Economics of Globalization

Sébastien Laffitte
CY Cergy Paris University

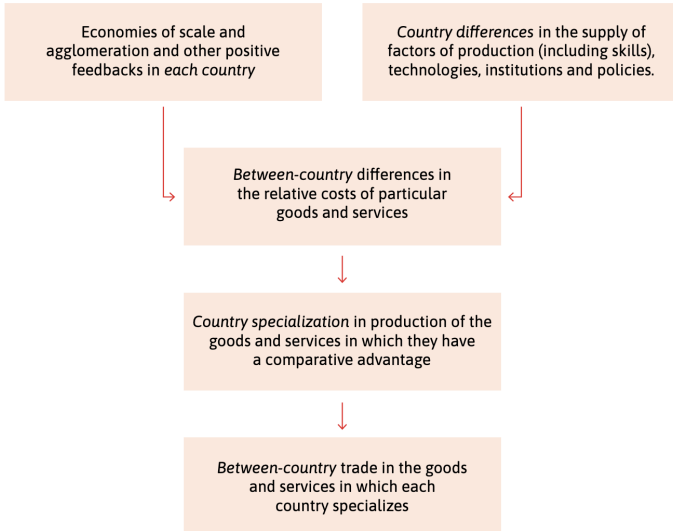
Last week

- We analyzed the Ricardian model to understand why countries trade, and what they trade.

Last week

- We analyzed the Ricardian model to understand why countries trade, and what they trade.
- Model where two countries differ only by their technology.
- Trade can be beneficial to all countries if they specialize in their comparative advantage.
- Gains are coming from the specialization, and the international division of labor.

Last week


Economies of scale and agglomeration and other positive feedbacks in *each country*
Country differences in the supply of factors of production (including skills), technologies, institutions and policies.
Between-country differences in the relative costs of particular goods and services
Country specialization in production of the goods and services in which they have a comparative advantage
Between-country trade in the goods and services in which each country specializes

This week

- Technology differences are only one reason for which countries trade.
- Today we will study the role of factor endowments.
- We will study the model of Hecksher-Ohlin (HO).
- We will introduce several factors of production.
- Now that there is within-country heterogeneity, there might be **distributive conflicts**.

The role of endowments

- Ricardo assumes that there is only one factor of production: labor.
- However, it is clear that labor is not the only factor generating international trade.
- *e.g.* Canada is exporting more forest products than the U.S. not necessarily because its lumberjacks are more productive, but also because there is a lot of forested land.
- HO is a model of comparative advantages, generated by the intersection of

The role of endowments

- Ricardo assumes that there is only one factor of production: labor.
- However, it is clear that labor is not the only factor generating international trade.
- *e.g.* Canada is exporting more forest products than the U.S. not necessarily because its lumberjacks are more productive, but also because there is a lot of forested land.
- HO is a model of comparative advantages, generated by the intersection of
  - factor abundance (nation resources),

The role of endowments

- Ricardo assumes that there is only one factor of production: labor.
- However, it is clear that labor is not the only factor generating international trade.
- *e.g.* Canada is exporting more forest products than the U.S. not necessarily because its lumberjacks are more productive, but also because there is a lot of forested land.
- HO is a model of comparative advantages, generated by the intersection of
  - factor abundance (nation resources),
  - production technology (relative use of different resources for production).

The role of endowments

- Ricardo assumes that there is only one factor of production: labor.
- However, it is clear that labor is not the only factor generating international trade.
- *e.g.* Canada is exporting more forest products than the U.S. not necessarily because its lumberjacks are more productive, but also because there is a lot of forested land.
- HO is a model of comparative advantages, generated by the intersection of
  - factor abundance (nation resources),
  - production technology (relative use of different resources for production).
- Because different factors will be affected differently by trade, there will be distributional consequences.
  - Is trade with low-wage countries to blame for the observed increase of inequalities in the North?
- To isolate the causal role of factor abundance, the model “closes” the other channels.

The HO model

- As in Ricardo gains are generated by relative price differences
- As in Ricardo, trade will generate net gains.
- However, the difference in productivity emerges from a difference in factor abundance.
- It generates incomplete specialization.
- There are winners and losers to trade.

The HO model

The big question behind the HO model.

- Is trade to blame for the observed increase in inequalities?

The HO model

Assumptions

- 2 goods, 2 countries, **2 production factors**
  - Capital (K) and Labor (L) or high-skilled labor and low-skilled labor.
- Different endowments in each countries.
- Different capital intensities across goods: one is capital-intensive (*e.g.* cars or food), the other is labor-intensive (*e.g.* clothes).

The HO model

The Hecksher-Ohlin theorem

- Contrary to the Ricardian model, producers have to choose the optimal combination of factors to produce a good: $Q_X = f(L, K)$.

- The choice of inputs depends on their relative price ($\frac{w}{r}$). If capital rental rates are high and wages are low, the producer will chose to employ relatively more labor.

The HO model

The Hecksher-Ohlin theorem

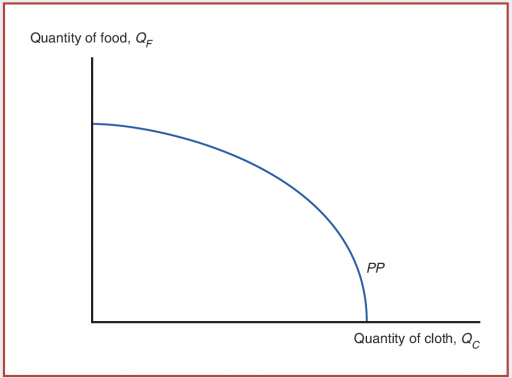


FIGURE 5-2

The Production Possibility Frontier with Factor Substitution

If capital can be substituted for labor and vice versa, the production possibility frontier no longer has a kink. But it remains true that the opportunity cost of cloth in terms of food rises as the economy's production mix shifts toward cloth and away from food.

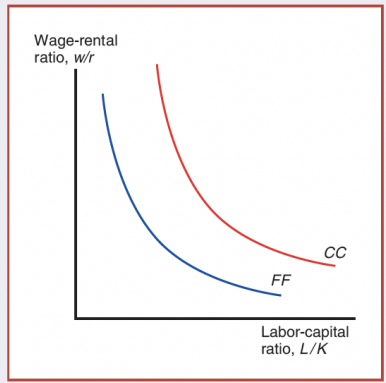
The HO model

The Hecksher-Ohlin theorem

FIGURE 5-5

Factor Prices and Input Choices

In each sector, the ratio of labor to capital used in production depends on the cost of labor relative to the cost of capital, w/r. The curve *FF* shows the labor-capital ratio choices in food production, while the curve *CC* shows the corresponding choices in cloth production. At any given wage-rental ratio, cloth production uses a higher labor-capital ratio; when this is the case, we say that cloth production is *labor-intensive* and that food production is *capital-intensive*.



The HO model

The Hecksher-Ohlin theorem

- Perfect competition implies zero-profit and then the price of the good equals its cost of production.
- A rise in wages implies a rise in the good's price.
- But if very few labor is used in the production of the good (case of a capital-intensive good), then the price will not increase a lot.
- Then, there is a relationship between the relative factor costs and the relative prices.

The HO model

The Hecksher-Ohlin theorem

FIGURE 5-6

Factor Prices and Goods Prices

Because cloth production is labor-intensive while food production is capital-intensive, there is a one-to-one relationship between the factor price ratio w/r and the relative price of cloth P_C/P_F; the higher the relative cost of labor, the higher must be the relative price of the labor-intensive good. The relationship is illustrated by the curve *SS*.

The HO model

The Hecksher-Ohlin theorem

- What happens when countries open to trade?
- Remember that both countries have the same technologies and only differ in terms of endowments.
- Assume that Home has a larger ratio of labor to capital: Home is labor-abundant, and Foreign is capital-abundant.
- Home's production possibility frontier is shifted out in the direction of producing more the labor-intensive good.

The HO model

The Hecksher-Ohlin theorem

- Trade leads to a convergence of relative prices (remember Ricardo).
- For any given ratio of the price of cloth to food, Home produces a higher ratio of cloth to food than foreign.
- Home will have a larger relative supply of the labor-intensive good.
- The price of the labor-intensive good rises in Home and decreases in Foreign.
- The economy exports the good whose relative price increases.
- Home then exports the labor-intensive good and Foreign the capital-intensive good.

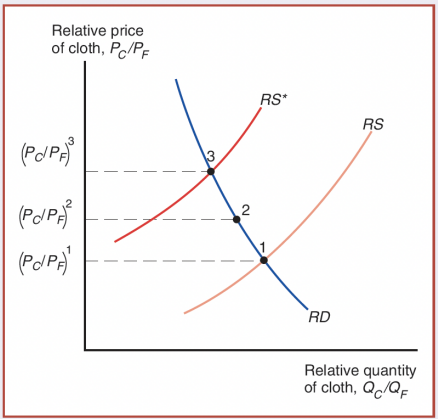
The HO model

The Hecksher-Ohlin theorem

FIGURE 5-9

Trade Leads to a Convergence of Relative Prices

In the absence of trade, Home's equilibrium would be at point 1, where domestic relative supply *RS* intersects the relative demand curve *RD*. Similarly, Foreign's equilibrium would be at point 3. Trade leads to a world relative price that lies between the pretrade prices $(P_C/P_F)^1$ and $(P_C/P_F)^3$, such as $(P_C/P_F)^2$ at point 2.



The HO model

The Hecksher-Ohlin theorem

- **The country that is abundant in a factor exports the good whose production is intensive in that factor.**
- This theorem predicts the patterns of trade.
- Why is it the case?

The HO model

The Hecksher-Ohlin theorem

- **The country that is abundant in a factor exports the good whose production is intensive in that factor.**
- This theorem predicts the patterns of trade.
- Why is it the case?
- Because it is relatively cheaper to produce the good that is intensive in the factor you are abundant in.

$\longrightarrow$ Factor abundance creates comparative advantages and then determine the pattern of trade.

The HO model

- Trade affects relative prices, which affects in return relative factor earnings.
- A rise in the price of the labor-intensive factor increases the purchasing power of labor in terms of both goods.
- What is the impact on inequalities?

The HO model

- Owners of a country's abundant factor gain from trade, but owners of country's scarce factors lose.

The HO model

- Owners of a country's abundant factor gain from trade, but owners of country's scarce factors lose.
  - Western countries (*e.g.* USA, France, Germany) are relatively abundant in capital or high-skill labor $\longrightarrow$ increase in their remuneration while (low-skill) labor loses $\longrightarrow$ increase in inequalities.

The HO model

- Owners of a country's abundant factor gain from trade, but owners of country's scarce factors lose.
  - Western countries (*e.g.* USA, France, Germany) are relatively abundant in capital or high-skill labor $\longrightarrow$ increase in their remuneration while (low-skill) labor loses $\longrightarrow$ increase in inequalities.
  - China was relatively abundant in (low-skill) labor $\longrightarrow$ increase in its remuneration $\longrightarrow$ decrease in inequalities.

The HO model

- Owners of a country's abundant factor gain from trade, but owners of country's scarce factors lose.
  - Western countries (*e.g.* USA, France, Germany) are relatively abundant in capital or high-skill labor $\longrightarrow$ increase in their remuneration while (low-skill) labor loses $\longrightarrow$ increase in inequalities.
  - China was relatively abundant in (low-skill) labor $\longrightarrow$ increase in its remuneration $\longrightarrow$ decrease in inequalities.
- Relatively scarce factors are relatively expensive compared to prices elsewhere when there is no trade. When their economies start trading with the rest of the world their price is dragged down towards the world average, because they are effectively competing with their abundant counterparts in the rest of the world.

The HO model

Takeaways

- In a world where there are two goods and two factors of production, there is a close relationship between the relative price of goods and the relative price of factors.
- A rise in the relative price of the capital-intensive good increase strongly the relative remuneration of capital. The real price of capital rises in terms of both goods.
- Similarly, the remuneration of labor (i.e. wages) decreases in terms of both goods.
- The converse is true when the relative price of the labor-intensive good increases.
- HO theory of trade: Countries tend to export goods that are intensive in the factors with which they are abundantly supplied.

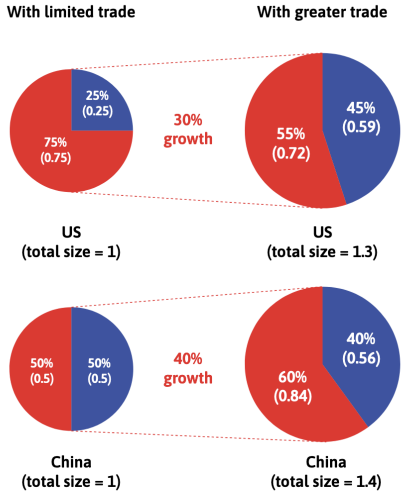
The HO model

Takeaways

- International trade has strong distributional effects!
- The owners of a country's abundant factors gain from trade, but the owners of scarce factors lose. In theory, there are still gains from trade, in the limited sense that the winners **could** compensate the losers and everyone would be better off.

The HO model

Takeaways



The HO model

Empirical tests

- The HO theory predicts the pattern of trade.
- Empirical tests tend to show that actual trade does follow HO, only when one relax the assumption of identical technologies (Trefler, 1995).
- In reality, a mix of Ricardo and HO seem to explain well many patterns of trade.

The HO model

Empirical tests

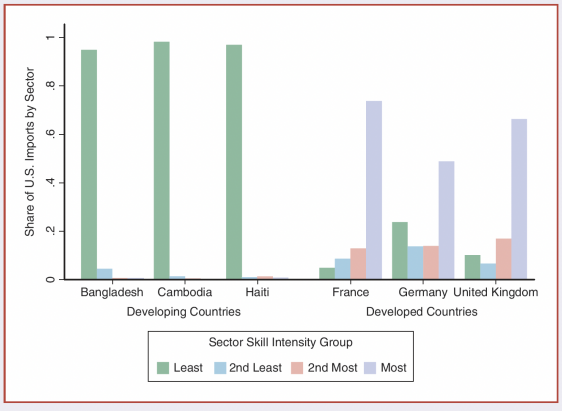


FIGURE 5-13

Export Patterns for a Few Developed and Developing Countries, 2008–2012

Source: NBER-CES U.S. Manufacturing Productivity Database, U.S. Census Bureau, and Peter K. Schott, "The Relative Sophistication of Chinese Exports," *Economic Policy* (2008), pp. 5–49.

The HO model

Empirical tests

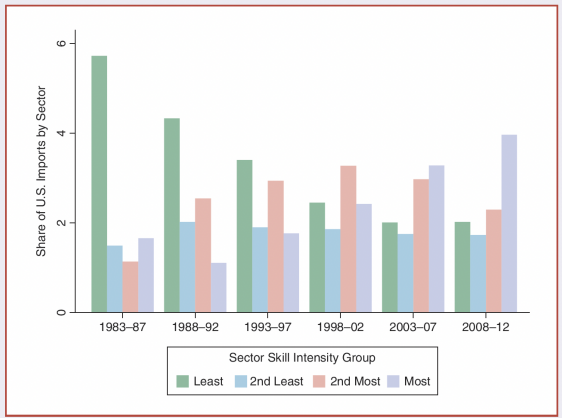


FIGURE 5-14

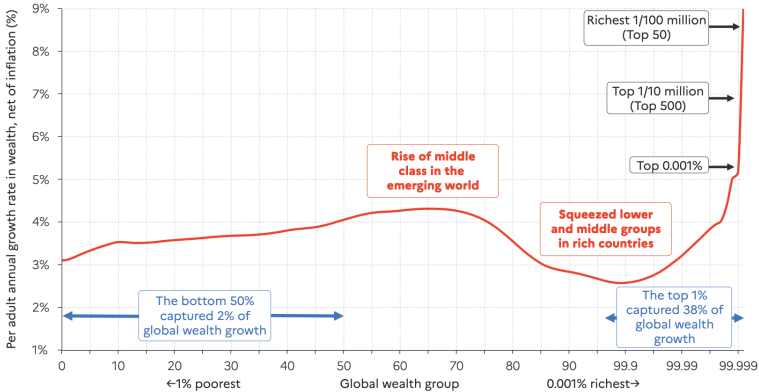
Changing Pattern of Chinese Exports over Time

Source: NBER-CES U.S. Manufacturing Productivity Database, U.S. Census Bureau, and Peter K. Schott, "The Relative Sophistication of Chinese Exports," *Economic Policy* (2008), pp. 5–49.

The HO model

Empirical tests

Figure 9 *Average annual wealth growth rate, 1995-2021*



Interpretation: *Growth rates among the poorest half of the population were between 3% and 4% per year, between 1995 and 2021. Since this group started from very low wealth levels, its absolute levels of growth remained very low. The poorest half of the world population only captured 2.3% of overall wealth growth since 1995. The top 1% benefited from high growth rates (3% to 9% per year). This group captured 38% of total wealth growth between 1995 and 2021. Net household wealth is equal to the sum of financial assets (e.g. equity or bonds) and non-financial assets (e.g. housing or land) owned by individuals, net of their debts.* ***Sources and series:*** *wir2022.wid.world/methodology.*

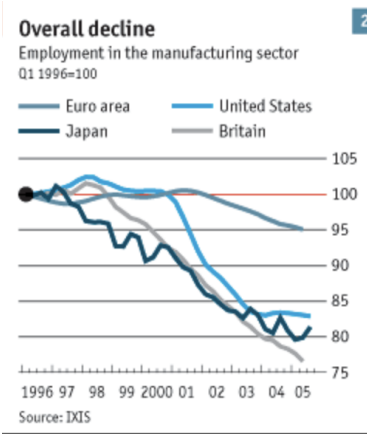
How trade affect exposed workers?

The China Shock

- Trade has been pointed as an important source of the decline in manufacturing employment in Western economies.

- In particular, China entered the WTO in 2001. Why should it matter?
  - No impact on trade barriers (China had the MFN status) since the 80'.
  - Pushed reallocation from small state-owned enterprises to private firms.
  - Greater access to inputs
  - Less uncertainty

  $\longrightarrow$ Annual rise in productivity of 8%



How trade affect exposed workers?

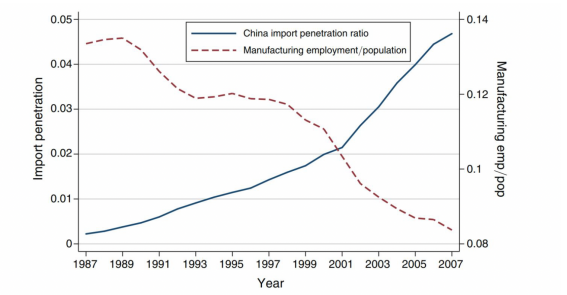
The China Shock

- Autor, Dorn, Hanson (2013): Chinese export competition reduced U.S. manufacturing employment (it can explain 16% of the observed decline tween 2000 and 2007).

- Stronger effect for least skilled workers (in line with HOS!).

- Effect different from the effect of technology.

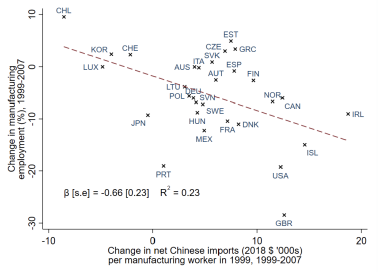
- Key question: are the losses offset by gains of exporters? By decrease in prices?



How trade affect exposed workers?

The China Shock

- Many Western countries affected.

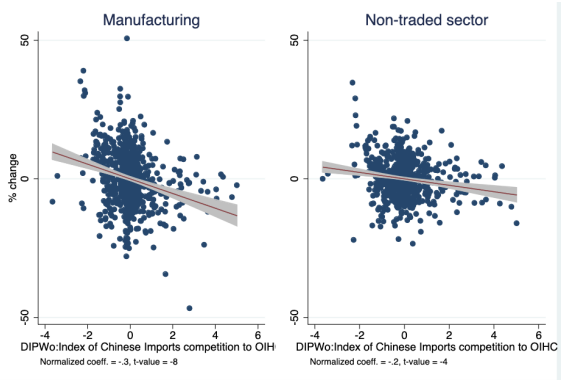


Source: Authors' calculations from OECD STAN database and UN Comtrade data. Figures are for OECD countries excluding Israel, Latvia, New Zealand and Turkey (which do not report manufacturing employment over the relevant time period) and the Netherlands and Belgium (see footnote 30).

How trade affect exposed workers?

The China Shock

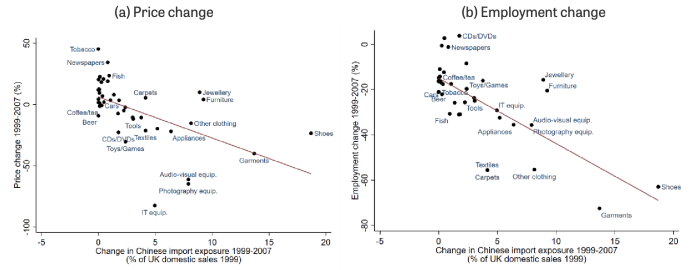
- Many Western countries affected.
- France (Malgouyres, 2017): Spill-overs on non-manufacturing sectors.
- Germany (Dauth et al., 2014): much of the shock comes from East-Europe countries after the fall in the iron curtain. Gains in export-oriented industries more than compensate losses.
- Norway (Balsvik et al., 2015): 10% of the decline in manufacturing job.



How trade affect exposed workers?

The China Shock

Figure 6. Change in Chinese import exposure, price changes and employment changes, 1999–2007

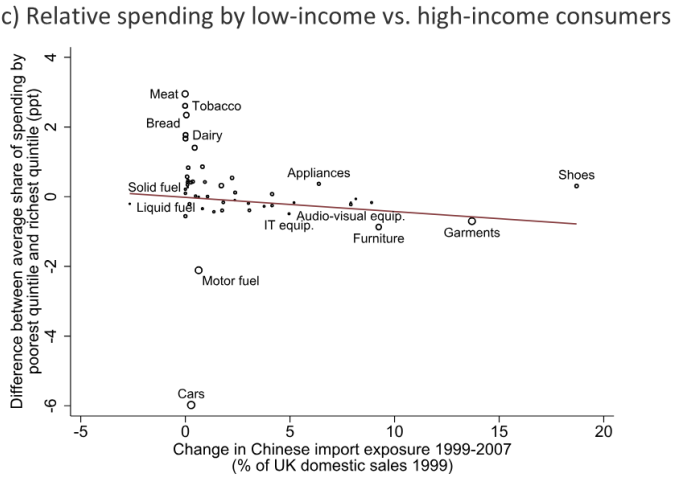


Note: Figures exclude services and fuel. Chinese imports include imports from Hong Kong.

Source: Authors' calculations using data from the CPI, UN Comtrade and the Business Structure Database. Employment data from the Office for National Statistics (2020).

How trade affect exposed workers?

The China Shock



How trade affect exposed workers?

What has HOS missed?

- Workers not perfectly mobile across sectors and regions.
- Labour markets adjust to shocks not only via wages but also through changes in employment levels.