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Price Elasticity of Demand for Delta State University: 2000-24

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Abstract

The percentage change in the price is measured as (ending price – beginning price) / beginning price. Delta State University (DSU) raised tuition (price) by 213% over 25 years from $2,696 in the year 2000 to $8,435 in 2024, or by $5,739 -- (8,435 – 2,696) / 2,696 = 5,739 / 2,696 = 213%.

Increase/decrease in the quantity demanded (student enrollment) is measured as (ending enrollment – beginning enrollment) / beginning enrollment. Total student enrollment was 3,782 in the year 2000 and 2,654 by the year 2024. This was a 30% decrease – (2,654 – 3,782) / 3,782 = -1,128 / 3,782 = -0.3 = -30%.

In spite of a 213% price increase, there was only a 30% drop in students (quantity demanded) for DSU. The price elasticity of demand for DSU was calculated as 0.3, very inelastic. The results imply that DSU should raise tuition again to increase revenue.

Keywords: price elasticity, quantity demanded, tuition, enrollment, price

Introduction

"The law of demand in Economics states that consumers will respond to a price decline by buying more of a product. However, the degree of consumer responsiveness to a price change may vary considerably from product to product and between different price ranges for the same product."[1]

"The responsiveness of consumers to a change in the price of a product is measured by the price elasticity of demand. Demand for some products is such that consumers are very responsive to price changes; small price changes lead to very large changes in the quantity purchased. The demand for such products is said to be elastic. For other products, consumers are quite unresponsive to price changes; substantial price changes result only in relatively small changes in the amount purchased. In such cases, demand in inelastic."[2]

The Price Elasticity Formula

"Economists measure the degree of price elasticity of demand by the following formulas:

$$E_d = \frac{\text{percentage change in quantity demanded of product x}}{\text{percentage change in price of product x}}$$

$$= \frac{\text{change in quantity demanded of x}}{\text{original quantity of x}} \Big/ \frac{\text{change in the price of x}}{\text{original price of x}}$$

$$= \frac{\text{change in quantity}}{\text{sum of quantities / 2}} \Big/ \frac{\text{change in price}}{\text{sum of prices / 2}}$$"[3]

Interpretation

"Demand is elastic if a given percentage change in price results in a larger change in quantity demanded. If a given percentage change is accompanied by a smaller change in quantity demanded, demand is inelastic. If the coefficient of price elasticity of demand, E_d, is greater than one, demand is elastic; if E_d is less than one, demand is inelastic."[4]

"If demand is elastic, a decrease in price will increase total revenue. Even though a lower price is received per unit, enough additional units are sold to more than make up for the lessor price. Also, the reverse is true; an increase in price will decrease total revenue."[5]

"If demand is inelastic, a price decrease will reduce total revenue. The relatively small increase in sales will not offset the decline in revenue per unit. The analysis is reversible; if demand is inelastic, a price increase will increase total revenue."[6]

Application

The percentage change in the price is measured as (ending price – beginning price) / beginning price. Delta State University (DSU) raised tuition (price) by 213% over 25 years from $2,696 in the year 2000 to $8,435 in 2024, or by $5,739 -- (8,435 – 2,696) / 2,696 = 5,739 / 2,696 = 213%.[7]

Increase/decrease in the quantity demanded (student enrollment) is measured as (ending enrollment – beginning enrollment) / beginning enrollment. Total student enrollment was 3,782 in the year 2000 and 2,654 by the year 2024. This was a 30% decrease – (2,654 – 3,782) / 3,782 = -1,128 / 3,782 = -0.3 = -30%.

In spite of a 213% price increase from 2000 through 2024, there was only a 30% drop in students (quantity demanded) for DSU.

The price elasticity of demand for DSU is calculated as (using the third equation shown previously):

$$E_d = \frac{2654 - 3782}{(2654 + 3782) / 2} \Big/ \frac{8435 - 2696}{(8435 + 2696) / 2}$$

$$= (-1{,}128 / 3218) / (5739 / 5566)$$

$$= 0.35 / 1.03$$

$$= 0.3$$

This 0.3 is very inelastic. The perfectly inelastic demand coefficient (used primarily in hypothetical examples in Economic theory) equals zero and refers to the extreme situation where a price change results in no change whatsoever in the quantity demanded.

These results imply that DSU could increase revenue by raising its price. The following table shows estimated revenue for DSU from students:[8]

	2000	2024
Total enrollment	3,782	2,654
Tuition	X $2,696	X $8,435
Revenue	$10,196,272	$22,386,490

From 2000 to 2024, estimated student revenue increased from $10,196,272 to $22,386,490, or by $12,190,218.

Conclusion

The results of this study suggest that DSU should raise tuition again to increase revenue. However, some qualifications are in order. All senior colleges in Mississippi have raised tuition in most of the 25 years from 2000-24. If all senior colleges raised tuition again, there would probably be a negligible decline in student enrollment for all Mississippi colleges. On the other hand, if DSU raised tuition and other colleges in Mississippi did not follow, the results would probably be different.

Also, there may be some price range where the student consumer response would be different. Other considerations, such as colleges are financially supported by the legislature who are voted on by the general public, should be factored into any tuition increase decision. Nevertheless, since the average college graduate makes $1.63 for every dollar earned by the high-school graduate,[9] tuition could be increased substantially before college costs would be higher than the benefits.

[1] Economics, by Campbell R. McConnell and Stanley L. Brue, thirteenth edition, McGraw Hill, New York, 1996.
[2] Economics, by Campbell R. McConnell and Stanley L. Brue, thirteenth edition, McGraw Hill, New York, 1996.
[3] Economics, by Campbell R. McConnell and Stanley L. Brue, thirteenth edition, McGraw Hill, New York, 1996.
[4] Absolute values are computed, since the price elasticity coefficient of demand will always be a negative number, since price and quantity demanded are inversely related. Economics, by Campbell R. McConnell and Stanley L. Brue, thirteenth edition, McGraw Hill, New York, 1996.
[5] Economics, by Campbell R. McConnell and Stanley L. Brue, thirteenth edition, McGraw Hill, New York, 1996
[6] Economics, by Campbell R. McConnell and Stanley L. Brue, thirteenth edition, McGraw Hill, New York, 1996
[7] Delta State University Bulletin 2000-2024, various pages 28-33.
[8] Undergraduate and graduate tuition for Mississippi residents was only considered, other factors such as out-of-state tuition, special fees, residence hall fees, scholarships, alumni donations, state of Mississippi financial support, etc. were not included.
[9] Davis, Bob, "At the Heart of the Trade Debate: Inequity," Wall Street Journal, October 31, 1997.