Exercise Sheet 5: The Footloose Factors Model. Short Solutions.

a) The non-profit conditions (unit costs = unit price) for the country A are $a^A_{LF} W^A = P_F$ for food and $a^A_{LC} W^A + a^A_{KC} R = P_C$ for clothing. The clothing sector cannot pay wages that are below the wages in the food sector (if that was the case, all labor would move to the food sector). Therefore the minimal wage the clothing sector can pay is given by $W^A = \frac{P_F}{a^A_{LF}}$. Inserting this into the non-profit condition for clothing, and using $P_F = 1\$$ yields $R^A = -2.5 + 1.25 P_C$. Doing the same thing for country B yields $R^B = -1.2 + P_C$. Those are the maximal capital rental rates the two countries can pay.

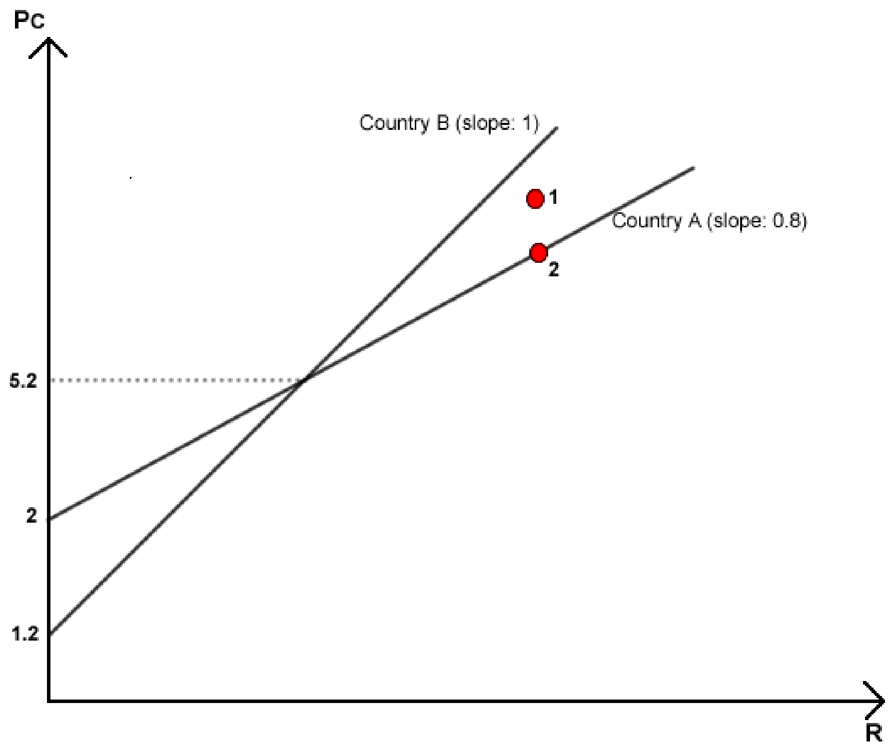
Country A has a disadvantage compared to country B because it has to pay higher wages (due to the higher labor productivity in the other sector, the food sector). This disadvantage is the stronger the higher the price of food, since this increases wages even more. However, country A can use the capital more efficiently ($a^A_{KC} < a^B_{KC}$). If wage payments are not too high it can offer a higher rental rate. Which of these effects is more important depends on the relative prices of clothing and food.

b) Country A can offer a higher capital rental rate if $-2.5 + 1.25 P_C > -1.2 + P_C$. Solving for P_C yields $P_C = 5.2\$$. If the price of food is above 5.2\$ country A can pay a higher rental rate, if the price is below 5.2\$, country B can pay a higher rental rate.

c) We have to use the non-profit condition in the clothing sector. For country A it is given by $a^A_{LC} W^A + a_{KC} R = P_C$. Solving for the wage W^A yields w = 0.55\$. Does country A produce food? The cost of producing one unit of food is given by $a^A_{LF} W^A = 1.1\$$. This is more than the world price of food (1\$). Country A therefore produces only clothing.

Doing the same thing for country B reveals that wages paid in the clothing sector are given by $W^B = \frac{1}{3}\$$. Does country B produce food? The price of producing one unit of good is given by $a^B_{LF} W^B = \frac{5}{3}\$$ which is above the world price of 1\$. Therefore, both countries produce only clothing at these world prices. The wage in country A is higher, due to the higher labor productivity in the clothing sector.

d)



At point 1, country A produces only clothing. The reason is that wages in the clothing sector are too high to make food production profitable. Country B produces only food, since the rental rate of capital is too high to make clothing production profitable.

At point 2, the capital rental rate is still too high to make clothing production profitable for country B. Country B thus produces only food. In country A, wages in the clothing are now exactly equal to the wages that can be paid in the food sector. The reason is that the cost of capital increased compared to point 1. Wages in the clothing sector decrease compared to the point 1 because firms have to pay more for the capital. The lower wages make food production possible in country A.