

Econ 101 | Demo E3

Demo E3 is adapted from a MiniExam in a previous semester.

Question 1 (of 2) | Big Flue Networks

Flue networks forms a convenient form of communication and transportation for those in the wizarding world. Its easy to move between flue portals on the network or use it to chat with those at a distance. Due to the benefits of adding *to* an existing network instead of starting a new one (i.e. network effects) there have historically only been two networks: Fast Flue Inc. and Soot Net. Suppose both networks have a constant marginal cost of 40 galleons and face a demand curve for flue network trips given by the following.

$$P = 400 - Q$$

The marginal revenue for Fast Flue Inc. is the following.

$$MR_F = 400 - 2q_F - q_S$$

The marginal revenue for Soot Net. is the following.

$$MR_S = 400 - 2q_S - q_F$$

The networks use a sophisticated ticketing system to charge a price for every trip. Prices are in galleons. This market is symmetric.

Q1.a | Fast Flue Inc.'s Quantity of Trips

What is the best response for Fast Flue Inc.?

$$MC_F = 40$$

$$MR_F = 400 - 2q_F - q_S$$

$$MC_F = MR_F$$

$$40 = 400 - 2q_F - q_S$$

$$2q_F = 360 - q_S$$

$$\text{BR}_F: q_F = 180 - \frac{1}{2}q_S$$

Q1.b | Market Quantity

What is the best response for Soot Net?

This market symmetric.

$$BR_s: q_s = 180 - \frac{1}{2}q_f$$

Q1.c | Equilibrium Price

What is the Nash equilibrium quantity and price in this market?

$$q_s = 180 - \frac{1}{2}(180 - \frac{1}{2}q_s)$$

$$Q^* = 240$$

$$q_s = 90 + \frac{1}{4}q_s$$

$$P^* = 160$$

$$\frac{3}{4}q_s = 90$$

$$q_s^* = 120$$

$$q_f^* = 120$$

Q1.d | Market Profit

What is the total profit (sum of both firms profit) in this market?

$$\pi = (160 - 40) 240 = 120 \cdot 240$$

$$\pi = 28,800$$

Question 2 (of 2) | The Great Flue Network Merger

Like with most infrastructure, the two networks were costly to maintain separately and provided very similar services to the same areas. Because of this, it had always been natural for the two networks to merge. One winter the executives of both networks penned a merger deal, dissolving both firms to form the new flue network: One Wizard International. While the Ministry of Magic's Commerce Division initially opposed the merger due to its effect on competition, One Wizard's marketing team successfully convinced the public of the advantages of being able to use a single network for any destination. The Ministry eventually approved the merger. One Wizard International's marginal cost is constant at 40 galleons, with a marginal revenue of

$$MR_O = 400 - 2q_O$$

Q2.a | Post Merger Quantity

Find the quantity of trips supplied after the merger. How does this quantity compare to the pre-merger market quantity?

$$MC_O = MR_O$$

$$40 = 400 - 2q_O$$

$$2q_O = 360$$

$$q_O^* = 180$$

Quantity after the merger went down.

Q2.b | Post Merger Price

What price will One Wizard International charge after the merger? How does this price compare to the pre-merger price?

$$P = 400 - 180$$

$$P^* = 220$$

The price went up after the merger.

Q2.c | Post Merger Profit

What is One Wizard International's profit? How does this profit compare to the pre-merger profit in the market?

$$\begin{aligned}\pi &= (220 - 40) 180 \\ &= 180 \cdot 180\end{aligned}$$

$$\pi = 32,400$$

Profit went up after the merger.