ECON 39: Undergraduate International Trade
Problem Set #4
Winter 2018, Professor Treb Allen
Due: **Tuesday February 20** at the beginning of class

Preliminaries

This week, we are learning about the Heckscher-Ohlin model of trade. As many of you requested in the midterm evaluation, these problems are meant to be more similar to what you would see on an exam (indeed, they are from exam questions in previous years). For those interested in the more abstract type of questions, I have posted additional practice problems on the class website.

Questions

1. Consider a Heckscher-Ohlin model with two countries (the U.S. and Mexico), two goods (footballs and soccer balls), and two factors of production (high skilled labor H and low skilled labor L). Suppose that footballs are produced with production function:

$$Q_i^{FB} = \left(H_i^{FB}\right)^{\phi} \left(L_i^{FB}\right)^{1-\phi}$$
$$Q_i^{SB} = \left(H_i^{SB}\right)^{\sigma} \left(L_i^{SB}\right)^{1-\sigma}$$

   for $i \in \{US, MEX\}$, where $\phi > \sigma$. Finally, suppose that $H_{US} > H_{MEX}$, $L_{US} = L_{MEX}$, and H_{US} and H_{MEX} are not "too" dissimilar.

   (a) Draw the equilibrium production possibility frontier for the U.S. and Mexico. How do we see which good the U.S. imports? How do we see that equilibrium condition #2 (consumer optimization) holds?

   (b) Suppose that the population of low skilled workers in Mexico doubles. Using words, figures, math or some combination thereof, show how this will affect the utility of high skilled workers, low skilled workers, and the overall welfare (i.e. the representative agent) in the United States.

   (c) If the population of low skilled workers in Mexico had halved instead of doubled, would your answer just be the opposite of what you said in part (b)? Why or why not?

2. Consider a Heckscher-Ohlin model with two countries (the U.S. and Mexico), two goods (computers and pencils), and two factors of production (high skilled labor and low skilled labor). Suppose that computers are intensive in high skilled labor and the U.S. is abundant in high skilled labor. Finally, suppose that the U.S. and Mexico are not "too" dissimilar in their endowed high-skilled labor to low-skilled labor ratio.

   (a) Which country exports what? How do we know?

   (b) Show using a figure (i.e. graph) how opening up to trade would affect the consumption and production of pencils and computers in the United States and in Mexico. Is the equilibrium world price of computers to pencils higher or lower than the autarkic price in the U.S.?

   (c) Indicate in the figure from part (b) that the equilibrium market clearing condition holds.

   (d) Show using a figure (i.e. graph) how the change in the relative price of computers to pencils you found in part (b) affects the relative wages of high skilled to low skilled workers in the United States. In the U.S., who is made better off by trade and who is made worse off?

   (e) Now suppose that all workers are born low skilled and choose whether or not to pay tuition to attend college and become high skilled. If all workers are identical, how do you think the price of college in the U.S. will change when the U.S. opens to trade?