International Trade Theory and Policy

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Specific-Factor Model: Income Distribution and Trade

Outline

1. Specific factors model of an economy in autarky
2. Prices, wages and the allocation of labor
3. Gains from trade and the distribution of income
4. Welfare effects of international labor mobility
5. Who gains and loses when domestic labor emigrates?
6. The political economy of trade

Structure of the model

Model with two goods, cloth (C) and food (F), one non-specific factor, labor (L) and two specific factors, capital (K) and land (T). It is assume that each factor is subject to diminishing returns.

(1) $Q_C = Q_C(L_C, K_C)$ $\quad \frac{\partial Q_C}{\partial L_C} = MP_{LC} > 0 \quad \frac{\partial MP_{LC}}{\partial L_C} < 0 \quad \frac{\partial MP_{LC}}{\partial K_C} > 0$

$\frac{\partial Q_C}{\partial K_C} = MP_{KC} > 0 \quad \frac{\partial MP_{KC}}{\partial K_C} < 0 \quad \frac{\partial MP_{KC}}{\partial L_C} > 0$

(2) $Q_F = Q_F(L_F, T_F)$ $\quad \frac{\partial Q_F}{\partial L_F} = MP_{LB} > 0 \quad \frac{\partial MP_{LF}}{\partial L_F} < 0 \quad \frac{\partial MP_{LB}}{\partial T_B} > 0$

$\frac{\partial Q_F}{\partial T_F} = MP_{TB} > 0 \quad \frac{\partial MP_{TF}}{\partial T_F} < 0 \quad \frac{\partial MP_{TB}}{\partial L_T} > 0$

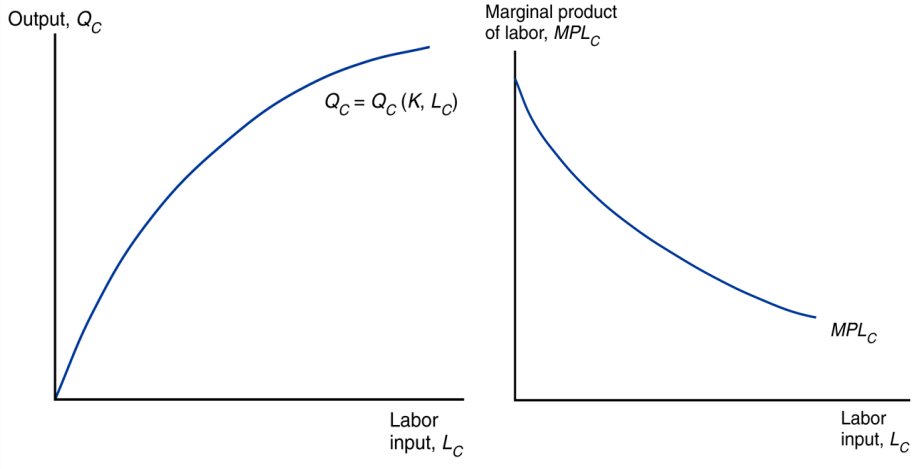
(3) $K \geq K_C$

(4) $T \geq T_F$

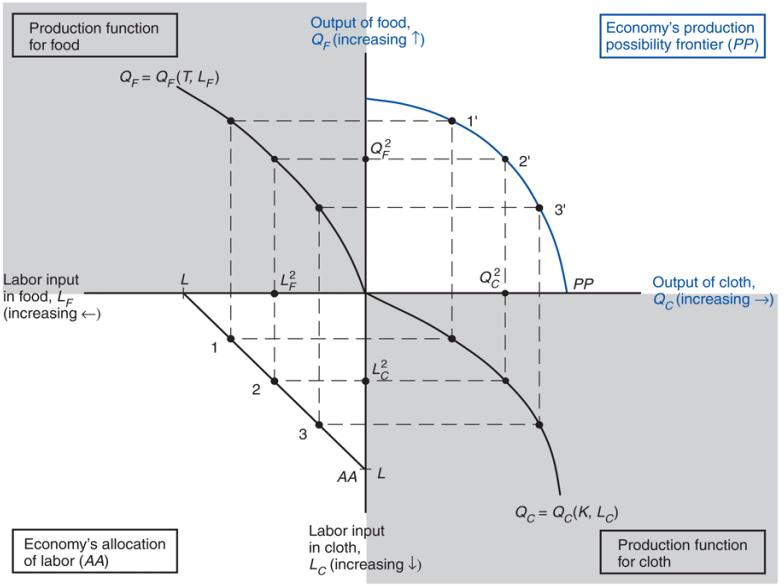
(5) $L \geq L_C + L_F$

Diagrammatic illustration of diminishing returns to labor in cloth

The slope of the production function (Q_C=Q_C(K,L_C) is the MPL_C. The MPL_C is positive, but diminishing.



Diagrammatic illustration of the model



The slope of the PPF

- The slope of the PPF is the opportunity cost of producing one unit of cloth in term of the units of food that is foregone and is given by the ratio: MPL_F/MPL_C
  - To produce one unit of cloth, you need $1/MPL_C$ units of labor.
  - To free up one unit of labor, you must reduce output of food by an amount equal to MPL_F .
  - So, the amount of food foregone to produce one unit of cloth is $(1/MPL_C) \times MPL_F = MPL_F/MPL_C$
  - Note: the marginal product of labor in food rises and the marginal product of labor in cloth falls, so MPL_F/MPL_C rises as output of cloth goes up.

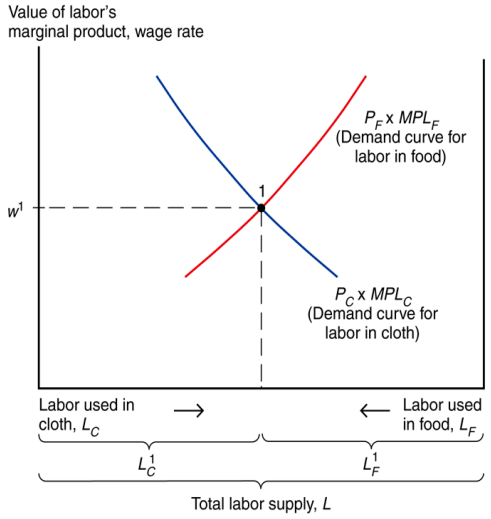
Prices, wages and the allocation of labor

In each sector (i), firms demand labor until the value of the marginal product of labor ($VMPL_i$) is equal to the wage (w_i):

$$VMPL_i = P_i \cdot MPL_i = w_i$$

If the labor market is efficient, the wage is uniform across sectors,

$$P_C \cdot MPL_C = P_F \cdot MPL_F$$



Prices, wages and the allocation of labor

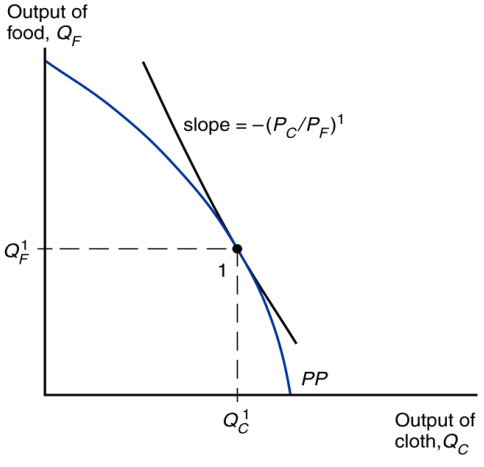
If the labor market is efficient

$$P_C \cdot MPL_C = P_F \cdot MPL_F$$

then

$$\frac{P_C}{P_F} = \frac{MPL_F}{MPL_C}$$

which means that the slope of the PPF reflects (1) the opportunity cost of producing one good in term of the other and (2) their relative prices.



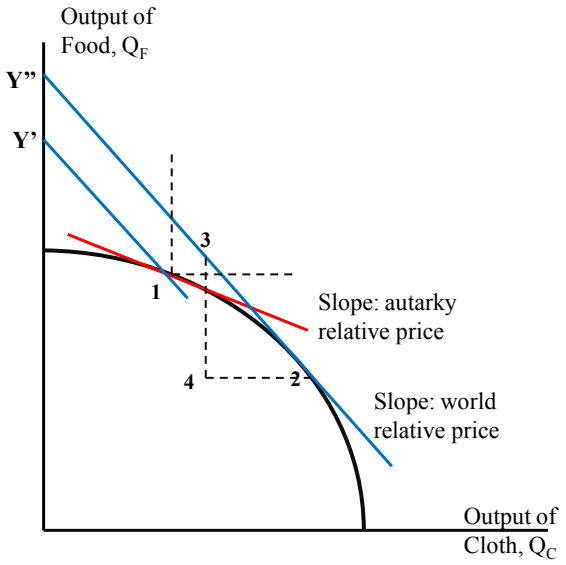
The gains from trade

In autarky economy produces and consumes bundle 1. The relative price of cloth is the slope of the red line.

The world relative price of cloth is the slope of the blue line.

With trade the economy produces bundle 2 and consumes bundle 3, exporting 42 of cloth in exchange for 34 of food.

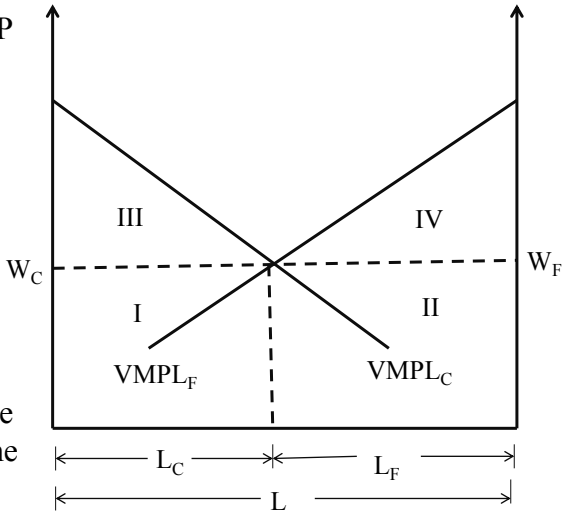
Y'Y'' is the gain from specialization



The distribution of income

The area under the VMP curves is the value of GDP or total domestic income (=I+II+III+IV)

Income is divided as:
I: wage income in C
II: wage income in F
I+II: total wage income
III: capital income
IV: land income
I+III: cloth output=income
II+IV: food output=income

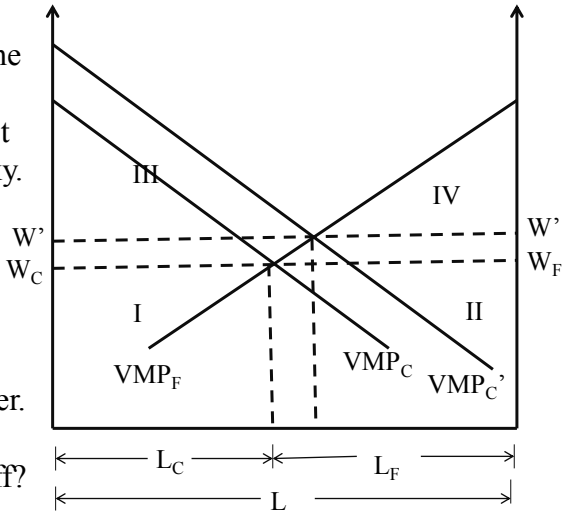


The distribution effects of trade

The country is opened to trade a different set of relative prices. Assume the relative price of cloth is higher in the world market than at home under autarky.

Cloth output expands by drawing labor from food, which contracts.

The value of GDP is higher. The country is better off. But is everybody better off?

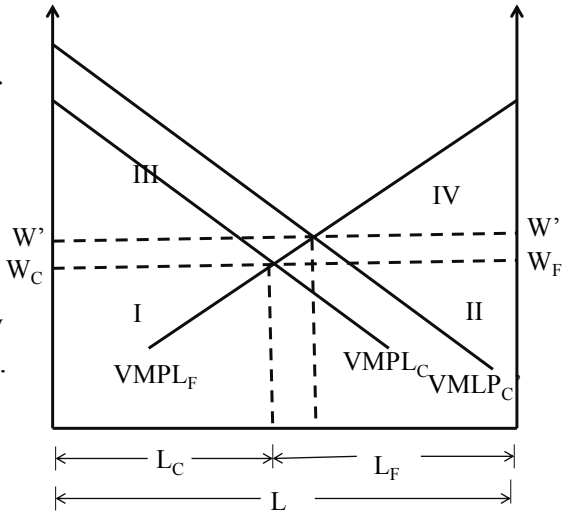


The distribution effects of trade

Wage earners enjoy a higher nominal wage, but not necessarily a higher real wage because the price of cloth has gone up. It depends on the relative share of cloth in their consumption bundle.

Capital owners are clearly better off. Higher VMPK.

Land owners are clearly worse off. Lower VMPT



The distribution effects of trade

The nation as a whole gains, but within the nation there are winners and losers.

The factor specific to the expanding sector (the export sector, cloth) clearly gains; the factor specific to the contracting sector (the import competing sector, food) clearly loses.

The non-specific factor (labor) may gain or lose, it all depends on how labor spends its wage income, so all we can say is that the effect on the non-specific factor is ambiguous.

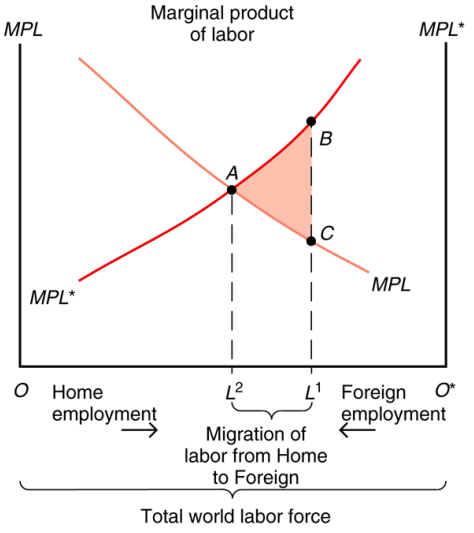
Note: the results would be the same if we considered a fall in the price of food instead of a rise in the price of cloth. The nominal wage would fall, but not necessarily the real wage. The return to capital would increase, and the return to land would decrease.

The welfare effects of international labor mobility

The movement of the factors of production across borders, just like the movement of goods, raises world GDP and therefore can potentially make everyone better.

When labor moves from where it MPL is low to where it is high, world GDP increases (as shown in the figure by the area ABC).

But, is everyone better off?



The distribution of income

Suppose L_M of our fellow citizens emigrate to earn a higher wage. Are those of us who remain at home better or worse off?

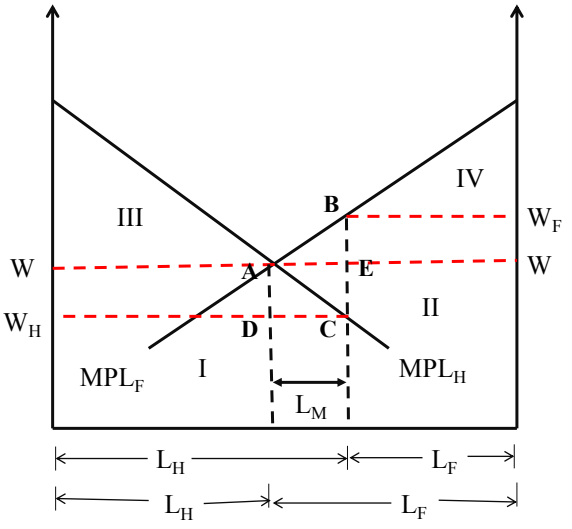
Will our GDP be higher or lower?

Will our per capita income rise or fall?

Will wage earners be better off?

Will owners of capital and land be better off?

How about the nation as a whole?



Migration and Relative Wages

The late 19th century witnessed mass migration from Europe to the "new world."

The data indicate that mass migration in the late 19th century led to wage convergence. Wages rose more rapidly in countries of emigration (origin countries) than in countries of immigration (destination countries)

TABLE 4-1

	Real Wage, 1870 (U.S. = 100)	Percentage Increase in Real Wage, 1870–1913
Destination Countries		
Argentina	53	51
Australia	110	1
Canada	86	121
United States	100	47
Origin Countries		
Ireland	43	84
Italy	23	112
Norway	24	193
Sweden	24	250

Source: Jeffrey G. Williamson, "The Evolution of Global Labor Markets Since 1830: Background Evidence and Hypotheses," *Explorations in Economic History* 32 (1995), pp. 141–196.

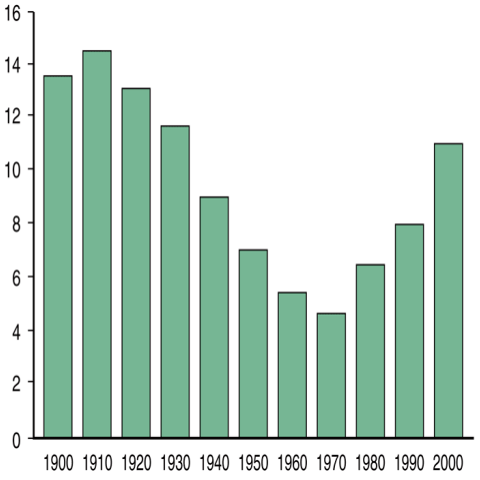
Migration and Relative Wages

In the 1920s the US imposed tough restrictions on immigration and the share of immigrants fell.

The past three decades there has been a resurgence of immigration in the US, mainly from Asia and Latin America.

Have immigrants depressed wages in the US or raised them? Whose wages? Low-skilled? High-skilled?

Immigrants as % of US Population



Questions for discussion

What does this model tell us about who the winners are and who the losers are from international trade and labor migration?

The theory suggests that the all countries gain from trade, but within countries there are always winners and losers. If there are losers, how can we be sure that the country as a whole gains?

In high-income countries, the losses from trade are concentrated on low-income, unskilled workers. Who mainly bears the costs of opening to trade in low-income countries?

Why do economist almost universally advocate for free trade, even though it may hurt poor people? Don't they care about poor people?

Practice Problem

Use this model to predict the income distribution effects of:

1. Technology change that increases the MPL in food
2. Increase in capital stock in cloth
3. Labor union in food that manages to fix wages in food 10% higher than in cloth