

Economics for International Affairs

Gonçalo Fonseca

EXERCISE # 1

I. Definitions

Provide brief (one sentence) definitions of the following:

(1) Exchange

(2) Opportunity cost

(3) Specialization

(4) Market

(5) Demand

(6) Supply

(7) The Law of Markets (or Law of Supply & Demand or Law of Price)

(8) Price floor

(9) Price ceiling

(10) The Theory of Comparative Advantage

Part II - Comparative Advantage

(Q. 1) Suppose a pound of coffee can be produced with four hours of labor in Kenya and six hours of labor in Zimbabwe. A pound of tea can be produced with three hours of labor in Kenya and three hours of labor in Zimbabwe.

- (a)** In the absence of trade, what is the opportunity cost of
- (i) 1 pound of Kenyan coffee
 - (ii) 1 pound of Zimbabwean coffee;
 - (iii) 1 pound of Kenyan tea;
 - (iv) 1 pound of Zimbabwean tea.

(b) Which country is more efficient in *absolute* terms?

(c) Which country has the *comparative* advantage in the production of each good? Who should specialize in what?

(Q.2) Consider two countries, India and Pakistan. In India, the average worker can produce 18 shirts or 12 jackets in a week. In Pakistan, the average worker can produce 30 shirts or 24 jackets in a week.

- (a)** In the absence of trade, what is the opportunity cost of
- (i) an Indian shirt
 - (ii) a Pakistani shirt;
 - (iii) an Indian jacket;
 - (iv) a Pakistani jacket

(b) Which country is more efficient in *absolute* terms?

(c) Which country has the *comparative* advantage in the production of each good?

(d) Suppose trade is opened up between India and Pakistan. Assuming only those two countries exist, give an example of a market price (i.e. a possible exchange ratio of shirts to jackets) you might see on the world market. Give an example of a market price you are definitely *not* likely to see on the world market.

(e) How would the situation change if the average Pakistani worker could produce 35 shirts per week (everything else remaining the same)? Does comparative advantage change? Give an example of a market price you might see on the world market.

(f) How would the situation change if the average Pakistani worker could produce 40 shirts per week (everything else remaining the same)? Does comparative advantage change? Give an example of a market price you might see on the world market.

(Q. 3) A car can be produced by 15 workers in Alabama and 10 workers in California. A truck can be produced by 25 workers in Alabama and 20 workers in California.

(a) If inter-state commerce is forbidden, what are the domestic price ratios, i.e. the prices in Alabama? In California? Which state has the comparative advantage in the production of which good?

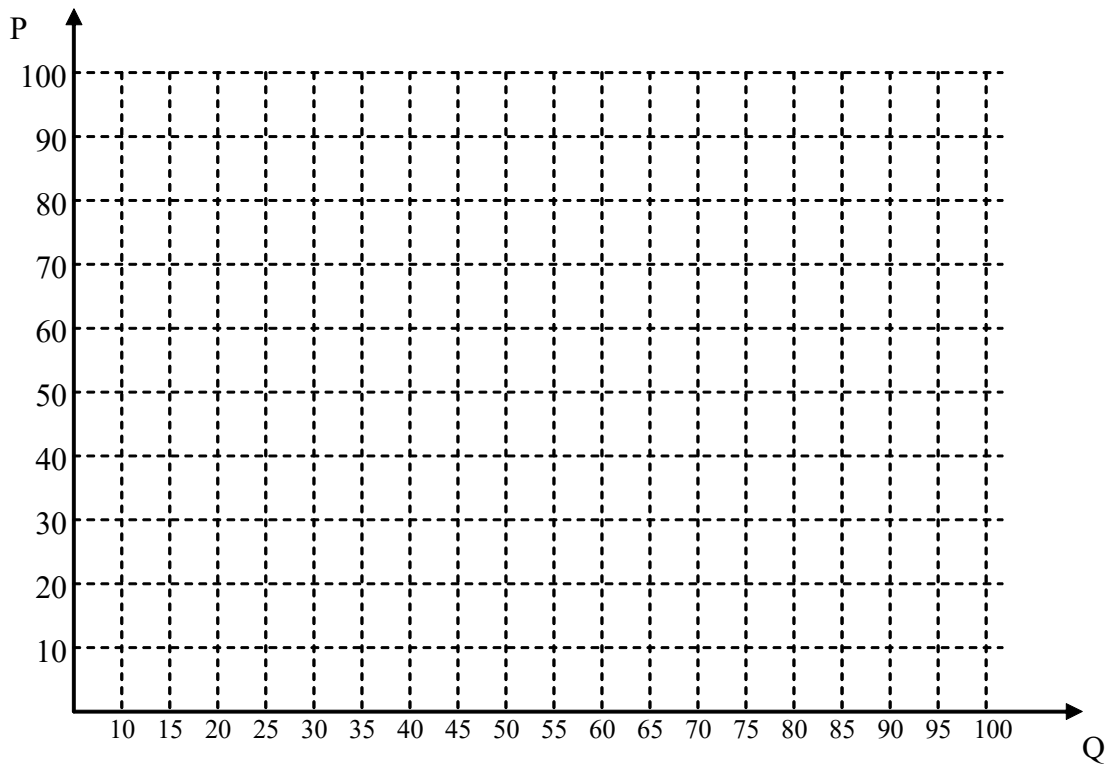
(b) Congress passes a law allowing commerce between the states of Alabama and California. Frenzied exchange proceeds. Who is exporting what to whom? Give an example of a possible market price (i.e. cars per truck) you might see.

(c) After trade is opened and a lot of exchange happens, you notice that the average truck in *both* California and Alabama sells for \$28,000, while the price of a car in *both* California and Alabama is \$14,000. Who is reaping the gains from inter-state trade? Explain your answer.

Part III - Supply & Demand

(Q. 4) The Single Market. Plot the following in the graph below (or on a side-sheet, if you find it easier):

| Barley Price per bushel | Demand for Barley (millions of bushels) | Supply of Barley (millions of bushels) |
|-------------------------|---|--|
| \$100 | 15 | 95 |
| \$90 | 20 | 90 |
| \$80 | 30 | 75 |
| \$70 | 35 | 65 |
| \$60 | 50 | 60 |
| \$50 | 55 | 55 |
| \$40 | 60 | 45 |
| \$30 | 75 | 35 |
| \$20 | 80 | 20 |
| \$10 | 90 | 10 |



Barley Market

(A) If the price of barley is \$60, are we in a situation of market-clearing, excess demand or excess supply? By how much is the excess, if any? What do you expect to happen to the price of barley?

(B) If the price of barley is \$50, are we in a situation of market-clearing, excess demand or excess supply? By how much is the excess, if any? What do you expect to happen to the price of barley?

(C) If the price of barley is \$40, are we in a situation of market-clearing, excess demand or excess supply? By how much is the excess, if any? What do you expect to happen to the price of barley?

(D) At what price is the market going to settle at? How much barley will be bought and sold on the market then?

(E) Suppose a spell of bad weather damages the yield of the barley crop. As a result, the amount supplied at each price is 10 bushels less than normal, so the new supply schedule for barley becomes:

| Barley Price per bushel | Supply of Barley (millions of bushels) |
|-------------------------|--|
| \$100 | 85 |
| \$90 | 80 |
| \$80 | 65 |
| \$70 | 55 |
| \$60 | 50 |
| \$50 | 45 |
| \$40 | 35 |
| \$30 | 25 |
| \$20 | 10 |
| \$10 | 0 |

(i) Plot the new supply schedule beside the old one (or do it on a separate graph, if you prefer).

(ii) At what price will the market settle now? How much barley will be bought and sold?

(Q.5) Price Stabilization Scheme

Consider the coffee market a certain unnamed country:

| Coffee Price per ton | Demand for Coffee (thousands of tons) | Supply of Coffee (thousands of tons) |
|----------------------|---------------------------------------|--------------------------------------|
| \$16 | 10 | 65 |
| \$14 | 15 | 55 |
| \$12 | 20 | 42 |
| \$10 | 30 | 30 |
| \$8 | 40 | 24 |
| \$6 | 60 | 16 |

(A) What is market price for coffee? What is the quantity bought & sold?

(B) Facing pressure from coffee growers, the government decides the free market price for coffee is too low for growers to make a living. Suppose the government imposes a binding price floor on the coffee market that is \$2 higher than the market price. What is the effect of this policy on the price of coffee and the quantity of coffee sold? Is there a shortage or surplus of coffee? By how much?

(C) Coffee growers complain that the price floor has reduced their revenues and they are *worse* off. Is this possible? Is demand for coffee elastic or inelastic? (Note: revenues = price × quantity sold.)

(D) In response to farmers' complaints, the government agrees to purchase any and all surplus coffee at the price floor. Using the numbers used above, calculate how much the government will spend. Compared to the basic price floor, who benefits from this new policy? Who loses? Explain your answer.

(E) What do you think the government should do with the surplus coffee it acquires? (There's no correct answer. Be imaginative. Propose the *least* economically harmful way to use it and defend your answer. Not looking for a thesis, just a few sentences.)

(Q.6) Oil Tales

Consider the following events (i)-(x) in the table below. Decipher how the event will influence the world demand and supply of oil (shift left, shift right or no shift) and the resulting impact on the price of oil (up or down). Provide a brief (one-sentence) reasoning you used to deduce the effect. If the answer is not clear, say so.

(Advice: for your own guidance, I strongly recommend you draw a demand & supply diagram for the market for oil for yourself on a side sheet of paper. It is the simplest way to keep track of how price changes when you shift a curve.)

| Event | Demand Curve for oil shifts: | Supply curve for oil shifts: | Price of oil moves: |
|---|------------------------------|------------------------------|---------------------|
| (i) Brazil discovers massive oil reserves off its coast. | | | |
| | | | |
| (ii) New electric-powered cars are a hit with US consumers. | | | |
| | | | |
| (iii) Global recession reduces consumer incomes worldwide | | | |
| | | | |
| (iv) Coal miners go on strike in Europe, many coal mines shut down. | | | |
| | | | |
| (v) More efficient oil drilling equipment is introduced | | | |
| | | | |

| | | | |
|--|--|--|--|
| (vi) Libya builds solar panels throughout the Libyan desert and begins exporting energy to Europe. | | | |
| | | | |
| (vii) Under pressure from unions, US oil companies agree to give oil workers on the Gulf Coast large wage increases. | | | |
| | | | |
| (viii) Nuclear reactors are built in Kazakhstan to meet the energy needs of several Central Asian countries. | | | |
| | | | |
| (ix) War breaks out in the Persian Gulf, between Bahrain and Qatar. | | | |
| | | | |
| (x) An unexpectedly nasty hurricane season in the Caribbean immobilizes natural gas platforms (but not oil platforms) throughout the summer. | | | |
| | | | |

(Q.7) Supply & Demand Equations

What we can do with tables and diagrams, we can also do with supply & demand equations

Let us consider the market for wool.

Demand for wool is governed by the equation:

$$Q^d = -3P + 30$$

Supply for wool is governed by the equation:

$$Q^s = 2P + 5$$

where Q^d is the quantity demanded, Q^s is quantity supplied and P is price.

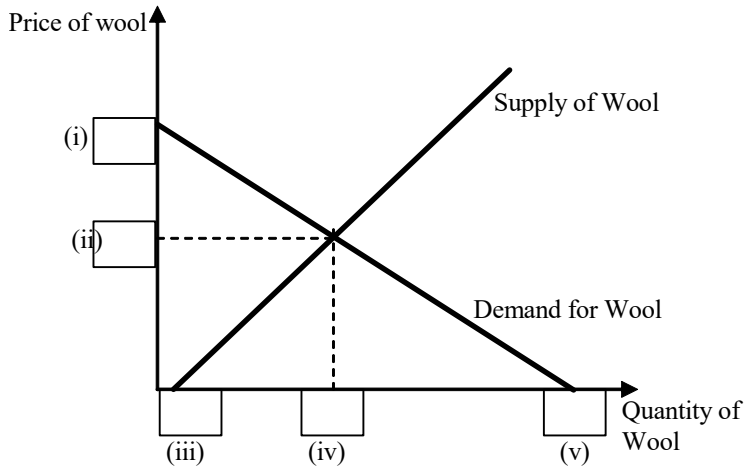
(A) Fill in the following table:

(I filled in two of the entries myself, just so you can make sure you're on track)

| Price | Quantity Demanded | Quantity Supplied |
|-------|-------------------|-------------------|
| \$10 | | |
| \$9 | | |
| \$8 | 6 | |
| \$7 | | |
| \$6 | | |
| \$5 | | |
| \$4 | | |
| \$3 | | |
| \$2 | | 9 |
| \$1 | | |
| \$0 | | |

(B) What is the market-clearing price? What is the market-clearing quantity bought & sold?

(C) Using your data from the table, fill in the values in the boxes (i) through (v) below (i.e. the values of the equilibrium price, quantity and the intercepts)



(Q.8) Supply & Demand Equations (Algebra time!)

Why do we even need tables? Let's just use the equations directly!

(A) Consider the market for oranges.

Demand for oranges is governed by the equation:

$$Q^d = -3P + 60$$

Supply of oranges is governed by the equation:

$$Q^s = 3P + 6$$

What is the market clearing price? What is the market clearing quantity?

[Note: You *could* convert this to a table and solve it that way. But I would prefer you try solving it directly with algebra. It's a lot simpler. You know that at the market-clearing equilibrium, quantity demanded must be equal to quantity supplied, i.e.

$$Q^d = Q^s.$$

and then just plug in the equations for Q^d and Q^s given above,

$$-3P + 60 = 3P + 6$$

and use basic algebra to solve for P.*

* Remember the rules of Basic Algebra?

(i) if you move something from one side of the equal sign (=), to the other, then the sign of the term *flips* from

$$P = \underline{\hspace{2cm}}$$

And that's your equilibrium price.

To find the equilibrium quantity, just plug in the variable P into either the Q^d or Q^s equation (doesn't matter which), e.g. let's use Q^s equation:

$$Q = 3 \text{ (plug your P here)} + 6$$

and then just calculate what Q will be:

$$Q = \underline{\hspace{2cm}}$$

That's your equilibrium quantity. Simple wasn't it?]

(B) Let's do it again! Suppose a unexpectedly sunny season boosts the harvest. The demand curve is as before:

$$Q^d = -3P + 60$$

But the supply curve is now governed by:

$$Q^s = 3P + 15$$

(notice the supply intercept has increased from 6 to 15)

What is the new market clearing price? What is the new market clearing quantity?

positive to negative (or from negative to positive). Example: if $3x + 2 = 5$, then $3x = 5 - 2$. Or $2 = 5 - 3x$. Or $3x + 2 - 5 = 0$

(ii) When you *group* variable terms together, just add the coefficients. e.g. $3x + 2x$ is the same as $(3+2)x$ or $5x$.

(iii) once you have placed and reduced the variable on one side with a multiplicative coefficient, then *divide*: e.g. $5x = 20$, then $x = 20/5 = 4$.