**ECO 2306 – Principles of Microeconomics**

Week 10

**Hello and Welcome to the weekly resources for ECO 2306 – Principles of Microeconomics!**

**This week is Week 10 of class, and typically in this week of the semester, your professors are covering these topics below.**  If you do not see the topics your particular section of class is learning this week, please take a look at other weekly resources listed on our website for additional topics throughout of the semester.

We also invite you to **look at the group tutoring chart on our website to see if this course has a group tutoring session offered this semester**.

If you have any questions about these study guides, group tutoring sessions, private 30 minute tutoring appointments, the Baylor Tutoring YouTube channel or any tutoring services we offer, please visit our website [www.baylor.edu/tutoring](http://www.baylor.edu/tutoring) or call our drop in center during open business hours. M-Th 9am-8pm on class days 254-710-4135.

Our main resource is going to be Principles of Microeconomics by N. Gregory Mankiw.

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**Topic of the week**

**Externalities**

**Keywords:** externality, corrective taxes, Coarse theorem, transaction costs.

**Concepts:**

The buyers, the sellers, and the government are not the only beneficiaries of the market. Every kind of economic activity has some effects on people who are not involved in it. For example, driving a car releases pollution into the air that is then inhaled by pedestrians. We study these effects of economic activities in this chapter.

**Externalities and Market Inefficiency**

The uncompensated impact of one person’s actions on the well-being of a bystander is called an **externality**. This impact could be positive (planting a tree) or negative (polluting a river). Because externalities exist, society’s interest in market outcomes extends beyond the people who are directly involved.

In a market equilibrium, resources are sometimes allocated inefficiently, buyers and sellers neglect the external effects of their actions, and the market fails to maximize the total benefit to society as a whole. The government can protect the interests of bystanders.



Figure 1 Pollution and the social optimum (source: Mankiw)

Consider the market for steel. Normally, the production has a certain cost to sellers. Also, the production of steel causes pollution, which is the negative externality of this economic activity. Social cost is the sum of the private costs of the producer and costs to bystanders due to the negative externality. When there is a negative externality, the market outcome is not efficient (see figure 1).

If production moves to the optimum instead of the equilibrium, the total welfare of the society will be maximized, even though the total market quantity will be lower. The government can achieve this by imposing a tax on steel production. Remember the effect of taxation? A tax will internalize this externality by raising government revenue that is equivalent to the social cost of production. This tax also alters people’s incentives and aligns their private interests with those of the society.

The banking industry is different. When a bank fails, the huge negative externality of this failure will affect a large portion of the market. There are two potential solutions to this problem. The government can regulate the banks to make sure they can’t be too risky and internalize their externality, or simply let the banks that fail go out of business and not bail them out.

Now consider positive externalities. Education is a very good example. Beside all its private benefits, education leads to a better government, lower crime rates, and higher productivity and wages. The social value of education pushes the social demand curve above the private market demand curve. Therefore, the socially optimal quantity is greater than the market equilibrium quantity.

The government can correct this market failure by offering subsidies. Subsidies have the exact opposite effect of taxes. These subsidies (public k-12, Pell grants, low-interest student loans) internalize the externalities, increase the private benefit of education, and encourage more people to go to school.



Figure 2 Education and the social optimum (source: Mankiw)

To summarize: *Negative externalities lead markets to produce a larger quantity than is socially desirable. Positive externalities lead markets to produce a smaller quantity than is socially desirable. To remedy the problem, the government can internalize the externality by taxing goods with negative externalities and subsidizing goods with positive externalities.*

**Public Policies Toward Externalities**

In general, the government can respond to externalities in one of two ways: **command-and-control** policies and **market-based** policies. Command-and-control policies try to regulate behavior directly. Regulation dictates maximum level of pollution, requires firms to adopt particular technology, or holds producers up to certain standards. Regulation is difficult to implement because it is expensive for the government to know the details of how firms operate.

Market-based policies provide incentives so that private decision makers will choose to solve the problem on their own. This way, the government doesn’t need to learn the details of firm operations and takes advantage of private information. A **corrective tax is** a tax designed to induce private decision makers to take into account the social costs that arise from a negative externality. This tax makes it expensive to pollute, raises revenue for the government, enhances economic efficiency, and is cheaper to implement than regulations.

A similar policy is tradable pollution permits. The government issues a fixed number of permits (perfectly inelastic supply) and allows firms to freely buy or sell them. Firms that can lower their pollution will sell their permits to firms that can’t, and the market reaches an efficient final allocation.



Figure 3 Corrective taxes and Pollution permits (source: Mankiw)

An important point to mention here is people face trade-offs. This principle of economics means that eliminating all pollution is impossible because people will have to give up some standard of living in exchange for clean water and clean air. Also, clean environment is a normal good, which means it has a positive income elasticity. Also, according to the law of demand, more people will want and support environmental protection if regulation comes at the lowest cost.

**Private Solutions to Externalities**

There are many types of private solutions including moral codes and social sanctions, charities, self-interest of the relevant parties, integrating different types of businesses, and interested parties entering into a contract. The **Coase theorem** states that if private parties can bargain without cost over the allocation of resources, they can solve the problem of externalities on their own.

For example, suppose there is a chemical plant that pollutes rivers, and there are people fishing in those rivers for their food. If the chemical plant has property right, the fishers could pay off the chemical plant. If the fishers have property right, the chemical plant could pay off the fishers. Efficiency is achieved and there is no need for the government.

These private solutions don’t always work. Assume the fishers and the plant have to pay a $500 fee for every negotiation session. This is known as a **transaction cost** and it stops parties from bargaining with each other. This transaction cost is especially high when there are a large number of parties involved. In a lot of cases, property right may not be well defined. Also, any kind of private bargaining can always break down.

**What you might struggle with**

Balancing economic well-being with our social, political, and environmental incentives can be tricky. Always think of government and private action in terms of public trad-offs as well as private benefits. Completely uncompromising policies usually lead to adverse unintended effects.

**Check your learning**

1. Consider two ways to protect your car from theft. The Club (a steering wheel lock) makes it difficult for a car thief to take your car. Lojack (a tracking system) makes it easier for the police to catch the car thief who has stolen it. Which of these methods confers a negative externality on other car owners? Which confers a positive externality? Do you think there are any policy implications of your analysis?? (source: Mankiw)

2. Consider the market for fire extinguishers.

a. Why might fire extinguishers exhibit positive externalities?

b. Draw a graph of the market for fire extinguishers, labeling the demand curve, the social-value curve, the supply curve, and the social-cost curve.

c. Indicate the market equilibrium level of output and the efficient level of output. Give an intuitive explanation for why these quantities differ.

d. If the external benefit is $10 per extinguisher, describe a government policy that would yield the efficient outcome. (source: Mankiw)

3. Some observers believe that the current levels of pollution in our society are too high.

a. If society wishes to reduce overall pollution by a certain amount, why might different amounts of reduction at different firms be efficient?

b. Command-and-control approaches often rely on uniform reductions among firms. Why are these approaches generally unable to target the firms that should undertake bigger reductions?

c. Economists argue that appropriate corrective taxes or tradable pollution permits will result in efficient pollution reduction. How do these approaches target the firms that should undertake bigger reductions? (source: Mankiw)

4. Bruno loves playing rock ‘n’ roll music at high volume. Placido loves opera and hates rock ‘n’ roll. Unfortunately, they are next-door neighbors in an apartment building with paper-thin walls.

a. What is the externality here?

b. What command-and-control policy might the landlord impose? Could such a policy lead to an inefficient outcome?

c. Suppose the landlord lets the tenants do whatever they want. According to the Coase theorem, how might Bruno and Placido reach an efficient outcome on their own? What might prevent them from reaching an efficient outcome? (Source: Mankiw)

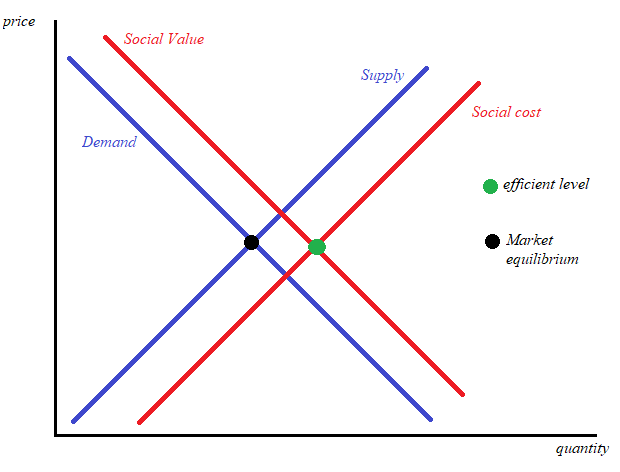
**Answers**

These are my answers. You should be able to come up with your own arguments that may or may not differ from mine.

1. (This is a general answer. Take econometrics for a more detailed answer) Relying on Lojack leads to a higher usage of public resources (the police), which is a negative externality. Relying on the Club makes your car less likely to be stolen and frees up the police to focus on other crimes. The government can subsidize the Club and tax the Lojack.

2. a. if you have a fire extinguisher at home, your fire is less likely to spread to other houses.

b. (to simplify the graph I assumed same elasticity of supply and demand)



c. many buyers can’t afford extinguishers at the manufacturers cost, so demand is lower than it should be. Also, supply with private cost is below the efficient level because manufacturers can justify a lower price.

d. a $10 tax break or subsidy to buyers or sellers of fire extinguishers. (5 to each, 2 and 8, 1 and 9, they all have the same effect)

3. a. not every firm has the same production cost and benefits. Each firm will have to make its own trade-off between lowering pollution and staying profitable.

b. a uniform regulation will have to target some market average, this would lead to smaller firms going out of business and larger firms getting away with a lot of pollution.

c. firms that pollute a lot will have to buy a lot of permits from smaller and more efficient firms. This gives them a financial incentive to lower their pollution levels and not have to spend money on permits.

4. a. the effect of undesirable music on each neighbor.

b. maximum decibel levels, curfews. Both are inefficient since maximum levels are useless if your neighbor isn’t home and curfews can’t work because people’s schedules change all the time.

c. they would meet and compare their schedules and come up with a plan to listen to music when the other person isn’t home. If such and arrangement has a cost (like having to change schedules) it will not work.

Thanks for checking out these weekly resources!

Don’t forget to check out our website for group tutoring times, video tutorials and lots of other resources: [www.baylor.edu/tutoring](http://www.baylor.edu/tutoring) ! Answers to check your learning questions are below!