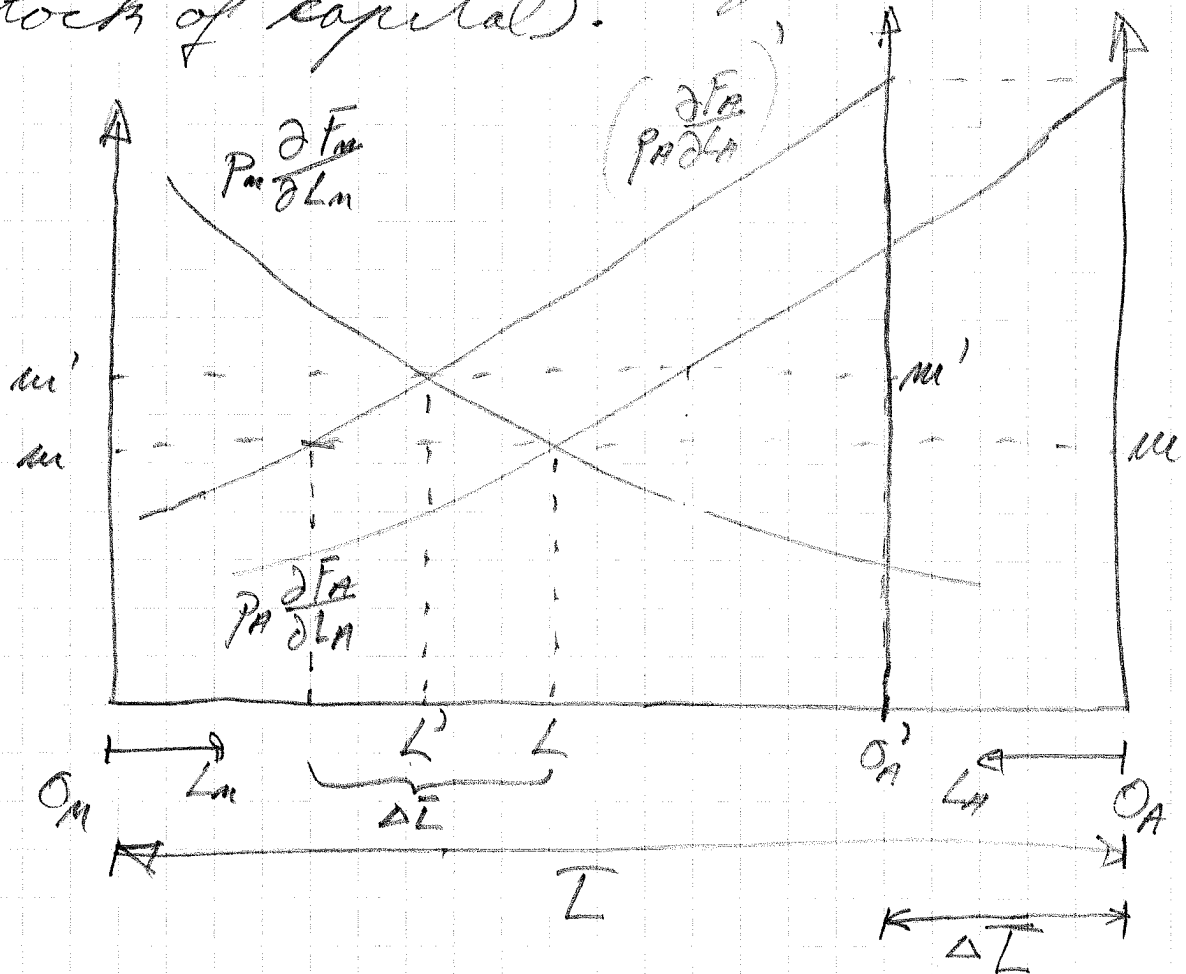


CHAPTER 5

Sol

Movt of L & K between countries

5.1) Effect of a natural disaster that reduces population size (but not stock of capital).



$\bar{L} \equiv$ initial population size

$\Delta \bar{L} \equiv$ prop in population size

$\Rightarrow O'_A$ is new origin for agricultural workers.

A decrease in L increases the real wage from w to w' (we assume constant prices P_D and P_M , as would be the case for a small open economy).

Workers are thus made better off (at least those who survive!).

We also have a drop in the workforce in the manufacturing sector by $\Delta L'$ and in the agricultural sector by $\Delta L - \Delta L'$.

Since the marginal product of both land and capital is increasing with labor, this implies that their returns drop with the reduction in population size.

N.B. Recall that in competitive land and capital rental markets, their rental prices must be equal to their marginal returns.

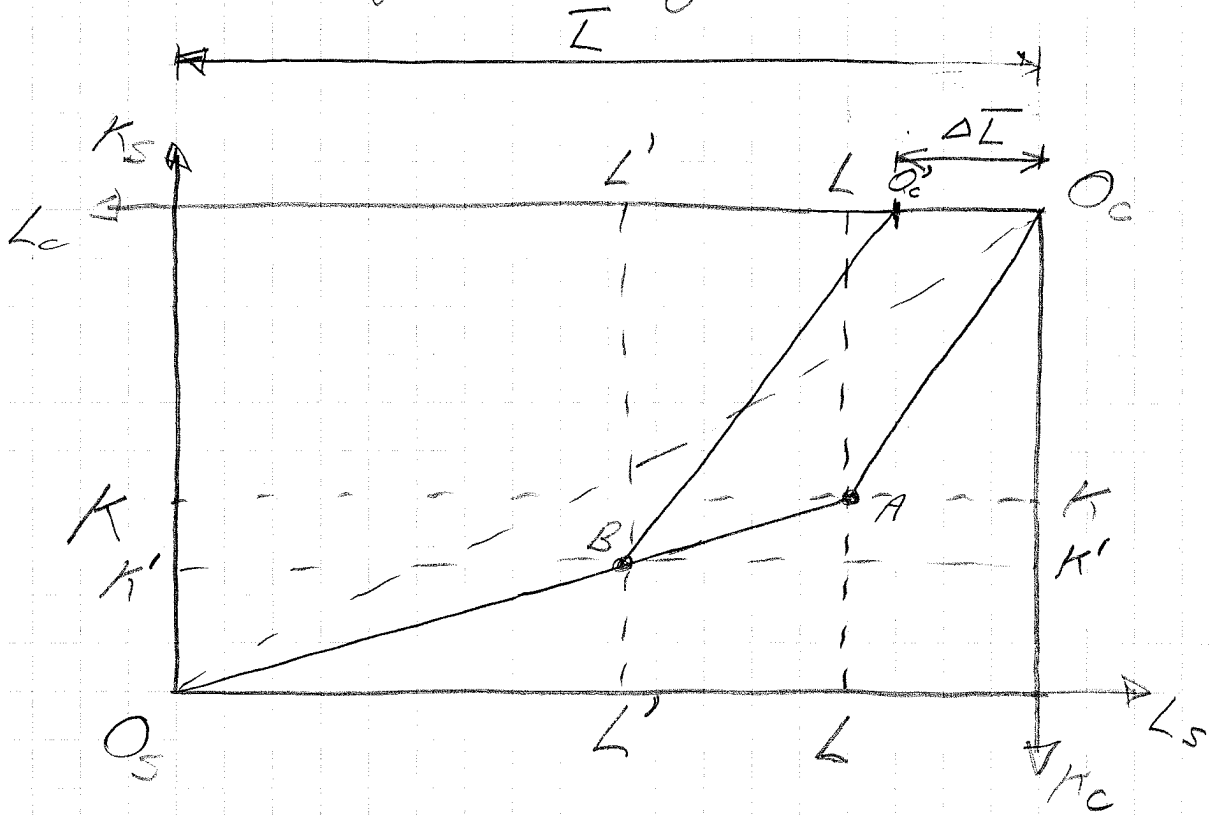
5.2) A drop in population size in the L-R, i.e. when capital is allowed to move between sectors.

NB We assume here only two factors of production: L and K.

In the L-R, variations in factor endowments have no effect on relative factor prices and intensities.

NB This result hinges on the following three assumptions:

- small open economy
- CRS in both sectors
- free entry in both sectors.



The initial equil. is at point A, which corresponds to the S-sector being more L-intensive than the C-sector.

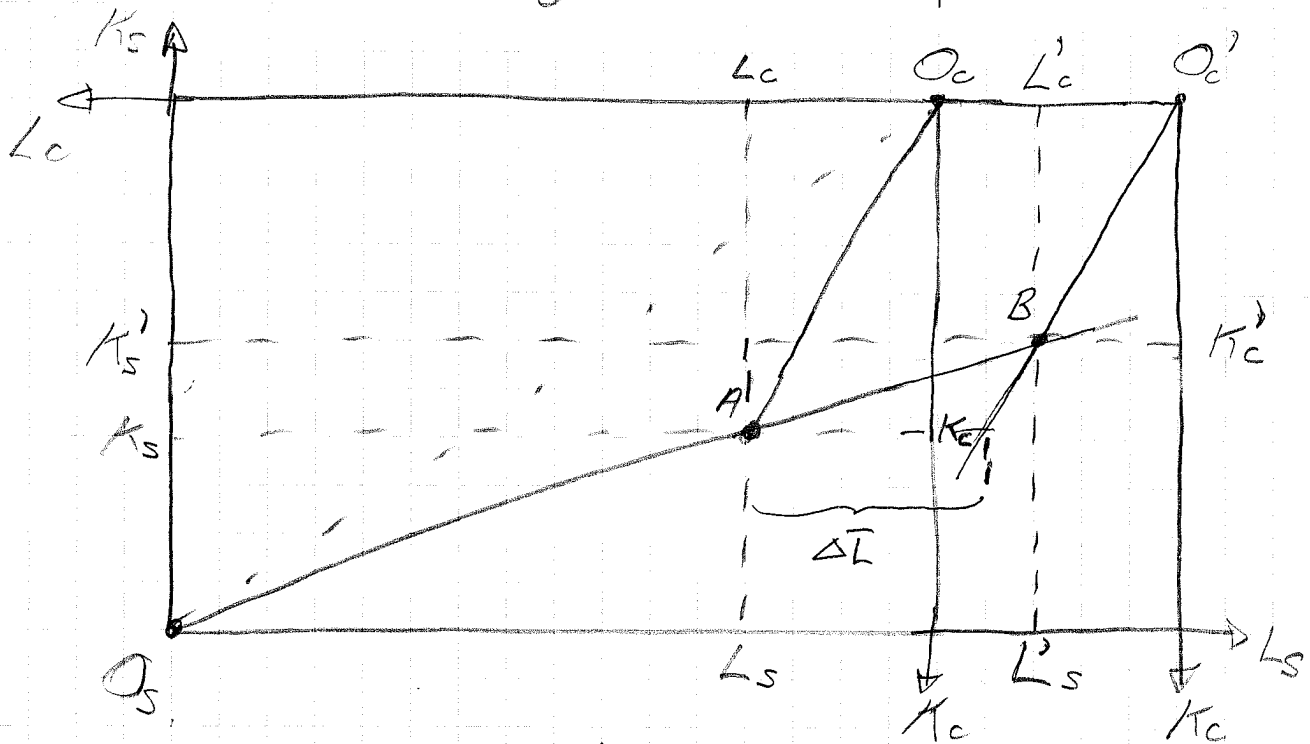
A drop in population size shifts the origin of the C-sector from O_c to O_c' . Since relative factor prices remain constant, so do factor intensities. We thus have a new equilibrium at point B.

The drop in population size causes the S-sector to shrink.

However, the C-sector actually expands in the L-R!!!

This result is consistent with the Rybczynski theorem. (Make sure to review it.)

5.3) L-R effects of an increase in the labor supply.



\bar{L} = initial labor force size

$\Delta \bar{L}$ = increase in labor force

Initial equil. at point A means that S-sector is L -intensive. L and K denote initial factor uses in each sector.

In the L-R, changes in factor endowments have no effects on factor intensities due to:

- small open economy (fixed P_S & P_C)
- CRS
- free entry (zero profit)

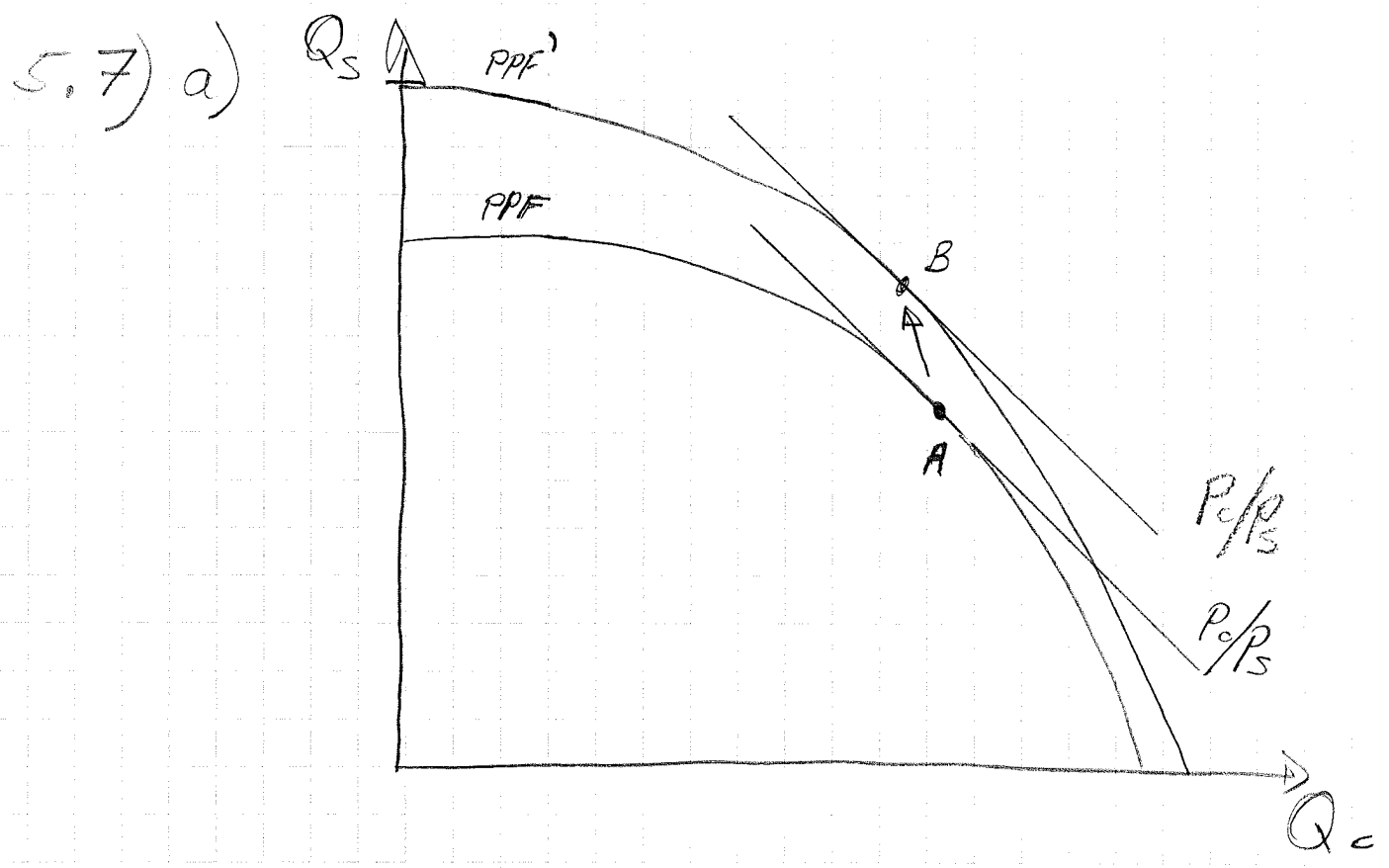
→ New equilibrium at point B .

At point B, we have that $\Delta^+ \bar{L}$ causes:

- ① S-sector to expand its production.
- ② C-sector reduces its output because it uses both less labor and less capital. Indeed,

$$\bar{L}'_c > \Delta \bar{L} \Rightarrow L'_c < L_c.$$

Also $K'_c < K_c$.

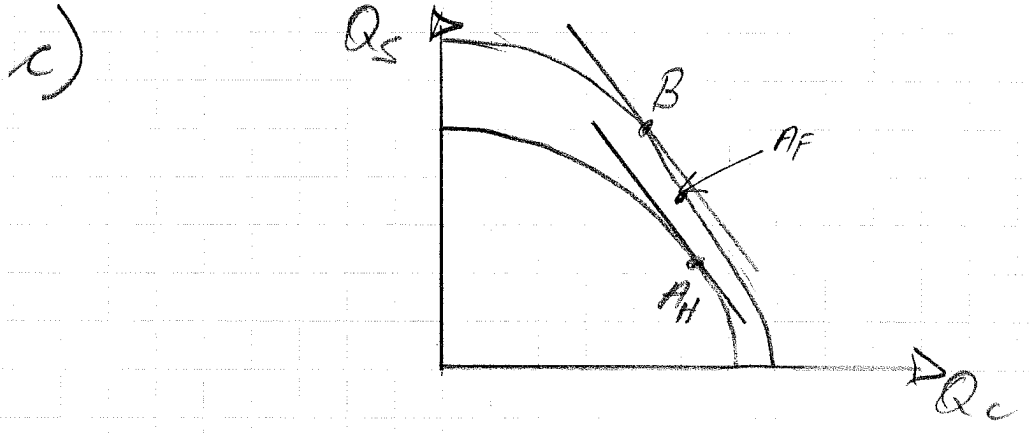


An increase in the labor force size at Home leads to higher output of S-goods and lower output of C-goods. This is because S-good production is L-intensive. Hence the movement from point A to B at Home. (NB slope of P_c/P_s is assumed unaffected.)

b) This question is not very well formulated. The idea is to compare two countries that differ only by their population size.

The difference between Home and Foreign will be similar to the difference between PPF and PPF' in part a).

In autarky, point B is unlikely to be an equilibrium because it assumes that relative prices are the same as the equilibrium prices at point A. Since country B produces less computers and more shoes than country A, the relative price of computers should be higher, thus corresponding to a steeper P_c/P_s line. This suggests that the autarky equilibrium in country F will be somewhere to the South-East of point B on PPF', but still to the N-W of point A.

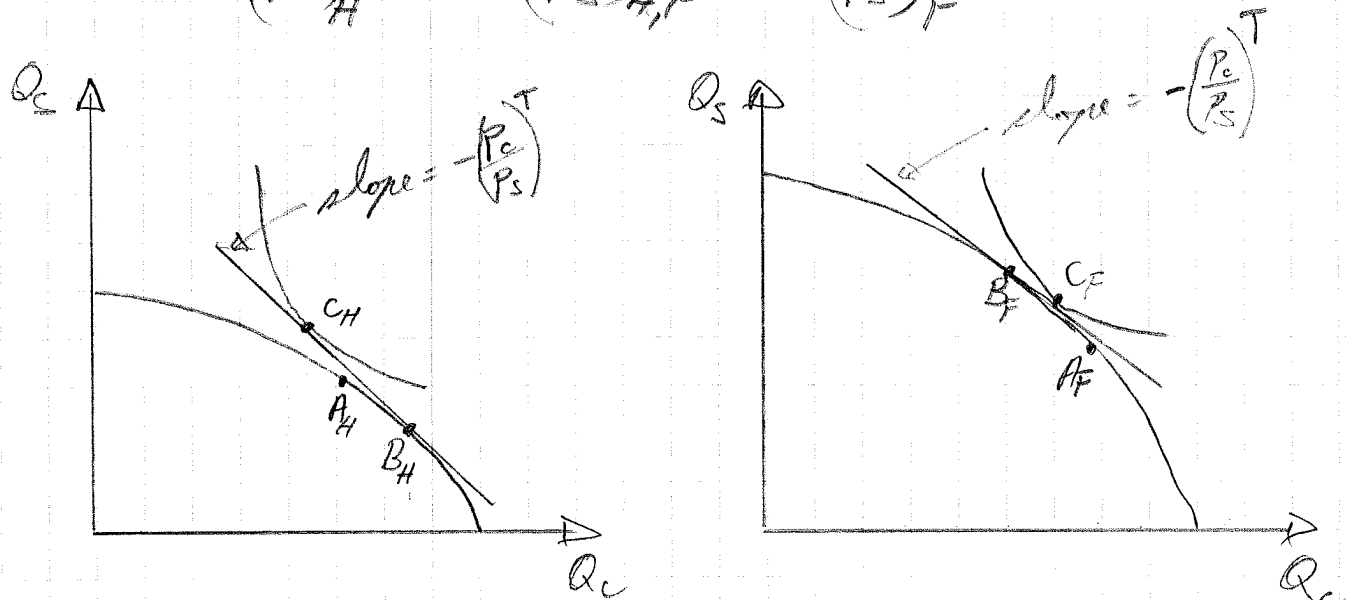


In autarky, countries H and F are at points A_H and A_F respectively. This implies that $\left(\frac{P_c}{P_s}\right)_H^{AU} < \left(\frac{P_c}{P_s}\right)_F^{AU}$,

i.e. computers are relatively cheaper at Home than at Foreign. Under trade, Home will thus export computers to Foreign and import shoes in return.

B) a) Under trade, output prices will be the same in both countries and such that

$$\left(\frac{P_c}{P_s}\right)_H^{AU} < \left(\frac{P_c}{P_s}\right)_{H,F}^T < \left(\frac{P_c}{P_s}\right)_F^{AU}$$



With trade, Home is producing at P_H and consuming at C_H . It is thus exporting computers and importing shoes. And conversely for Foreign.

b) According to the factor price insensitivity result, since output prices are the same in both countries under trade, wages and rental rates will be the same in both countries.

We have therefore shown that trade openness has the effect of equalizing factor returns between countries.

To summarize, we have:

$$w_H^{AU} > w_F^{AU} \text{ since } \left(\frac{P_S}{P_C}\right)_H^{AU} > \left(\frac{P_S}{P_C}\right)_F^{AU}$$

and S-goods are L-intensive.
(The Stolper-Samuelson theorem.)

$$r_H^{AU} < r_F^{AU} \text{ since } \dots$$

$$w_H^T = w_F^T \text{ and } r_H^T = r_F^T$$

$$\text{since } \left(\frac{P_C}{P_S}\right)_H^T = \left(\frac{P_C}{P_S}\right)_F^T$$

The model predicts that exporting L-intensive goods constitutes an indirect way of exporting labor as a factor of production.

→ Labor is "embodied" in shoe exports.

Capital is "embodied" in computer exports.

- c) According to observations, wages are NOT equalized between countries that trade. Why?
- d) ① Differences in technologies
- ② " " " prices
- transport costs
- trade barriers
- ③ Full specialization
- ④ Non-tradables?
- ⑤ Inefficiencies?