ECO 364 - Topic 2

The Specific Factors Model

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- The early U.S. economy was primarily agricultural and the Americans imported virtually all their manufactured goods from Europe.
- From the beginning of the 19th century, a manufacturing sector started to develop, with cotton and woolen textiles as key products. These manufacturing firms were concentrated in the Northern states.
- The country exported mostly agricultural products such as cotton and tobacco, with the plantations concentrated in the Southern states.

- As the manufacturing sector started to expand in the U.S., Northern industrialists began to apply pressure for protection.
- From 1816 onwards, Congress started to raise tariffs on manufactures, sometimes substantially.
- But this act by the Congress was met by stiff resistance from the Southern members.

What was the economic rationale behind this conflict?

- Ricardo had shown that a country gains from trade by exporting goods and services in which it has comparative advantage.
- Labour, which is the only factor of production and is perfectly mobile across sectors, experiences an increase in welfare due to trade.
- There is no conflict in the Ricardian model.

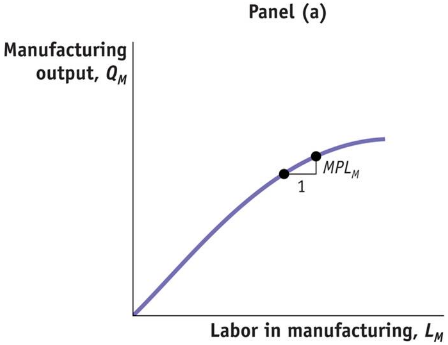
- In the real world, however, there are more than one factor of production, with each factor earning a different income.
- Opposition to free trade arises because trade changes the income distribution *within* a country.

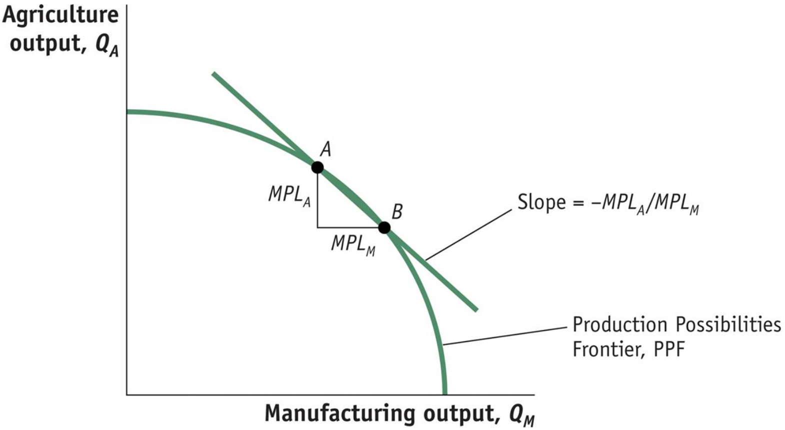
There are two reasons why international trade has a strong impact on the distribution of income within a country:

- Factors cannot move immediately or costlessy from one sector to another, possibly because of their specificity - a short run consequence of trade.
- A change in the composition of goods produced by a country alters the demand for factors, thereby affecting their price - a long run consequence of trade.

In this topic, we examine the first reason.

- Three factors - Land, Capital and Labor.
- Land is specific to agriculture.
- Capital is specific to manufacturing.
- Labor is mobile across the two sectors.


Panel (a)
Manufacturing output, Q_M
MPL_M
1
Labor in manufacturing, L_M
Panel (b)
Marginal product of labor, MPL_M
MPL_M
Labor in manufacturing, L_M



Unlike in the Ricardian model, the opportunity cost of one unit of manufacturing good in terms of agricultural good (MPL_A/MPL_M) increases as Q_M rises.

- Assume that $(P_M/P_A) < (P_M^*/P_A^*)$.
- Home's comparative advantage in the manufacturing sector could be due to various reasons.
- Following trade, we shall have

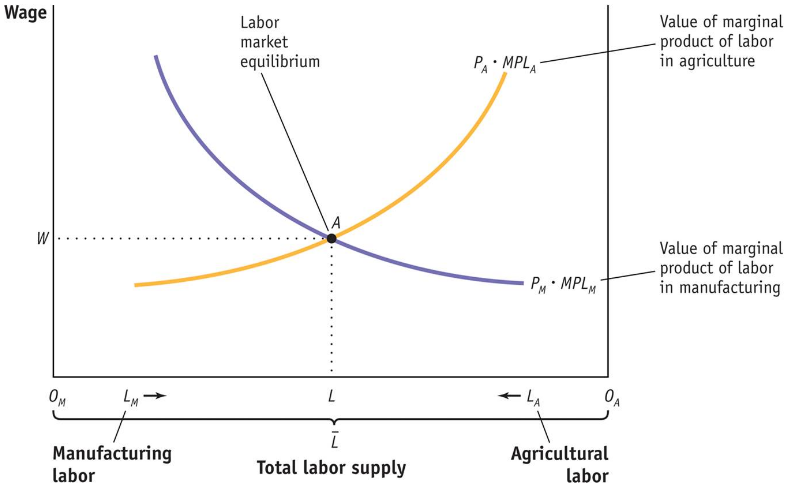
$$(P_M/P_A) < (P_M^W/P_A^W) < (P_M^*/P_A^*).$$

- Home's *Terms of Trade* (how much imported good it can buy with one unit of exported good) rises.
- Home exports manufacturing goods and imports agricultural goods.

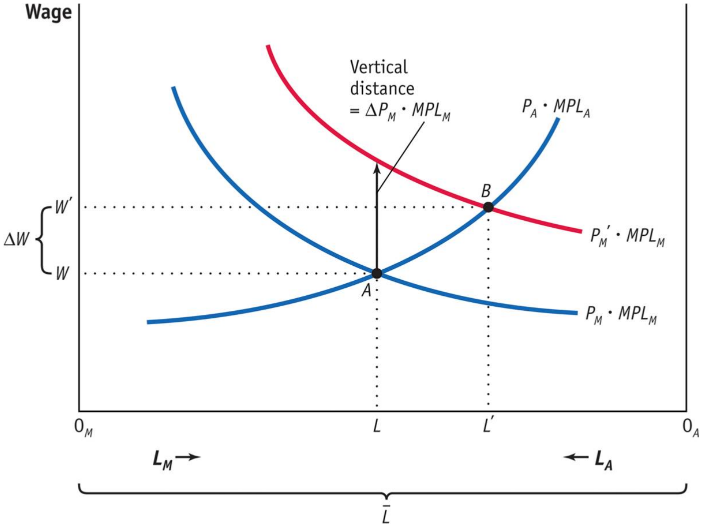
- Let the labor allocated to agriculture and manufacturing sectors be given by L_A and L_M respectively.
- Labor market clearing requires that

$$L_A + L_M = \bar{L}.$$

- Free mobility implies that labor will move until it earns the same wage in both the sectors.



Wage
Labor market equilibrium
$P_A \cdot MPL_A$
Value of marginal product of labor in agriculture
A
W
$P_M \cdot MPL_M$
Value of marginal product of labor in manufacturing
0_M
L_M
L
L_A
0_A
Manufacturing labor
$\bar{L}$
Total labor supply
Agricultural labor


Wage
Vertical distance = $\Delta P_M \cdot MPL_M$
$P_A \cdot MPL_A$
W'
ΔW
W
B
A
$P_M' \cdot MPL_M$
$P_M \cdot MPL_M$
0_M
L
L'
0_A
$L_M \rightarrow$
$\leftarrow L_A$
$\bar{L}$

- Nominal wage W goes up. But welfare depends on how much goods individuals can purchase with their wage, i.e., on *real wage*?
- Need to know how W changes relative to P_A and P_M.
- Since P_A has not changed, W/P_A goes up.
- But P_M has also increased.
- Note that,

$$\Delta W < \Delta P_M \cdot MPL_M$$

- It follows that,

$$\frac{\Delta W}{W} < \frac{\Delta P_M \cdot MPL_M}{P_M \cdot MPL_M} = \frac{\Delta P_M}{P_M}.$$

- Hence, W/P_M goes down.

- Real wage in terms of agricultural goods goes up but that in terms of manufactured goods goes down.
- Overall impact depends on workers' preference.
- If workers consume only agricultural goods, welfare increases unambiguously; if they consume only manufactured goods, welfare decreases unambiguously.
- As long as workers consume both goods, there are two forces acting in opposite directions. Overall impact depends on which force dominates.
- Very different from predictions of the Ricardian model!!

- In each industry, capital and land receive the residual payments.
- Payments to capital $= P_M \cdot Q_M - W \cdot L_M$.
- Payments to land $= P_A \cdot Q_A - W \cdot L_A$.
- Under CRS, rental on capital is given by

$$R_K = \frac{P_M \cdot Q_M - W \cdot L_M}{K} = P_M \cdot MPK_M$$

- Under CRS, rental on land is given by

$$R_T = \frac{P_A \cdot Q_A - W \cdot L_A}{T} = P_A \cdot MPT_A$$

- With an increase in P_M, holding P_A constant, labor shifts from agriculture to manufacturing.
- Since capital has more labor to produce with, MPK_M rises.
- But $MPK_M = \frac{R_K}{P_M} \implies R_K$ rises more than proportionately than P_M.
- Since P_A does not change, $\frac{R_K}{P_A}$ increases too.
- Unlike workers, capital owners can purchase more of both goods.

  $\implies$ Capital owners gain unambiguously.

- Unlike capital, land has less labor to produce with, resulting in a lower MPT_A.
- But $MPT_A = \frac{R_T}{P_A} \implies R_T$ falls since P_A does not change.
- Furthermore, since P_M increases, $\frac{R_T}{P_M}$ falls too.
- Unlike workers, land owners can purchase less of both goods.
- Land owners lose unambiguously.

- For an increase in P_M,

$$\frac{\Delta R_T}{R_T} < 0 < \frac{\Delta W}{W} < \frac{\Delta P_M}{P_M} < \frac{\Delta R_K}{R_K}.$$

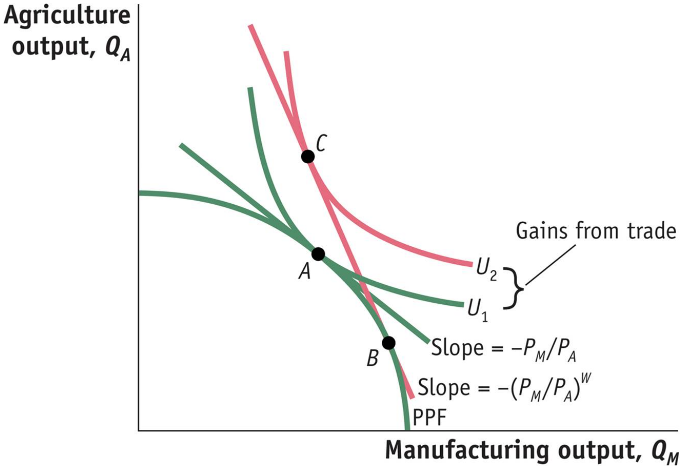
- For an increase in P_A,

$$\frac{\Delta R_K}{R_K} < 0 < \frac{\Delta W}{W} < \frac{\Delta P_A}{P_A} < \frac{\Delta R_T}{R_T}.$$

- The specific factors experience the most dramatic changes in their real earnings; this is due to their immobility.
- Labor is able to partly insulate itself by relocating to the sector whose relative price increases.

In a more realistic model with unemployment, the losers from trade not only include certain owners of specific factors, but also workers who find it hard to transition from import-competing sectors to other export sectors.

Does it mean that trade should not be allowed if it hurts lower-income individuals?



Although there are winners and losers from trade, the winners could *potentially* compensate the losers and still be better off - the country as a whole still gains from trade.

- It is always better to allow trade and compensate those who are hurt by it, than prevent trade altogether. If compensation is inadequate, more government support to the losers rather than less trade is the answer. E.g. Trade Adjustment Assistance (TAA) programs in the U.S.
- Income distribution effects are not specific to international trade. Every change in a nation's economy, including technological progress, shifting consumer preferences, exhaustion of older resources and discovery of new ones, etc., affects income distribution. If losers from trade are compensated, so should losers from any other form of technological progress.

- Agriculture is highly inefficient in Japan - the average farm in Japan is just 1.6 hectares in size, more than 2,000 times smaller than in Australia.
- The agricultural sector in Japan is heavily protected. The import duty on rice is close to 800%, while that on sugar is close to 328%.
- Japanese industry, on the other hand, want greater access to international markets as the domestic market is getting saturated.
- This sets up a conflict between agriculture and industry as Japan decides whether to join the Trans-Pacific Partnership (TPP), a huge free trade area around the Pacific Ocean.

- An adverse shock, for example a trade shock, affects different groups of workers in different ways.
- Typically, older workers (age 45 to 64) experience earnings losses, whereas younger workers (age 25 to 44) are able to find new jobs with higher wages.
- Compared to younger workers, older workers are also less likely to be re-employed within two years of losing jobs.
- Suggests that sector-specific skills are important.