Economics 101
Spring 2018
Homework #3
Due Thursday, March 15, 2018

Directions:

- The homework will be collected in a box **before** the lecture.
- Please place **your name, TA name, and section number** on top of the homework (legibly). Make sure you write your name as it appears on your ID so that you can receive the correct grade.
- Late homework will **not** be accepted so make plans ahead of time.
- **Show your work**. Good luck!

Please realize that you are essentially creating "your brand" when you submit this homework. Do you want your homework to convey that you are competent, careful, and professional? Or, do you want to convey the image that you are careless, sloppy, and less than professional? For the rest of your life you will be creating your brand: please think about what you are saying about yourself when you submit any work for someone else.

Part I: Excise Taxes

1) Recently, McDonald's re-introduced its Szechuan dipping sauce as an option at its restaurants located across the United States. Suppose that the U.S. government considers the Szechuan sauce market as a potential source of government revenue and that the government decides to levy an excise tax on Szechuan dipping sauce of $.80 per unit of sauce. The market clearing price before the excise tax is levied is $1.20 and the equilibrium quantity is 1500 units of Szechuan dipping sauce. After the excise tax is levied the consumer will pay $1.80 and the equilibrium quantity in the market will drop to 1200 units of Szechuan dipping sauce.

a. Given the above information, derive the equations for the supply curve and the demand curve in Szechuan sauce market.

b. Consider this market prior to the implementation of the excise tax. Calculate the values of Consumer Surplus (CS), Producer Surplus (PS) and Total Surplus (TS) when this market is initially at equilibrium.

c. Now, consider this market after the implementation of the excise tax. Calculate the value of Consumer Surplus with the excise tax (CSt), Producer Surplus with the excise tax (PSt), the tax revenue the government receives from implementing the tax (Tax Revenue), Total Surplus in this market after the excise tax is implemented (TSt) and the Deadweight Loss (DWL) due to the implementation of this excise tax.

d. Consider this market after the implementation of the excise tax. Calculate the Consumer Tax Incidence(CTI) and Producer Tax Incidence(PTI) of this excise tax. Which one is larger? If the demand curve became more elastic (eg: if the new demand curve was "flatter" but went through the initial equilibrium point before the excise tax was levied), would consumers pay a higher or lower share of the total taxes collected? What conclusion can you make about the relationship between elasticity and tax incidence?

Part II: International Trade

2) As a Mexican-style dish, Nachos are loved by many people around the world. The domestic demand and supply for Nachos in Kazakhstan are given by the following equations where Q is the quantity of Nachos and P is the price in dollars per unit of Nachos:

Domestic Demand: $P = 6 - \frac{1}{150}Q$

Domestic Supply: $P = 2 + \frac{1}{50}Q$

a. Calculate the equilibrium price, quantity, Consumer Surplus (CS), Producer Surplus (PS) and Total Surplus (TS) for the domestic market of Nachos when Kazakhstan is in autarky (i.e. the market is closed to trade). Illustrate your answer graphically.

b. Suppose Kazakhstan now opens it Nachos market to international trade and the world price for Nachos is $3 per unit of Nachos. Furthermore, suppose the market for Nachos in Kazakhstan is small relative to the global market. Given this information, what is the new market price in Kazakhstan? How many units of Nachos will be consumed domestically in the Kazakhstan market? How many units of Nachos will be imported/exported? Calculate the new Consumer Surplus, Producer Surplus and Total Surplus when the market for Nachos opens in Kazakhstan. Illustrate your answers graphically.

c. Suppose Kazakhstan government, fearing that the domestic Nachos suppliers are unduly suffering from the influx of cheap foreign Nachos, decides to implement a $1 per unit tariff on imports. With the implementation of this tariff, what is the new price for a unit of Nachos in the domestic market, the quantity consumed, the quantity imported, the Consumer Surplus, Producer Surplus, Government Tariff Revenue, Total Surplus and Deadweight Loss? Illustrate your answers graphically.

d. Now, suppose the government only cares about its revenue. Suppose the government is willing to close the market to trade provided domestic suppliers of Nachos compensate the government by paying them an amount equal to the tariff revenue the government earned in the previous question. Will domestic suppliers accept this deal and ask the government to implement it?

e. Continue our discussion in part (d). What is the tariff that maximizes the government's tariff revenue? Find the revenue-maximizing tariff.

3) Granola bars are often served as a quick on-the-go meal and are popular among students especially when they are busy doing their homework. Suppose that the domestic supply and demand for granola bars in a small economy are given as follows:

Domestic Demand: $Q = 240 - 5P$
Domestic Supply: $Q = 10P - 60$

where Q is the quantity of granola bars and P is the price per granola bar.

a. What is the equilibrium price and quantity in autarky (remember "autarky" is the term used to describe a closed market)? Also calculate the value of Consumer, Producer, and Total Surplus.

b. The small economy now decides to enter the international market for granola bars. Once the market clears, we find that the quantity of imports is twice as large as the quantity produced by the domestic producers. Given this fact, what is the world price for a granola bar? What is the new consumer, producer, and total surplus in the open market for granola bars? And what is the value of the gains from trade that this economy experiences when it opens its granola bar market to trade? Illustrate your answers graphically.

c. Now suppose the government decides to set an import quota of 60 granola bars; i.e. only 60 granola bars may be imported. What are the new equilibrium price, quantity, surpluses (CS, PS and TS) with the import quota, license holder revenue and deadweight loss due to the imposition of this import quota? Illustrate your answers graphically.

d. Suppose the government in this some economy decides to sell a single license to an importer granting the right to import and sell all the imported granola bars up to the import quota of 60 granola bars. At most how much would a seller be willing to pay in order to purchase the license to sell granola bars? Explain your answer.

Part III: Real vs. Nominal

4) In Merryland, there are only 3 goods: cups of coffee, movie shows, and laptops. The following table shows the *nominal* prices for these three goods from 2014 -2017:

Year	**Price per Cup of Coffee**	**Price per Movie Show**	**Price per Laptop**
2014	$5	$20	$350
2015	$5	$25	$400
2016	$6	$23	$300
2017	$5.5	$22	$375

Suppose a typical consumer basket throughout the year consists of 200 cups of coffee, 30 movie shows, and 1 laptop.

a. Using the above information to calculate the cost of the market basket for each of the years and present your calculations in the table below:

Year	**Cost of Market Basket**
2014	
2015	
2016	
2017	

b. Let 2014 be the base year, calculate the CPI for each year using a 100-point scale. Then, for 2015 to 2017, calculate the annual inflation rate. Round your answers to two places past the decimal.

Year	**CPI**	**Inflation Rate**
2014		-
2015		
2016		
2017		

c. Now, 2014 is still the base year. Calculate the real price of a movie show in each year. Again, show your answers to the hundredths.

Year	**Real price of movie shows**
2014	
2015	
2016	
2017	

Part IV: Elasticity

5) Suppose the residents on a small island consume only two goods, fish and kelp. The demand curve for fish (f) is given by:

$$Q_f = 160 - 2P_f + P_k - \frac{1}{4}I$$

where P_f and P_k are the prices of fish and kelp, respectively, and I is income.

Currently, residents are purchasing fish and kelp at P_f = \$25 and P_k = \$10. Income of the residents is equal to \$400.

a. What is the quantity of fish currently being consumed?

b. At the current amount of fish being purchased that you calculated in part (a), use the point elasticity formula to calculate the price elasticity of demand for fish. (Hint: plug in all the information given EXCEPT for the price of fish. After doing so, the problem should look more familiar since you will now have an equation with two variables, Qf and Pf.)

c. Given the price elasticity of demand you found in part (b), are suppliers of fish maximizing their revenue? If not, should they increase or decrease the price they charge for fish to increase their revenue? Find the price and quantity of fish at which total revenue is maximized.

d. Holding everything else constant, suppose residents' income decrease to \$200. Find the residents' demand for fish and use the standard (or regular) percentage formula to calculate the income elasticity of demand for fish. Are fish a normal or inferior good?

e. Return to the initial situation. If the price of kelp increases by \$10, find the residents' new demand for fish. What is the cross-price elasticity of fish for kelp? Use the arc elasticity formula concept when calculating this cross-price elasticity. Based upon your value for the cross-price elasticity of demand of fish for kelp, are these two goods substitutes or complements? Explain your answer.