1 Microeconomics

A monopolist has constant marginal cost MC = 20 and is selling a product in two separate and distinct markets. The demand functions facing the monopolist in the two separate markets are:

$$\begin{array}{lrcl} \text{Market A} & Q_A & = & 200 - 5P_A \\ \text{Market B} & Q_B & = & 1400 - 50P_B \end{array}$$

(a) If the monopolist is a profit maximiser, find the prices that will be charged in the different markets and the corresponding quantities.

(b) What will the monopolist's profit be (assuming fixed costs can be ignored)?

(c) In each market, find the price elasticities of demand at the price-quantity combinations found in part (a).

(d) Are the relative prices in the two markets what you would expect given your results in part (b)? Explain your answer.

2 Micro Answers

A Monopolist has constant marginal cost MC = 20 and is selling a product in two separate and distinct markets. The demand functions facing the monopolist in the two separate markets are:

$$\begin{array}{lrcl} \text{Market A} & Q_A & = & 200 - 5P_A \\ \text{Market B} & Q_B & = & 1400 - 50P_B \end{array}$$

1. (a) If the monopolist is a profit maximiser, find the prices that will be charged in the different markets and the corresponding quantities.

Rearrange the demand functions for markets A and B to find inverse demand for each market:

$$\begin{aligned} P_A &= 40 - \frac{1}{5}Q_A \\ P_B &= 28 - \frac{1}{50}Q_B \end{aligned}$$

Hence, marginal revenue for each market is given by:

$$\begin{aligned} MR_A &= 40 - \frac{2}{5}Q_A \\ MR_B &= 28 - \frac{1}{25}Q_B \end{aligned}$$

The monopolist sets marginal revenue equal to marginal cost in each market. Hence:

$$MR_A = MR_B = MC = 20$$

Thus:

$$\begin{aligned} 40 - \frac{2}{5}Q_A &= 20 \\ 28 - \frac{1}{25}Q_B &= 20 \end{aligned}$$

Solving simultaneously yields: $Q_A = 50, Q_B = 200, P_A = 30, P_B = 24$.

1. b. What will the monopolist's profit be (assuming fixed costs can be ignored)?

$$\begin{aligned} \Pi &= \Pi_A + \Pi_B \\ &= (4)(200) + (10)(50) = 1300 \end{aligned}$$

1. c. In each market, find the price elasticities of demand at the price-quantity combinations found in part (a).

Recall that (review the derivation of the formula in class):

$$P_A\left(1 - \frac{1}{|\epsilon_A|}\right) = P_B\left(1 - \frac{1}{|\epsilon_B|}\right) = MR_A = MR_B = MC = 20$$

Hence:

$$P_A\left(1 - \frac{1}{|\epsilon_A|}\right) = 30\left(1 - \frac{1}{|\epsilon_A|}\right) = 20 \qquad (3)$$

$$P_B\left(1 - \frac{1}{|\epsilon_B|}\right) = 24\left(1 - \frac{1}{|\epsilon_B|}\right) = 20 \qquad (4)$$

Solving (3) and (4) yields: $|\epsilon_A| = 3$ and $|\epsilon_B| = 6$

1. d. Are the relative prices in the two markets what you would expect given your results in part (b)? Explain your answer.

The market with the less elastic demand has the higher price. Discuss role of elasticity in price discrimination.