

Price elasticity of demand for Mississippi State University: 2000-2014

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ABSTRACT

“The responsiveness of consumers to a change in the price of a product is measured by the price elasticity of demand. 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 lesser price. Also, the reverse is true; an increase in price will decrease total revenue.”¹

“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.”²

The percentage change in the price is measured as (ending price – beginning price) / beginning price. Mississippi State University (MSU) raised tuition (price) by 126% over 15 years from \$3,117 in the year 2000 to \$7,040 in 2014, or by \$3,923 -- $(7,040 - 3,117) / 3,117 = 3,923 / 3,117 = 126\%$.

Increase/decrease in the quantity demanded (student enrollment) is measured as (ending enrollment – beginning enrollment) / beginning enrollment. Total student enrollment was 15,764 in the year 2000 and 20,219 by the year 2014. This was a 28% increase -- $(20,219 - 15,764) / 15,764 = 4,455 / 15,764 = 0.28 = 28\%$.

In spite of a 126% price increase, there was a 28% rise in students (quantity demanded) for MSU. The price elasticity of demand for MSU was calculated as 0.32, inelastic. The results imply that MSU should raise tuition again to increase revenue.

Keywords: Price elasticity of demand, quantity demanded, price, total revenue, tuition, enrollment

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.”³

“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 is inelastic.”⁴

THE PRICE ELASTICITY FORMULA

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

$$\begin{aligned} E_d &= \frac{\text{percentage change in quantity demanded of product } x}{\text{percentage change in price of product } x} \\ &= \frac{\text{change in quantity demanded of } x}{\text{original quantity of } x} \div \frac{\text{change in the price of } x}{\text{original price of } x} \\ &= \frac{\text{change in quantity}}{\text{sum of quantities} / 2} \div \frac{\text{change in price}}{\text{sum of prices} / 2} \end{aligned}$$
⁵

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.”⁶

“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 lesser price. Also, the reverse is true; an increase in price will decrease total revenue.”⁷

“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.”⁸

APPLICATION

The percentage change in the price is measured as (ending price – beginning price) / beginning price. Mississippi State University (MSU) raised tuition (price) by

126% over 15 years from \$3,117 in the year 2000 to \$7,040 in 2014, or by \$3,923 --
 $(7,040 - 3,117) / 3,117 = 3,923 / 3,117 = 126\%$.⁹

Increase/decrease in the quantity demanded (student enrollment) is measured as
 (ending enrollment – beginning enrollment) / beginning enrollment. Total student
 enrollment was 15,764 in the year 2000 and 20,219 by the year 2014. This was a 28%
 increase – $(20,219 - 15,764) / 15,764 = 4,455 / 15,764 = 0.28 = 28\%$.

In spite of a 126% price increase, there was a 28% rise in students (quantity
 demanded) for MSU.

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

$$E_d = \frac{20,219 - 15,764}{(20,219 + 15,764) / 2} \quad / \quad \frac{7,040 - 3,117}{(7,040 + 3,117) / 2}$$

$$= (4,455 / 17992) / (3,923 / 5079)$$

$$= 0.24761 / 0.7723961$$

$$= 0.32$$

This 0.32 is 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 MSU could increase revenue by raising its price. The
 following table shows estimated revenue for MSU from students:¹⁰

	<u>2000</u>	<u>2014</u>
Total enrollment	15,764	20,219
Tuition	<u>X \$3,117</u>	<u>X \$7040</u>
Revenue	\$49,136,388	\$142,341,760

From 2000 to 2014, estimated student revenue increased from \$49,136,388 to
 \$142,341,760, or by \$93,205,372.

CONCLUSION

The results of this study suggest that MSU 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 10 years from 2000-14. 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 MSU 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,¹¹ tuition could be increased substantially before college costs
 would be higher than the benefits.

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- ¹ Economics, by Campbell R. McConnell and Stanley L. Brue, thirteenth edition, McGraw Hill, New York, 1996.
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- ³ Economics, by Campbell R. McConnell and Stanley L. Brue, thirteenth edition, McGraw Hill, New York, 1996.
- ⁴ 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 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.
- ⁷ Economics, by Campbell R. McConnell and Stanley L. Brue, thirteenth edition, McGraw Hill, New York, 1996.
- ⁸ Economics, by Campbell R. McConnell and Stanley L. Brue, thirteenth edition, McGraw Hill, New York, 1996.
- ⁹ Delta State University Institutional Research and Planning Memorandums, 2000-14.
- ¹⁰ 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.
- ¹¹ Davis, Bob, “At the Heart of the Trade Debate: Inequity,” Wall Street Journal, October 31, 1997.