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Economics

Elasticity: Practice Problems

Elasticity Practice Calculations. Show all of your work and interpretations.

1) According to *WSJ* data, in 2006 a gallon of milk was \$2.99. In 2007, a gallon of milk was \$3.90. Let's assume that demand for milk decreased slightly from a gallon (128 oz.) to 120 oz. from 2006 to 2007. Calculate the price elasticity of demand for milk over this time period.

$$[Q_2 - Q_1 \div (Q_1 + Q_2) / 2] \div [P_2 - P_1 \div (P_1 + P_2) / 2]$$

$$128-120 \div 120+128/2 \div 3.90-2.99 \div 2.99+3.90/ 2$$

$$8 \div 248/2 \div 0.91 \div 6.89/2$$

$$8 \div 124 \div 0.91 \div 3.45$$

$$0.0645 \div 0.2638$$

$$=0.245\%$$

Because the answer is less than 1% or .245%, that means the demand for milk is inelastic. This means that the prices for the quantity can rise and the demand will only decrease -2.45% or 0.245%.

2) The office vacancy rate for New York City in 2006 was 13.8% in the 2nd Q. This office vacancy rate declined to 13.5% in the 3rd Q. The office rent was \$21.41/sq ft. in the 2nd

Q. and \$21.90 sq ft. In the 3rd Q. What was the demand response to this slight change in office rent?

$$\begin{aligned}
 & [Q_2 - Q_1 \div (Q_1 + Q_2) / 2] \div [P_2 - P_1 \div (P_1 + P_2) / 2] \\
 & 13.5-13.8 / (13.8+13.5)/2 / 21.90-21.41/(21.41+21.90)/2 \\
 & -0.30/27.3/2 \quad / \quad 0.49/43.31/2 \\
 & -0.30/13.65 \quad / \quad 0.49/21.66 \\
 & -0.021978 \quad / \quad 0.02262 \\
 & = - 0.09715175\%
 \end{aligned}$$

The demand for offices in New York city is inelastic. Because the percentage - 0.09715175 is less than 1 this means that the demand for offices would only decrease slightly due to a rent increase.

3) For 2012, according to the *WSJ* (10/3/12), office rents in the country as a whole went from \$28.23 sq ft. to \$28.29 sq ft. from the 2nd Q. to the 3rd Q. Likewise, over the same period, the office vacancy rate went from 17.1% to 17.2%. Calculate the elasticity for office vacancy in the U.S. in 2012 from the 2nd Q. to the 3rd Q.

$$\begin{aligned}
 & [Q_2 - Q_1 \div (Q_1 + Q_2) / 2] \div [P_2 - P_1 \div (P_1 + P_2) / 2] \\
 & 17.2-17.1 / (17.1+17.2)/2 / 28.29-28.23 / (28.23+28.29)/2 \\
 & 0.1/34.3/2 \quad / \quad 0.06/56.52/2 \\
 & 0.1/17.15 \quad / \quad 0.06/28.26 \\
 & 0.0058 \quad / \quad 0.0021 \\
 & = 2.76\%
 \end{aligned}$$

The demand for offices is elastic as 2.76% is greater than 1%. This means that if prices for offices were to increase or decrease drastically so will the demand or amount of vacancies.