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Natural Monopolies

Introduction

A key assumption for the market system to work efficiently is for consumers to be sovereign. This means that consumer demand determines what goods and services are to be produced. It also assumes that markets are competitive. This means there are many firms competing. If firms are making supernormal profits other firms will enter the industry and the profits will be competed away.

In reality a variety of market structures exist. Markets that have imperfect competition usually mean that firms can make monopoly type profits. Allocative efficiency is not occurring because output is not being maximised based on consumer demand.

This chapter explores a particular type of imperfect competition called a natural monopoly.

Examples of natural monopolies in New Zealand include railways, phone land lines and water supply.

What is a Natural Monopoly?

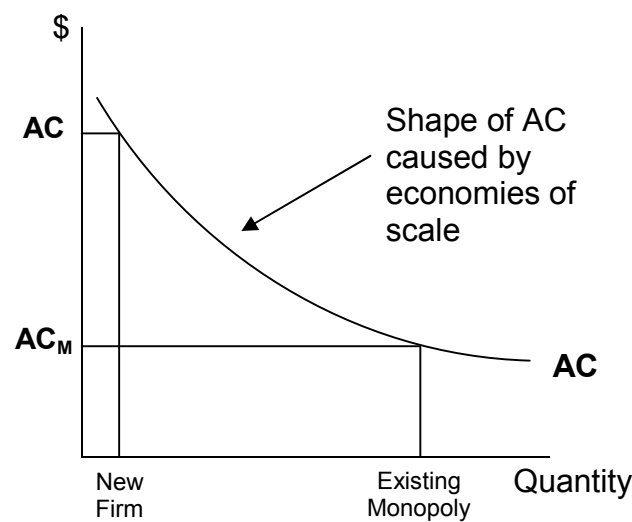
A natural monopoly is a situation in which one firm can produce a good at a lower cost than if there were two or more firms competing. This is usually due to economies of scale.

Key Features of a Natural Monopoly

1. Economics of scale

A key feature of a natural monopoly is usually economies of scale. These occur when a firm expands its level of output and the average cost of output decreases. Because the monopoly has economies of scale this makes it very difficult for new firms to enter the market because their average costs of production are much higher as shown on the graph below.

Average Costs for a Natural Monopoly v A New Firm



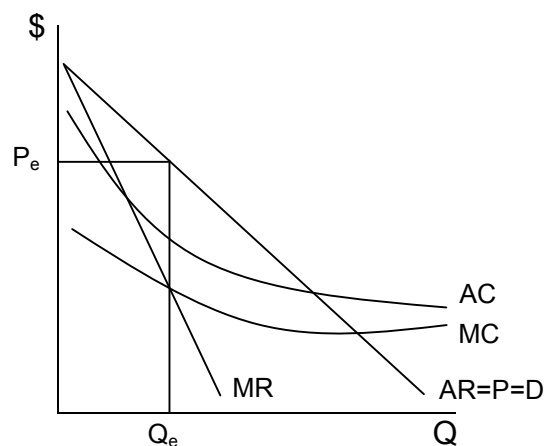
2. Networks

A natural monopoly usually occurs when there is a network of infrastructure required for production. This may involve such structures as telephone lines, pipelines, electricity lines or railway lines. A new firm entering the market would have to set up their own network so this acts as a barrier to entry for new firms. The high set up costs also contribute to the economies of scale of the natural monopoly. As the firm increases its output the set up costs are spread over a larger amount of output. This causes the average cost of production to decrease.

Illustration of a Natural Monopoly

The graph below shows the profit maximising equilibrium of a natural monopoly. The firm is maximising profits when $MR=MC$. The unique feature of this graph is the average cost curve declines over the output because of economies of scale.

Natural Monopoly Equilibrium



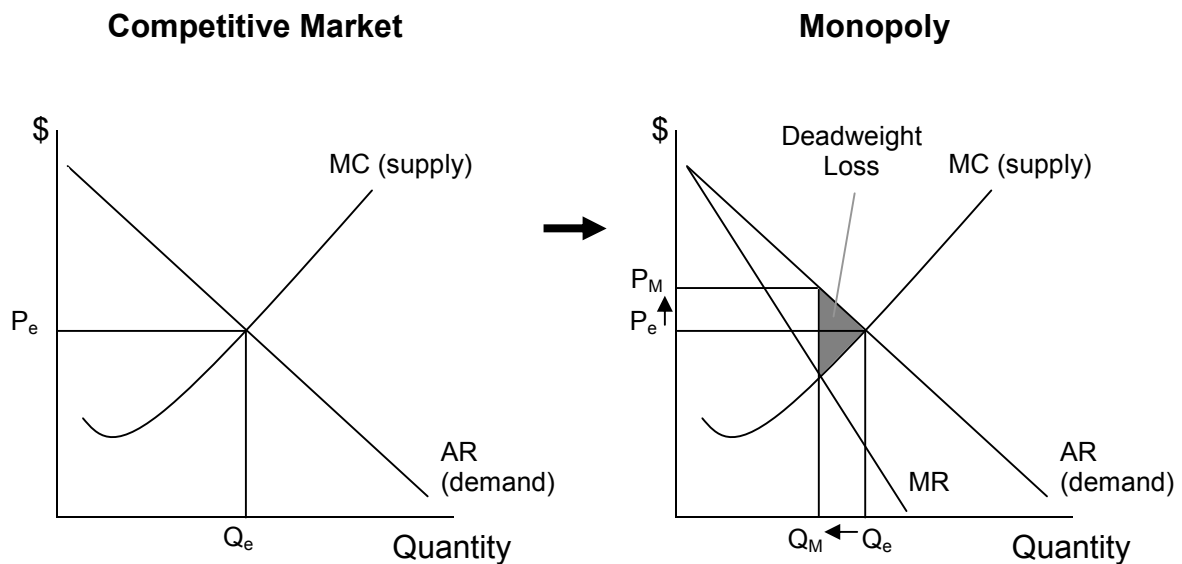
Why is a Natural Monopoly regarded as market failure?

A natural monopoly is a type of market failure because the outcome of its decisions are not in the best interests of society. In a competitive market a firm will produce at the output where price = marginal cost. In the monopoly situation the firm will restrict output to increase the price it receives. It is able to do this because it is a price maker.

A natural monopoly represents market failure because it restricts output to increase the price it receives.

The graph below shows the effects of a competitive market becoming a monopoly.

The Effect of a Competitive Market Becoming a Monopoly



The natural monopoly results in a loss of allocative efficiency as shown on the graph above. This loss of allocative efficiency is called a deadweight loss because output is not being maximised to meet consumer demand.

Why could a natural monopoly be beneficial for society?

It would be wasteful to have several networks

The need for a network such as power lines or water pipes can create a natural monopoly. This is because the high set up costs make it very difficult for new firms to enter the market. It would also be a waste of resources to have several networks replicating each other.

A natural monopoly has the potential to supply at a lower price due to economies of scale but is unlikely to do so

Because of economies of scale it could be possible for a natural monopoly to provide the good or service at a lower cost and therefore a lower price than if there were several firms competing. This is however unlikely to happen voluntarily. The monopoly will exercise its market power to maximize its profits.

Government Policies for a Natural Monopoly

A government can use laws to control the price and output of the natural monopoly. It can use marginal cost pricing or average cost pricing. It could also take over the monopoly in a process called nationalisation.

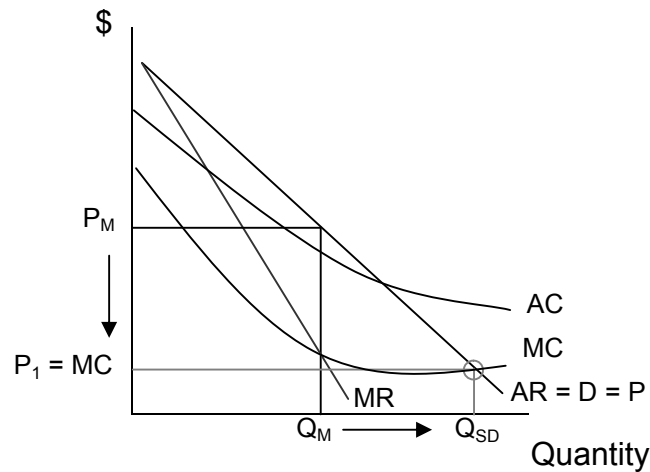
Marginal Cost (Socially Desirable) Pricing

The government could force the monopoly to price as though it was in a competitive market ($P=MC$). This will force the monopoly to produce at an allocatively efficient level. This is called the socially desirable price.

The graph below shows the effects of the government requiring the monopoly to charge a socially desirable price.

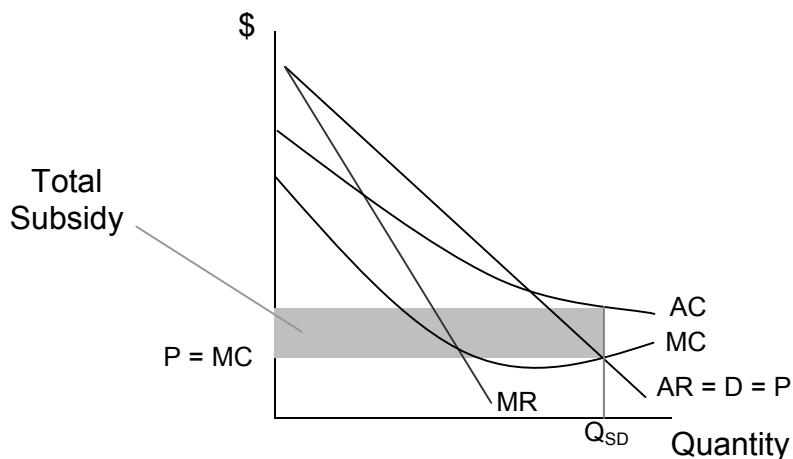
A Natural Monopoly Using Marginal Cost Pricing

Natural Monopoly Forced to Price at MC



On the graph above the effect of the government requiring the monopoly to price at MC is that the monopoly is now making a sub normal profit. In this situation the government may need to subsidise the monopoly to ensure that it stays in business. The shaded area represents the subsidy.

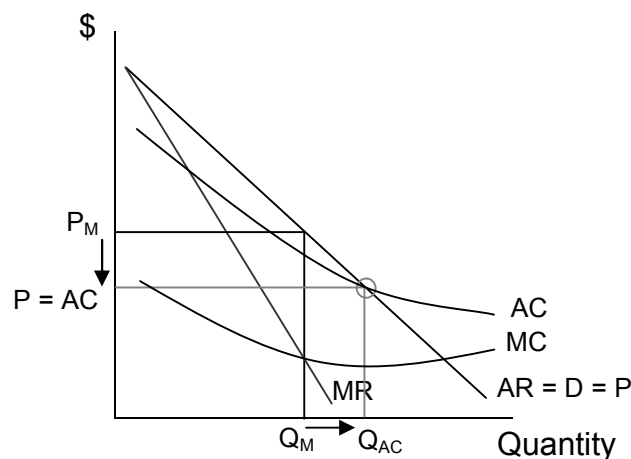
Natural Monopoly Pricing at MC with Subsidy



Average Cost Pricing (Normal profit)

The government may force the monopoly to price to make a normal profit. This occurs when price = average cost. This is shown on the graph below.

A Natural Monopoly using Average Cost Pricing



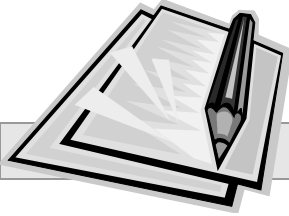
The Problem of Using Price Controls

A key difficulty with price controls for a monopoly is that the government must determine the costs for the monopoly. It has to rely on the monopoly to provide these costs. The monopoly will tend to overstate its costs. This problem is called regulatory capture. The regulator (government) is caught by having to rely on the monopoly to tell its true costs.

Public Ownership of the Natural Monopoly

A government could also take over the monopoly. In 2008 the New Zealand government bought the national rail system from Toll Holdings. The rail system is a type of natural monopoly.

If a government operates a natural monopoly it can increase output and reduce price to achieve allocative efficiency. However government ownership may result in inefficiencies because there is less profit motive. This may cause the costs of production to increase because managers are less accountable to competition.



Chapter Review Exercise

Case Study 1 – Telecom as a Natural Monopoly

1. Telecom has been regarded as a natural monopoly because it controls the copper phone lines that provide phone and internet service to New Zealand households.

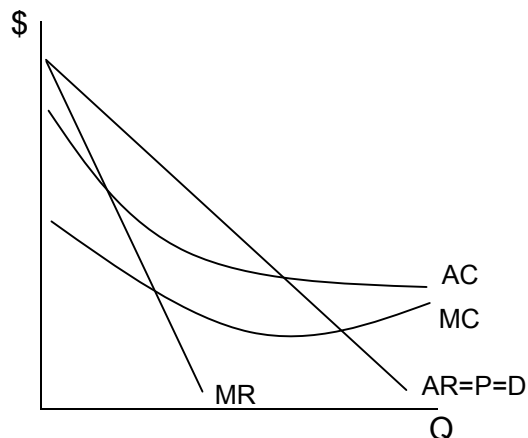
What feature of Telecom described above is common to a natural monopoly?

2. There has been substantial criticism from other suppliers of telecommunication services as well as the public about Telecom abusing its monopoly power.

According to economic theory what are two likely criticisms of Telecom as a natural monopoly?

3. (a) Use the graph below to illustrate the likely price and level of output of fast broadband provided by Telecom.

Telecom Broadband Internet



- (b) On the previous graph, label the price and quantity that would be provided if the market was opened to competitors.
- (c) Shade on your graph the loss of allocative efficiency as the result of Telecom acting as a monopoly.
- (d) Why would Telecom be regarded as a type of market failure?
-
-
4. In recent years the government has considered a variety of tools for solving the market failure caused by Telecom. It has considered using price controls.
- (a) What price would be considered the socially desirable price?
-
- (b) What price would provide Telecom with a normal profit?
-
- (c) State one possible difficulty in using price controls for solving the market failure caused by Telecom.
-
-
5. In 2007 the government acted to remove Telecom's monopoly power.
- Communications Minister David Cunliffe said today the original plan for Telecom to split into wholesale, retail and network divisions would go ahead, creating a more level playing field for competitors wanting access to Telecom's network.*

(a) What is meant by the term “*network*” with regard to Telecom?

(b) What is meant by “*provide a level playing field for competitors*”?

6. Telecom has criticised the break up into three parts because this could result in a loss of economies of scale.

(a) What are economies of scale?

(b) How could the break up reduce economies of scale?

(c) Give a possible advantage to consumers of the breakup of Telecom.

(d) Give a possible disadvantage to consumers of the break up of Telecom.

Case Study 2 - Natural Monopoly

(The characters in this story are almost entirely fictitious)

An Economic Tale from a Faraway Island

In the small island country of Pepeleau there is one water supply company called Timato Waters after the main crop of the country (spelling is not a strong point on the island). The company owns the water reservoir and the pipes that supply the businesses and households of the small island community.

1. What type of business would Timato Waters Ltd represent? (Explain your answer)

2. What is the formal definition of this type of market situation?

3. A common feature of this type of market is a “network.” Use the water company to explain what is meant by a network.

4. Timato Waters Ltd is a very profitable business. The extra cost of supplying new customers is low as it involves adding a few extra pipes to the existing system. Over the years other water supply businesses have tried to set up in competition but have been unable to compete.

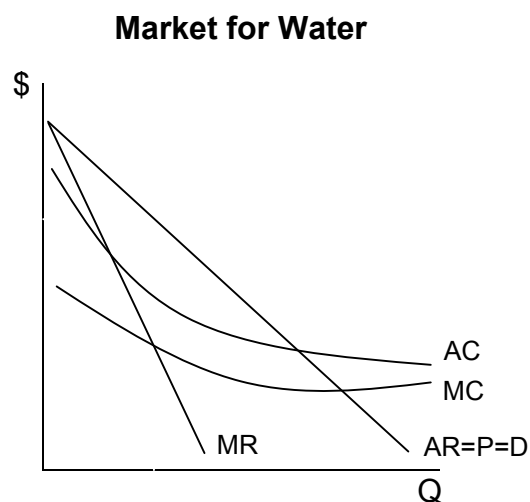
- (a) What is the economic term for the advantage that Timato Waters Limited has over potential competitors?

- (b) Define this economic term.

5. Unfortunately for the people of the island the current president Sir Jorgeous the Third had to sell the business to pay for his 5th divorce. Sir Jorgeous had run the business so that it made a normal profit and did not charge too much for water.

- (a) Explain what is meant by a normal profit in economics.

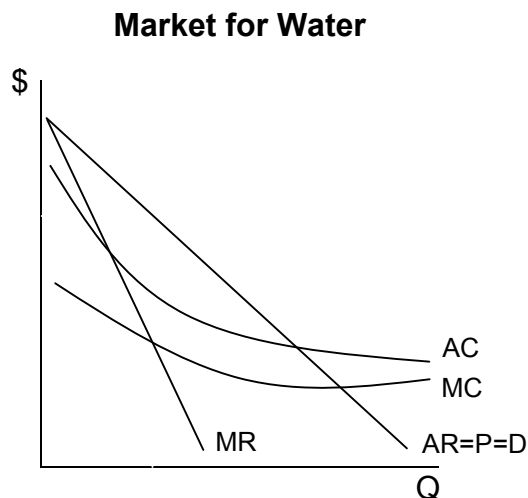
- (b) Complete the graph below for Timato Waters Ltd and show the price and quantity that would be supplied if the business makes a normal profit.



- (c) Explain the shape of the average cost curve on the graph above.

6. The water company has fallen into the hands of the notorious Lee brothers from the neighboring island of Semalu. The Lee brothers are hard nosed capitalists eager to make the most profit from the business.

- (a) Use the graph below to show the price and quantity supplied that will occur if the Lee's maximise profits from the business.



- (b) What has happened to output?

- (c) What has happened to the price of water?

- (d) Explain the impact of the changes on efficiency?

(e) What is this change in efficiency called?

(f) Explain the effects of the changes on equity.

(g) Why would a natural monopoly be regarded as a type of market failure?

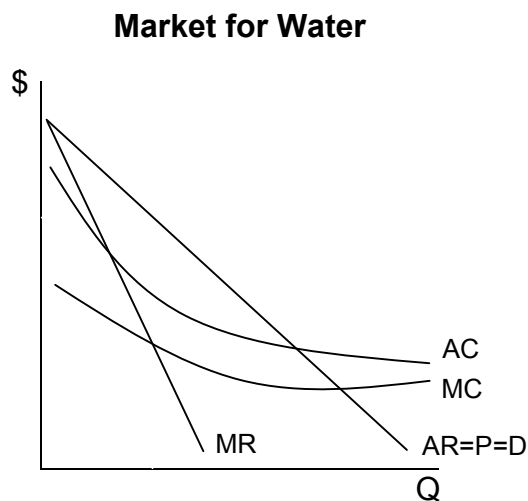
(h) State two options that a government could use to solve the market failure caused by a natural monopoly.

7. The people of the island community held a massive protest in the town square. All fifty of them turned up at the rally carrying placards and banners. The rally was lead by Jono Rossi the lead singer of the famous rock group called Me2. Jono had studied economics during his 23 years at secondary school. He demanded that the government require the water company to charge a competitive price for water.

(a) What price would be regarded as a competitive price?

- (b) This price can be called the socially desirable price. Explain why?

- (c) Complete the graph below labeling the competitive (socially desirable) price and quantity for the firm.



- (d) From your graph above what problem would be caused for the business by the government requiring it to charge a competitive price?

8. Sir Jorgeous was worried as the protests could disrupt his upcoming wedding to Princess Mavis O Donald of Rowlandia. He spoke to his Prime Minister Fraser Suckram. Fraser had also done economics at school and had eventually passed after many years.

Fraser suggested that Sir Jorgeous should use his wedding dowry to buy back the water company from the Lee brothers. Sir Jorgeous thought this was a splendid idea. He rang the Lee brothers and suggested that they either sell the company back to him or he would have them shot. Pepeleau has yet to adopt certain democratic freedoms. They readily accepted his kind offer.

The government regained ownership of the water company.

- (a) Evaluate the effects of government ownership on equity?

- (b) Evaluate the effects of government ownership on efficiency.
