Solution Problem Set #2

This problem set is designed to help you master the concepts and tools covered in class so far and to prepare you better for the coming Midterm

I. Multiple Choice Questions (40 points)

1. According to the Heckscher-Ohlin model,
   (a) everyone gains from trade
   (b) the scarce factor necessarily gains from trade
   (c) the gainers could compensate the losers and still retain gains.
   (d) a country gains if its exports have a high value added.
   (e) None of the above.

2. The Heckscher-Ohlin model states that a country will have a comparative advantage in the good or service whose production is relatively intensive in the _____ with which the country is relatively abundant.
   (a) tastes
   (b) technology
   (c) factor of production
   (d) opportunity cost
   (e) scale economy

3. In international-trade equilibrium in the Heckscher-Ohlin model,
   (a) the capital rich country will charge less for the capital intensive good than the price paid by the capital poor country for the capital-intensive good.
   (b) the capital rich country will charge the same price for the capital intensive good as that paid for it by the capital poor country.
   (c) the capital rich country will charge more for the capital intensive good than the price paid by the capital poor country for the capital-intensive good.
   (d) the workers in the capital rich country will earn more than those in the poor country.
   (e) the workers in the capital rich country will earn less than those in the poor country.
4. If Australia has relatively more land per worker, and Belgium has relatively more capital per worker, then if trade were to open up between these two countries,
   (a) the relative price of the capital-intensive product would rise in Australia.
   (b) the world price of the land-intensive product would be higher than it had been in Belgium.
   (c) the world price of the land intensive product would be higher than it had been in Australia.
   (d) the relative price of the land intensive product would rise in Belgium.
   (e) None of the above.

5. Starting from an autarky (no-trade) situation with Heckscher-Ohlin model, if Country H is relatively labor abundant, then once trade begins
   (a) wages and rents should rise in H
   (b) wages and rents should fall in H
   (c) wages should rise and rents should fall in H.
   (d) wages should fall and rents should rise in H.
   (e) None of the above.

6. In the H-O model, international trade
   (a) is beneficial to everyone in both trading countries.
   (b) will tend to hurt one trading country.
   (c) will tend to hurt some groups in each trading country.
   (d) will tend to hurt everyone in both countries.
   (e) will be beneficial to capital owners in each country and hurt labor in each country.

7. Suppose that there are two factors, capital and land, and that the United States is relatively land endowed while the European Union is relatively capital-endowed. According to the Heckscher-Ohlin model,
   (a) European landowners should support U.S.-European free trade.
   (b) European capitalists should support U.S.-European free trade.
   (c) all capitalists in both countries should support free trade.
   (d) all landowners should support free trade.
   (e) None of the above.

II. Provide definition of the following term (4 points):

**H-O Theorem:** With two goods and two factors, each country will export the good that uses more intensively the factor which is more abundant in the country.

III. True or False (6 points)

1____ T_____ The Heckscher-Ohlin model predicts which factor of production within each country will gain from trade.

2_____ F_____ As opposed to the Ricardian model of comparative advantage, in the Heckscher-Ohlin model complete specialization is not possible.
IV. Quantitative/Graphing Problem (50 points)

A. H-O Model (25 points). Two countries, France (F) and Germany (G) produce two goods, cars (C) and wine (W). France has 2050 units of capital and 916 units of labor. Germany has 816 units of capital and 270 units of labor. In France, 926 units of capital and 618 units of labor are employed in the wine industry. In Germany, there are 366 units of capital and 135 units of labor employed in the wine industry.

a. Which country is labor abundant? Which country is capital abundant? Which good is labor intensive? Which good is capital intensive?

To find abundance, compare the ratio of labor to capital in each country. For France, it is 916/2050. For Germany, it is 270/816. The ratio is higher for France. Hence, France is labor abundant and Germany is capital abundant. To find intensity, compare the ratio of labor to capital for each good. For example, in France the ratio of labor to capital in wine is 618/926 and the ratio of labor to capital in cars is (916-618)/(2050-926). Thus, Wine is labor intensive and Cars are capital intensive. Check if this is confirmed for Germany.

b. Assume identical preferences and technologies between the two countries. Use graphical analysis to present the autarky equilibrium in each country. Which country will have lower relative price of wine in autarky?

The relative price of wine will be lower in France in autarky.

c. Use graphical analysis of the relative demand and relative price of labor in terms of capital for each industry to show how the equilibrium relative price of labor and the equilibrium relative quantities of labor in each industry are determined in Germany.
d. Suppose now that the countries open to trade. What will happen to the relative price of wine in Germany? Show the new trade equilibrium in Germany on your graph. Clearly indicate how much wine will be produced and consumed in Germany after the country opens up to trade. What is the good that Germany will export?

After trade, the relative price of wine will fall in Germany. Germany will produce \( w_1 \) units of wine and consume \( w_2 \) units of wine. Germany will export cars and Germany’s exports will be equal to the difference between \( c_1 \), which is the amount of cars produced in the country after trade, and \( c_2 \), which is the amount of cars consumed in the country after trade.
Use graphical analysis to show the effects of trade on the relative factor prices and relative factor demands in Germany. Put relative wage on the Y-axis and relative labor on the X-axis. Write a clear statement about the direction of the relative factor price change and the changes in relative labor demand in each sector. What will happen to real wages and real rental on capital in Germany?

Since, after trade, Germany produces more cars and less wine, the weight on the relative labor demand in cars production will be higher in the determination of the relative labor demand in the economy as the weighted average of the relative labor demands in cars and wine. This should be the case because capital moves from wine to cars. Thus, the new relative labor demand for the economy as a whole will shift toward \((Lc/Kc)d\) in the picture. This will result in lower relative wage and more workers per unit of capital in each of the two sectors. I use bold lines and arrows to represent the changes in the following graph.

Since, after trade, each worker in each industry will have less capital to work with, this means that MPL will fall in each sector. The real wages before trade are:

\[w/Pc = MPLc\] in terms of cars
\[w/Pw = MPLw\] in terms of wine

The real wages after trade are:

\[w'/P'c = MPL’c\] in terms of cars
\[w'/P'w = MPL’w\] in terms of wine

Since MPL is lower in both sectors after trade, this means that real wages fall in terms of each good. Symmetrical analysis hold for the real returns to capital, but remember that after trade each unit of capital has more labor to work with, therefore, real returns to capital will increase.