A Brief Overview about Price Elasticity of Demand

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ABSTRACT:

The idea of elastic demand, which assesses how responsively quantity demanded is to changes in price or other variables, is crucial to economics. Understanding consumer behavior, market dynamics, and policy analysis depend heavily on it. An overview of demand elasticity is given in this chapter, with particular emphasis on its concept, techniques of calculation, and actual applications in a range of economic situations. It covers the various types of demand elasticity, such as price, income, and cross-price elasticity, and investigates how they may affect market outcomes, revenue optimization, and policy development.

KEYWORDS:

Demand Elasticity, Demand Curve, Elasticity Demand, Elastic Demand, Inelastic Demand.

I. INTRODUCTION

Elasticity is a general term for responsiveness. Elasticity is used to illustrate how demand for a commodity responds to changes in price, either upward or downward. By understanding the elasticity of the things, he sells, managers have many advantages. A larger response indicates more flexibility, whereas a smaller response suggests less elasticity. A manager is really curious to discover whether lowering prices by 8% will result in an increase in sales of 4%, 10%, or more. Elasticity of demand, then, gauges how responsively demand responds to changes in the commodity's price. Economics was first exposed to the idea of demand elasticity by Professor Alfred Marshall. The elasticityof demand in a market is great or small depending on the amount demanded increasing much or little for a given fall in price and diminishing much or little for a given rise in price, he wrote. Thus, the ratio of the percentage change in quantity demanded to the percentage change in price may be used to determine elasticity of demand[1], [2].

Both elastic and inelastic demand exist. Demand is said to be elastic when it can shift significantly in response to a modest change in price. Demand is said to be very elastic if a 5% decrease in automobile pricing results in a 30% rise in sales. In other words, demand has significantly increased. On the other hand, inelastic demand occurs when a large change in price is followed by a modest change in demand. For instance, it is argued that the demand for salt is inelastic because the same amount would be bought regardless of price changes. A slight increase or decrease in price can significantly diminish or boost demand, but the demand for cars is elastic. Demand-side price elasticity is represented as follows:

Ep = Change in Demand as a Percentage

Price variation as a percentage

Five situations or types of price elasticity of demand exist. These are listed below:

1. **Perfectly Inelastic Demand:** If the quantity demanded for a good change not at all in response to a given change in price, the demand is said to be perfectly elastic. It is precisely inelastic demand if a 10% change in price results in a 0% change in demand. As seen in Fig. 5.1, the demand curve in this instance is a vertical straight line perpendicular to the Y-axis.

2. **Inelastic or less than Unit Elastic Demand:** If the percentage change in quantity sought is smaller than the percentage change in price, the demand for a commodity is said to be inelastic or less than unit elastic. Inelastic demand occurs when a 10% change in price causes a 6% change in demand.

3. **Unitary Elastic Demand:** If the percentage change in the amount sought equals the percentage change in the price, the demand for a good is said to be unit elastic. Unit elastic demand occurs when a 10% change in price causes a 10% change in demand. In this scenario, the demand curve is known as a rectangular hyperbola and is depicted in the adjacent.Demand for a product is considered to be more than unit elastic if a change in price causes a sizable shift in consumer preferences for that commodity. Elastic demand occurs when a 10% change in price causes a 14% change in demand. Elastic demand is depicted in Figure 5.4 below.

4. **Elastic Demand:**Perfectly Elastic Demand when a commodity's demand changes infinitely with a slight change in price, it is said to have perfectly elastic demand. Demand is perfectly elastic if a 10% change in price causes a (%) change in demand. As illustrated, the demand curve in this instance is a horizontal straight line parallel to the X-axis. Real-world instances of the first and last situations are uncommon. The table illustrates how a 10% change in a good's price affects the quantity demanded. Elasticity is completely inelastic if the quantity needed changes neither way nor changes by zero. Demand is inelastic if the change is comparatively small. Elastic demand is unitary and elastic demand, respectively, in cases of the same change and greater changes in demand. Demand is perfectly elastic when there is very large change[3], [4].

Assessment of Price Leverage and Demand

Understanding how responsive, or elastic, or inelastic, demand is crucial. Elasticity measurement is required for this objective. The following are crucial techniques to gauge elasticity:

1. Using a percentage.
2. Arc technique
3. The method of total outlay.
4. The geometric or point technique.
5. The earning approaches.

Method of Total Outlay/Expenditure

The Total Outlay/expenditure made by a family on the purchase of a commodity can be used to gauge how elastic demand is for a given good. TQ stands for total outlay, p and q for price and quantity, respectively, and the formula for total outlay is (TQ = p q). The three measurements of the elasticity of demand that this methodology offers us are as follows:

(1) Unit Elasticity Less Than (e 1)

(2) (e = 1) Unit Elastic

(3) More Elastic than One Unit (e > 1)

Prof. Marshall utilised the total outlay method to measure demand elasticity primarily. This approach compares the sum of consumer spending on the products before and after price adjustments in order to calculate elasticity. The following three circumstances can all be measured for elastic properties. Elasticity at unit (e = 1): Elasticity is referred to as unitary when the total expenditure (TE) does not change despite though the price of the good changes. Consider the scenario below, where TE is left unchanged. When the price drops to Rs 2 per unit, it can be seen that the overall cost remains the same[5], [6].

II. DISCUSSION

The quantity demanded for a good is measured according to its price elasticity of demand, or PED (End). Almost all goods see a decrease in quantity demanded when prices rise, however certain goods experience this decrease more than others. When a price increases by 1% while all other factors remain

constant, the price elasticity provides the percentage change in quantity required. If the elasticity is 2, a 1% increase in price results in a 2% decrease in amount demanded. Other elasticities quantify how changes in one variable affect the quantity required the income elasticity of demand for changes in consumer income. Except in rare circumstances, price elasticities are negative. When a good is said to have an elasticity of 2, this nearly generally refers to the formal definition, which states that the good has an elasticity of 2. Ignoring the sign, the term more elastic refers to a good's elasticity's bigger magnitude. Two uncommon exceptions to the rule of demand, Veblen and griffin goods are two groups of goods with positive elasticity.

When the elasticity is less than one in absolute terms, the demand for a good is said to be inelastic, meaning that changes in price have a minimal impact on the amount demanded. When the elasticity of demand for a good exceeds one, the demand is said to be elastic. A good with an elastic demand of 2 has a quantity response that is twice as great as the price rise, whereas a good with an inelastic demand of 0.5 has a quantity response that is only half as great as the price increase.In the absence of any price rises, consumption would remain constant with an elasticity of 0.When the price is chosen so that the elasticity is exactly one, revenue is maximized. The incidence of a tax on a good can be predicted using the elasticity of the good. To ascertain price elasticity, a variety of research techniques are employed, such as test markets, historical sales data analysis, and conjoint analysis. Price elasticity of demand is the variance in demand in response to a change in price. The ratio of the percentage change in the amount required to the percentage change in the price of a specific commodity may also be used to define it.

The following equation can be used to calculate a good's price elasticity of demand: The change is measured by the delta Q. In other terms, the percentage change in demand for a commodity as a result of a specific percentage change in the price is known as the price elasticity of demand. The quantity demanded has decreased by 10% and the price has increased by 5% if the quantity demanded decreases by 20 tones from an initial 200 tones after a price increase of $5 from an initial price of $100. The law of demand states that when prices increase, quantity required decreases, resulting in a negative price elasticity of demand. Veblen and griffin goods are two uncommon groups of items that have elasticity greater than 0 consumers buy more if the price is higher. Economists frequently omit the word negative or the minus sign and refer to the price elasticity of demand as a positive value because the price elasticity of demand is negative for the vast majority of goods and services unlike most other elasticity's, which take both positive and negative values depending on the good. Yachts have an elasticity of two means that the elasticity is equal to two. Students frequently get confused about this [6]–[8].

A good is classified as having elastic demand, inelastic demand, or unitary elastic demand depending on how elastic it is. When demand is elastic, the amount desired is very responsive to changes in price, such as when a 1% increase in price results in a 10% drop in quantity. If demand is inelastic, quantity changes less than price but demand for the good is largely responsive to price. The supply decreases by the exact percentage by which the price increases if demand is unitary elastic. Perfectly elastic demand, where even a slight increase in price causes the amount demanded to decrease to zero, and perfectly inelastic demand, where an increase in price causes the quantity to remain unchanged, are two significant particular instances. In order to distinguish it from the elasticity of demand for that good with respect to the change in the price of some other good, i.e., an independent, complementary, or substitute good, the aforementioned measure of elasticity is sometimes referred to as the own-price elasticity of demand for a good, i.e., the elasticity of demand with respect to the good's own price. A cross-price elasticity of demand is the name given to such two-good form of elasticity

For a combination of two factors, the elasticity definition loses validity as the magnitude of the price shift increases. First off, a good's elasticity is not always constant; it fluctuates along the demand curve depending on whether the beginning price is high or low. This is because a 1% change in price has a quantity effect that may vary. Contrary to popular belief, the price elasticity fluctuates rather than remaining constant along a linear demand curve. The slope of a linear demand curve is constant, to be sure, but even if / display style Delta P/Delta Q is constant, the elasticity can fluctuate. The percentage

change between any two values is not symmetrical; rather, it depends on which value is selected as the initial value and which as the ending value. Consider the scenario where the quantity decreases from 100 to 80 units when the price increases from $10 to $16. To address these issues with the fundamental elasticity formula, two improvements to the notion of elasticity are used: arc elasticity and point elasticity.

Price Determinants Less Steady Demand

Demand elasticity varies from one commodity to another. Elasticity depends on a number of different variables, including:

1. Good Substitutes: A commodity's demand will be elastic if there are quality alternatives available. This is due to the fact that as a good's price increases, consumers would instead buy its equivalent.

2. Commodity Nature: All needs, such as salt and rice, will have an inelastic demand since there are no alternatives or few alternatives available. Such goods must be purchased by people in order to survive. Therefore, despite the price modifications, there will be some demand. On the other hand, demand for luxury items will be flexible. Consumers choose not to purchase such goods if the price even slightly increases. At the same time, a small price reduction on these goods draws in a lot of buyers.

3. Commodity's Number of Uses: A commodity's elasticity will increase with the number of uses it can be put to. As a result, the demand for such commodities will be elastic. For instance, milk can be utilised in a variety of ways to make curd, cake, desserts, and other things. Demand rises when its price decreases, but falls sharply when its price is raised.

4. The Possibility of Delaying Consumption: If a commodity's consumption can be delayed, demand will be elastic; otherwise, it won't be. Demand for some products, such as computers, printers, scanners, etc., can be delayed for a while. People might wait until they are less expensive. Their demand is elastic as a result. The need for food or electricity, however, cannot be put off. Their demand is inelastic as a result.

5. Proportion of Income Spent: The proportion of income spent on a commodity's purchase has an impact on the elasticity of demand. The demand will be inelastic if the percentage is relatively low. As an illustration, we spend very little of our overall revenue on items like agarbatties, matches, pens, and pencils. Our demand is not diminished if the price of such things also rises. Inelastic demand exists for such commodities as a result.

6. Fashion: Demand for commodities that are in style will be inelastic. People that care about fashion don't cut corners on budget. Some consumers will expect more even though the pricing is high simply because the product is in style.

7. Change in Taste: A commodity that has become a consumer's habit or for which they have developed a taste will have an inelastic demand. A chain smoker constantly needs a cigarette, no matter the cost. Similarly, despite price increases, a habitual pan chewer cannot break his or her habit. Demand is consequently elastic in these circumstances.

8. The Price of the Commodity: Items with extremely high or extremely cheap prices have low elasticity, whereas items with moderate prices have a high degree of elasticity. Even if a good's price somewhat decreases, demand will not rise significantly if it is extremely costly. And because individuals have already purchased their needs at low prices, demand won't increase even at extremely low levels.

Determinants

The main determinant of elasticity is how eager and able consumers are to delay purchasing decisions about a good after a price change in order to hunt for alternatives wait and look. Thus, a variety of variables can impact how elastic the demand for a good is People can readily migrate from one good to

another if an even slight price change is made, hence the more readily available and nearby replacements there are, the higher the elasticity is likely to be; A significant substitution impact exists. The substitution effect will be minimal and the demand will be inelastic if there are no close substitutes available. The flexibility decreases when the definition of a good or service is expanded. If there are numerous substitutes, for instance, Company X's fish and chips would typically have a very high elasticity of demand, whereas food in general would have a very low elasticity of demand because there are no substitutes. Some foods, such as ice cream, meat, and spinach, or groups of foods, such as dairy, meat, and seafood goods, may be stretcher.

Proportion of Income

People tend to pay more attention while buying the good because of its cost, hence the elasticity tends to be larger the higher the percentage of the consumer's income that the product's price represents; there is a large revenue effect. The income effect and demand elasticity will be negligible when the commodities only make up a tiny fraction of the budget. The less elastic a good is, the less likely it is to be purchased because consumers will try to purchase it regardless of cost, as is the case with insulin for those who require it. Since more and more consumers discover they have the time and desire to look for alternatives, the longer a price change persists, the higher the elasticity is likely to be for most items. For example, when gas prices spike suddenly, consumers may continue to fill up their empty tanks in the short term, but when prices stay high for a long time, more consumers will reduce their demand for fuel by using carpooling or public transportation, buying more fuel-efficient vehicles, or taking other actions.

However, this is not true for consumer durables like cars because buyers may eventually need to replace their current vehicles, which would cause demand to be less elastic. Demand may become more inelastic if there is a strong loyalty to a certain brand, whether out of habit or due to proprietary obstacles. Demand is likely to be more rigid in situations where the consumer does not directly pay for the commodity they use, like with corporate spending accounts. More addictive products typically have an inelastic PED (PED absolute value 1). These include, for instance, alcohol, heroin, and cigarettes. This is due to the fact that consumers view these products as necessities and are hence compelled to buy them despite even major price fluctuations. Implication for tax incidence Consumers will be responsible for a larger part of the tax burden than producers when demand is more inelastic than supply.

Article Focus: Tax Incidence

In order to determine where the incidence burden of a per-unit tax is decreasing or to forecast where it will fall if the tax is implemented, demand elasticity can be used in conjunction with price elasticity of supply. For instance, when demand is perfectly inelastic, the quantity sought would remain constant because, by definition, consumers have no other option but to buy the commodity or service even if the price increases. As a result, providers may raise prices by the full amount of the tax, with the consumer ultimately bearing the cost. In contrast, if demand is absolutely elastic, consumers would completely stop purchasing the commodity or service in question if the price increased since they have an infinite number of options to choose from. As a result, the quantity required would decrease to zero. As a result, businesses would be obliged to pay the entire tax themselves because they are unable to pass any portion of it along by raising prices.

Demand is most likely merely to be slightly elastic or slightly inelastic in practice, that is, somewhere in between the extremes of complete elasticity or inelasticity. In general, then, the harder the burden on producers, the higher the elasticity of demand relative to PES, and the heavier the burden on consumers, the higher the inelasticity of demand compared to supply. The basic rule is that a greater amount of the tax burden will fall on the party (i.e., consumers or producers) that has fewer chances to reduce the tax by choosing alternatives. Individual families ultimately bear the whole tax burden because they are the actual owners of the production assets used by the business see Circular flow of revenue. The deadweight loss brought on by a tax scheme can also be impacted by PED and PES. The deadweight loss is less than in a scenario with higher elasticity when PED, PES, or both are inelastic.

Laws of Supply and Demand

According to the law of demand, demand for a product will decline as its price rises, all other things being equal. Therefore, as a product's price drops, so does consumer demand for that goods? As a result, the law of demand establishes an inverse relationship between a product's price and quantity components. Contrarily, according to the rule of supply, an increase in price will result in an increase in the quantity supplied, all other things being equal. In other words, the quantity delivered will fluctuate in the same manner as the price. Production facilities will make greater investments in their operations and produce more goods at a higher cost. Because of this, the law of supply establishes a direct connection between price and quantity. View related categories in the Theory of Demand Meaning and Determinants of Demand section below:

1. Demand Elasticity and the Law of Demand.
2. Absences from the Law of Demand.
3. Demand Elasticity Movement along the Demand Curve and Demand Curve Shift.
4. Demand Elasticity and Income.
5. Demand Cross elasticity.
6. Demand Forecasting Techniques Demand Price Elasticity Forecasting.

As was already mentioned, the elasticity of demand gauges how variables like price and income affect consumer demand for a given good. Demand's sensitivity to price changes is quantified as price elasticity of demand. The price elasticity of demand (PED) can now be calculated quantitatively as follows Price Elasticity of Demand (PED) is defined as the ratio between changes in quantity requested and price. Let's move on to how PED can be measured.

Elasticity of Price Coefficient

The price elasticity of demand (PED) is quantified by economists using coefficients. Depending on the coefficient, the demand for a good may be elastic, perfectly elastic, inelastic, or perfectly inelastic in response to the change in price. You now need to comprehend that the coefficient will have a negative value because price and demand move in the opposite directions. However, economists typically avoid using the negative sign and instead concentrate on the coefficient itself. Let's now examine the PED coefficient's numerical values.

The Demand-Price Elasticity Critical

Since this idea enables them to predict their company's success, economists and marketers place a high priority on price elasticity of demand. They are committed to creating a product with inelastic demand, meaning that people will purchase it regardless of price changes. When fixing a price for their goods, monopolists and owners of goods with few or no substitutes on the market take the elasticity of demand into account. When demand is inelastic, businesses can establish high prices, but when demand is elastic, they must set lower prices to differentiate themselves from the competitors. If you want to launch a business in international trade, you must assess the elasticity of demand for the essential goods of the nation you want to sell to. You will have to cut your prices, which could result in losses, if the importer's market turns out to have elastic demand for your country's inelastic product demand. Additionally, you can be required to pay higher taxes on commodities with inelastic demand under the current tax structure. Heavy crops ironically hurt farmers. Rich harvests increase farmer rivalry, which leads to rigid demand for particular items. Therefore, a large supply prevents farmers from raising their income. Now that you are aware of how the elasticity of demand functions and why it is crucial, let's look at the variables that affect it.

Factors Affecting Demand's Price Elasticity

We'll identify the top 5 variables influencing demand elasticity. A product's nature. Traditionally, we can divide all products into three categories: necessities for survival, luxuries, and comforts. Gas, electricity, higher education, and life-saving medications like insulin are all necessities. These goods and services are hard to reject and cannot be substituted by anything else, therefore either their demand

elasticity is very low or they are inelastic. People's flexibility is higher since they can survive for a while without comforts like freezers. Finally, luxury items like jeweler and cars have a high degree of flexibility.Existence of alternatives. A premium product becomes more price sensitive as more alternatives become available as customers search for less expensive options. The owner will have to drop pricing as a result of the decline in demand for a high-end product. Income range.

It's crucial to research not only the local market and economy, but also the income bracket of your target customers. As opposed to those with low salaries, those with greater incomes are less sensitive to price increases. As a result, individuals with higher incomes will have very low demand elasticity, and low-income groups will have high demand elasticity. Spending a portion of revenue on a purchase. In general, if consumers only spend a tiny fraction of their money on these goods, the price elasticity of demand is low. For instance, since items like salt, soap, and matchboxes don't account for a large portion of customers' overall spending, a price change for these items won't result in a rise in demand elasticity. Conversely, because the cost of more expensive goods is more directly related to customers' income, such as computers, they will have a higher elasticity of demand. Time frame. People don't like to change their buying habits or brands; thus, demand is typically inelastic in the near term. However, if prices rise over time, consumers may start looking for alternatives. With the seasonal price swings that consumers have grown accustomed to, this does not work.

III.   CONCLUSION

A key idea in economics, elasticity of demand offers important insights into consumer behavior, market dynamics, and policy analysis. Elasticity of demand aids in making decisions for firms, government officials, and economists by determining how sensitive changes in quantity desired are to changes in price or other causes.Price elasticity, income elasticity, and cross-price elasticity are just a few examples of the several types of demand elasticity that make it possible to fully comprehend how changes in variables like price, income, and the prices of related commodities affect consumer demand. Businesses may identify revenue-maximizing price points, optimize their pricing strategies, and successfully react to market shifts thanks to this expertise. Elasticity of demand is a tool used by policy makers to gauge how economic policies affect consumer behaviour and market results.

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