

Chapter 4

Economic Efficiency and Markets

ECON 260
Environmental Economics

Learning Objectives

1. Define social efficiency and graphically illustrate when it is achieved.
2. Explain why a competitive market may fail to reach a socially efficient equilibrium.
3. List and explain the causes of market failure.
4. Contrast the equilibrium outcomes in markets where externalities are accounted for versus when they are not.
5. Explain the distinguishing characteristics of public goods and why they give rise to free riding.

Economic Efficiency

- Economic efficiency in production is achieved when the marginal benefits from production equal the marginal costs
- This is achieved when Marginal Willingness To Pay (Demand) is equal to the Marginal Cost (Supply)

Efficiency and Equity

- Efficiency does not distinguish between people – a market that achieves the maximum total benefit is considered efficient no matter who receives the benefits (One person can achieve all the benefits)
- Equity is a concept that does consider distribution of benefits – to be equitable, the distribution needs to be fair
- An efficient outcome may not be considered equitable if a small number of people benefit and many do not
- It may be hard to define fairness – different people have different views – but fairness usually means that benefits are shared widely among the population

Economic Efficiency and Equity

Economic Efficiency does not demand equity in distribution

- Efficiency says to maximize the size of the pie, don't worry about how it is sliced. If a project creates more benefits than costs, then it is good, no matter who pays the costs and who receives the benefits.

However if we assume diminishing marginal utility from income, then equity is important

- If we assume \$1 is worth less to a rich person than to a poor person (because the rich have many dollars and the poor few), if we redistribute money from someone who is wealthy to someone who is poor, the utility level of society is increased.

The Use of Markets

- Almost all countries, including Canada, rely on markets to allocate scarce goods
- Like Democracy, markets are not completely efficient, but for most goods and services they beat the alternatives
- Some alternatives to markets:
 - Distribution based on ‘need’
 - Equal distribution
 - First come first served
 - Lottery
 - Mad Max – Might makes right
- All the alternatives raise issues with regard to giving the right incentives to both producers and consumers
- Overall markets are preferred to the alternatives to allocate goods to those who value them most highly, and give producers incentives to make the goods that people value

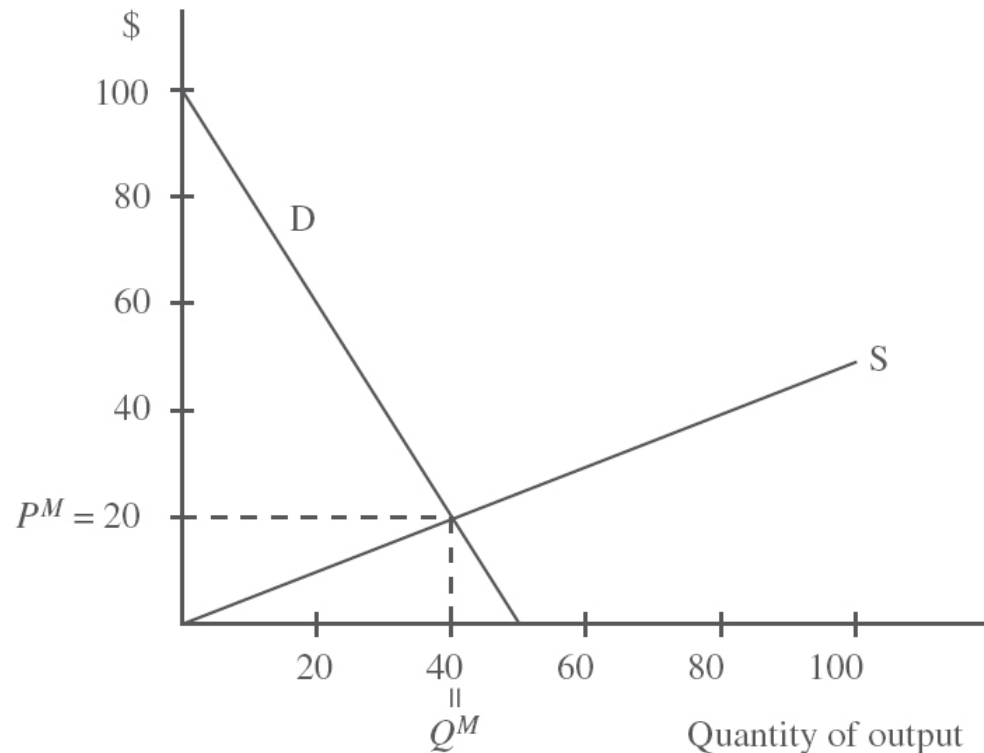
The Use of Markets

- Why do we have a market economy?
- Alternatives?
- Do Markets “usually” work?

Market Equilibrium

The Price Level where Quantity Supplied = Quantity Demanded is the only point of market equilibrium

Figure 4-2



Take me home to the equilibrium...

Markets always try to move toward their equilibrium level where Quantity Demanded = Quantity Supplied

and they usually get there....

- Stores do not have lots of items they can not sell...(if they do, they lower the price)
- Stores are usually not short of items they can sell...(if they are, they raise the price)

- Stores can adjust prices to reach equilibrium

Market Failures

- **Market failures** prevent a socially efficient equilibrium from being reached
- People get too much of something they do not want (negative externalities)
- Or not enough of something they do want (positive externalities)

Main Types of Market Failures

1. Negative Externalities

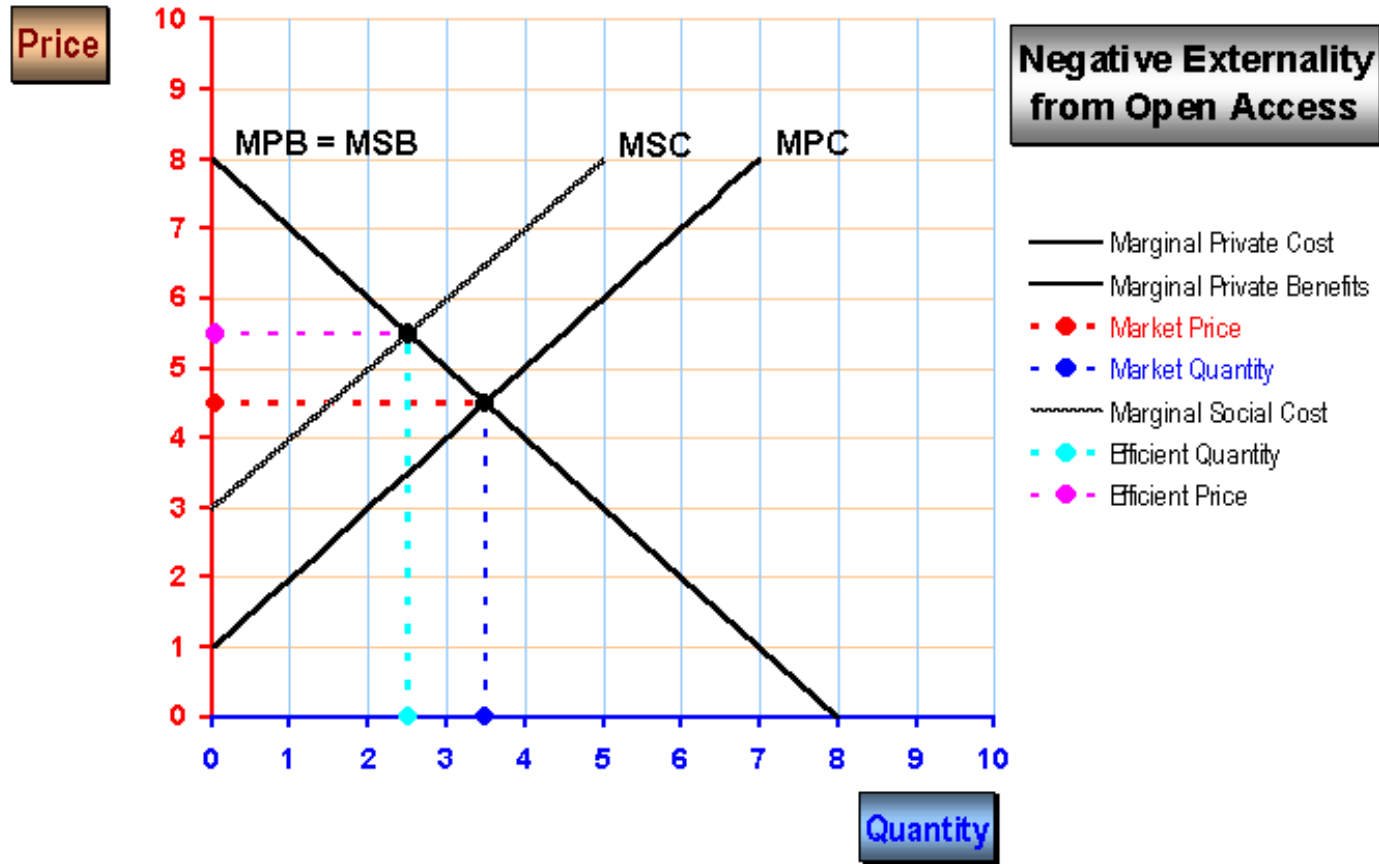
- When producers do not pay the full costs of production
- Such as when the production of a good produces pollution that affects other people
- The price of the good in the market is below the true price
- Producers produce more than the socially optimal amount of the good

2. Positive Externalities

- When producers can't capture the full benefits of production
- Producers produce less than the socially optimal amount of the good

Emissions as a Negative Externality

- Pollution emissions may create a negative externality
- The negative externality exists when there are costs to society and the environment from the production or use of a good or service that the producer of the good does not have to pay
- Pollution may create negative externalities, but even if we removed all negative externalities by forcing producers to pay the full cost of production, pollution would still exist because of the benefits we receive from consuming the good



- When Marginal Social Costs (MSC) of production > Marginal Private Costs (MPC), there is a Negative Externality
- MPC will not reflect the true or full cost of providing the good
- If the external costs are not added, the price of the good in the market will be below the correct price (\$4.50 vs. \$5.50) and too much of the good will be produced (3.5 vs. 2.5)

LO3 and LO4

Water Pollution Example

- Suppose a new paper mill is established on a river and begins discharging waste into the river
- The fishery downstream may be negatively affected
- If the paper mill does not take this impact into consideration when deciding how much to pollute, it over produces its products and produces too much emissions

What if we tax the polluter for the damage? (Jumping ahead here to policy to make a point)

- Impose a tax on the paper mill equal to the damages its pollution causes
 - This type of tax is known as a Pigouvian tax
- Now the paper mill is considering the full social costs in its private costs
- The Negative Externality no longer exists, but pollution still does.
 - Its now the socially efficient level of pollution

Traffic Congestion as a Negative Externality

<u>Number of Cars</u>	<u>Average Travel Time Between A and B</u>
1	10
2	10
3	10
4	11
5	12
6	14
7	18
8	24

Alternative Route takes 18 minutes

Explain the negative external costs in this situation

OPEN ACCESS RESOURCES

- Open access resources are a limited (scarce) resources with uncontrolled access
 - Such as the open ocean, the air or some public lands
- No one controls or owns the resource, therefore it can be hard to prevent people from overusing or abusing the resource

Review of Negative Externalities

- How do social costs differ from private costs when a negative externality exists?
- When a negative externality exists, what is true of the price and quantity of the good produced if the negative externality is not taken into consideration?

Positive Externalities

- An action has some positive benefits to others (society) that are not taken into consideration by the person making the decision about how much of a good or service to produce
- $MB \text{ to society} > MB \text{ to the person producing the good.}$
- The producer makes the goods until private $MB =$ private MC , but this means the good is underprovided in an uncontrolled market

Positive Externality - Examples

- Flower Gardens
- Firework Shows
- Education
- Vaccinations

Positive Externalities

- Society would be better off if it finds a way to compensate individuals who produce goods with positive externalities, to encourage them to produce the socially efficient level
- Public Goods are related to positive externalities

Public Goods

- A pure Public Good is
 - **Non-rival** – One person's use of the good does not diminish another person's ability to use the good.
 - If you breath the air, there is still plenty for me to breath
 - If you listen to an MP3 file, I can still listen to it as well
 - **Non-excludable** – Individuals can not be prevented from using a good for free.
 - I can watch a fireworks show without paying.
 - I can breath the air for free.



Free Riders

- Free riders are people who pay less than their Marginal Willingness to Pay (MWTP) for a good
- Many public goods suffer from free riders because they are non-excludable, people can't be excluded from enjoying the benefits of the good even if they do not pay for the good

Private Land Conservation as a Public Good

Land conservation organizations prevent development and preserve land in its natural state

The benefits of land conservation, such as clean air, clean water, greater biodiversity, go to all people, whether or not they contributed to the effort to conserve the land.

Therefore, most people free ride off the donations of others, and less land is conserved than is optimal for society.

Public Goods Examples

- Which of these are these pure public goods (non-rival and non-excludable)? Please explain:
 - Lighthouse?
 - Clean air?
 - Public TV?
 - Broadcast TV?
 - Cable TV?
 - Satellite TV?
 - Computer Software?

Market Failure and Public Goods

- Public Goods are underprovided in a free market
 - Non-excludable makes it hard to prevent free riders
 - People try to avoid paying even with a positive MWTP because they figure someone else will pay and provide the good
 - We often use taxes to address the issue, which may be efficient for society, but not necessarily for each individual

Chapter Overview

This chapter provided an application of the market model to situations where environmental quality is an issue.

Due to external costs and external benefits, market prices and quantities may not be at their efficient level when environmental quality issues are involved.

Markets may fail to deliver efficient levels of environmental quality, and therefore environmental policies may be necessary to rectify these market failures. Policy options are covered in more depth starting in Chapter 9 of this textbook.