Problem Sets 2

(Due March 13 W in class)

1. Consider a 2-2-1 (two countries-two goods-one factor) model in international trade. The production technology is given in the following table. Assuming away transportation and transaction costs in the model. (10*5=50pts)

Technology	Goods	US	CH
Productivity (units/hour)	Apple	4	3
	Orange	6	2
Production input (hours/unit)	Apple		
	Orange		
Opportunity cost of production	Apple		
	Orange		

1) Complete the table and draw the PPF for both countries. Could trade happen between two countries? Why?
2) Assume consumers prefer average consumption on both goods. What is the autarky equilibrium in US, and in CH? Mark the equilibrium points in each country's PPF graph respectively.
3) Focus first on US, from autarky equilibrium to trade, at an exchange rate of 1apple for 1 orange, how would its new consumption possibility frontier (CPF) look like? At the same exchange rate, how would CH's new CPF look like?
4) Would trade happen at the exchange rate of 1 apple for 1 orange? Why?
5) Which country has absolute advantage in producing apple? In orange? Which country has comparative advantage in producing apple? In orange?
6) What would US and CH do if they want to cooperate by following the cost minimization principle?
7) Show the points of complete specialization for both countries in separate graphs. What is the determinant?
8) After complete specialization, if US can trade at CH's relative price, how would its new CPF look like? If CH can trade at US relative price, how would CH's new CPF look like? Graph them respectively.
9) After specialization, if 1 apple for 1 orange is the terms of trade (TOT), trace out the new CPF for both countries.
10) Summarize the model in the table below and comment on this model. What is the difference between absolute advantage model and comparative advantage model in international trade? Which you think is more important?

		US	CH	Total
Autarky equilibrium	Apple			
	Orange			
Specialization in production	Apple			
	Orange			
Trade equilibrium (1a:1o)	Apple			
	Orange			
Net Gains from trade	Apple			
	Orange			

2. Consider a 2-2-2 international trade model (two countries-two goods-two factors) in which Home country and Foreign country apply identical production technology in both goods – A and B, but differ in their factor endowment, i.e., owning different amount of production factors K and L. Assume in the model both country share similar consumption preference. All firms operate in a perfectly competitive market. Transportation and transaction cost are trivial. Initial endowment of the economy is summarized in the table below. (2*5=10pts)

Country	Capital K	Labor L
H	3000	1000
F	200	400

1) Which country is capital abundant country? Which country is labor abundant country? Explain.
2) In which country is capital relatively more expensive? Which country has a higher wage-interest ratio (W/R)? Explain.

Now, consider the production technology for the goods A and B. Suppose one unit of A requires 10 units of labor and 30 units of capital. One unit of B requires 4 units of labor and 2 units of capital. The wage of labor and the interest of capital in two countries are shown in the following table. (5*5=25pts)

Country	Interest R	Wage W
H	$2	$4
F	$4	$1

1) Which product is capital intensive? Which is labor intensive? Explain.
2) Calculate the prices for goods A and B in Home country. And for Foreign country.
3) Calculate the relative price of A to B in H and F. Predict the trade pattern when they open up.
4) Compared with Autarky relative prices, what would happen to the relative price of A to B in both countries? Predict the possible range of relative price of A to B that facilitates international trade.
5) Compared with Autarky factor prices, what would happen to the wage-interest ratio in both countries? Predict the possible range of relative factor price of K to L in trade equilibrium.

In Autarky, how many units of A and B could both countries produce by applying all available production factors? What determines their consumption equilibrium? Once opening up to trade, what are the possible trade equilibria? If complete specialization is possible between countries, what is the trade equilibrium? (10pts)

3. Suppose two countries, Canada and Mexico, produce two goods: timber and televisions. Assume that land is specific to timber, capital is specific to televisions, and labor is free to move between the two industries. When Canada and Mexico engage in free trade, the relative price of televisions falls in Canada and the relative price of timber falls in Mexico. (10pts)

1) In a graph, show how the wage changes in Canada due to a fall in the price of televisions, holding constant the price of timber. Can we predict that change in the real wage?
2) What is the impact of opening trade on the rentals on capital and land in Canada? Can we predict that change in the real rentals on capital and land?

4. Use the following information to answer the questions below:

Manufacturing:
Sales revenue = PM · QM = 150
Payments to labor = W · LM = 100
Payments to capital = RK · K = 50

Agriculture:
Sales revenue = PA · QA = 150
Payments to labor=W·LA =50
Payments to land=RT ·T=100

Holding the price of manufacturing constant, suppose the increase in the price of agriculture is 20% and the increase in the wage is 10%. Determine the impact of the increase in the price of agriculture on the rental on land (RT) and the rental on capital (RK). Explain what has happened to the real rental on land RT and the real rental on capital RK. (15pts)