FRE 306 (2016): Problem Set #1

Answer Sheet

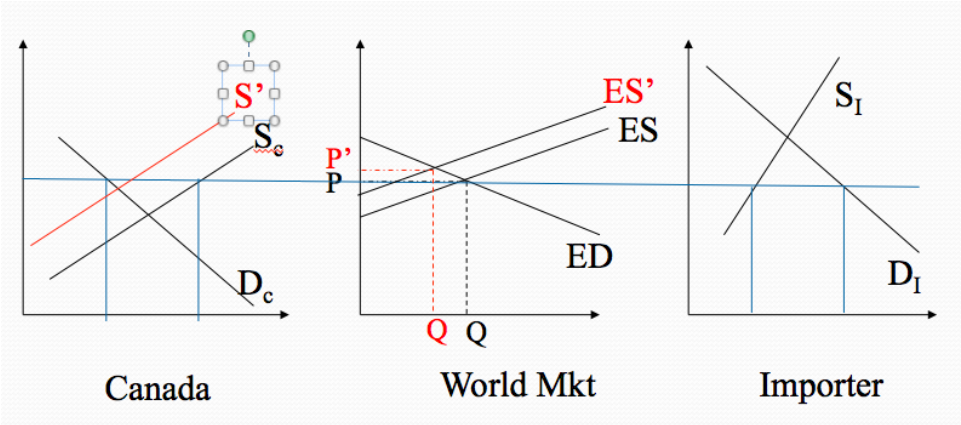
1. Suppose you were given the following price series in nominal (observed) terms and the CPI (Consumer Price Index) series. Calculate the real price series using 2009 at the base year. (5 marks)

	Year	Nominal Price	CPI	Real Price (2009 dollars)
a.	1989	0.31	64.9	0.57
b.	1994	0.41	82.1	0.60
c.	1999	0.47	100.0	0.57
d.	2004	0.52	107.3	0.58
e.	2009	0.57	120.3	0.57

2. In the world lentil market there is a very large producer, India, which is a net importer and the largest consuming country, but the largest exporter in the world is Canada. Answer the following three questions using excess supply and demand diagrams to illustrate your answers. (15 marks)

    a. There is a large price spike in cereals (e.g., wheat, barley) in Canada, substitute crops to lentils in production, and this reduces domestic lentil production by 40%. Show what this will do to the world price and to worldwide trade volumes.

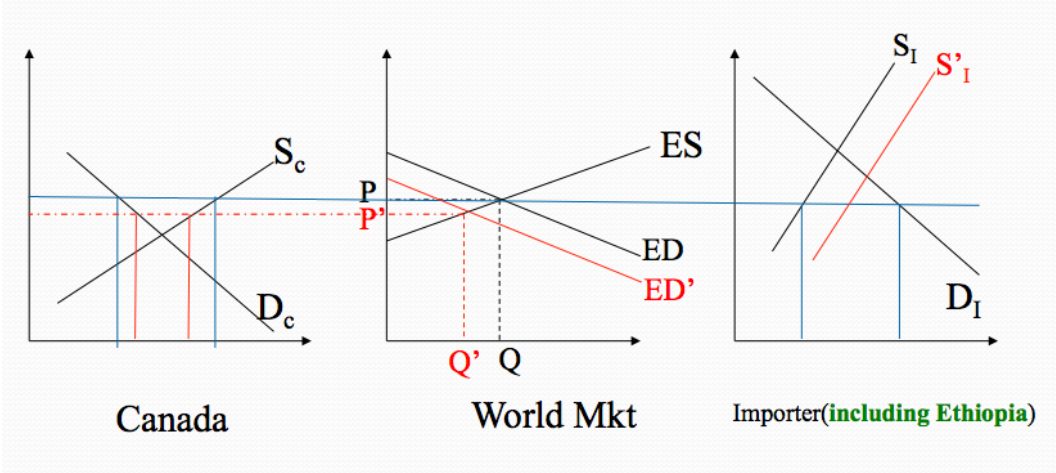
The exporter's supply curve shifts left, shifting the Excess Supply curve also to the left. This will result in a higher world market price and a lower trade volume.
Note: It might be useful also to state that when we say Canada is the largest exporter that we are also assuming it is a 'large country' and can affect the world price (this is not always the case so it is useful to make this assumption clear).



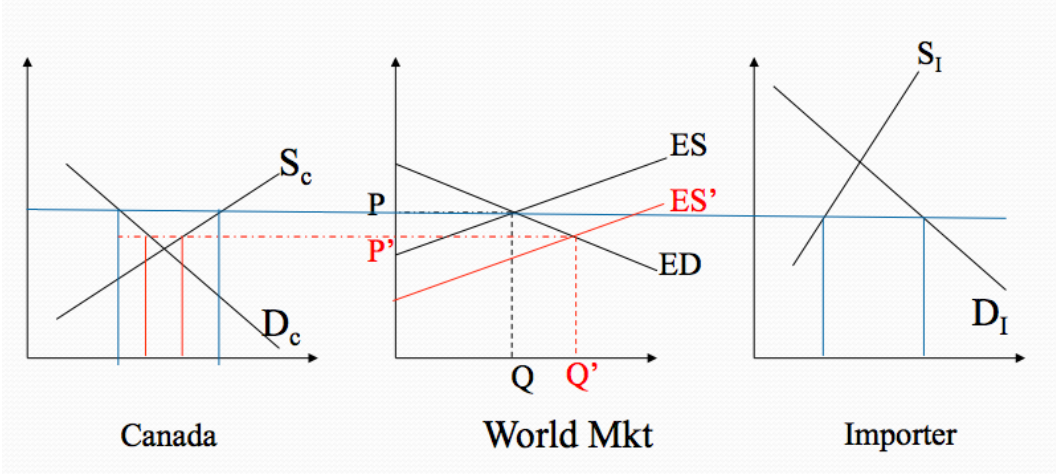
b. Suppose that Ethiopia invests heavily in new plantings and increased productivity so that it becomes one of the top 5 exporters and adds to world supply. Show what this will do to Canada's export quantity.

The first issue is, do we include Ethiopia in the ES curve (exporter side of the diagram) or do we include them among the 'rest of the world', with Canada as the only exporter. To answer the question on the effect on Canada's export quantity, it is easier to do the latter.

1) Ethiopia as the "rest of the world": The increased production by Ethiopia will shift the 'rest of the world' supply curve to the right, in turn shifting the ED curve to the left. This will mean a fall in the world price, reduced trade, and hence reduced Canadian export sales to the world market.



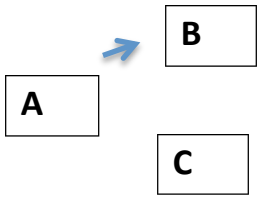
2) Ethiopia in the exporter side of the world market: The ES curve would shift to the right, and prices in the world market would fall. This would lower production in Canada, increase its consumption, and Canada's exports would therefore fall, just as in the earlier case.



c. Consumers in Canada are learning to love lentils due to their high protein content, and domestic consumption of lentils increases significantly. Assuming Canada is a "small country" in its share of world lentil consumption, show what this will do to the price received by Canadian lentil growers who sell most of their crop onto the world market.

If Canadian consumers are such a small part of the world market (small country assumption), then their increased level of consumption will have no effect on the world market price. All it will do is increase domestic consumption, which will mean a small decrease in the exportable surplus from Canada onto the world market, again, not enough to change the world price. [Some students may grapple with the earlier statement that Canadian exporters are so large that Canada is a large country. In this part (c), you can either accept that in this case Canada is now a 'small country', or that even though the exporters CAN affect the world price due to their size, the country's lentil consumption is so small that it is negligible in the world market. The consumption in Canada likewise is so small that even with the increased consumption, Canadian lentil exports are not reduced significantly enough to affect the world price.]

3. Suppose there are three countries A, B and C that are equi-distant from each other, and transport costs depend only on distance. It is observed that shipments are moving from A to B. No other trade is observed. (6 marks)



(a) Assuming the transport cost from A to B is $100, write down the range of possible prices in Country C, expressed in terms of where P_C would be relative to P_A and P_B.

This question is probing the **spatial law of one price**.

We know that $P_A + 100 = P_B$. The transportation costs between AB, AC and BC are all equal to $100. For no trade to be happening between AC and BC, the price difference between each of AC and BC has to be less than 100. Then you should be able to see that

1) if PC < PA, C would be exporting to B => but there is no trade, therefore PC must > PA

2) if PC > PB, A would be exporting to C => but there is no trade, therefore PC must < PB

3) Therefore **PA < PC < PB**

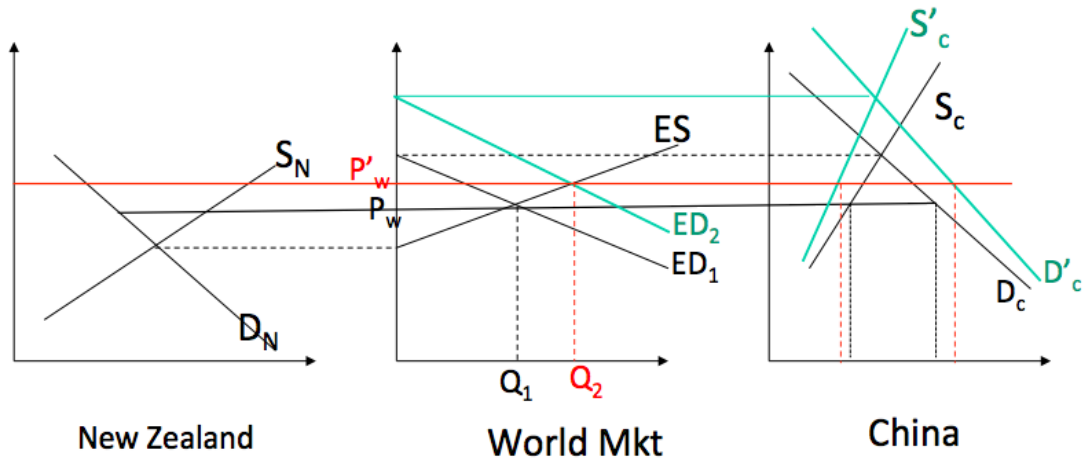
(b) Suppose B experiences a terrible drought. By how much would prices in B have to rise (at the minimum) for us to observe C exporting to B?

The price in B has to rise by at least **(Pc – Pa)** for us to observe C starting to export to B. Let Pc-Pa be x. We know that Pb-Pc is 100 – x (from part (a)). Therefore, we need Pb to go up by x to exceed the transport cost of 100.
Another way to think about this is to use sample numbers: given we do not know the price at C, Pc could be as high as PB – 1. If that was the case, we would need the price in B to rise by 99 to be sure to observe C exporting to B. It could also be as low as PA + 1, in which case just an increase of 1 in the price would result in exports from C to B.

4. Suppose that New Zealand is the sole exporter of milk powder in the world, and China is the largest importer (and large enough that its actions affect the price). Using a 3-panel ES/ED trade diagram, answer the following. Be sure to label prices, quantities and demand/supply schedules.

(a) Illustrate how a 10% increase in the value of the Chinese yuan (currency), with its effects on domestic demand and supply, would affect the world price, and import quantity, of milk powder. Assume transport costs are negligible. (6 marks)

The analysis of a currency appreciation by the importer country has the same initial effects as in the case of an exporter country (slide 5, Lec 6), except that in this example, the shifts in domestic D and S shown in the exporter's panel (left panel) are occurring in the importer (right) panel.
With D shifting to the right, and S shifting to the left, the ED curve will shift up and to the right. This will increase the world price and increase imports into China. Note that the shifts should **not be parallel** to reflect percentage changes.



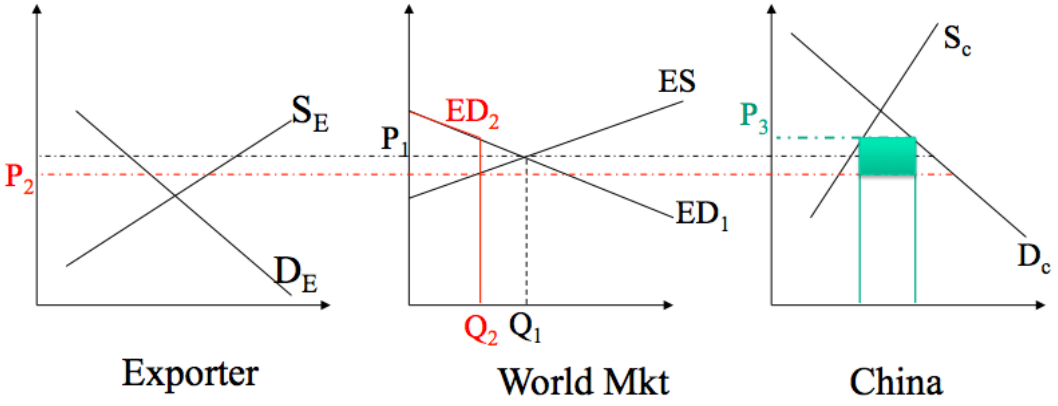
(b) Assume that the Chinese government is frustrated by these results and chooses to introduce an import *quota* that would reduce the quantity of imports by 50%. Illustrate with a diagram. What are the effects (an increase, decrease, or no change) on the following variables: (7 marks)

a. Price of milk powder in New Zealand? Price in China? Price in the rest of the

world? (3)

What an import quota does is **change the ED curve to a simple vertical line** at the quantity of the quota. Of course, it intersects the existing ED curve at some point, above which the original ED curve applies (it would show that above that price, the country would CHOOSE not to fill the import quota because the price is too high, so the new ED curve is the old one down to the point where the quantity just equals the import quota, and then it kinks to become vertical).

The result is that **price in the importing country (China) will be raised** by the import restriction (somewhat like the case of the tariff, in slide 3 Lec 6), but **the world price (NZ price) falls** to the point where the new (vertical) ED curve intersects the existing ES curve. The price in the rest of the world will be the new world price P2, also lower.



Quota Imposed in China: World P drops from P_1 to P_2 (in export country); Price rises to P_3 in import country; $P_3 - P_2$ = quota value

b. Because this is a quota, not a tariff, there is no tariff revenue, but there *are* some gains or surplus from this measure. Illustrate it in the diagram. Who gets it? (4)

The gain is **the rectangle of imports (width=import quota quantity) * (height=Price in China-world price)**. There are several possibilities for who will capture the surplus on importing the quota amount of the commodity. It could be captured by the Chinese government, if they sold it (typically auctioned it off to private buyers). Or, as is more common, the quota could be given to certain firms, agencies, or individuals (whomever the government wishes to 'reward'), and then those recipient firms, agencies, or individuals will gain this surplus.

5. True, False, Uncertain (2 marks)
   A luxury good has an income elasticity that is positive while an inferior good refers to an income elasticity that is negative.

The statement is False. A luxury good has an income elasticity that not only is positive but is greater than 1. An inferior good has an income elasticity that is negative. In other words, the second part of the statement (about inferior goods) is true, but the first part about luxuries is false. It is possible that a good can behave like a luxury initially, but then act like

an inferior good at higher income levels.