**ECO 2306 – Principles of Microeconomics**

Week 8

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

**This week is Week 8 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.

**Topic of the week**

**Application: The Cost of Taxation**

**Keywords:** deadweight loss.

**Concepts:**

Taxation is a very controversial topic and we are going to learn more about it. We’ve already learned that taxed on any given good will make both buyers and sellers worse off, but what are other effects of taxation? Taxes raise revenue for the government and the government uses that revenue for various purposes. We need to compare government revenue with the losses to buyers and sellers to better understand the impact of taxation.

**The Deadweight Loss of Taxation**

 We’ve already learned about consumer surplus and producer surplus. With taxation, the government becomes another beneficiary of the market. If *T* is the size of the tax and *Q* is the quantity of the good sold, then the government gets total tax revenue of *T* ×*Q*. The revenue can also be measured buy the supply and demand curves.



Figure 1 Tax Revenue (source: Mankiw)

 In the previous chapter we saw how to figure out total welfare (consumer surplus and producer surplus) from the supply and demand curves. Taxation affects this welfare by decreasing both consumer surplus and producer surplus. As we saw before, taxation moves us away from the point of equilibrium.



Figure 2 How a tax affects welfare (source: Mankiw)

 In figure 2, when we move from Q1 to Q2, consumer surplus is reduced by B+C, and producer surplus is reduced by D+E. As we see in figure 1, government revenue is represented by B+D. The total surplus in the market falls by C+E. *Thus, the losses to buyers and sellers from a tax exceed the revenue raised by the government.* The fall in total surplus that results from a market distortion, such as a tax, is known as **deadweight loss.**

 So, taxation distorts incentives and causes the resources in the market to be allocated inefficiently. The assumption of taxes is government revenue delivers some kind of benefit to the society. Whether you agree or disagree with this assumption depends on your beliefs about the role of government.

 Subsidies have the exact opposite effect of taxes. When the government subsidizes a good, the demand and supply of that good artificially increase. Therefore, there will be a higher level of consumer and producer surplus. Just like taxes, it doesn’t matter if the subsidies are paid to consumers (food stamps) or producers (farm subsidies).

In this situation, total surplus goes down, because the government spending (from other taxation) is more than the gains in consumer surplus and producer surplus. Here’s the lesson: If you can get the government to subsidize you, you can pass off costs to other people.



Figure 3 The source of a deadweight loss (source: Mankiw)

**The Determinants of the Deadweight Loss**

 Price elasticities determine the size of the deadweight loss. The more elastic the supply curve, the larger the deadweight loss of taxation is going to be. Also, the more elastic the demand curve, the larger the deadweight loss of taxation is going to be.



Figure 4 Tax distortions and elasticities (source: Mankiw)

 Societies accept some deadweight loss in exchange for some government revenue to be spent on various programs. But when do we have too much taxation? As the tax rate increases, the deadweight loss increases at a faster rate than the size of the tax. Tax revenue increases initially, and then decreases. The reason should be obvious: a higher tax drastically reduces the size of the market.



Figure 5 Size of a tax and tax revenue (source: Mankiw)

 Economist Arthur Laffer first described this phenomenon and explained how decreasing the tax rate could increase the total amount of government revenue. The **Laffer curve** is the graphical representation of the relationship between the size of the tax and the size of government revenue. Economists have no disagreement about the Laffer curve itself, but widely disagree about where the revenue maximizing point is. Reason? They disagree about the size of the elasticities that we discussed above.



Figure 6 The Laffer Curve (source: Mankiw)

**What you might struggle with**

Based on what you learned in chapter 6, the effect of deadweight loss might seem paradoxical. In chapter 6, we argued that you’re hurt more the more inelastic you are. Here, we learn that you’re hurt more the more elastic you are. This is not a paradox. Remember, you’re relatively hurt more if you can’t change your behavior, but you don’t change your behavior from optimum efficient behavior.

**Check your learning**

1. Evaluate the following two statements. Do you agree? Why or why not?

a. “A tax that has no deadweight loss cannot raise any revenue for the government.”

b. “A tax that raises no revenue for the government cannot have any deadweight loss.” (source: Mankiw)

2. After economics class one day, your friend suggests that taxing food would be a good way to raise revenue because the demand for food is quite inelastic. In what sense is taxing food a “good” way to raise revenue? In what sense is it not a “good” way to raise revenue?. (source: Mankiw)

3. Daniel Patrick Moynihan, the late senator from New York, once introduced a bill that would levy a 10,000 percent tax on certain hollow-tipped bullets.

a. Do you expect that this tax would raise much revenue? Why or why not?

b. Even if the tax would raise no revenue, why might Senator Moynihan have proposed it? (source: Mankiw

4. The government places a tax on the purchase of socks.

a. Illustrate the effect of this tax on equilibrium price and quantity in the sock market. Identify the following areas both before and after the imposition of the tax: total spending by consumers, total revenue for producers, and government tax revenue.

b. Does the price received by producers rise or fall? Can you tell whether total receipts for producers rise or fall? Explain.

c. Does the price paid by consumers rise or fall? Can you tell whether total spending by consumers rises or falls? Explain carefully. (*Hint*: Think about elasticity.) If total consumer spending falls, does consumer surplus rise? Explain. (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. a. disagree, if demand is perfectly inelastic (insulin) a tax would not change the size of the market (no deadweight loss), but will raise revenue for the government.

b. disagree. A tax on a perfectly elastic demand (Pepsi) will turn the entire market for Pepsi into deadweight loss (everybody will switch to Coke, as they already should), and there will be no revenue for the government.

2. It is a good way because the inelastic demand leads to a very small deadweight loss and the government revenue will be quite high. It is not a good way because taxing a good with inelastic demand will leave people with much less disposable income to spend in the market, and that will lead to a smaller market overall.

3. a. such a tax will raise pretty much no revenue, since the vast majority of people will switch out of the market and buy other kinds of ammunition.

b. the purpose of this tax is not to raise money for the government, but to discourage people from buying hollow-tipped bullets.

4. a. before the tax: equilibrium price and quantity, larger market, higher levels of consumer and producer surplus, no government revenue.

After the tax: Price goes up, total quantity sold goes down, the market is smaller, total spending by consumers is down, total revenue for producers is down, government tax revenue exists.



b. the price received by producers increases change (see the graph above). Total receipt by producers may or may not fall depending on the elasticity of demand. If demand is elastic, total receipt is down, if demand is inelastic, total receipt is up.

c. like before, if demand is inelastic, total spending increases and if demand is elastic, total spending falls. With less spending, consumer surplus is down, because the area under the demand curve is smaller.

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!