YORK UNIVERSITY   **Dr. Farrokh Zandi**
Schulich School of Business   **Winter 2018**

INTL 2200.03 S

Assignment # 1
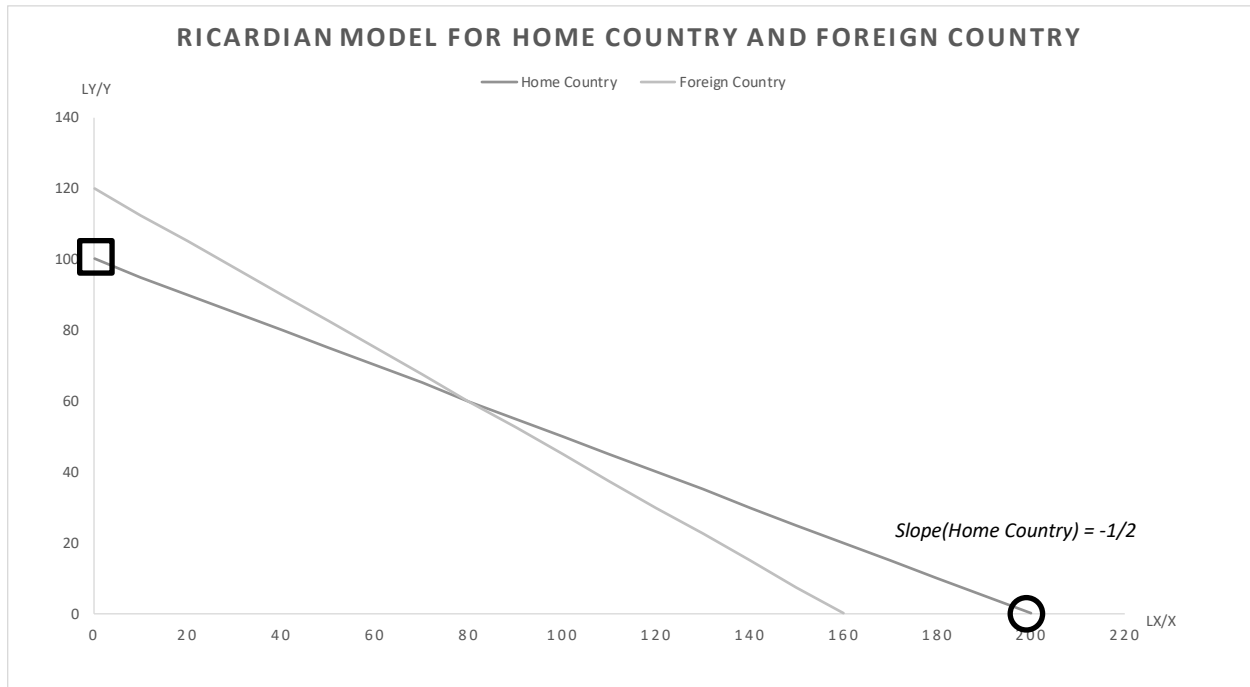
Due: February 6, 2018

Total Marks: 25

Question 1: Gains from Trade in Ricardian Model (15 marks)

Answer all of the questions below. SHOW ALL YOUR WORK: answers without any explanation or proof will not be counted. All parts in this question are based on the table below:

	H	F
Lx/x	4	3
Ly/y	8	4

Answers to questions begin on the next page

(a)   Suppose country H has a labor force of 800 workers while country F has a labor force of 480 workers. Derive the production possibility curves (PPCs) of these countries and draw them on the same graph, labeling each curve and marking their X and Y intercepts and slopes. Write the mathematical equation for each PPC in the form $Y = f(X)$.

RICARDIAN MODEL FOR HOME COUNTRY AND FOREIGN COUNTRY

LY/Y

—— Home Country   —— Foreign Country

Slope(Home Country) = -1/2

LX/X

PPC for the Home Country:

The PPC for the Home Country is denoted in the darker grey and is also denoted through the legend.

X-Intercept:

The X-Intercept for Home Country exists at (200,0) and is signaled by the black circle (◯). This value signals the amount of Product X produced if Home Country decides to specialize in producing Product X.

Y-Intercept:

The Y-Intercept for Home Country exists at (0,100) and is signaled by the black square (▢). This value signals the amount of Product Y produced if Home Country decides to specialize in producing Product Y.

Slope:

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The slope for Home Country is -1/2. This is a function of the rise-over-run depicted in the graph. A slope of -1/2 suggests that, to produce two additional units of Product X, Home Country must sacrifice one unit of Product Y.
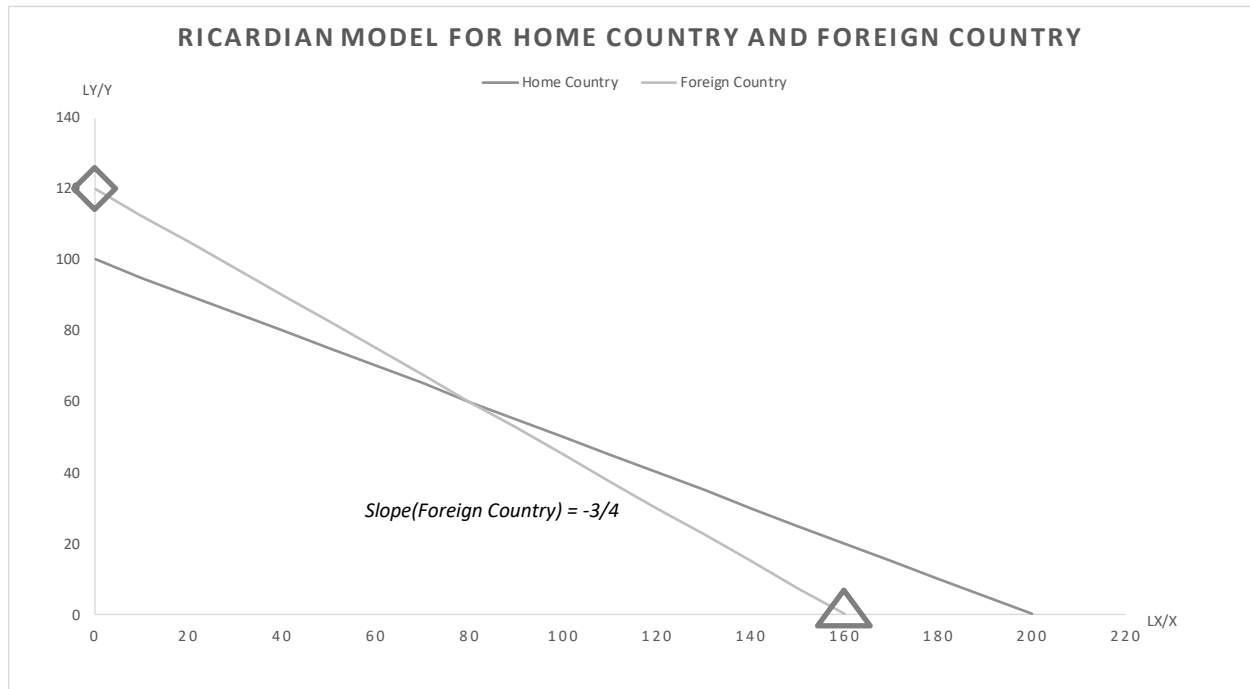
Mathematical Equation:

The mathematical equation for the PPC of Home Country is a function of Product X produced and Product Y produced. In Y=mX+B terms, the equation for Home Country is:

$$800 = 4 * (X) + 8 * (Y)$$

Or, when re-organized:

$$Y = 100 - \left(\frac{1}{2}\right) * (X)$$

RICARDIAN MODEL FOR HOME COUNTRY AND FOREIGN COUNTRY

Home Country — Foreign Country

Slope(Foreign Country) = -3/4

PPC for the Foreign Country:

The PPC for the Foreign Country is denoted in the lighter grey and is also denoted through the legend.

X-Intercept:

The X-Intercept for Foreign Country exists at (160,0) and is signaled by the grey triangle( ). This value signals the amount of Product X produced if Foreign Country decides to specialize in producing Product X.

Y-Intercept:

The Y-Intercept exists at (0,120) and is signaled by the grey diamond( ). This value signals the amount of Product Y produced if Foreign Country decides to specialize in producing Product Y.

Slope:

The slope for Foreign Country is -3/4. This is a function of the rise-over-run depicted in the graph. A slope of -3/4 suggests that, to produce four additional units of Product X, we must sacrifice three units of Product Y.

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<u>Mathematical Equation:</u>

The mathematical equation for the PPC of Foreign Country is a function of Product X produced and

Product Y produced. In Y=mX+B terms, the equation for Home Country is:

$$480 = 3 * (X) + 4 * (Y)$$

Or, when re-organized:

$$Y = 120 - \left(\frac{3}{4}\right) * (X)$$

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(b)   Suppose each country is initially in autarky. Assume that consumers in each country have very unusual tastes: they always consume 60 units of Y. Calculate how much X they each consume. Mark each country's consumption and production in autarky on your PPCs.

Home Country:

To determine how many units of Product X Home Country consumes when Home Country consumes 60 units of Product Y, we must use the function outlined in the previous question:
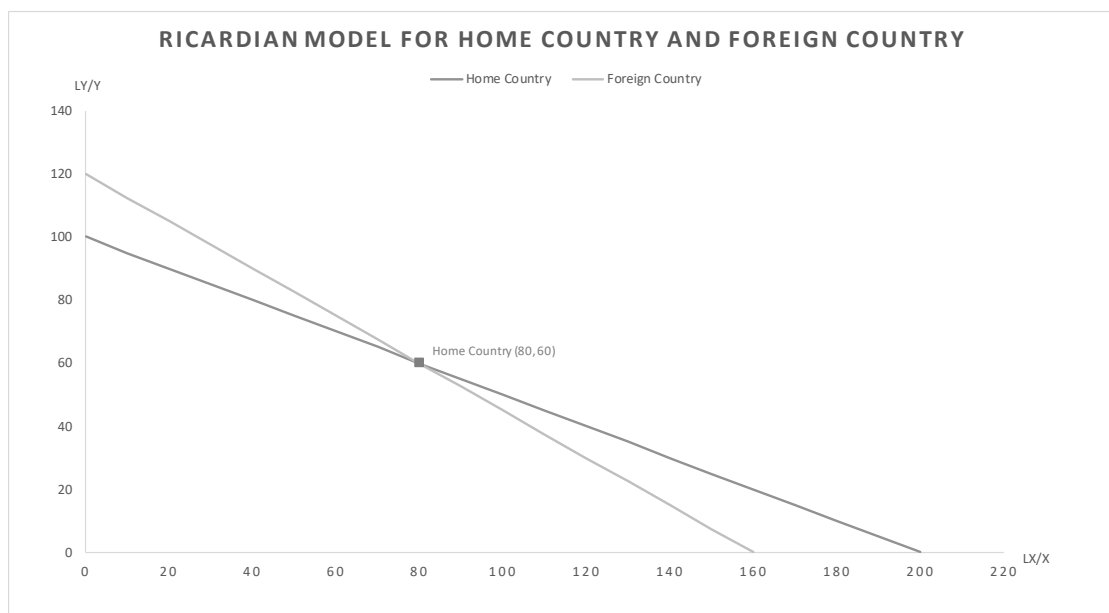
$$Y = 100 - \left(\frac{1}{2}\right) * (X)$$

If we plugged in 60 units of Product Y, we would get:

$$60 = 100 - \left(\frac{1}{2}\right) X$$

$$X = \frac{100 - 60}{\frac{1}{2}} = 80$$

Therefore, in autarky, Home Country would produce and consume 80 units of Product X. The consumption of Home Country would be 80 units of Product X and 60 units of Product Y. This can be proven through the graph;

Foreign Country:

To determine how many units of Product X Foreign Country consumes when Foreign Country consumes 60 units of Product Y, we must use the function outlined in the previous question:
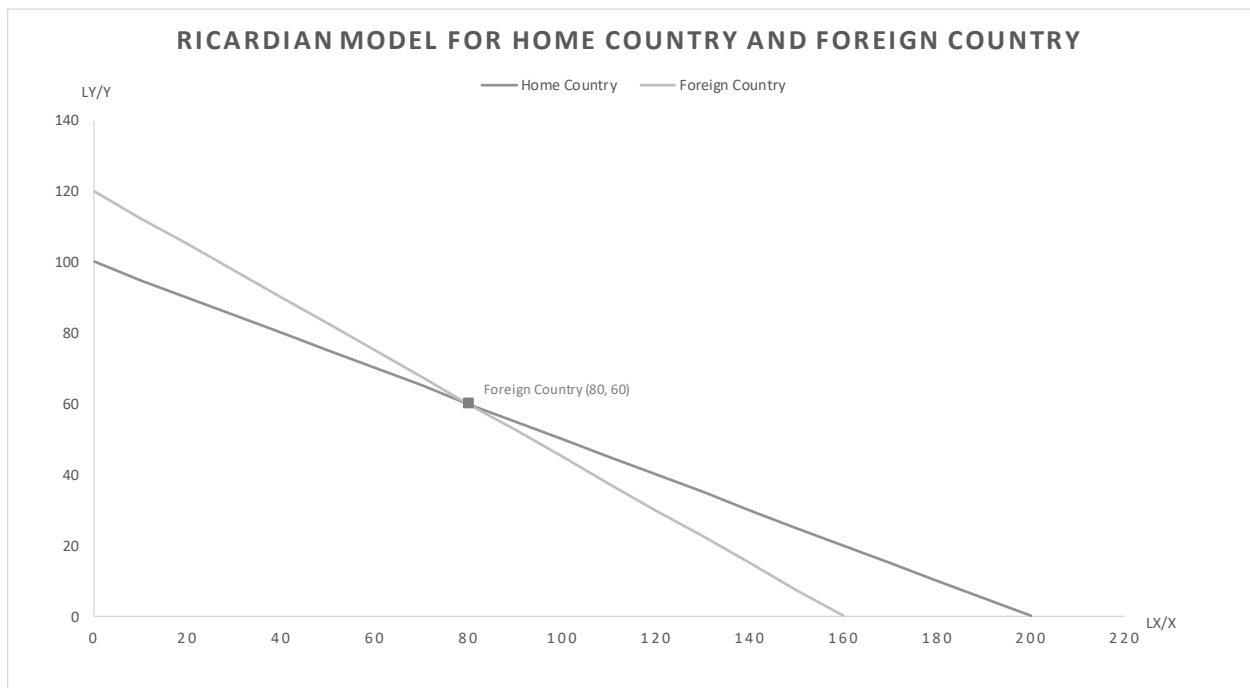
$$Y = 120 - \left(\frac{3}{4}\right) * (X)$$

If we plugged in 60 units of Product Y, we would get:

$$60 = 120 - \left(\frac{3}{4}\right) X$$

$$X = \frac{120 - 60}{\frac{3}{4}} = 80$$

Therefore, in autarky, like Home Country, Foreign Country would produce and consume 80 units of Product X. The consumption of Foreign country would be 80 units of Product X and 60 units of Product Y. This can be proven through the graph;

RICARDIAN MODEL FOR HOME COUNTRY AND FOREIGN COUNTRY

(c)   Now assume the two countries open up to trade. Within what range must the equilibrium

world price ratio or terms of trade lie, and why?

We must first determine which country has comparative advantage in which product. To do this, we must

put the price of Products X and Y in relative price:

	LX/X	LY/Y
H	4	8
F	3	4

The above table can be restructured to show comparative advantage:

	X	Y
H	4/8=1/2Y	8/4X=2X
F	3/4Y	4/3X

The above table demonstrates the price of Product X in terms of Product Y for both Home Country and

Foreign Country, and vice versa. By further examining the chart, we can denote that Home Country has a

comparative advantage in producing Product X. Home Country produces Product X for 1/2 units Product

Y whereas Foreign Country produces Product X for 3/4; Home Country produces Product X at 1/4 units

of Product Y cheaper than Foreign Country. On the other hand, we can denote that Foreign Country has a

comparative advantage in producing Product Y. Foreign Country produces Product Y for 4/3 units of

Product X whereas Home Country produces Product Y for 2 units of Product X; Foreign Country

produces Product Y at 2/3 units of Product X cheaper than Home Country. We now recognize that Home

Country should specialize in Product X whereas Foreign Country should specialize in Product Y:

	X	Y
H	1/2Y	2X
F	3/4Y	4/3X

If the two countries were to open to trade, the terms of trade would lie between the comparative price of

either Product Y relative to the Price of Product of X in each country, or Product X relative to the price of

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Product Y in each country. To simplify, we will denote terms of trade relative to one unit of Product X.

Therefore, the relative price of Product Y relative to the Price of Product X would be:

	X	Y	
H	1/2Y	2X	X=1/2Y
F	3/4Y	4/3X	X=3/4Y

The terms of trade would be trapped between the price of one unit of Product X in each country:

$$\frac{1}{2}Y < \frac{PX}{PY} < \frac{3}{4}Y$$

Simplified, the above suggests that the price of trade that the two countries set for Product X must fall

between 1/2Y and 3/4Y; trade must be between two units of Product X for one unit of Product Y and four

units of Product X for 3 units of Product Y. The terms of trade would be set at these because of relative

price. If the price was to be set less than 1/2 units of Product Y for one unit of Product X, it would be

great for Foreign Country but would not make sense for Home Country as they are better off not trading

and producing Product Y on their own; it is cheaper to produce one unit of Product Y in exchange for two

units of Product X than it is to trade more than two units of Product X for one unit of Product Y. The

same is applicable on the other spectrum; if the price was set to be greater than 3/4 units of Product Y for

one unit of Product X. Home Country would love this trade, yet Foreign Country would much rather not

trade and produce Product X on their own; it is cheaper to produce four units of Product X in exchange

for three units of Product Y than it is to trade more than three units of Product Y for 4 units of Product X.

(d)   Assume the world terms of trade settle at Px/Py = 6/10 = 0.6. Draw a box diagram of the

two PPCs as illustrated below, labeling the dimensions of the box and the PPCs, both

their intercepts and slopes; labeling the initial consumption points as Ah and Af. Now

assume that even though the price ratios have changed consumers in both countries

continue to demand 60 units of Y. If trade flows according to the law of comparative

advantage, show the new production points, Bh and Bf, and consumption points, Ch and

Cf. Shade in the areas representing the gains from trade to each country. Show the

volumes of exports and imports of each country.
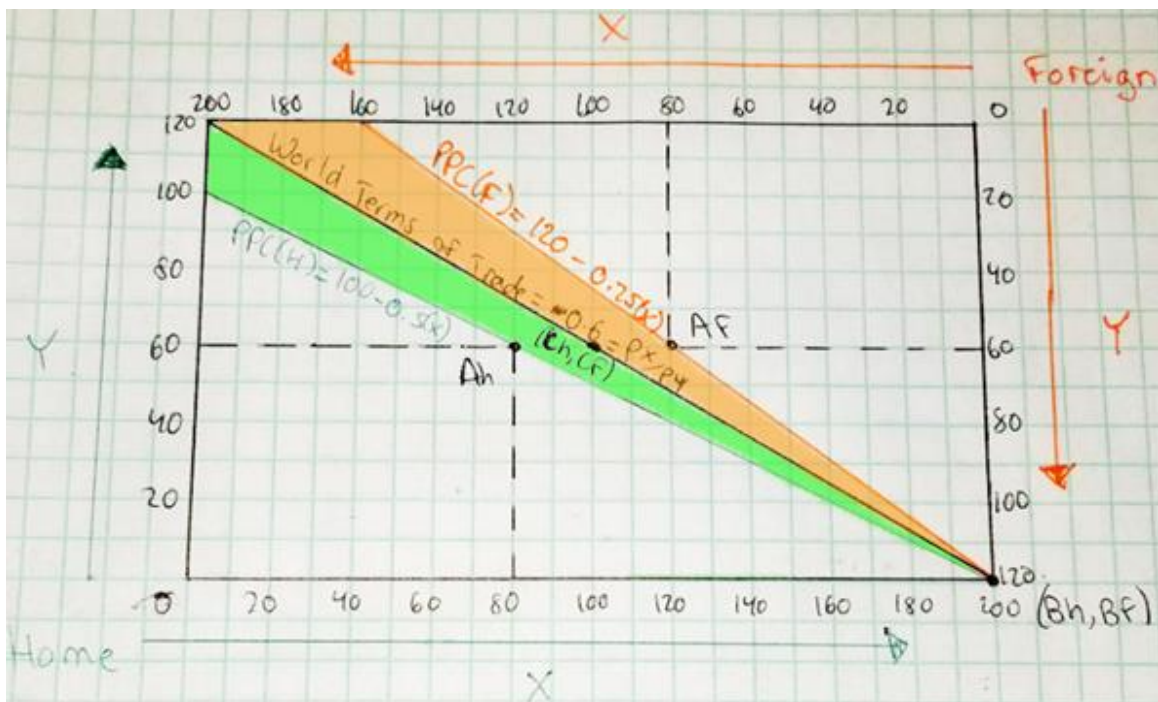
Initial Production and Consumption Points:

The initial points are the same for both countries and follow the same pattern as that of the

previous question. Both Home Country and Foreign Country initially produce and consume at 80 units of

Product X and 60 units of Product Y.

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Post-Trade Production Points:

<u>Home Country:</u> According to comparative advantage, Home Country will specialize in Product X.

Therefore, Home Country will produce 200 units of Product X and 0 units of Product Y.

<u>Foreign Country:</u> According to comparative advantage, Foreign Country will specialize in Product Y.

Therefore, Foreign Country will produce 120 units of Product Y and 0 units of Product X.

Post-Trade Consumption Points:

Post-Trade Consumption Points will be identical for both Home Country and Foreign Country. Initially, both countries need to be able to satisfy the demand of 60 units of Product Y. Foreign Country will specialize in Product Y and will produce 120 units of Product Y, and will therefore satisfy the demand of 60 units of Product Y. Home Country must, however, satisfy the demand for 60 units of Product Y. Therefore, Home Country will import 60 units of Product Y at the terms of trade 1X=0.6Y, and therefore give up 100 units of Product X. Therefore, Foreign Country will be importing 100 units of Product X for 60 units of Product Y and will consume at 100 units of Product X and 60 units of Product Y. Home Country will also consume 60 units of Product Y and the leftover Product X units; 100 units.

Gains from Trade:

Gains from trade for Home Country is defined by the area highlighted in green. Gains from trade for Foreign Country is defined by the area highlighted in the orange. The gains from trade for both countries are defined in the following table:

	Value of Exported Good defined in relative Imported Good within country	Terms of Trade	Gains from Trade	Explanation
Home Country	1X = 1/2 Y	1X = 6/10 Y	6/10Y – 1/2Y = 1/10 Y	Originally, Home Country would give up 1 unit of Product X to produce 1/2 units of Product Y. With trade, instead of producing 1/2 units of Product Y for 1 unit of Product X, Home Country now receives 6/10 units of Product Y for every 1 unit of Product X exported, 1/10 units more than if they decided to produce rather than trade. Therefore, for every unit of Product X Home Country decides to export, they gain 1/10 units of Product Y.
Foreign Country	1Y = 4/3 X	1Y = 10/6 X	10/6X – 4/3X =1/3 X	Originally, Foreign Country would give up 1 unit of Product Y to produce 4/3 units of Product X. With trade, instead of producing 4/3 units of Product X for 1 unit of Product Y, Foreign Country now receives 10/6 units of Product X for every 1 unit of Product Y exported, 1/3 units more than if they decided to produce rather than trade. Therefore, for every unit of Product Y Foreign Country decides to export, they gain 1/3 units of Product X.

Volume of Exports and Imports for Each Country:

The following is a summation of production, exports and imports, and consumption of both countries:

	Production	Export	Import	Consumption
Home Country	200 units of Product X	100 units of Product X	60 units of Product Y	100 units of Product X, 60 units of Product Y
Foreign Country	120 units of Product Y	60 units of Product Y	100 units of Product X	100 units of Product X, 60 units of Product Y

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Question2: Options toward Free Trade (10 marks)

The specific-factors model holds that an increase in the relative price of a good lead to real gains for the specific factor used in that sector, losses for the other specific factor, and an ambiguous change in the real wage for labour, whereas the Heckscher Ohlin model predicts unambiguous real gains for one factor and losses for the other. In other words, the industry of employment should not matter in Heckscher Ohlin model but it does in the alternative model. Discuss the underlying causes of these different predictions.

The Heckscher-Ohlin model holds multiple assumptions:

1. 2 nations are being examined

2. 2 commodities are being examined

3. Both nations possess the same technology

4. Commodity X is labour intensive, and Commodity Y is capital intensive

5. Both commodities are produced under constant returns

6. The two nations do not completely specialize in either good

7. Tastes are the same in both nations

8. Perfect competition exists in both commodities and factor markets

9. There is perfect internal mobility

10. All resources are fully employed by both nations

11. International trade is balanced between the two nations

The Heckscher-Ohlin model does a great job of specifying and simplifying the economics of trade yet does not tackle a real issue when it comes to an increase in relative prices, something the Specific-Factors model outlines. The Specific-Factors model is like the Heckscher-Ohlin model, yet

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suggests that some factors are specific to certain industries and are therefore immobile in the short-run. This poses a difference between the two models.

The Heckscher-Ohlin model suggests that a rise in the prices of a commodity, indifferent of which commodity it is, will result in an ambiguous increase in the gains within the industry of that commodity and an ambiguous loss for the industry of the unchanging commodity, which causes the net impact to be a net of the gain and loss. This suggests that, indifferent of which factor-intensive commodity is produced, there will be a shift in labour towards the industry that is impacted by the price gain and will eventually result in gains for that industry.

The Specific-Factors model, however, recognizes that, in the short-run, capital is not mobile between industries. The Specific-Factors model therefore distinguishes between two different capital-intensive industries, generally capital (K) and land (T). This is done to distinguish the effects of a rising or falling price in the specific industry. The suggestion is that, if there was an increase in the price of a commodity, the industry that is specific to the production of that specific commodity will stand to win whereas the opposing industry will lose the import-power. For example, if the price of the land-intensive commodity for a nation increased, yet it was stable in the capital-intensive commodity, there will be a shift in labour from the capital-intensive commodity to the land-intensive commodity. This is because, since land-intensive products are producing higher gains, more labour will want to participate in the gains of the land-intensive industry, and the result will be a shift in labour from the capital-intensive industry to the land-intensive industry. This is what the Specific-Factors model suggests; the immobile factor that participates in the price increase will benefit, the immobile factor that does not participate in a price gain will be harmed, and there will be an ambiguous affect on the mobile factor (labour) as that is determined by whether the industry that is subject to higher prices the endowed factor or not.

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