

The Price Of A Good Rises From \$8 To \$12, And The Quantity Demanded Falls From 110 To 90 Units. Calculated

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In the realm of microeconomics, understanding how price changes influence the quantity demanded of a good is fundamental. When the price of a product increases, consumers tend to buy less of it, illustrating the law of demand. Conversely, a decrease in price generally leads to an increase in quantity demanded. This relationship is crucial for businesses, policymakers, and economists who seek to analyze market behaviors, set optimal pricing strategies, or predict how markets respond to shifts in economic variables.

In this article, we explore a specific scenario where the price of a good increases from \$8 to \$12, and as a result, the quantity demanded decreases from 110 units to 90 units. By calculating the price elasticity of demand, we can gain insights into how sensitive consumers are to price changes for this particular good. This analysis not only helps in understanding consumer responsiveness but also aids in making informed decisions regarding pricing, marketing, and inventory management.

Let's delve into the details of this scenario, understand the concept of price elasticity, and explore what the calculations reveal about consumer behavior and demand elasticity.

Understanding Price and Quantity Demanded

The Basic Relationship

The fundamental principle in microeconomics is the law of demand, which states that, *ceteris paribus* (all other factors constant), there is an inverse relationship between the price of a good and the quantity demanded. When the price rises, consumers tend to buy less; when the price falls, they tend to buy more.

In the scenario presented:

- Initial Price (P_1): \$8
- New Price (P_2): \$12
- Initial Quantity Demanded (Q_1): 110 units
- New Quantity Demanded (Q_2): 90 units

This data indicates that as the price increases by \$4, the quantity demanded

decreases by 20 units.

The Significance of Price Changes

Analyzing how demand responds to price changes allows businesses to:

- Determine optimal pricing strategies
- Maximize revenue or profit
- Understand consumer sensitivity to price variations
- Forecast demand under different pricing scenarios

For policymakers, understanding demand elasticity aids in predicting how taxes or subsidies might influence consumption patterns.

Calculating Price Elasticity of Demand (PED)

What Is Price Elasticity of Demand?

Price elasticity of demand measures the responsiveness of the quantity demanded of a good to a change in its price. It is calculated as the percentage change in quantity demanded divided by the percentage change in price.

Mathematically:

$$\text{PED} = \frac{\text{Change in Quantity Demanded}}{\text{Change in Price}}$$

A PED value:

- Greater than 1 ($|\text{PED}| > 1$): Demand is elastic (sensitive to price changes)
- Equal to 1 ($|\text{PED}| = 1$): Demand is unit elastic
- Less than 1 ($|\text{PED}| < 1$): Demand is inelastic (less sensitive)

Calculating the PED for the Scenario

Given:

- $Q_1 = 110$ units
- $Q_2 = 90$ units
- $P_1 = \$8$
- $P_2 = \$12$

Step 1: Calculate the percentage change in quantity demanded

$$\Delta Q = \frac{Q_2 - Q_1}{(Q_1 + Q_2)/2} \times 100 = \frac{90 - 110}{(110 + 90)/2} \times 100$$

$$\frac{-20}{100} \times 100 = -20\%$$

Step 2: Calculate the percentage change in price

$$\Delta P = \frac{P_2 - P_1}{(P_1 + P_2)/2} \times 100 = \frac{12 - 8}{(8 + 12)/2} \times 100$$

$$\frac{4}{10} \times 100 = 40\%$$

Step 3: Calculate PED

$$\text{PED} = \frac{-20\%}{40\%} = -0.5$$

The negative sign indicates the inverse relationship between price and demand, but in elasticity calculations, we often consider the absolute value.

$$\text{PED} = 0.5$$

Interpreting the Results: Demand Elasticity

What Does a PED of 0.5 Indicate?

A PED of 0.5 signifies that the demand for this good is inelastic. In other words, the quantity demanded is relatively insensitive to price changes. Specifically, a 1% increase in price would result in approximately a 0.5% decrease in quantity demanded.

This has several implications:

- The good is relatively necessity or has few substitutes.
- Consumers are less likely to reduce their consumption drastically when prices rise.
- Revenue could potentially increase with a price hike, as the percentage increase in price outweighs the percentage decrease in quantity demanded.

Price Elasticity and Revenue

Understanding elasticity helps businesses predict how total revenue responds to price changes:

- If demand is elastic, raising prices may decrease total revenue.
- If demand is inelastic, raising prices may increase total revenue.
- Conversely, lowering prices when demand is elastic can boost total sales,

but may reduce revenue.

In this scenario, since demand is inelastic ($PED = 0.5$), increasing the price from \$8 to \$12 could lead to higher total revenue.

Implications for Business Strategy

Pricing Decisions

Given the inelastic demand:

- The business might consider increasing prices to boost revenue.
- Price hikes should be approached cautiously, considering consumer sentiment and market competitiveness.
- It's essential to ensure that the price increase does not cross a threshold where demand becomes more elastic.

Market Analysis and Consumer Behavior

Understanding that demand is inelastic suggests:

- Consumers view this good as a necessity or lack readily available substitutes.
- The company should focus on maintaining quality and availability rather than competing solely on price.

Potential Revenue Impact

Calculating the change in total revenue:

- Initial revenue: $\$8 \times 110 = \880
- New revenue: $\$12 \times 90 = \$1,080$

Despite the decrease in quantity demanded, total revenue increases by \$200, confirming the inelastic nature of the demand.

Additional Considerations

Limitations of the Calculation

While the elasticity calculation provides valuable insights, it's important to consider:

- Short-term vs. long-term demand elasticity
- External factors influencing demand (income levels, substitute availability)
- Consumer preferences and market trends

Other Types of Elasticities

Beyond price elasticity of demand, other relevant elasticities include:

- Income elasticity of demand
- Cross-price elasticity of demand
- Price elasticity of supply

Understanding these can provide a more comprehensive picture of market dynamics.

Conclusion

The scenario where the price of a good rises from \$8 to \$12, leading to a fall in quantity demanded from 110 to 90 units, illustrates the practical application of price elasticity of demand calculations. With a calculated PED of 0.5, demand is inelastic, meaning consumers are relatively insensitive to price changes within this range.

For businesses, recognizing inelastic demand can inform strategic pricing decisions, potentially allowing for price increases to boost revenue without significantly reducing sales volume. However, it's essential to consider market conditions, consumer perceptions, and long-term trends before implementing such strategies.

Understanding the nuances of demand elasticity empowers businesses and policymakers to make informed decisions that optimize outcomes, whether that's maximizing revenue, ensuring market stability, or meeting consumer needs.

In summary:

- The price increase from \$8 to \$12 results in a 40% rise.
- The quantity demanded decreases by 20 units, a 20% decrease.
- The calculated PED of 0.5 indicates inelastic demand.
- As a result, the total revenue increases despite the decrease in quantity demanded.
- Strategic pricing should consider elasticity to optimize market performance.

By mastering demand elasticity concepts and calculations like these, stakeholders can better navigate market complexities and achieve their economic objectives.

Frequently Asked Questions

What is the percentage change in price when the

price rises from \$8 to \$12?

The percentage change in price is $((12 - 8) / 8) 100 = 50\%$.

What is the percentage change in quantity demanded when it falls from 110 to 90 units?

The percentage change in quantity demanded is $((90 - 110) / 110) 100 \approx -18.18\%$.

What is the price elasticity of demand for this product?

Price elasticity of demand = (% change in quantity demanded) / (% change in price) = $(-18.18\%) / (50\%) \approx -0.36$.

Is the demand for this product elastic or inelastic based on the calculated elasticity?

Since the absolute value of elasticity is less than 1 (≈ 0.36), the demand is inelastic.

What does the inelastic demand imply about consumers' sensitivity to price changes?

Inelastic demand implies consumers are relatively insensitive to price changes; a price increase leads to a proportionally smaller decrease in quantity demanded.

How does the change in price affect total revenue in this scenario?

Since the price increases and the quantity demanded decreases slightly, total revenue increases (from $\$8110 = \880 to $\$1290 = \1080).

What is the concept illustrated by the change in quantity demanded with price change?

The concept is the law of demand, which states that, ceteris paribus, an increase in price leads to a decrease in quantity demanded.

Calculate the change in total revenue resulting from the price increase.

Total revenue before = $\$8 \ 110 = \880 ; after = $\$12 \ 90 = \1080 ; thus, total revenue increased by \$200.

What factors could influence the price elasticity of demand for this good?

Factors include the availability of substitutes, necessity vs. luxury status, time period considered, and proportion of income spent on the good.

Based on the data, should the seller consider raising prices further?

Since demand is inelastic, raising prices could increase total revenue, but the seller should consider consumer response and potential long-term effects.

Additional Resources

The Price Of A Good Rises From \$8 To \$12, And The Quantity Demanded Falls From 110 To 90 Units. Calculated

In the realm of economics, understanding the relationship between the price of a good and its demand is fundamental. The scenario where the price of a product increases from \$8 to \$12, leading to a decrease in quantity demanded from 110 to 90 units, provides a practical illustration of this core principle. This article delves into the nuances of this price change, explores the concept of elasticity, and offers a comprehensive analysis of the implications for consumers, producers, and market dynamics.

Understanding the Scenario: Price and Quantity Demanded

Setting the Context

In this case, a specific good's price increases by 50%, from \$8 to \$12. Correspondingly, the quantity demanded decreases by approximately 18.18%, from 110 units to 90 units. These figures serve as the foundation for analyzing demand behavior and elasticity.

Significance of the Price Change

Price fluctuations are common in markets, influenced by factors such as production costs, consumer preferences, and external economic conditions. The change from \$8 to \$12 is substantial, and the resulting decline in demand highlights typical consumer responses to price increases.

Demand Curve and Its Characteristics

Graphical Representation

A demand curve graphically illustrates the inverse relationship between price and quantity demanded. In this scenario:

- At \$8, the quantity demanded is at 110 units.
- At \$12, the quantity demanded drops to 90 units.

Plotting these points reveals a downward-sloping demand curve, consistent with the law of demand, which states that, ceteris paribus, an increase in price leads to a decrease in quantity demanded.

Elasticity of Demand

The responsiveness of consumers to price changes is measured by price elasticity of demand (PED). Calculating this elasticity helps determine whether demand is elastic, inelastic, or unit elastic.

Calculating Price Elasticity of Demand (PED)

Formula for PED

Price elasticity of demand is calculated as:

$$\text{PED} = \frac{\text{change in quantity demanded}}{\text{change in price}}$$

or more precisely,

$$\text{PED} = \frac{\Delta Q / Q_{\text{avg}}}{\Delta P / P_{\text{avg}}}$$

where:

- ΔQ is the change in quantity demanded,
- Q_{avg} is the average quantity demanded,
- ΔP is the change in price,

- (P_{avg}) is the average price.

Step-by-Step Calculation

1. Determine the changes:

- $(\Delta Q = 90 - 110 = -20)$

- $(\Delta P = 12 - 8 = 4)$

2. Calculate the averages:

- $(Q_{avg} = (110 + 90) / 2 = 100)$

- $(P_{avg} = (8 + 12) / 2 = 10)$

3. Compute percentage changes:

- $(\% \text{ change in } Q) = \frac{-20}{100} = -0.20$ or -20%

- $(\% \text{ change in } P) = \frac{4}{10} = 0.40$ or 40%

4. Calculate PED:

$[$

$\text{PED} = \frac{-0.20}{0.40} = -0.5$

$]$

Interpretation: The absolute value of PED is 0.5, indicating inelastic demand. Consumers are relatively less responsive to price changes for this good; a 1% increase in price results in only a 0.5% decrease in quantity demanded.

Implications of Price Elasticity

Understanding Inelastic Demand

An elasticity value less than 1 (in absolute terms) signifies inelastic demand. In this scenario, demand is inelastic, meaning that even a significant price increase does not substantially reduce the quantity demanded. Consumers may perceive the good as essential, lack substitutes, or face limited alternatives.

Market and Business Strategies

For producers, recognizing inelastic demand offers strategic insights:

- They might consider raising prices to increase revenue, as the decrease in quantity demanded is proportionally smaller.

- However, they should be cautious of potential long-term shifts if consumers

find substitutes or develop alternatives.

Consumer Welfare and Market Efficiency

Inelastic demand can lead to consumer welfare concerns if higher prices limit access or affordability. It also impacts market efficiency, as inelastic goods tend to generate higher revenue for suppliers without a proportional reduction in consumption.

Broader Market Dynamics and External Factors

Substitutes and Complementary Goods

The demand elasticity is often influenced by:

- Availability of substitutes: Fewer substitutes tend to result in more inelastic demand.
- Necessity versus luxury: Necessities generally exhibit inelastic demand, while luxury goods tend to be more elastic.

Income Effect and Consumer Behavior

A price increase can affect consumers' purchasing power:

- Consumers may cut back on other expenditures.
- The perceived value and importance of the good influence the demand response.

External Economic Conditions

Factors such as inflation, income levels, and economic downturns can modify demand elasticity:

- During economic hardship, demand for non-essential goods becomes more elastic.
- Conversely, essential goods maintain inelastic demand despite price changes.

Conclusion: Market Insights and Policy Considerations

The scenario where the price of a good rises from \$8 to \$12, reducing demand from 110 to 90 units, exemplifies classic demand principles and highlights key considerations for stakeholders. The calculated price elasticity of demand at -0.5 underscores inelastic behavior, suggesting that consumers are relatively insensitive to price increases for this particular good.

For businesses, this indicates potential for revenue enhancement through strategic price hikes, provided consumer loyalty remains intact. For policymakers, understanding demand elasticity informs taxation policies and pricing regulations; goods with inelastic demand may sustain higher taxes without significantly reducing consumption.

Overall, analyzing such price-demand dynamics is crucial for making informed decisions, optimizing market strategies, and understanding consumer behavior. As markets evolve, continuous assessment of demand responsiveness remains vital for balancing profitability with consumer welfare.

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