

# The Specific Factors Model

## International Trade

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Lecture Slides

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# Outline

- 1 Overview
- 2 The effects of trade
- 3 Further topics

## The Model:

- i. Two sectors of production  $X$  and  $Y$ .
- ii. Three factors of production, two of them are industry specific:

$$X = F(K, L) \quad Y = G(T, L)$$

- iii. Technology is the same across countries.

## **Production pattern:** Incomplete specialization

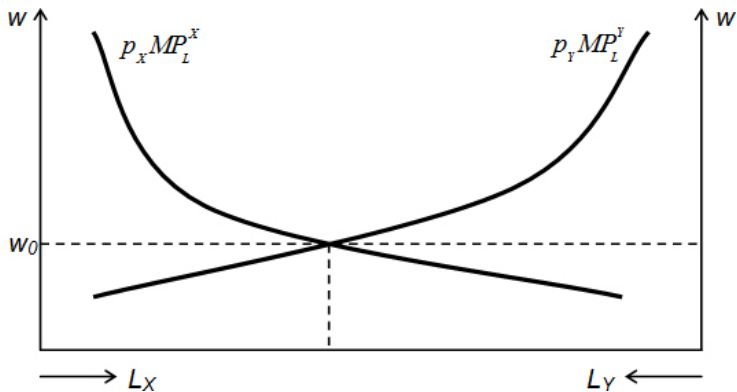
The country will produce on that point of the PPF where the slope equals the relative price of the two goods.

Alternatively, one can use the following graph to determine how much labor will be employed in each sector (and thus, given  $K$ ,  $T$  also the level of production of  $X$  and  $Y$ ).

Assuming that firms face competitive labor markets, they will pay a wage rate that is equal to the value of the marginal product of labor:

$$w = VMP_L^i = p_i MP_L^i.$$

Additionally, labor mobility implies that the wage rates must be equal in both sectors.



## Trade pattern:

Relative price differences across countries: Home exports  $X$  if

$$\left(\frac{p_X}{p_Y}\right) < \left(\frac{p_X}{p_Y}\right)^W.$$

Note: A plentiful specific factor makes it likely that the good that uses it will end up being the exportable good.

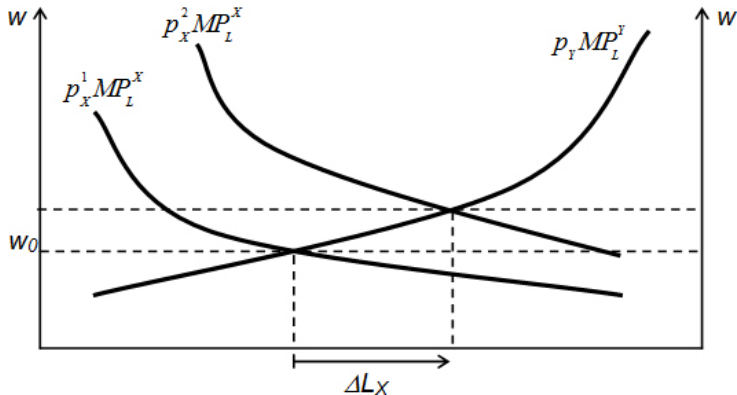
## Effects of international trade on production and the distribution of income

Assume that a country's relative price  $\left(\frac{p_X}{p_Y}\right)$  is smaller than the world market relative price. After opening up for trade, the country faces the world price and will export  $X$  and import  $Y$  (for simplicity assume that  $p_Y$  remains at the initial level and only  $p_X$  rises).

What happens to the production pattern and the income distribution?

## (a) Production:

The sector of export goods ( $X$  in the example) draws more of the mobile factor (labor) and expands at the expense of import competing industries ( $Y$ ).





## (b) The distribution of income:

Who benefits from free trade and who loses?

Factor rental = (good price) · (marginal product of factor)

$$r_K = p_X MP_K^X \qquad MP_K^X = f\left(\frac{L_X}{K}\right)$$

$$r_T = p_Y MP_T^Y \qquad MP_T^Y = f\left(\frac{L_Y}{T}\right)$$

$$w = p_X MP_L^X = p_Y MP_L^Y \qquad MP_L^X = f\left(\frac{K}{L_X}\right), \quad MP_L^Y = f\left(\frac{T}{L_Y}\right)$$

Capital owners:

$$p_X \uparrow, L_X \uparrow \Rightarrow MP_K^X \uparrow \Rightarrow (p_X \uparrow) \cdot (MP_K^X \uparrow) = \underline{\underline{r_K \uparrow}}$$

Land owners:

$$\bar{p}_Y, L_Y \downarrow \Rightarrow MP_T^Y \downarrow \Rightarrow \bar{p}_Y \cdot (MP_T^Y \downarrow) = \underline{\underline{r_T \downarrow}}$$

Workers:

$$\underline{\underline{w \uparrow}} = (p_X \uparrow) \cdot (MP_L^X \downarrow) = \bar{p}_Y \cdot (MP_L^Y \uparrow)$$

But it is ambiguous what happens to the real wage  $\frac{w}{p}$ !

The relative price of the exportable good goes up. The factor specific to that sector is better off while the other specific factor loses. The mobile factor is less affected and could end up either gaining or losing.

Political implications: The issue of free trade will find the specific factors in diametrically opposite positions, each one vying for the support of the mobile factor.

## Effects of factor growth (immigration):

Assume:  $\bar{p}_X$  and  $\bar{p}_Y$

- **Case 1:**  $L \uparrow, \bar{K}, \bar{T}$

$$\underline{\underline{r_K \uparrow}} = (\bar{p}_X) \cdot (MP_K^X \uparrow)$$

$$\underline{\underline{r_T \uparrow}} = (\bar{p}_Y) \cdot (MP_T^Y \uparrow)$$

$$\underline{\underline{w \downarrow}} = (\bar{p}_X) \cdot (MP_L^X \downarrow) = (\bar{p}_Y) \cdot (MP_L^Y \downarrow)$$

The immigration of a factor of production affects the income of the specific factors inversely than that of the mobile factor.

- **Case 2:**  $\bar{L}$ ,  $K \uparrow$ ,  $T \uparrow$

$$\underline{\underline{r_K \downarrow}} = (\bar{p_X}) \cdot (MP_K^X \downarrow)$$

$$\underline{\underline{r_T \downarrow}} = (\bar{p_Y}) \cdot (MP_T^Y \downarrow)$$

$$\underline{\underline{w \uparrow}} = (\bar{p_X}) \cdot (MP_L^X \uparrow) = (\bar{p_Y}) \cdot (MP_L^Y \uparrow)$$

Mobile and immobile factor fortunes move in opposite directions.

## Political alliances:

The specific factors will be united in their support (or opposition) to factor immigration policies (while they are always on different sides concerning trade policy).

## The Dutch disease

A favorable change in international conditions for one exportable sector may spell doom for other exportable sectors:

*Suppose a number of industries produce and sell their products on the world market. For the production they need labor (which is mobile across industries) combined with another factor that is specific to each industry. As the world market price for one of these exportables rises, the industry expands, leading also the wage rate to rise. This increase in wages squeezes the other exporting industries because they also face higher wages (and hence higher MCs) but the world market prices for their goods remains at the former level.*





## Empirical analysis

Key prediction: Political coalitions involved in the design of trade policy are based mostly on industry affiliation rather than on factor ownership!

The empirical evidence from lobbying for US trade agreements favors the SF over the HO prediction

**Table 6.2** Lobbying on the 1973 Trade Reform Act: industry agreement (disagreement) of labor and capital

**Position of the industry's labor**

	<i>Protection</i>	<i>Freer trade</i>
<b>Position of the industry's capital owners</b>	<b>Protection</b>	<b>Tobacco</b>
	<b>Freer trade</b>	<b>Petroleum</b>
	Distilling, Shoes, Chemicals, Textiles, Stone products, Apparel, Iron & steel, Cutlery, Plastics, Hardware, Rubber shoes, Bearings, Leather, Watches	Paper, Machinery Trucks, Aviation, Tractors

Source: Magee (1980).

Summary: The key concept of factor endowments-intensities

- As in HO, the relative national supplies of factors of production coupled with the "preference" for certain factor by certain industries determine the pattern of trade
- International trade can have dramatic implications for the income of specific factors but not for that of the non-specific
- International trade can have dramatic implications for the viability of industries (Dutch disease)
- Specific factors agree on issues of immigration /int'l factor mobility. Disagree on free trade