

1. The Acme Paper Co. sells envelopes. The company recently observed a 2.5% reduction in the Q of envelopes sold as a result of raising the P of its envelopes by 10%. Based on this information, what is your estimate of the own P elasticity of D for Acme's envelopes at the original P. Also, indicate if it is inelastic, elastic, or unitary at that point.

$$E_D = \frac{\% \Delta Q}{\% \Delta P} = \frac{-2.5}{+10} = -0.25 = \text{inelastic}$$

2. If the own P elasticity of D for Picante salsa sauce is -.50, what change in P for this product would result in a 10% Q sold increase in order to reduce inventory?

$$E_D = \frac{\% \Delta Q}{\% \Delta P} \Rightarrow -.50 = \frac{+10}{\% \Delta P} \Rightarrow (-.5) \% \Delta P = +10 \Rightarrow \% \Delta P = \frac{+10}{-.5} = -20\%$$

3. If the own P elasticity of D for men's suits sold by Men's Warehouse is -1.2, what is your estimate of the change in Q of suits sold by this firm if it announces a 20% 'off' (i.e. P reduction) in the P of its suits?

$$E_D = \frac{\% \Delta Q}{\% \Delta P} \Rightarrow -1.2 = \frac{\% \Delta Q}{-20} \Rightarrow \% \Delta Q = (-1.2)(-20) = +24\%$$

4. Assume OPEC oil ministers announce plans to cut oil production by 1 million barrels per day, prior to the announcement daily world oil production was 80 million barrels, and the short run own P elasticity of D for oil is -0.2. Assuming everything else held constant, derive an estimate of the likely short run impact on world oil prices due to OPEC's decision.

$$\% \Delta Q = \frac{-1}{80} \times 100 = -1.25\%$$
$$E_D = \frac{\% \Delta Q}{\% \Delta P} \Rightarrow -0.2 = \frac{-1.25}{\% \Delta P} \Rightarrow \% \Delta P = \frac{-1.25}{-0.2} = +6.25\%$$

5. A 'negative' own P elasticity of D for a product implies that product is an 'inferior' good. Explain why you agree or disagree with this statement.

Disagree. An inferior good is noted by a negative income elasticity of D. Nearly all goods have a negative own P elasticity of D.

6. Assume the D for cheese in a given market is given by $Q = 6 - P$. Calculate the own P elasticity of D at $P = 2$ and explain its meaning at that point.

$$E_o = \frac{dQ}{dP} \cdot \frac{P}{Q} = (-1) \cdot \frac{2}{4} = \left(-\frac{1}{2} = -0.5 = E_o \right)$$

\Rightarrow For each 1% ΔP of cheese at this pt, we expect a 1/2% ΔQ_d of cheese in the opposite direction

7. Assume the D for a product (X) is given by the equation:

$$Q = 1000 - P_x + 2P_y + .1I$$

where I = income and the P variables represent product prices

What is the cross P elasticity of D for X with respect to P_y if $P_x = 200$ and $I = 10,000$?

$$\Rightarrow Q = 1000 - 200 + 2P_y + .1(10000) = 900 + 2P_y$$

$$\Rightarrow E_c = \frac{dQ}{dP_y} \cdot \frac{P_y}{Q_x} = \left(+2 \right) \frac{P_y}{Q_x} = E_c$$

note: need specific P_y to calculate E_c at that pt.

8. Which of the following depends on the Q unit of measurement at a given point on a D curve:

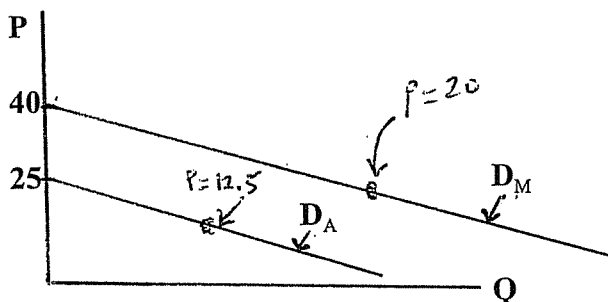
- a. The slope of the D curve at that point
- b. The own P elasticity of D at that point
- c. Both a and b depend on the Q unit of measurement
- d. Neither a nor b depend on the Q unit of measurement

9. Suppose the state government, in an attempt to raise revenue, is considering imposing a '1% per dollar sales' tax on one of two different products (A and B) where the total dollar sales of each product is the same or very similar. The own P elasticity of D for A is elastic and for B is inelastic. Which product should be taxed in order to raise the most tax revenue for the state? Explain why.

Tax B

A tax will $\uparrow P$ of each product. D for B is inelastic, so an $\uparrow P_B$ will $\uparrow TR_B \Rightarrow \uparrow$ gov't revenue.
D for A is elastic $\Rightarrow \uparrow P_A$ will $\downarrow TR_A \Rightarrow$ gov't revenue won't be as much.

10. Suppose the graph below shows the 'market' D ($= D_M$) for a given product as well as the D for firm A's production of that product ($= D_A$). Show that the statement "If the own P elasticity of D for the market is inelastic, then the own P elasticity of D for a firm's product in that market is also inelastic" by identifying a range of P's over which the own P elasticity of D is "inelastic" for the market yet "elastic" for the firm.



Note: for linear D curves, E_o is elastic above the midpt, inelastic below the midpt.
In this example, for $12.5 < P < 20$ E_o for D_A is elastic while E_o for D_M is inelastic.