

Elasticity



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Demand, Supply, Elasticity and Revenue Impact

If the demand for corn increases due to its use as an alternative energy source, what will happen to the supply of corn's substitute such as soybean? Assume that, besides being substitutes for one another, corn and soybeans require the same raw material, such as the same farmland. Think about whether farmers will use their soybean farms to produce more or less corn. Explain, in economic terms [e. g. supply determinants], why this is so. When the price of corn increase as a result of its being used as an alternative energy source, the supply of corn substitutes like soybeans will decrease. Given an increasing price for corn, farmers will shift to producing corn rather than corn substitutes like soybeans. In addressing the impact of an increase in the demand for corn resulting from using corn as an alternative energy source, it is useful to understand the determinants of demand. According to Mankiw (2007), the determinants of demand or the variables affecting the quantity of the good demanded are price, income, prices of related goods, tastes, expectations, and number of buyers. While movement in prices represents a movement along the demand curve, the demand curve shifts leftward or rightward based on changes in income, prices of related goods, tastes, expectations, and number of buyers. The determinants of demand or the variables affecting the quantity demanded of a good are identified in Table 1.

Table 1. Determinants of Demand Source: Mankiw, 2007, p. 69

When the demand for corn increases when corn is utilized as an alternative energy source, we can represent the situation as a rightward shift in the demand curve. This is shown in Figure 2 where the rightward shift in demand is represented in the movement from D2 to D3.

Figure 2. Shifts in Demand Curve

Price of Corn Quantity of Corn

Source: Mankiw, 2007, p. 68

Meanwhile,

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ceteris paribus or other variables unchanged, the rightward shift in the demand curve for corn will cause a leftward shift in the supply of substitutes such as soybeans when soybeans are not used as an alternative energy source. This happens because the increase in the demand for corn triggers a competition in land use between corn and its substitutes. The rightward shift in the demand curve for corn will lead to higher corn prices and, ceteris paribus, farmers will find it more profitable to plant corn instead of the corn substitutes. It is useful to understand the situation in terms of the determinants of supply or in terms of the variables determining the quantity supplied. According to Mankiw (2007), the determinants of supply or the variables affecting the quantity of the goods supplied are the price of the good, the prices of inputs for the production of the good, technology, expectations, and the number of sellers. The determinants of supply or the variables affecting the quantity of the good supplied are identified in Table 2.

Table 2. Variables Affecting Quantity Supplied Source: Mankiw, 2007, 75 As indicated in Table 2, changes in the quantity supplied for the good is indicated as a movement along the supply curve. In contrast, changes in input prices, technology, expectations, and increases in the number of sellers are represented by a leftward or rightward shift in the supply curve that will have the effect of a decrease or increase in the quantity supplied at any given price. The increase in the price of corn will decrease the number of sellers for soybeans or it will cause the supply curve for soybeans to shift to the left. What will happen to the price of corn oil? Because corn is an input to the production of corn oil, the price of corn oil will increase. An increase in the price of inputs for the production of corn oil is captured by a leftward shift in the supply curve of corn oil. In turn, the leftward shift in the supply

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curve or quantity supplied for corn oil at any given price will lead to a higher equilibrium price for corn oil. How does the price elasticity of demand for corn oil influence the quantity-demanded of corn oil and the Total Revenue earned by sellers of corn oil? Explain, using economic terms, why this is so. As pointed out by Varian (2005, pp. 270), the price elasticity of demand is the “ percent change in quantity demanded divided by the percent change in price.” As implied in Varian (2005, pp. 270-275), when the price elasticity of demand for corn oil is elastic or greater than 1, then an increase in the price of corn will lead to less revenues for sellers of corn oil as the percentage decrease in quantity demanded for corn oil is more than percentage increase in price. Note that percentage change in quantity demanded is negative while the percentage change in price is positive. When the price elasticity of demand for corn oil is unitary or equal to 1, then the revenue change for sellers of corn oil is zero because the percentage change in quantity demanded for corn oil and the percentage change in the price of corn oil are the same. Finally, when the price elasticity of demand for corn oil is less than 1 or inelastic, then an increase in the price of corn oil will lead to more revenues for the sellers of corn oil because the percentage decrease in quantity demanded is less than the percentage increase in price. It must be pointed out that based on the discussion of Ye et al. (2003), our discussion on the impact of elasticity on revenues are in the short run. Ye et al. (2003) have pointed out that the price elasticity of demand has a short run and a long run impact. References Mankiw, N. G. (2007). Principles of microeconomics. 4th ed. Thomson South-Western. Varian, H. (2005). Intermediate microeconomics. New York: 7th ed. W. W. Norton & Company. Ye, M., Zyren, J., and Shore, J. (2003). Elasticity of demand for relative

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petroleum inventory in the short run. *Atlantic Economic Journal*, 31 (1), 87-103.