



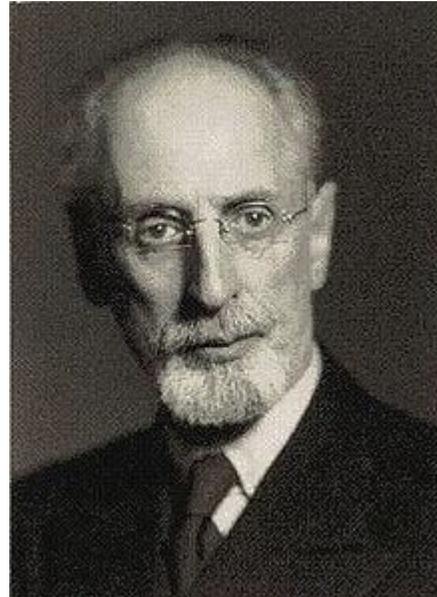
Prof. Dimitar Hadjinikolov, DSc

[www.hadjinikolov.pro](http://www.hadjinikolov.pro)

# Two Factor Theories

1. Heckscher-Ohlin theory of international trade
2. Leontief Paradox
3. Criticism

Under p. 1



Eli Heckscher and Bertil Ohlin. Heckscher (1879-1952) was Swedish political economist and economic historian and Ohlin (1899-1979) - Swedish economist and politician, Minister for Trade from 1944 to 1945. Both are social-liberals.

- **Factor endowment**—the quantities of productive resources possessed by a country
- **Factor intensity**—the amount of labor per unit of capital used in production of a product

- **Factor abundance** versus **factor scarcity**: When a country enjoys a **relative abundance** of a factor, the **factor's relative cost** is less than in countries where the factor is **relatively scarce**
- A country's **comparative advantage** lies in the production of goods that use relatively abundant factors

**The recommendation is to export goods** that intensively use factor endowments which are locally **abundant**.

So ... A country that is relatively **labor abundant** (*capital abundant*) should specialize in the production and export of that product which is relatively **labor intensive** (*capital intensive*).

**Q: Which goods are labor intensive and which are capital intensive?**

## Country Factor Abundance

- Country A is *relatively* capital-abundant if:

$$K_A / L_A > K_B / L_B$$

Obviously, County B would be *labor*-abundant :

$$L_B / K_B > L_A / K_A$$

Let's take two economies (EU and India) and two factors (labor and capital)

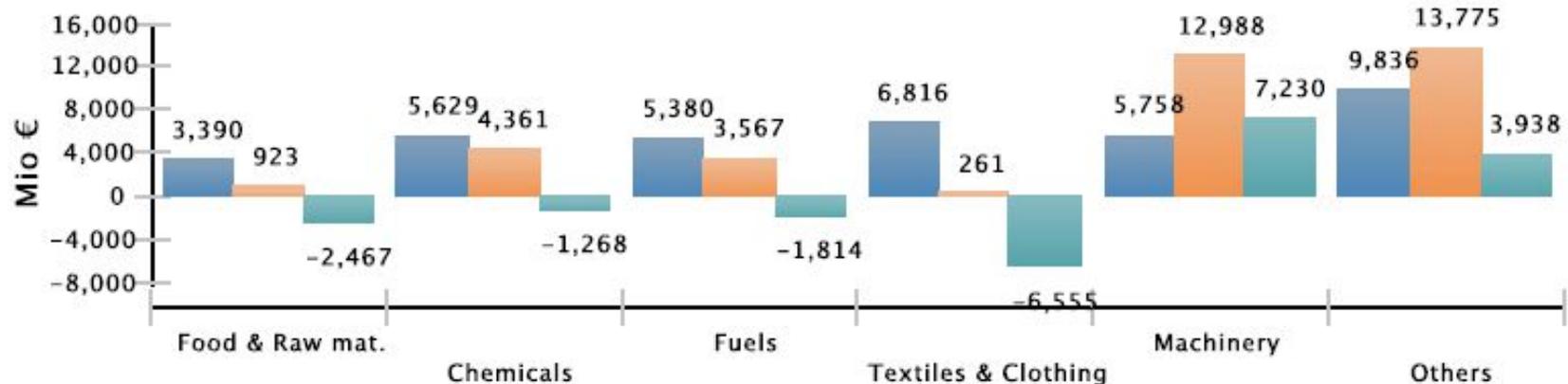
EU is *capital-abundant* compared to India (and India is *labor-abundant* compared to EU) *if and only if* the ratio of the total amount of capital to the total amount of labor (K/L) available in EU is greater than that in India.

- **EU's capital-labor ratio is higher, it is the relatively capital abundant economy.**
- $(K_{EU} / L_{EU} > K_{Ind.} / L_{Ind.})$
- India is relatively labor abundant economy.

EU will export capital-intensive goods (machinery) and India labor-intensive goods (textile, cloths).

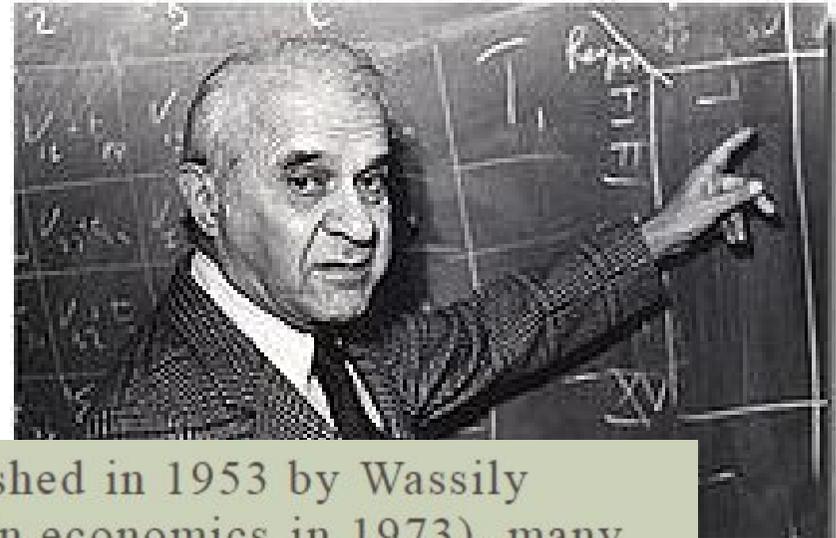
**Q: Is it true?**

EU Merchandise trade with India by product (2013) - SITC\* (UN) & AMA/NAMA



**Q: What will happen if EU exports capital to India, or India labor to EU?**

## 2. Leontief Paradox



- Beginning with a famous study published in 1953 by Wassily Leontief (winner of the Nobel Prize in economics in 1973), many of these tests have raised questions about the validity of the Heckscher-Ohlin theory
- Using the Heckscher-Ohlin theory, Leontief postulated that since the United States has relatively abundant capital compared to other nations, the United States would be an exporter of capital-intensive goods and an importer of labor-intensive goods
- To his surprise, however, he found that U.S. exports were less capital intensive than U.S. imports. Since this result was at variance with the predictions of the theory, it has become known as the Leontief **paradox**.

- No one is quite sure why we observe the Leontief paradox. One possible explanation is that the United States has a special advantage in producing new products or goods made with innovative technologies.
- Such products may be less capital intensive than products whose technology has had time to mature and become suitable for mass production. Thus, the United States **may be exporting goods that rely heavily on *skilled labor and innovative entrepreneurship*, such as computer software, while importing heavy manufacturing products that use large amounts of capital.** Some empirical studies tend to confirm this.
- Tests using data for a large number of countries tend to confirm the existence of the Leontief paradox.

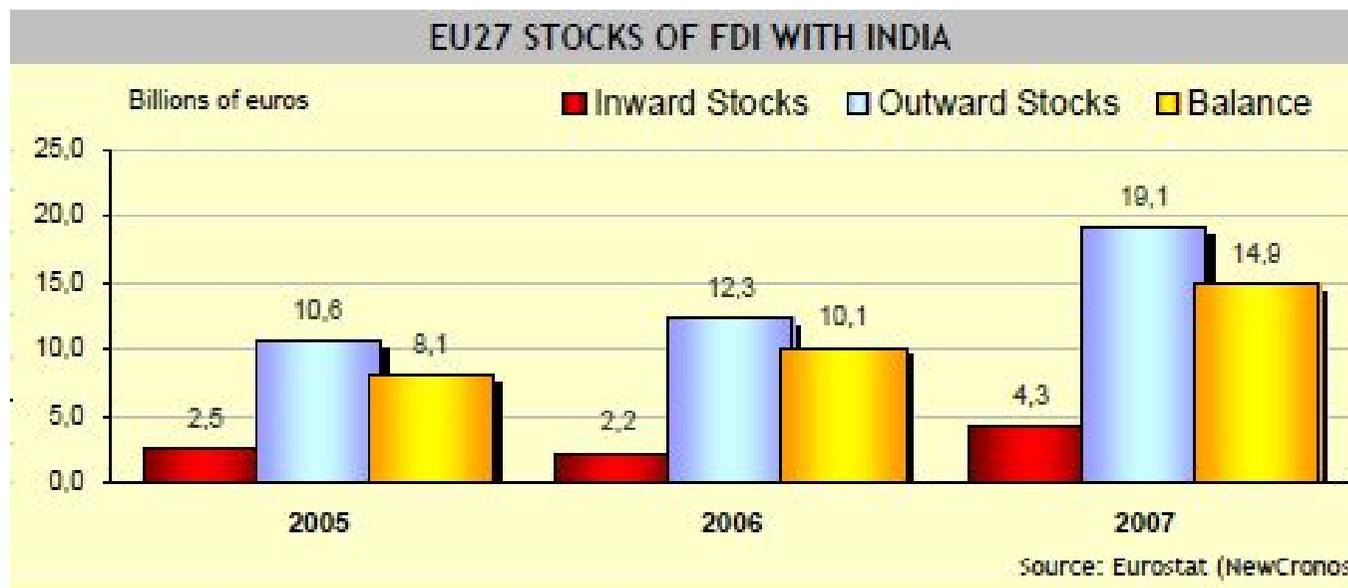
**Some years ago oil was with the highest dollar value in UK global shipments!**

### 3. Criticism

1) Too many Assumptions (limitations) in the H-O model:

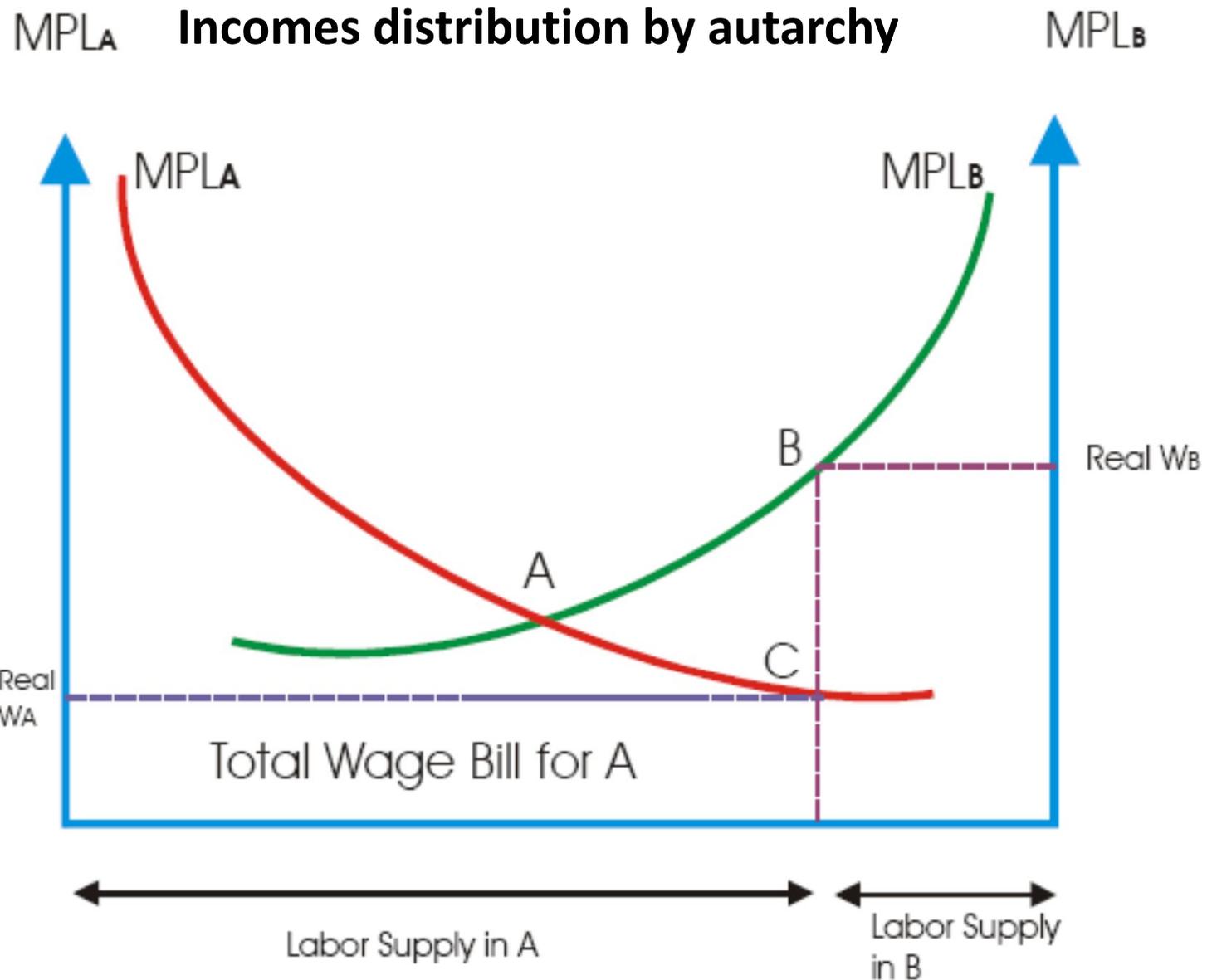
- No transport costs
- Consumer preferences are identical for all individuals
- The same technological knowledge is available everywhere
- The mix of labor and capital used in production varies across goods.
- The supply of labor and capital in each country is constant and varies across countries.
- Both labor and capital can move across sectors.

2) H-O model ignores the impact of exports of capital (outsourcing) or exports of labor



**Q: What will happen if, due to the exports of capital, all countries became capital abundant?  
Will the international trade stop?**

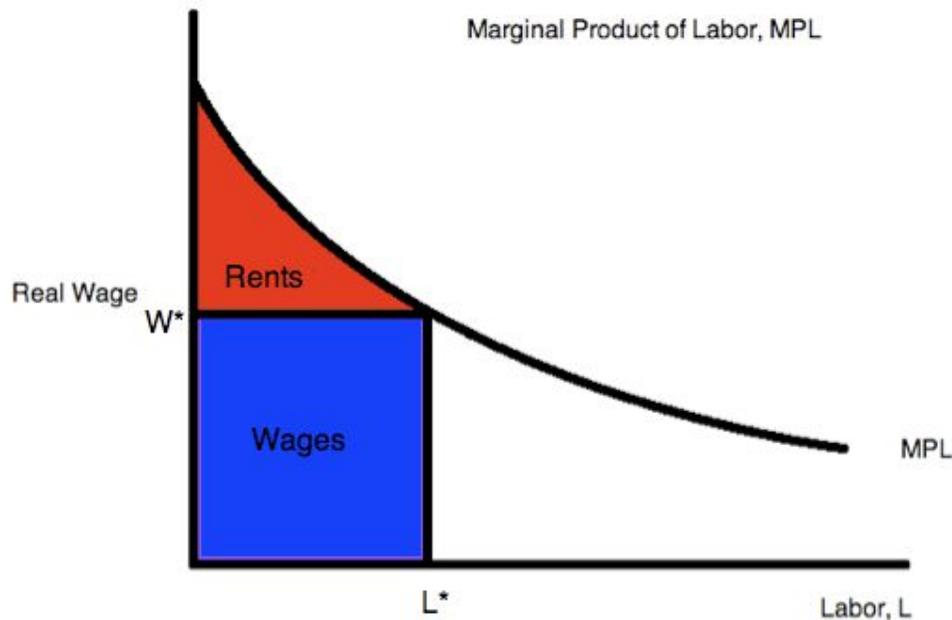
# Impact of exports of labor



The marginal product of a factor of production is generally defined as the change in output associated with a change in that factor, holding other inputs into production constant.

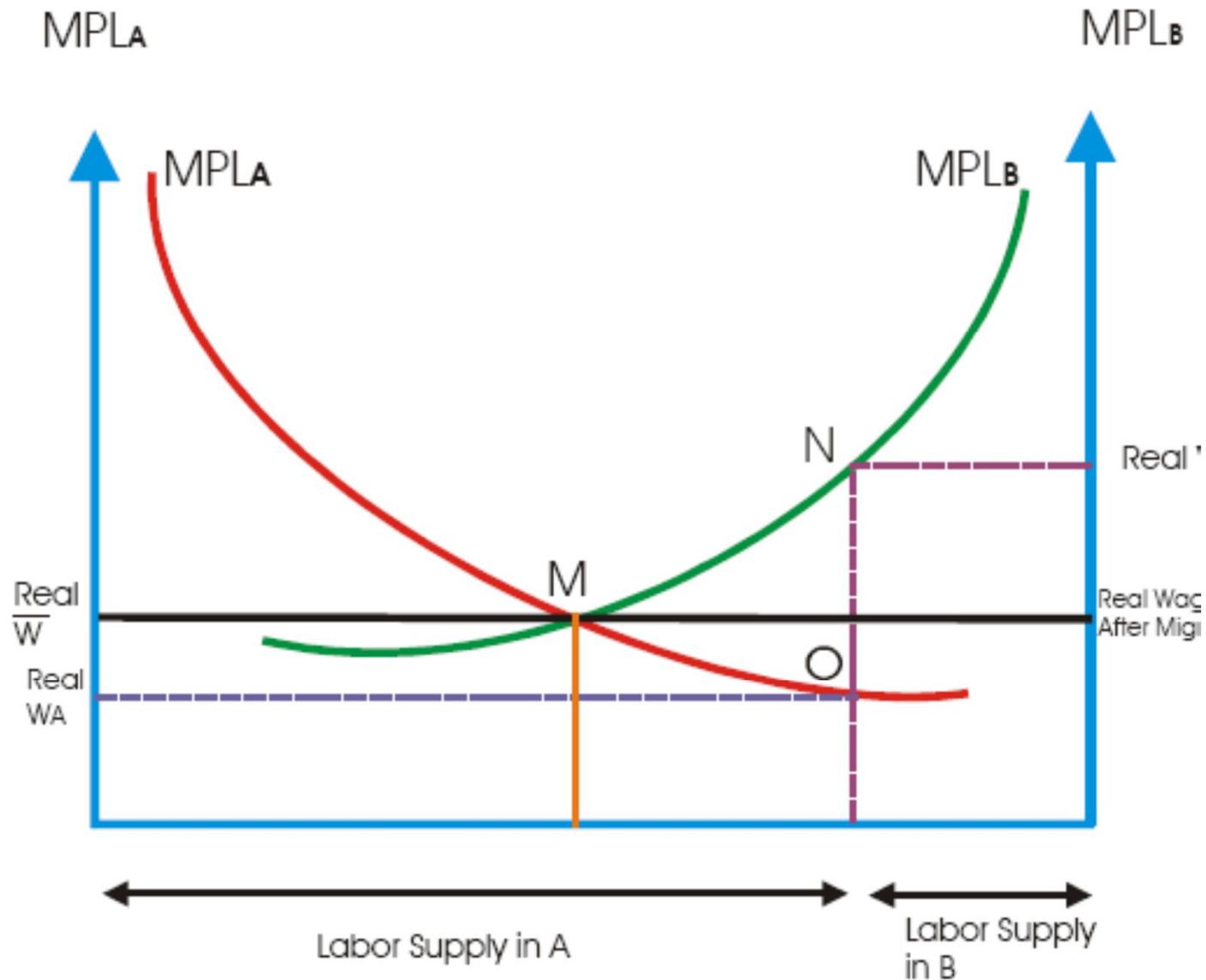
The marginal product of labor is then the change in output ( $Y$ ) per unit change in labor ( $L$ ). In discrete terms the marginal product of labor is:

$$\frac{\Delta Y}{\Delta L}$$



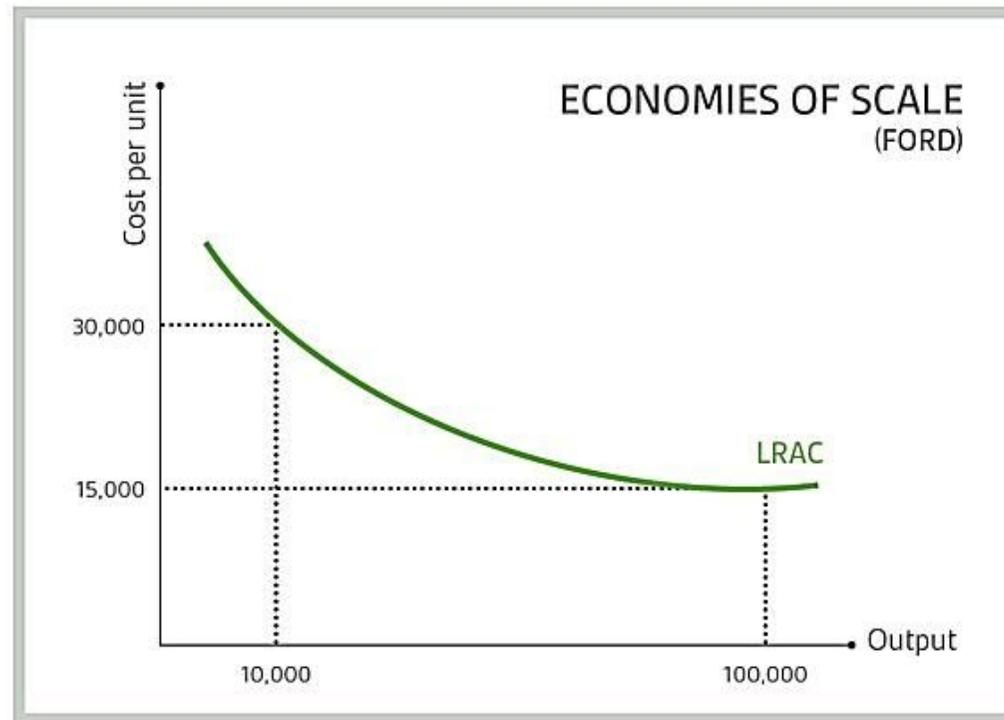
Marginal Product of Labor		
Labor (number of employees)	Output (number of toys per hour)	Marginal Product of labor
0	0	0
1	6	6
2	11	5
3	14	3
4	21	7
5	22	1
6	24	2
7	28	3
8	27	-1
9	28	1
10	26	-2

## Situation after the exports of labor



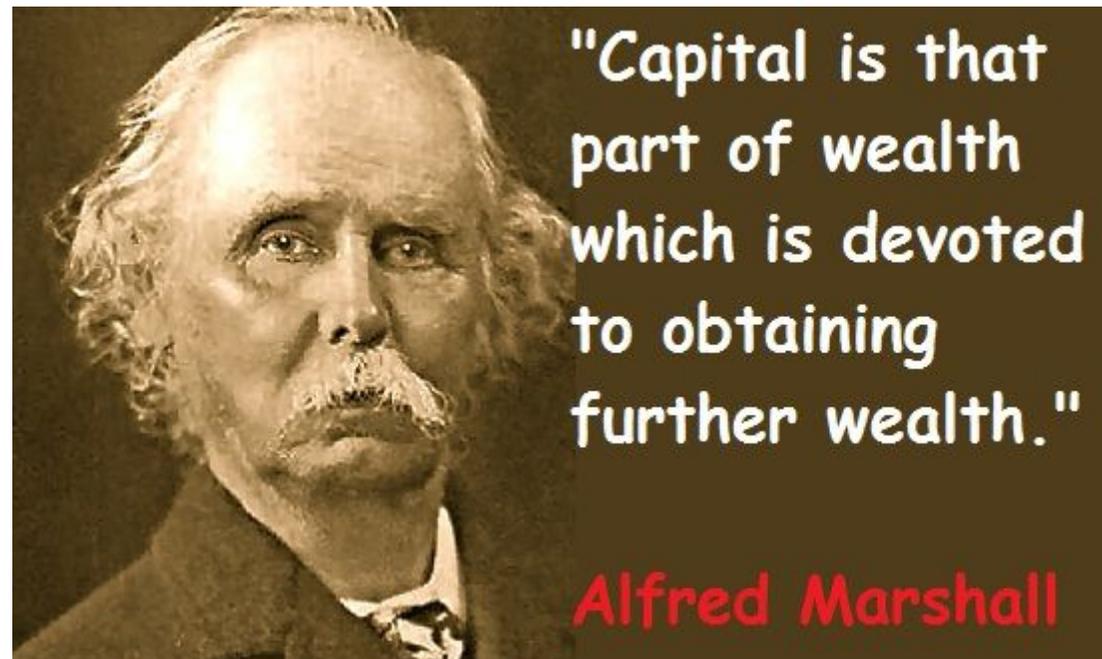
**Q: Who are the winners and who are the losers?**

The H-O model ignores also the impact of Economies of scale.



**When more units of a good or a service can be produced on a larger scale, yet with (on average) less input costs, economies of scale (ES) are said to be achieved. Alternatively, this means that as a company grows and production units increase, a company will have a better chance to decrease its costs. According to theory, economic growth may be achieved when economies of scale are realized.**

**Alfred Marshall made a distinction between internal and external ES. When a company reduces costs and increases production, internal economies of scale have been achieved. External economies of scale occur outside of a firm, within an industry. Thus, when an industry's scope of operations expands due to, for example, the creation of a better transportation network, resulting in a subsequent decrease in cost for a company working within that industry, external economies of scale are said to have been achieved. With external ES, all firms within the industry will benefit.**



**Q: Are there also international economies of scale?**