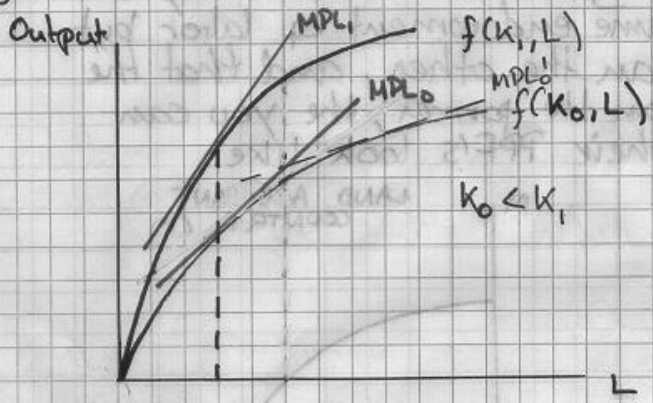


DISCUSSION SECTION WEEK 4 (SPECIFIC FACTORS).

IMPORTANT FACT TO RECALL:

What happens with the marginal productivity of labor as you increase the endowment of a specific factor, for instance Capital

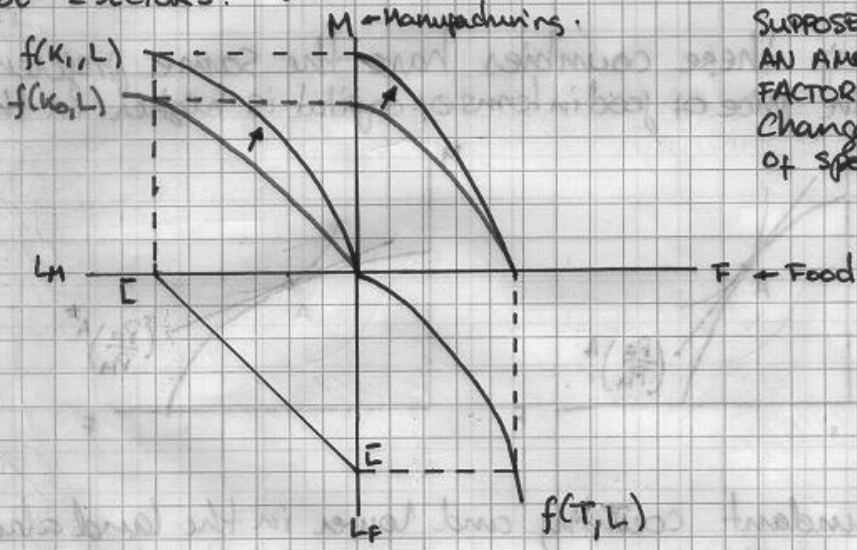


It is clear that as you increase the endowment of capital the marginal product of labor increases.

$MPL_1 > MPL_0$

Notice also that as you increase the amount of labor (given a level of capital, say  $k_0$ ) the MPL decreases.

Notice then the implications of this over the PPF's form. SUPPOSE 2 SECTORS.



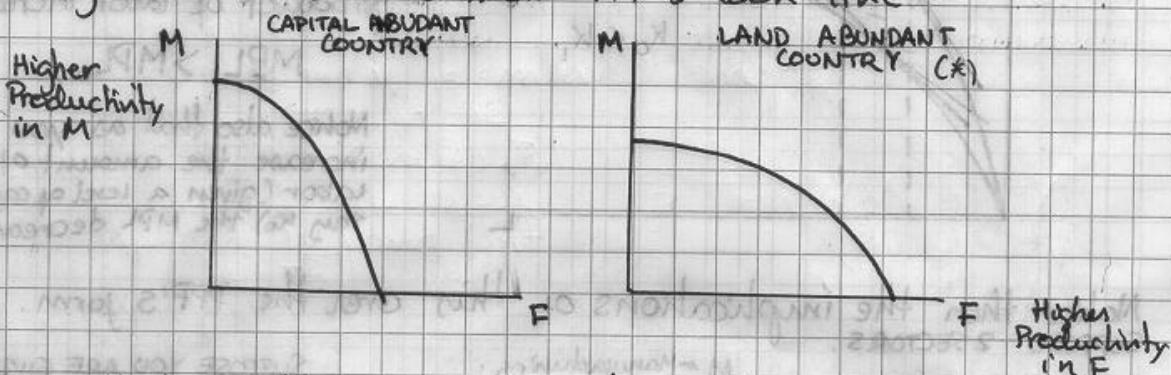
SUPPOSE YOU ARE GIVEN AN AMOUNT OF MOBILE FACTOR LABOR. Then changes in the amount of specific factor will shift the PPF.

Manufacturing  $\rightarrow M = f(K, L)$   
 Food  $\rightarrow F = f(T, L)$

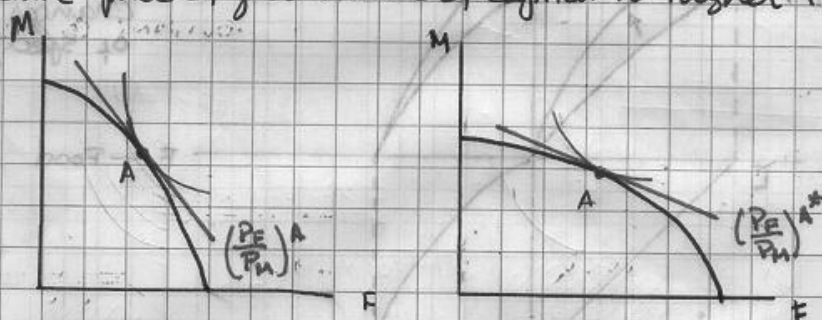
$$\left(\frac{\partial Q}{\partial L}\right) > \left(\frac{\partial Q}{\partial L}\right) > \left(\frac{\partial Q}{\partial L}\right)$$

Obviously, you don't need to do all this drawings. Suppose however, that you are told that the amount of capital increases then you already know what will happen with the PPF.

Then if you are comparing 2 countries and you know that they have the same endowment of labor but one has more capital than the other, and that the other has more land than the former, then you can easily determine how their PPF's look like.



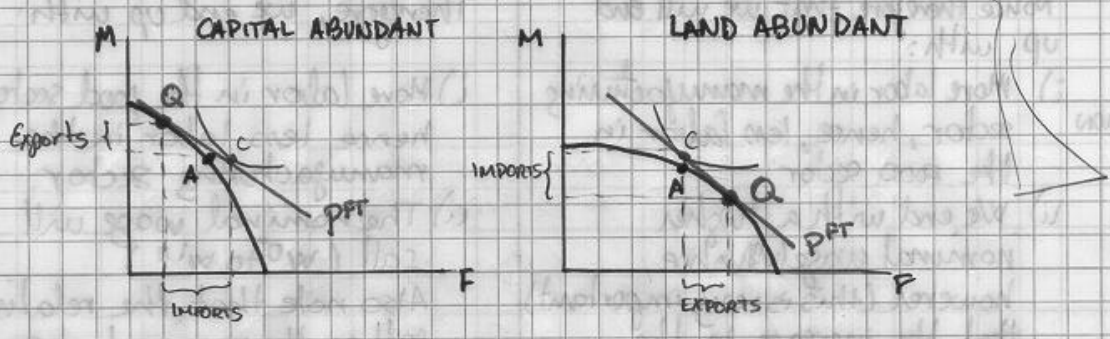
Notice that if these countries have the same preferences then the relative price of good in terms of capital is higher in the



capital abundant country and lower in the land abundant country.

Notice that as was discussed in the general trade model, we already know that if we open these economies to trade it must be the case that:

$$\left(\frac{P_F}{P_M}\right)^{A*} < \left(\frac{P_F}{P_M}\right)^{FT} < \left(\frac{P_F}{P_M}\right)^A$$



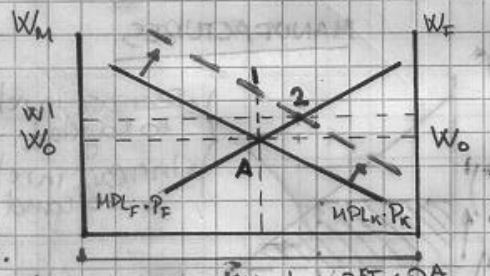
So notice that the mobile factor will move toward sectors where the country enjoys comparative advantage.

So the capital abundant country exports manufactures, and the land abundant country will export land.

Notice that once you have determined with the pattern of trade and also what happens with the free trade price relative to the autarky price, we will be interested in determining what happens with the distribution of income within each country. i.e. who gains and who loses.

In general in this model we can proceed as follows.

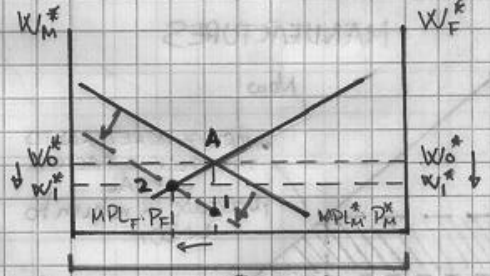
CAPITAL ABUNDANT COUNTRY



↑ is size of labor force.

- ① From before we know that  $P_M^* < P_A^*$  which means that  $\downarrow \left(\frac{P_F}{P_M}\right)$  which implicitly implies that  $P_M^*$  increased more than  $P_F$ . So we will simplify the analysis by assuming that  $P_M^* = 1$  (You also set  $P_F$  as Numeraire if you wish).
- ② As  $P_M \uparrow$  then  $\uparrow (MPL_M \cdot P_M)$  so we shift it the curve to the right
- ③ Notice that if no reallocation of labor takes place then we would move from A to ①. This vertical distance equal the  $\uparrow$  in  $P_M$ .
- ④ Notice however that as we reallocate labor into manufacturing the  $MPL_M$  falls (we move from ① to ②) (see behind)

LABOR ABUNDANT COUNTRY



- ①  $P_A^* < P_M^* \Rightarrow \uparrow \left(\frac{P_F^*}{P_M^*}\right)$  therefore fix  $P_M$  as numeraire, i.e.  $P_M^* = 1$  Therefore we have  $\downarrow P_M^*$
- ② As  $\downarrow P_M \rightarrow \downarrow (MPL_M^* \cdot P_M)$  so we shift the curve to the left.
- ③ Note that if no reallocation of labor take place we would move from A to ①. This vertical distance is equal to the  $\downarrow$  in  $P_F$ .
- ④ As we reallocate labor into the Food sector the  $MPL_M$  increases so we move from ① to ② (see behind)

Notice therefore that we will end up with:

LABOR ALLOCATION

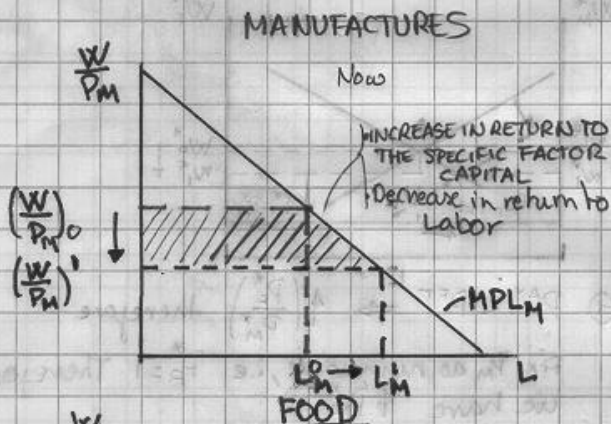
i) More labor in the manufacturing sector, hence, less labor in the food sector.

REAL WAGE

ii) We end with a higher nominal wage ( $w$ ) however (this is very important) that the increase in the nominal wage as measured by the vertical distance between  $w_0$  and  $w_1$  is smaller than the increase in the price of manufactures ( $P_M$ ).

⑤ Therefore we have that the real wage  $\downarrow \left(\frac{w}{P_M}\right)$  and that  $\uparrow \left(\frac{w}{P_F}\right)$ .

⑥ Now we can determine what happens with income distribution:



EFFECTS }  
• LABOR → Effect are ambiguous  
• CAPITAL → Better off  
• LAND OWNER → WORSE OFF

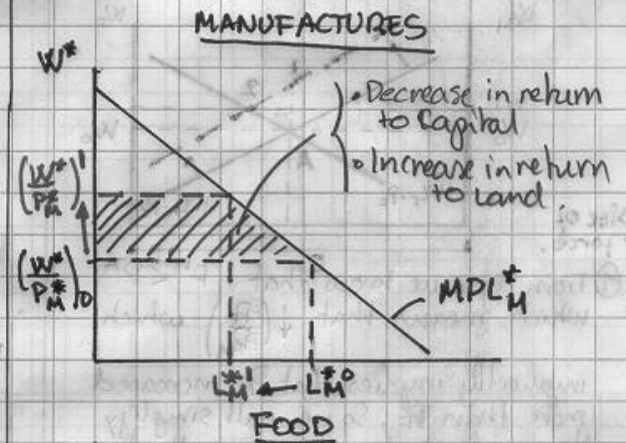
Therefore, we end up with:

i) More labor in the food sector, hence less labor in the manufacturing sector.

ii) The nominal wage will fall ( $w^0$  to  $w^1$ )  
Also note that the relative fall of the nominal wage ( $w^0 - w^1$ ) is smaller than the fall of the manufactures price ( $P_M$ )

⑤ Then  $\uparrow \left(\frac{w^*}{P_M^*}\right)$  and  $\downarrow \left(\frac{w^*}{P_F^*}\right)$

⑥ Now we can determine what happens with income distribution.

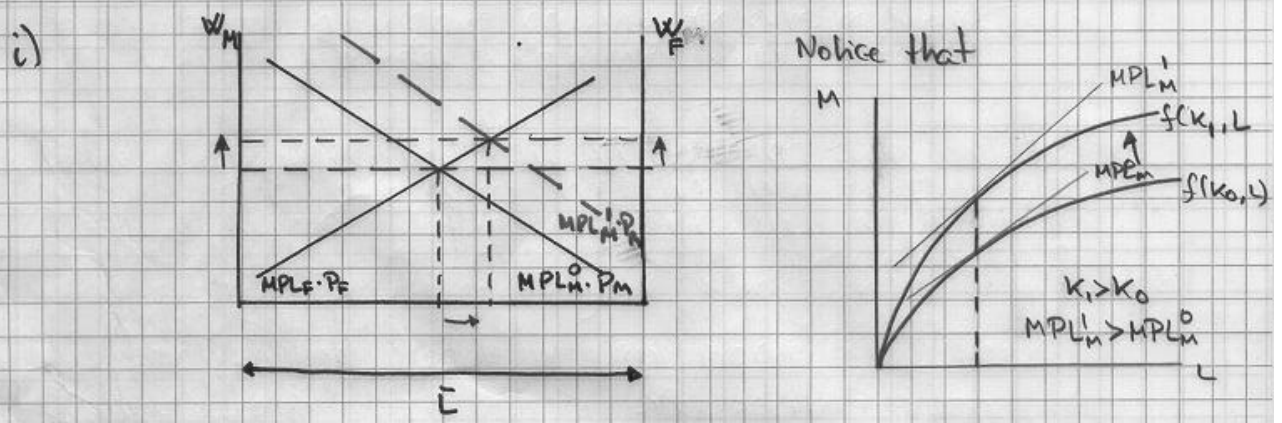


EFFECTS }  
• LABOR → Ambiguous  
• CAPITAL → WORSE OFF  
• LAND OWNER → Better off

SUPPOSE NOW THAT SUDDENLY THE CAPITAL ABUNDANT COUNTRY has more capital (This is unrealistic, in HW you have a more realistic case where you have a country that is suddenly with less land available.).

- i) What will happen to allocations of labor across sectors?
- ii) What will happen to wages?
- iii) What will be the effect on output in each sector?

→ Assume Free trade relative prices do not change.



- ① As  $\uparrow k$  then  $\uparrow MPL_M$  therefore holding prices constant  $\uparrow MPL_M \cdot P_M$ . So we shift the curve to the right.

Now we will have that more labor is employed in the manufacturing sector and less in the food sector.

- ii) Nominal wages go up. Given prices constant real wages increases.
- iii) Output increases in the manufacturing sector and decreases in the food sector.

