Berkeley Student Learning Center

ECONOMICS PROGRAM

Mastery through Collaborative Learning

Econ 1 MT 1 Review Session

Drop-in Hours: Pod Tutoring: Facebook Page:
Mon – Thurs 10 am – 2 pm   Fri 1 – 2:30 pm   UC Berkeley SLC Econ Support
                                                Team

Concept Review

I.   Opportunity Cost
      a. The most desired activity foregone in order to do something
II.   Production Possibilities Frontier (PPF)
      a. Economic growth shifts the PPF out
            i. Increased quantity of resources
           ii. Increased productivity of resources
      b. Consume beyond PPF
            i. Foreign aid
           ii. Trade
III. Demand and Supply: If prices changes, move *along* the curve. Everything else that is
      not on axis, *shift*
IV.   Market Equilibrium
      a. Q demanded = Q supplied
      b. When price is determined by the market, total surplus is maximized
V.   Price Restrictions
      a. Binding Price Ceiling: a maximum price below P_{eq} imposed on a market, causes a
         shortage
      b. Binding Price Floor: a minimum price above P_{eq} imposed on a market, causes a
         surplus
VI.   Elasticity
      a. *Price elasticity of demand* $= \frac{\%\Delta Q}{\%\Delta P}$
            i. Determinants: availability of substitutes, share of total spending, time
                horizon
      b. *Income elasticity of demand* $= \frac{\%\Delta Q}{\%\Delta I}$
            i. Change in quantity demanded of a good/service in response to changes in
                real income
      c. Tax: A per unit tax shifts the supply or demand by the amount of the tax
            i. Yields the same result regardless of whether imposed on the buyer or
                seller
           ii. The more inelastic party bears greater burden of the tax
          iii. Taxes lead to a *DWL = ½ (T) * (Q_e - Q_t)*
VII. World Trade
      a. Trade will occur when the world price of a good is below the domestic supplier
         price
            i. Imports: The amount of a good bought outside the domestic market

1. Quantity imported is the difference between quantity demanded at world price and the quantity supplied domestically at the world price
   ii. Tariff: A tax levied on trade increasing the relative world price
   iii. Quota: A quantity restriction placed on suppliers

VIII. Firms' supply decisions
    a. Costs
        i. Total Costs (TC) = Total Fixed Costs (TFC) + Total Variable Costs (TVC)
        ii. Marginal Costs (MC) = $\Delta\,Total\,Cost / \Delta\,Quantity$

IX. Perfectly competitive industry
    a. Assumptions
        i. Lots of firms → firms are price-takers
        ii. Homogeneous Product
        iii. No barriers to entry or exit

X. To maximize profit, produce q so that MR=MC.
    a. Profit = $(P \times Q) - (ATC \times Q)$
    b. In the long run, profit = 0

XI. Marginal product of labor (MPL): the increase in the amount of output from an additional unit of labor
    a. Wages = value of MPL = $P \times MPL = P \times \Delta Q / \Delta L$
    b. Diminishing MPL: as you add more and more labor to fixed amount of capital and land, the additional output you get gets smaller and smaller
    c. For a competitive, profit-maximizing firm, this value-of-marginal-product curve (downward sloping) is also the firm's labor-demand curve

XII. Types of goods
    a. Public
    b. Private
    c. Club
    d. Common

Practice Problems

1) What is opportunity cost? *What you forego in choosing one choice over another. Not always monetary.*
2) What is the Law of Demand? *Increase P → decrease Q_d*
3) What causes a movement along the demand curve? A shift of the demand curve?
   a) *Price. Complements, substitutes, preferences, income, future expectations*
4) What causes a movement along the supply curve? A shift of the supply curve?
   a) *Price. TWIGS: technology, weather, input costs, government (subsidies, etc.), # of suppliers*
5) What are the determinants of price elasticity of demand?
   a) *Availability of close substitutes: more subs → more Elastic*
   b) *Necessities vs. Luxury goods: necessities → more INelastic*
   c) *Time horizons: how immediate is the need; if you have more time to look for substitutes → more Elastic*
   d) *Market definition: what you define market as; ex) food is inelastic, but apples are more elastic*
6) T / **F**: The 3 rules for perfect competition are homogeneous products, sellers are price-**makers**, and there are no barriers to entry or exit. *False; All true except sellers are price-takers*
7) T / **F**: Cal mugs initially sell at of a price of $10 at equilibrium. The next year the government decides to impose a price restriction of a price no more than $8 per mug to the market. This is an example of a price ceiling that creates a surplus of 3 mugs.
   a) *FALSE: While this is an example of a price ceiling (an upper bound), price ceilings create shortages of quantity supplied as more people want to buy than sellers want to sell.*
   b) *KEY TAKEAWAYS:*
      i) *Price Ceiling: an upper bound restriction on price, below equilibrium price. This causes a shortage. Examples include rent control to make housing more affordable for students.*
      ii) *Price Floor: a lower bound restriction on price, above equilibrium price. This causes a surplus. Examples include minimum wage where a government may want to protect worker's basic living conditions.*
8) T / F: All organic, non-gmo quinoa is initially sold at a market price of $5 in California. Realizing that consumers of organic, non-gmo quinoa have relatively inelastic demands compared to producers, they impose a $3 tax on *producers*. The new equilibrium price is $8 where producers pay for the majority of the tax leading to decreased total surplus.
   a) *FALSE: Equilibrium price does not have to be $8. Additionally, the tax is absorbed by the party with the LEAST elastic curve bears the majority of the tax. What is true is that a tax always leads to a decrease of total surplus (revenue + deadweight loss)*
   b) *KEY TAKEAWAYS:*
      i) *A per unit tax, regardless of who it is imposed on will be reflected onto the party with the least elasticity.*
      ii) *Taxes always create a deadweight loss equal to (Tax/2) * (Q_e-Q_t)*
      iii) *Revenue = Tax * Q_t*
9) The following events will cause an increase in the demand for software developers:
   a) T / F: App prices decrease
      i) *FALSE - Decreases in output price shifts demand left*

b) T / F: Developers become more educated
    i) TRUE - The marginal product of labor increases as developers become more educated, increasing labor demand. Developers can contribute more productivity.
c) T / F: Computers become faster and more efficient
    i) TRUE - Labor-augmenting technology increases the MPL and shifts the labor demand right.
d) T / F: A.I. is developed that can write its own code
    i) FALSE - This would be considered a labor saving technology and would decrease the demand for labor. Labor-saving in this case can be thought of as replacing software developers.

10) T / **F**: Two countries are trading avocados and steel. In order for it to be beneficial for both countries, one of the countries must have the absolute advantage in both goods.
    i) FALSE; when considering trade, we look at opportunity costs, which is comparative advantage.

11) Suppose that in the United States, producing an automobile takes 10,000 hours of labor and producing a shirt takes 2 hours of labor. In China, producing an automobile takes 40,000 hours of labor and producing a shirt takes 4 hours of labor. What will these nations trade?

a) China will export aircraft, and the United States will export shirts.

b) China will export shirts, and the United States will export aircraft.

c) Both nations will export shirts.

d) There are no gains from trade in this situation.

Opportunity cost of auto:
  In US: 10000hrs = 1 Auto= $\frac{10000}{2}$shirts= 5000 Shirts => to produce one auto you need to give up 5000 shirts
  In China: 40000hrs = 1 Auto= $\frac{40000}{4}$shirts=10000 Shirts => to produce one auto you need to give up 10000 shirts
  Therefore, China should specialize in shirts and US should specialize in auto.
  Alternative way of solving this problem:
  Per hour, China can produce 1/40000 auto and ¼ shirts while US can produce 1/10000 auto and ½ shirts.
  OC of auto in China= $\frac{\frac{1}{4}shirts}{\frac{1}{40000}autos}$=10000 shirts/auto

  OC of auto in US= $\frac{\frac{1}{2}shirts}{\frac{1}{10000}autos}$=5000 shirts/auto
  You arrived at the same answer.
  Don't get confused here because the given conditions in the question is phrased as "cost of labor hour per unit of good" rather than "production per labor hour", which is the way we used to. It would be helpful to compare how they phrased this question with question number 19. It is more important to think about the definition of "opportunity cost". The opportunity cost of auto is how much shirt you need to give up for one unit of auto.
 *The opportunity cost for shirts are just inverse of the opportunity cost of auto. And China has a lower opportunity cost of shirts. The answer to this question should be B.*

12) Eight years ago, the number of new graduates of engineering and the number of new jobs was about the same. Today, there are about 4 times as many new graduates as there are jobs for new engineers. What do you predict has happened to the salary paid to new engineers over the last eight years? Explain and include a graph.
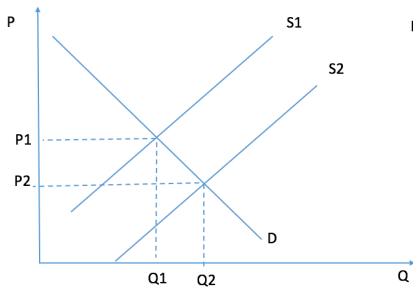
The surplus tells us the salary has decreased.
Option 1) the supply of engineers increased, which decreases price (salary) and increases quantity of engineers (graph on left)
Option 2) the demand for engineers decreased, which decreases salary and decreases quantity
~~of engineers demanded.~~

13) A $3 per unit tax is levied on all consumables in the U.S. Below are graphs of three markets affected by this tax. Rank these markets from those that would bear the least to most deadweight loss. From least to greatest deadweight loss: B, C, A. This is due to the elasticities of the supply and demand, as elasticity increases, the deadweight loss does as well.

A   B   C
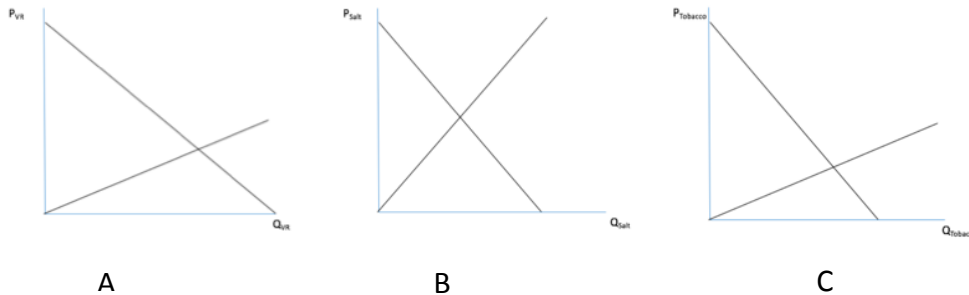
14) The nation of Gymtopia is "small" and unable to affect world prices. The demand curve for free weights in Gymtopia is Q_D= 400 - 10P. The supply curve is Q_s= 100 + 5P.

a) Fill the following table. What is the equilibrium price and quantity of treadmills without trade with other nations? Draw this graphically. Q_e = 200, P_e = 20. To fill out table, plug in each price to Demand and Supply equations.

| Price	Demand	Supply
0	400	100
5	350	125
10	300	150
15	250	175
20	200	200
30	100	250
40	0	300

To find the demand and supply curves, the inverse demand and supply must first be found.
P_D = 40 - (1/10)Q_D
P_S = (1/5)Q_s - 20

b) Suppose the world price of free weights is $10 per weight. If trade with other nations is unrestricted, will Gymptopia import or export free weights? How many free weights will be imported or exported? Draw this graphically. *Gymtopia would*

import 150 free weights because quantity demanded at this price is 150 units larger than supplied domestically.

P_{FW}

40

$P_{E} = 20$

$P_{W} = 10$

100   150   200   300   400

Q_{FW}
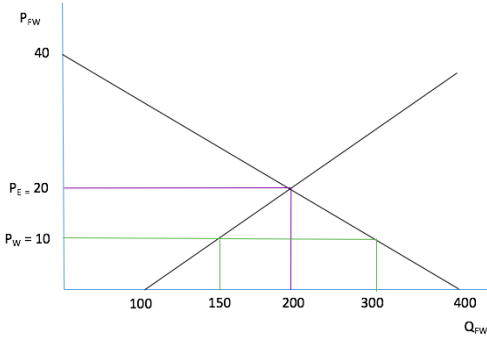
c) Now let's say the government wants a limit of 75 *imported* free weights. What will be the resulting domestic price and production? Draw this graphically two ways (1) using a quota and (2) using a tariff.

Using either method the resulting price would be $15 a with domestic quantity of 175 free weights produced domestically.

P_{FW} Quota

40

$P_{E} = 20$
$P_{Q} = 15$
$P_{W} = 10$

100   150   200   300   400

Q_{FW}

75
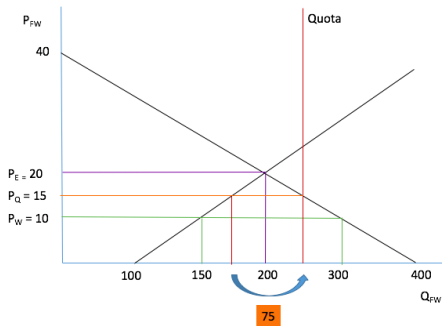
Using a quota requires finding where the quantity imported (distance between demand and supply) is 75. Once that is found plug quantity demanded or supplied into their respective equations to find the new domestic price of $15.

P_{FW}

40

$P_{E} = 20$
$P_{T} = 15$
$P_{W} = 10$

100   150   200   300   400

Q_{FW}

175   250
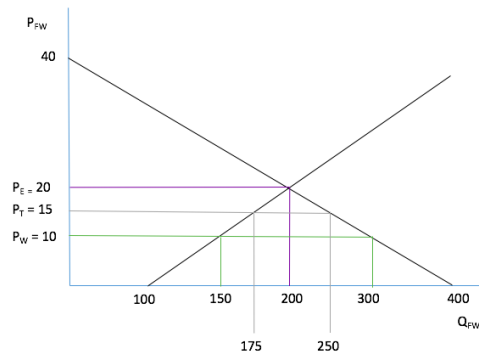
Using a tariff requires finding the price that leads to an excess of 75 units demanded. Just like the quota the price ends up being $15.

d) Which is the main difference between using the quota versus tariff? *Using a tariff results in revenue collected for the government while quotas only increase domestic producer's surplus. Both result in the same import quantity and price.*

e) Now consider Lazyland. Lazyland exports free weights to Gymtopia. Without using numbers, draw a graph of what the exporting country's demand and supply may look like. Remember to include equilibrium price and world price in your graph.

Lazyland's equilibrium price would be below the world price. More specifically, if Gymtopia and Lazyland were the only two nations trading, Lazyland's exports would equal that of Gymtopia's imports. Here is just one example of what Lazyland's supply and demand may look:

PFW

Pw = 10

50   200

QFW
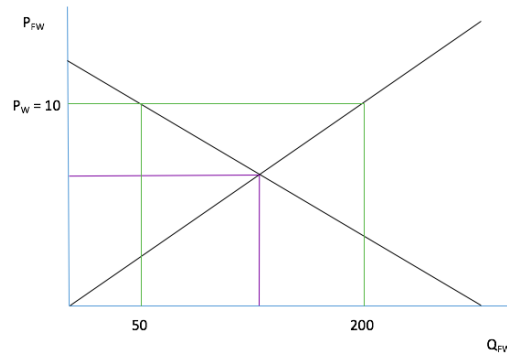
15)   The country of Westeros is trying to decide whether or not to take part in the
world market and import iron or produce it at home. They hire you as an economic
consultant to help them decide.

Piron

A

PE = 12

B   C

PT

Pw=8   D   E   F   G

H

40   80   140

Qiron
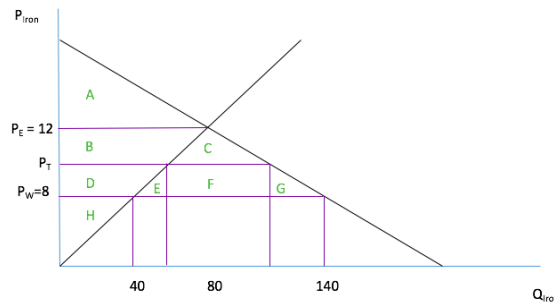
a) What is the equilibrium price and quantity before imports? What areas make up the
consumer and producer surplus? Total Surplus? P_e = 12, Q_e = 80, CS = A, PS = B + D
+ H, TS = A + B + D + H

b) What is the new price and quantity if Westeros decides to import? How much of that
quantity is being imported? P_I = 8 , Q_I = 100   Imports = (140 - 40) = 100

c) What are the areas of the new consumer and producer surplus? Total surplus? CS = A
+ B + C + D + E + F + G , PS = H TS = CS + PS

d) Does Westeros have higher social welfare with or without imports? With
imports! Just compare the total surplus areas.

e) After recommending the import of iron, Highgarden (an opposing political faction)
demands that tariffs are placed on imports of iron to protect jobs at home,
increasing the import price to 10.   Intuitively, what happens to the total surplus
when a tariff is placed on imports? Total surplus decreases, even if producer
surplus increases a little.   With deadweight loss of E + G

16)   A good is **excludable** if it is possible to prevent someone from using it

17)   A good is **rival** in consumption if one person's use of the good reduces others'
ability to use the same unit of the good

a) Rival & excludable = **private good.** Ex) clothes, cars. Generally, the market
provides a good societal outcome for private goods.

b) Rival & nonexcludable = **common goods.** Ex) fish. Suffer from the "tragedy of the
commons." Government regulation to restrict appropriation is necessary to use the
commons good at the socially optimum equilibrium.

c) Nonrival & nonexcludable = **public goods.** Ex) *national defense; fireworks.* There is no competition to provide public goods because they are supplied to everyone. Public goods are affected by the **free-rider problem,** which is a form of market failure that occurs when people take advantage of being able to use a common resource without paying for it (i.e. not paying taxes for public roads).

d) Nonrival & excludable = **club goods** (or artificially scarce goods). Cinemas, pay-per-view TV. These goods are often provided by a natural monopoly. Congestion is a problem associated with club goods.

18) Classify the commodities listed below. What are they predominantly: private, public, commons, or club goods? And if they are not a pure type, add a phrase explaining why and how they are not a pure type:

a) An iPhone *Rival + excludable = Private good*

b) "Keeping Up with the Kardashians", a TV show *Nonrival + excludable = Club good*

c) Weather forecasts *Nonrival + nonexcludable = Public good*

d) A community college (assuming there are enough spaces)

   i) *Nonrival + nonexcludable = Public good (if free)*

   ii) *Can also be considered club good if consider it to not be free and available to everyone*

e) A fishery *Rival + nonexcludable = Common good*

f) A room at the Claremont Hotel for a night *Rival + Excludable = Private good*

g) Electrical power provided by PG&E *Nonrival + excludable = Club good*

19) Amy and Michael just joined the SLC Econ tutoring program and Abigail, the supervisor, wants to decide how to assign their work. Amy can create 4 pages of ECON1 review sheets per hour and 2 pages of ECON100A review sheets. Michael can create 9 pages of ECON1 and 3 pages of ECON100A.

a) What is each tutor's opportunity cost of creating review sheets in different classes? Who has the absolute advantage in ECON1? Who has the comparative advantage in ECON1?

|	1 page of ECON1	1page of ECON100A
Amy	1/2	2
Michael	1/3	3

Michael has absolute advantage and comparative advantage in ECON1.

b) How should Abigail decide on their specialization? *Amy should specialize in ECON 100A and Michael should specialize in ECON1.*

c) The "price" of ECON100A review sheets can be expressed in terms of pages of ECON1 review sheets. What is the highest price at which ECON100A review sheets can be traded that would make both tutors better off? What is the lowest price? Explain. *The highest price would be 3 pages of ECON1 and the lowest price would be 2 pages of ECON1. If the price is higher than 3 pages, Michael's OC of 100A, he would be*

better off just doing both by himself. Similarly, if price is lower than 2 pages,
Amy wouldn't benefit from the trade. The price just need to between their
opportunity costs

20) An economy is producing cars and bikes. Graph the PPFs in the following situations:

   a) A technological advancement decreased the cost of producing cars.

   b) The technological advancement decreased the cost of producing both goods.

   c) The country opened up to immigration. A large group of immigrants entered the country and joined the labor force.

   d) The Martians arrived in the country and gave them some more cars.
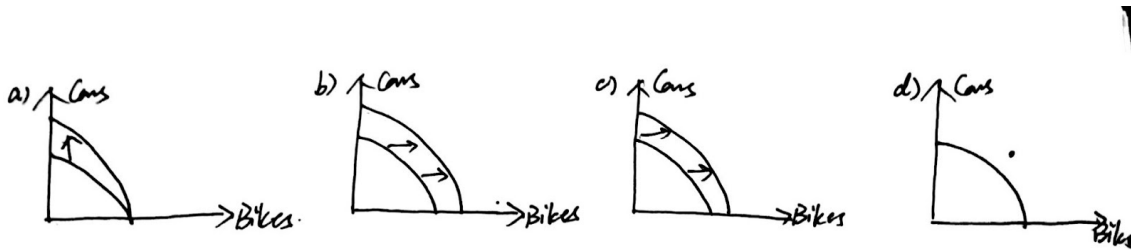
21) What is efficiency? What is equity?

   a) **Efficiency:** _Reduce DWL;_ finance public goods, corrective externalities

   b) **Equity:** help those in need; food stamps, Medicaid, unemployment benefits, welfare

      i) _Fairness;_ how to distribute resources; depends on opinion of "what is right"