

Elasticity

Problem 1 (APT'98, P1)

Assume that the market supply and demand curves for wheat are price inelastic, but not perfectly price inelastic at the equilibrium price. For ALL parts of the question, assume that price remains in the relatively inelastic portion of the supply and demand curves.

(a) As a result of favorable growing conditions, the number of bushels of wheat produced increases. Use a graph to explain the result of this change on each of the following.

- (i) Market price of wheat
- (ii) Industry output of wheat
- (iii) Revenue of wheat farmers

(b) Use a new graph to show what happens in the wheat market if the cost of fertilizer used in the production of wheat increases, and if the government announces that the consumption of wheat products greatly reduces the risk of having a heart attack. Explain the impact these events will have on each of the following.

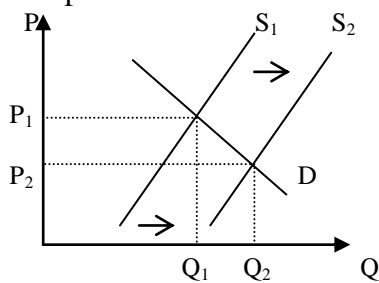
- (i) Market price of wheat
- (ii) Industry output of wheat

(c) Assume now that the government establishes an effective price floor for wheat. Use a new graph to indicate where an effective price floor will be set. Explain the effects of such a program on each of the following.

- (i) Consumer surplus in the wheat market
- (ii) Allocative efficiency

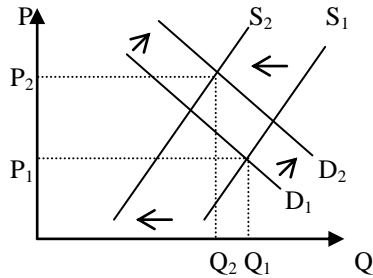
Sample answer:

(a) As the production of wheat increases, the supply curve for wheat shifts to the right. Thus, as one can see from the following graph, the improvement in growing conditions will bring about a fall in the market price and an increase in the total output of wheat:



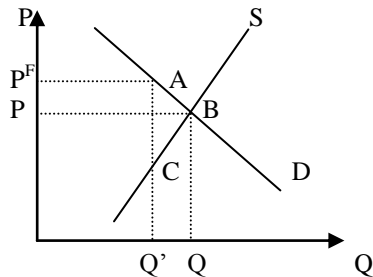
Since we assumed that equilibrium always occurs in the inelastic portion of the demand curve, the reduction in price will cause total spending on wheat and therefore total revenue of wheat farmers to decrease.

- (b) If the cost of fertilizer goes up thus causing an increase in the cost of wheat production, the supply curve of wheat will shift leftwards. At the same time, the government's announcement of the positive effect on health of wheat consumption will increase the demand for wheat. Both these changes are captured in the graph below:



As follows from the graph, the market price of wheat will rise from P_1 to P_2 . As regards the quantity of wheat produced, we cannot tell for sure whether it will increase or decrease – although in the graph it falls, in general the answer depends on the relative size of the changes in supply and demand.

- (c) To be effective, the price floor must be set above the equilibrium level (otherwise it will have no binding effect, as the going market price is higher than the required minimum):



By definition, consumer surplus is the amount consumers are willing to pay for the good in excess of what they actually pay. Graphically, it is depicted by the area between the demand curve and the line $P=P^*$, where P^* is the consumer price. In our example, price increases from P to P^F , so that consumer surplus is reduced by the area P^FABP , part of which goes to producers and part represents the deadweight loss. Allocative efficiency is obviously damaged by the imposition of the price floor. Although, as has already been mentioned, part of the consumer surplus is absorbed by producers, there is still a deadweight loss to the society as whole, measured by the area of the triangle ABC (this is the amount of total surplus that society foregoes by not producing at the point where $P=MC$).

Problem 2 (APT'2000, P3)

Assume all of the following about imported and domestically produced shoes.

- They are sold in two separate and perfectly competitive markets.
- They are close substitutes.
- The demand for both is price elastic.

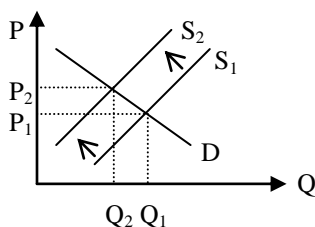
Now assume that a tariff is imposed on imported shoes.

- (a) Using a correctly labeled graph, show the impact of the tariff on each of the following in the market for imported shoes.
- Price
 - Output
- (b) Using a new correctly labeled graph, show the impact of the tariff on each of the following in the market for domestically produced shoes.
- Price
 - Output
- (c) Given that the demand for imported shoes is price elastic, will expenditure on imported shoes by consumers increase, decrease, or remain the same? How do you know?

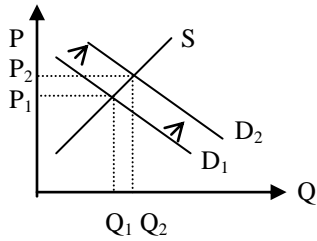
Sample answer:

- a) The imposition of a tariff will shift the supply curve for imported shoes up. This will lead to an increase in the price of imported shoes coupled with a reduction in output:

Market for imported shoes:



- b) Since imported and domestically produced shoes are close substitutes, the increase in the price of the former will produce an increase in the demand for the latter. As the following graph illustrates, the result will be a higher price and a bigger output.



c) Since the demand is price elastic it is rather sensitive to changes in price, so that a 1% increase (decrease) in price causes the quantity demanded to decrease (increase) by more than 1%. Consequently, when price goes up total expenditure on the good whose price elasticity of demand is greater than 1 decreases, and vice versa. As we identified in part (a) the imposition of a tariff will bring about a rise in the price of imported shoes, which will tend to increase the consumers' expenditure on the good. However, since the demand is price elastic the contraction of output will by far offset this effect and ultimately the total expenditure on imported shoes will go down.