

Handout on Monopoly and Perfect Competition

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Monopoly Questions

Let demand be given by $Q = 100 - 5p$. Let total costs be $C(Q) = 20 + 2Q$.

1. What are fixed costs, variable costs, marginal costs? Does this industry have economies of scale or not.

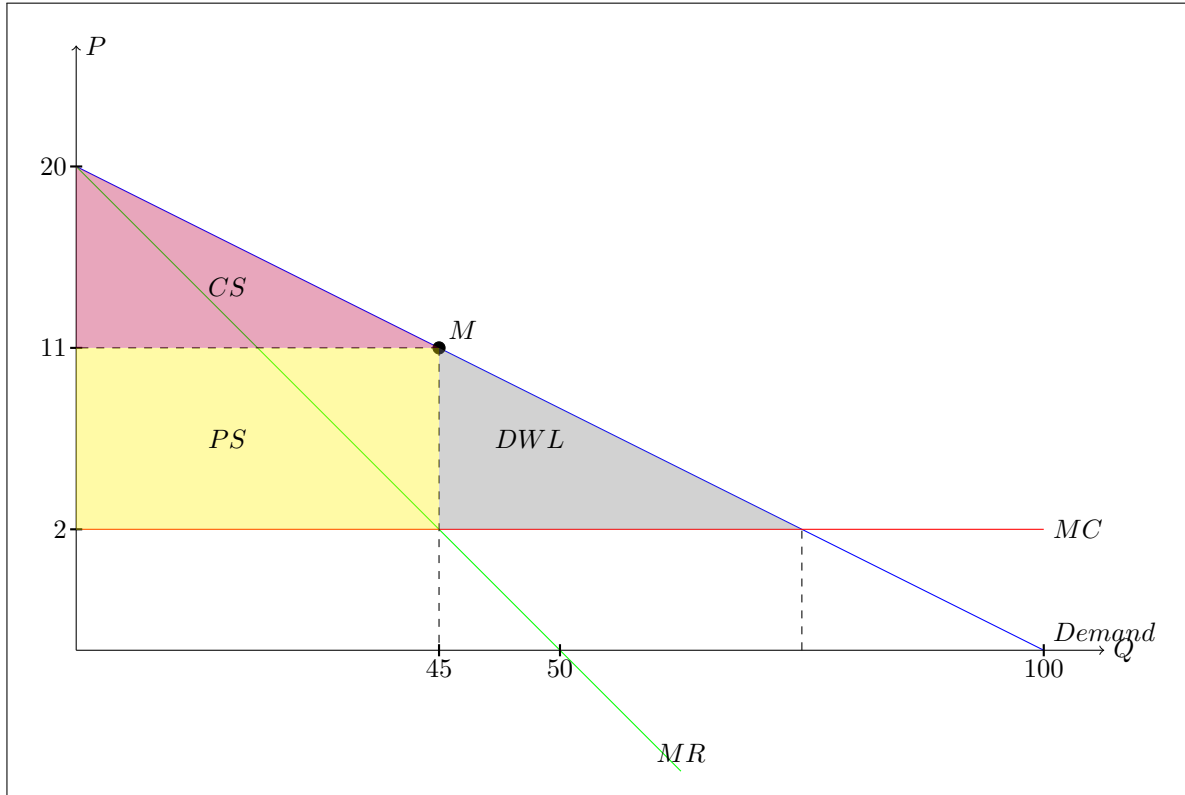
Solution: Fixed cost = 20
Variable cost = marginal cost = 2
Yes, this industry has economies of scale, since its average cost drops as output goes up.

2. What is the optimal price and quantity for the monopolist?

Solution: The profit is given by $Pi = p \times Q - C(Q) = \frac{100-Q}{5} \times Q - C(Q)$
FOC: $\frac{dPi}{dQ} = 0 \Rightarrow Q = 45$

3. Illustrate this using an appropriate diagram. On the same diagram, also show the marginal revenue curve.

Solution:



4. What is the elasticity of demand at the point at which the monopolist produces? Can this elasticity take a value between 0 and -1? Justify your answer.

Solution: Elasticity = $\frac{\partial Q/\partial p}{Q/p} = -11/9$;

it cannot be between 0 and -1, because if it is, then the monopolist can increase p by Δp with Q reduced by ΔQ , $\Delta Q/Q < \Delta p/p$

$$\Rightarrow (p + \Delta p)(Q - \Delta Q) - C(Q - \Delta Q)$$

$$= pQ - C(Q - \Delta Q) + \Delta pQ - p\Delta Q - \Delta p\Delta Q$$

$$> pQ - C(Q - \Delta Q) - \Delta p\Delta Q$$

$$= pQ - C(Q) + 2\Delta Q - \Delta p\Delta Q$$

$$> pQ - C(Q) \text{ for some small } \Delta p$$

However, the monopoly should have maximized profit profit by setting p , a contradiction!

5. What is consumer and producer surplus? What is the dead weight loss resulting from this market outcome?

Solution: $CS = (20 - 11) \times 45/2 = 202.5$

$PS = (11 - 2) \times 45 = 405$

$DWL = (11 - 2) \times 45/2 = 202.5$

6. At what fixed cost would the firm choose to close down?

Solution: When fixed cost is higher than PS (405), the firm will choose to shut down.

7. Suppose that there are 100 firms in the industry. Would this arrangement be socially optimal?

Solution: It would NOT be socially optimal.
100 firms would incur fixed cost of $100 \times 20 > 100 \times 20/2 > \text{max social surplus}$.

8. Derive the expression for the Lerner Index as a function of elasticity of demand.

Solution: $L = \frac{p-MC}{p}$
A monopoly $\max (p - MC) \times Q \Rightarrow \frac{d(p-MC)Q}{dp} = 0$
 $\Rightarrow Q + (p - MC) \frac{\partial Q}{\partial p} = 0$
i.e., $\frac{p-MC}{p} = -\frac{Q}{\partial Q / \partial p \times p} = -\frac{1}{\frac{\partial Q / \partial p}{Q/p}} = -\frac{1}{\text{elasticity}}$

Vertical and Horizontal Integration: Evidence from Japan, United States, Germany and the U.K.

This problem set is based on the paper by Chandler "The Emergence of Managerial Capitalism" on the course website.

1. In what industries were economies of scale the most important. Why does this matter for the evolution of large firms.

Solution: In "capital intensive" industries, economies of scale is most important.
This is because greater economies of scale give larger firms a greater cost advantage over small firms.

2. What is the difference between the multi-division firm and a the firm run by a manager (such as the Medici banks)? What made this necessary?

Solution: A multi-division firm has more employees and handles a much larger volume of activities.
In the Medici Bank example, a middling-size state bank of today handles more transactions in a week than the Medici Bank processed in the century of its existence.

3. Why was there an extensive service network in sewing machines? What is this an example of? What are other examples of vertical integration in the article?

Solution: Because the extensive network enables mass distribution of products.
This is an example of forward integration.

Other examples include

- i) producers of perishables - meat, beer and dairy products
- ii) oil companies, tire companies
- iii) producer of new machines that are mass produced: typewriters, cash registers
- iv) makers of heavier but still standardized machinery for industrial users: manufacturers of shoe machinery, pumps, boilers, elevators, printing presses, telephone equipment, and machinery that generated electric power and light

4. Why did Germany not develop many packaged and branded good industries?

Solution: Because per capita income in Germany is lower than in US or UK, and because Germany was neither a large importer or exporter of foodstuff, its demand to create large enterprises in packaged and perishable foodstuff or other consumer products is low.

5. What were the differences between countries in terms of merger activity in the early 1900's. What reasons does Chandler give for this.

Solution:

US -transformed from a loose federation of small operating concerns into a single centralized enterprise.

-common law prohibits against combination in restraint of trade; Sherman act makes contractual cooperation by means of a holding company legally suspect.

UK -holding companies remained federations of family firms.

Germany -large firms reduce competition by making contractual arrangements for setting price and output and allocating markets, because such arrangements were legal.

Chandler attributes these differences to differences in technologies and markets available to the industrialists of the different nations, in their entrepreneurial organizational skills, in alws, and in cultural attitudes and values.