas if something is perceived to be a necessity, people will tend to buy it even if the price rises (may purchase a little less). As a result, luxuries tend to have higher elasticities and necessities have lower elasticities.

Time is also a factor in determining whether the demand for a product is likely to be elastic or inelastic. If a purchase needs to be made very soon, price will be less of a concern thus resulting in an inelastic demand. However, if a person has more time to make a decision, she can shop around, find substitutes, etc., and the demand will be more elastic.

Which factor should you consider when trying to determine if the elasticity of a product is elastic or inelastic? It's not a multiple choice question, all of the factors listed help determine the price elasticity of demand for a product.
STOP AND THINK: Given the factors described above, is the demand for your company's products likely to be elastic or inelastic?