Lecture 1: Gobalization and Comparative Advantages

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Course Overview

1. Globalization and comparative advantages
2. The neo-classical model of international trade
3. International trade under imperfect competition
4. Trade policies
5. Economic geography
6. Intertemporal choice and the balance of payments
7. The foreign-exchange market
8. The equilibrium exchange rate
9. Foreign exchange crises

Today's Course

- Globalization : Historical perspective
- Questions raised by globalization
- The theory of comparative advantages

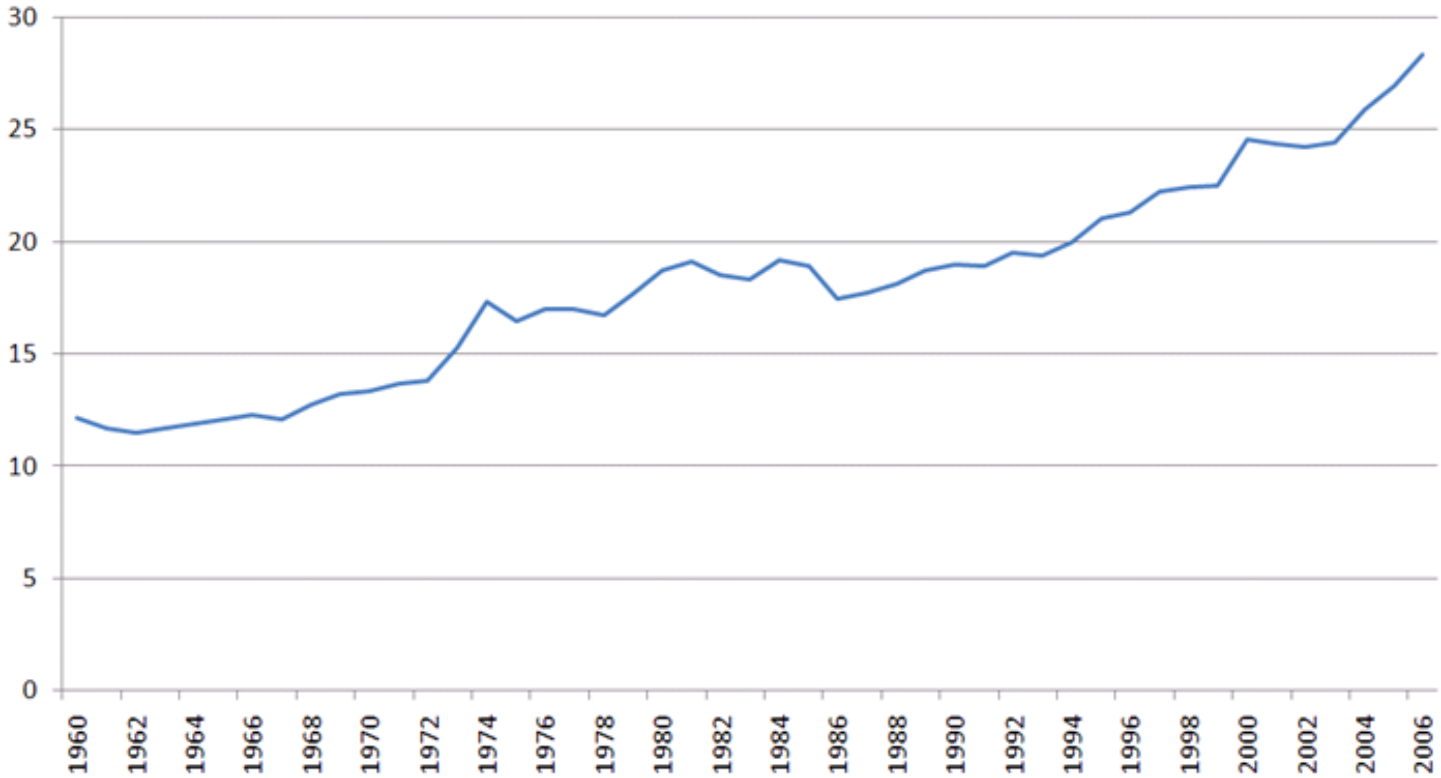
Definition

- What does globalization mean ?
  - Integration of national economies into the international economy through trade, foreign direct investment, capital flows, migration, and the spread of technology
  - $\Rightarrow$ **Exchange of goods, services, assets, labor across countries**
  - Microeconomic impact : Firms' strategy in a globalized environment (export/domestic sales, international supply chain, etc.)
  - Macroeconomic impact : Interdependence between countries, Transmission of shocks (eg. financial crisis)

Globalization : Historical perspective

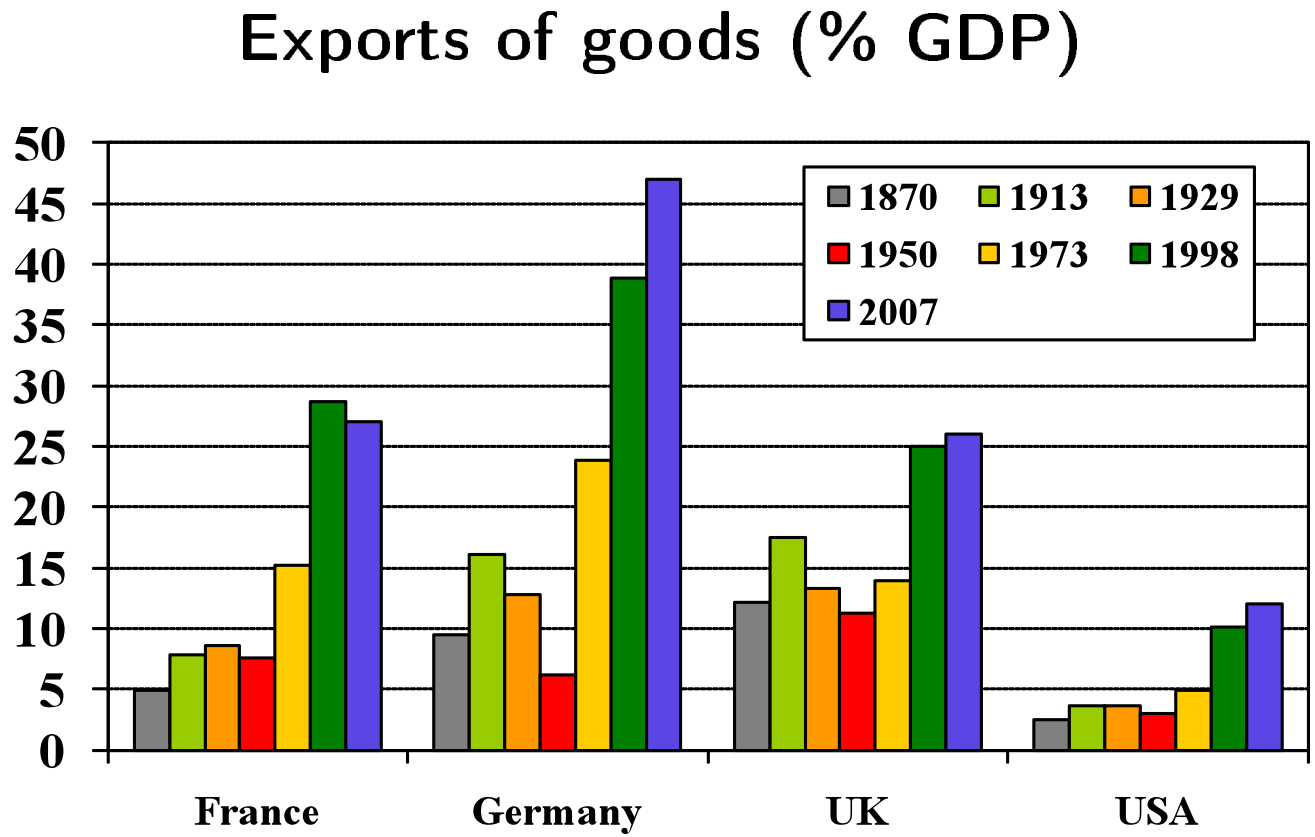
World trade over time : Rising openess

World exports of goods and services, % of world GDP



Source : IMF, World Development Indicators

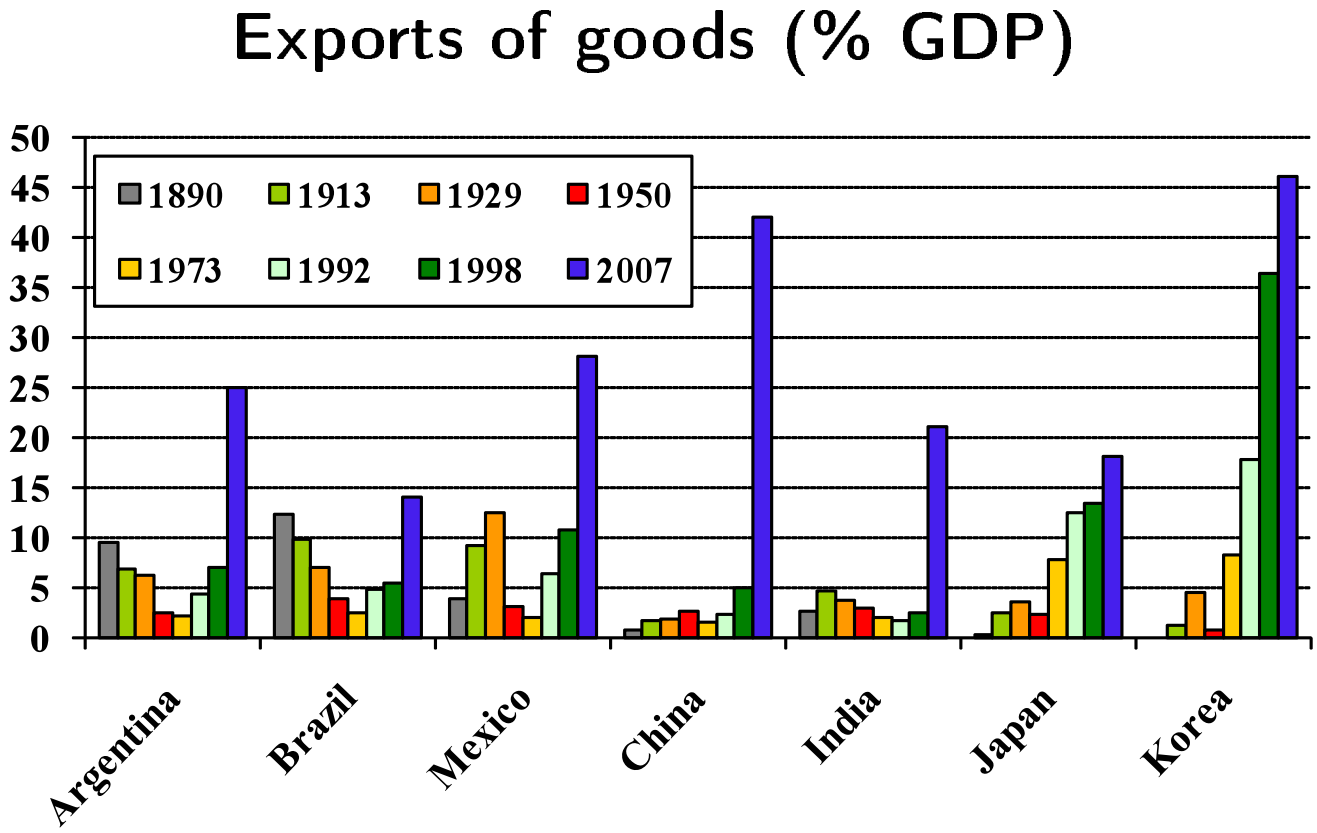
World trade over time : Non-smooth process



Source : Baldwin & Martin (1999), CEPII-CHELEM database.

- Globalization is not entirely new : 1870-1914, 1960- ?
- Globalization is not irreversible : Aftermath of Great Depression

World trade over time : Heterogeneous across countries



Source : Baldwin & Martin (1999), CEPII-CHELEM database.

- Globalization is more recent (but very sharp) in the South

Two episodes of globalization

- **1870-1914, "Golden Age" of Trade**
  - Fall in transportation costs (railway, steamboat, telegraph)
  - Europe's colonial expansion $\longrightarrow$ trade in raw material, agriculture
  - Industrialization in the North, dis-industrialization in the South
  - Long-run capital flows (railway)
  - Gold Standard

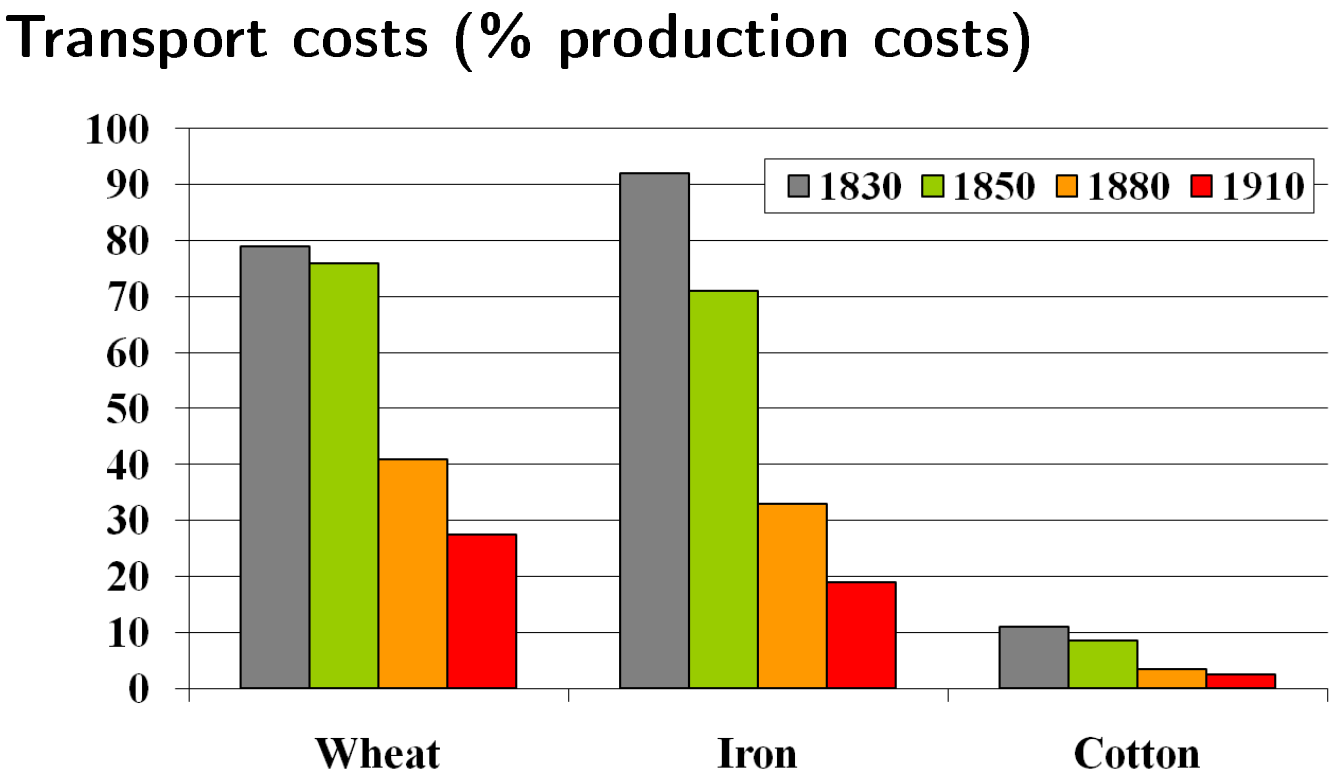
$\Rightarrow$ Stopped by WWI, Protectionist Pressures during the Great Depression (eg Smoot-Hawley tariffs in the US) and until the end of WWII

Two episodes of globalization (2)

- **1960- ?, Second "Golden Age" of Trade ?**
  - Fall in transportation costs (shipping container, telecom, internet)
  - North-North intra-industry trade (manufactured goods)
  - Industrialization in the South (high growth rates + multinationals + intra-firm trade)
  - From 1980, financial liberalization $\longrightarrow$ Increase in capital flows (three times faster than trade growth from 1990)
  - Regional trade
  - Until 1973, Fixed exchange rates

$\Rightarrow$ Note : Protectionist pressures in the aftermath of the financial crisis

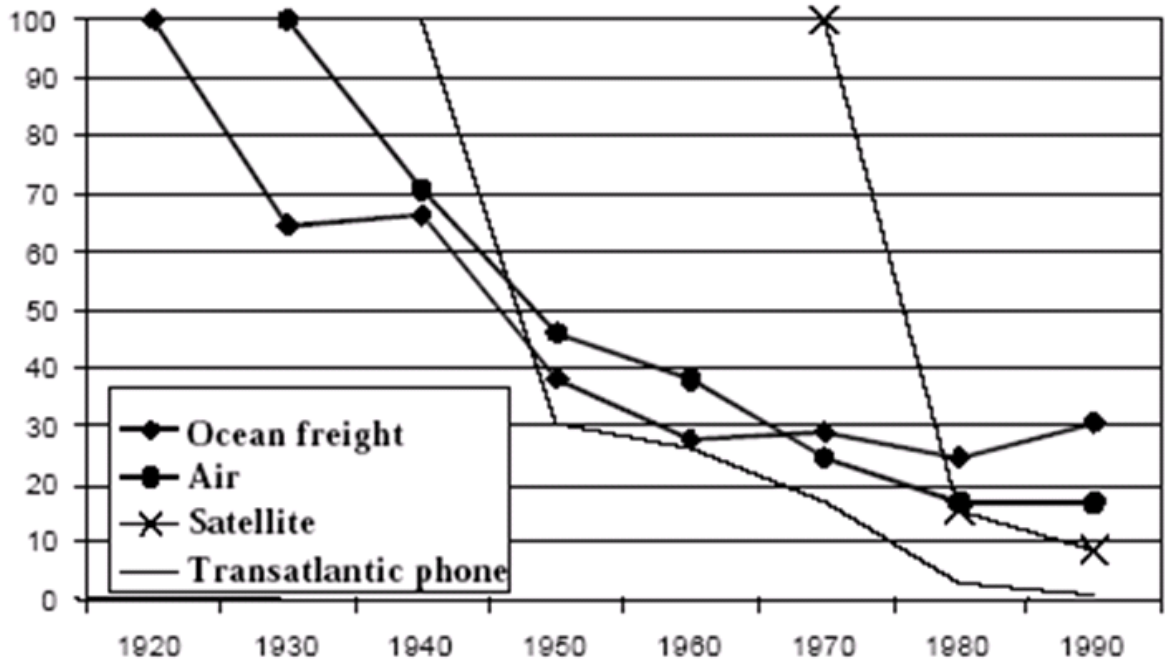
Transport costs



Source : Baldwin & Martin (1999)

Transport costs (2)

Transportation and communication costs



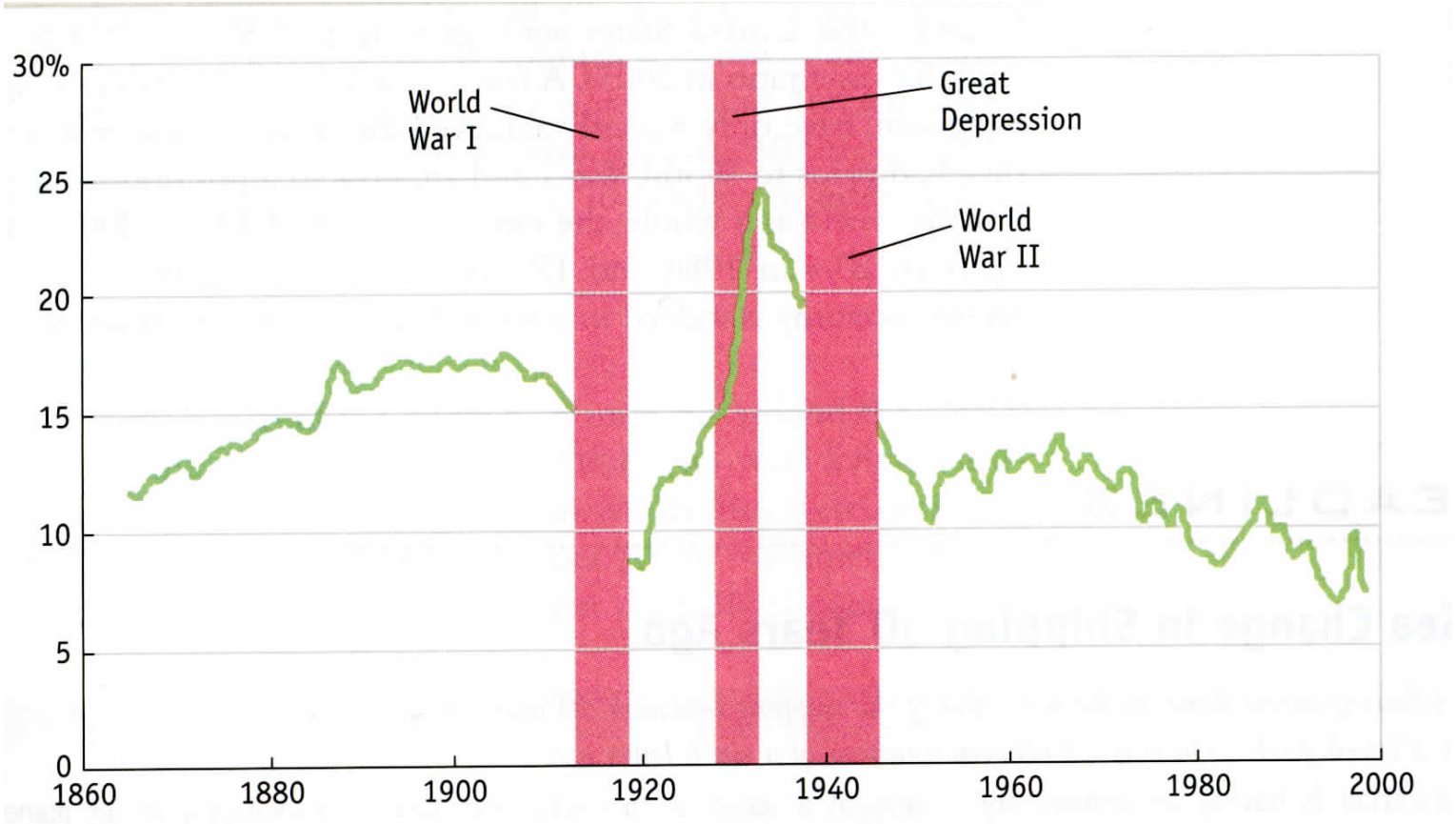
Source : World Bank (1995)

Transport costs (3)

- Today, more than 20% of world trade by value occurs between countries that share a land border → Mainly cheap surface modes (truck, rails, pipeline)
- For trade with nonadjacent partners, nearly all merchandise trade moves via ocean and air modes
- Hummels (2007) : Prices for air shipment declined by 2.52% annually from 1980 to 1993. Trend much less pronounced for ocean shipment → Drop in the relative price of air transport and strong increase in the use of air cargos in international trade (+7.4% per year between 1975 and 2004)
- "Time as a trade barrier" (Hummels, 2001) : each additional day spent in transport reduces the probability that the US will source from that country by 1 - 1.5 percent

Trade barriers over time

Import duties over imports



Source : Clemens and Williamson (2004)

Trade barriers over time

Average tariff on manufactured goods

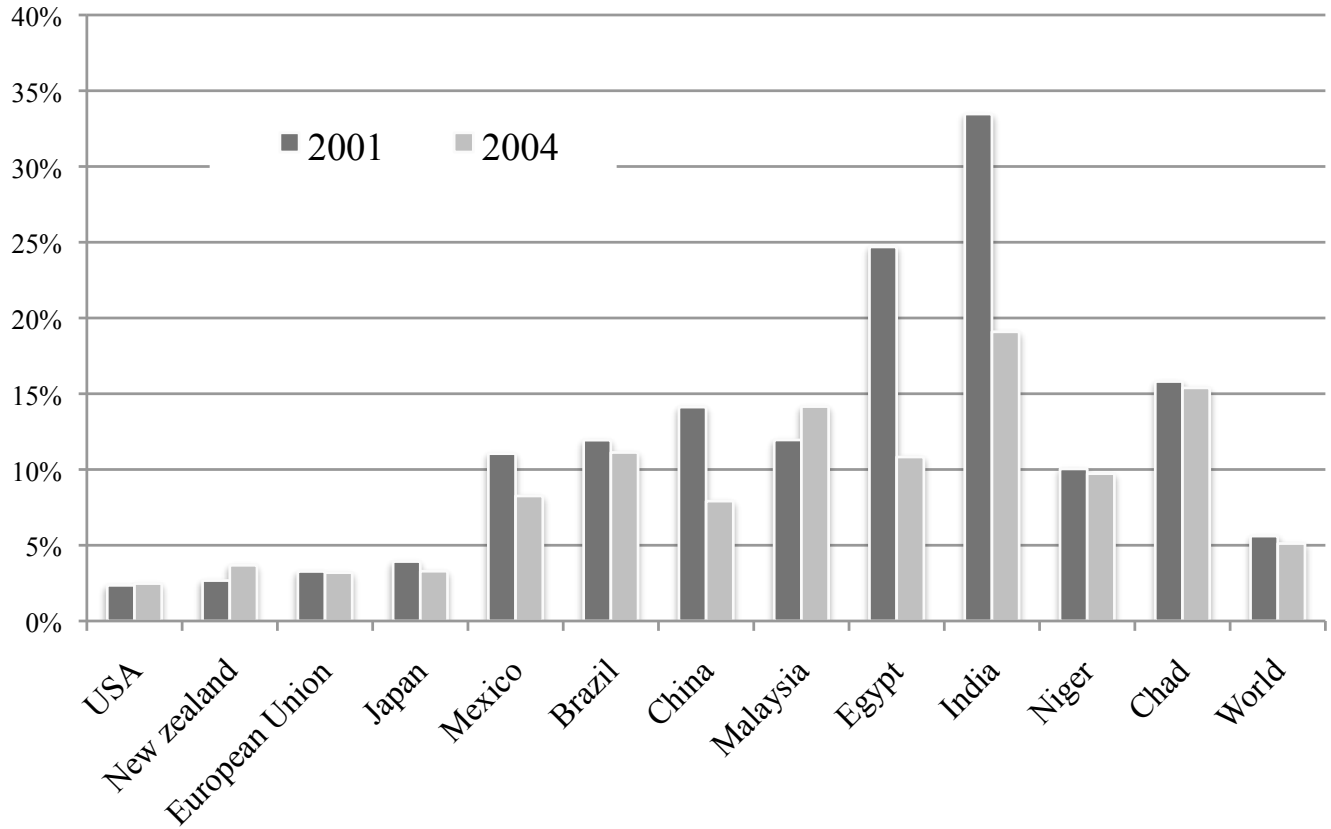
	1913	1931	1950	1980	1999	2004
France	20	30	18	8.3	4.1	2.5
Germany	13	21	26	8.3	4.1	2.5
USA	44	48	14	7	.4.5	2.2

Sources : Mayer and Martin (2008), Boumellassa et al. (2009)

- Strong increase in the interwar period : Smoot-Hawley tariffs in the US during the Great Depression (60% tariffs on some import categories) $\rightarrow$ Cause other countries to retaliate
- Reduction after WWII : International agreements (General Agreement on Tariffs and Trade, now World Trade Organization)

Trade barriers : Unachieved liberalization

Average protection in %



Source : MacMaps-HS6-v2 database, Boumelassa, Laborde and Mitaritonna (2009)

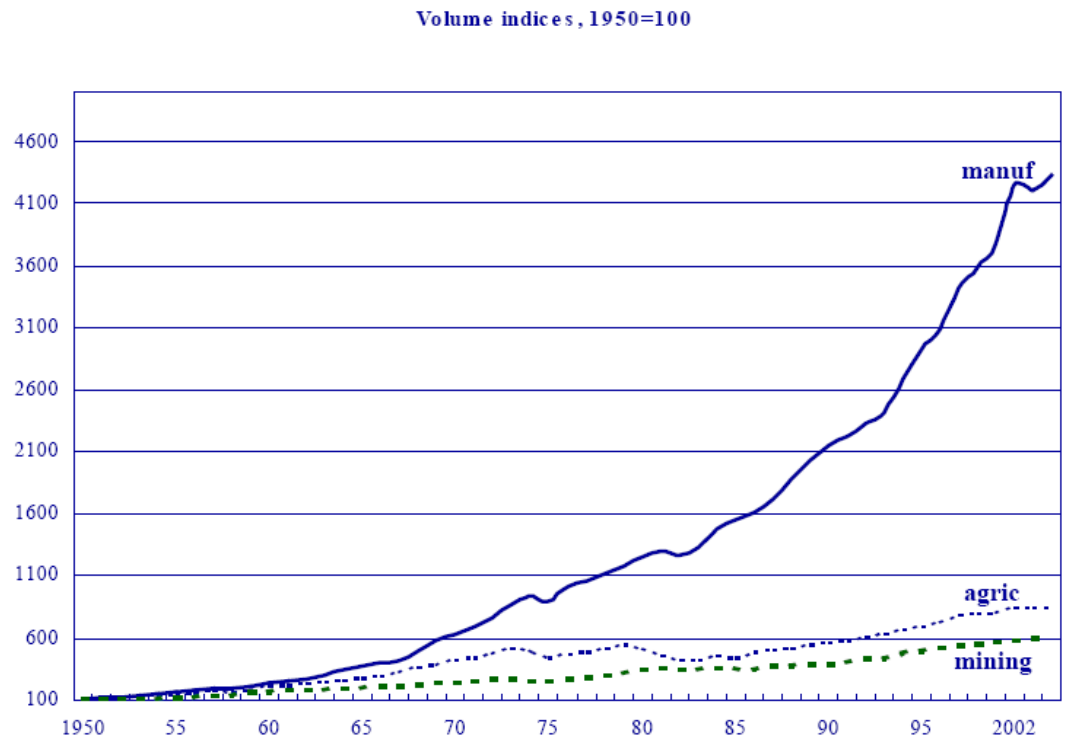
Trade barriers : Heterogeneity across countries/goods

World protection in 2004 in %

Goods	*World*	*HICs*	*MICs*	*LDCs*
Agricultural goods	18.9	18.0	20.8	14.1
of which:				
Primary and semi-processed	*12.8*	*12.1*	*14.2*	*9.5*
Final	*22.8*	*21.7*	*25.4*	*16.8*
Industrial goods	4.4	2.7	8.9	11.7
of which:				
Primary and semi-processed	*2.8*	*1.2*	*6.2*	*10.9*
Final	*5.0*	*2.9*	*9.9*	*11.9*
Extraction and energy products	1.9	0.6	5.6	12.7
of which:				
Primary and semi-processed	*1.4*	*0.3*	*4.6*	*14.4*
Final	*3.3*	*1.4*	*7.6*	*11.2*
All products	**5.1**	**3.3**	**9.6**	**12.2**
of which:				
Primary and semi-processed	*3.3*	*1.8*	*6.8*	*11.4*
Final	*6.0*	*3.9*	*11.0*	*12.4*

Source : MacMaps-HS6-v2 database, Boumelassa, Laborde and Mitaritonna (2009)

Composition of Trade : Agriculture lagging behind

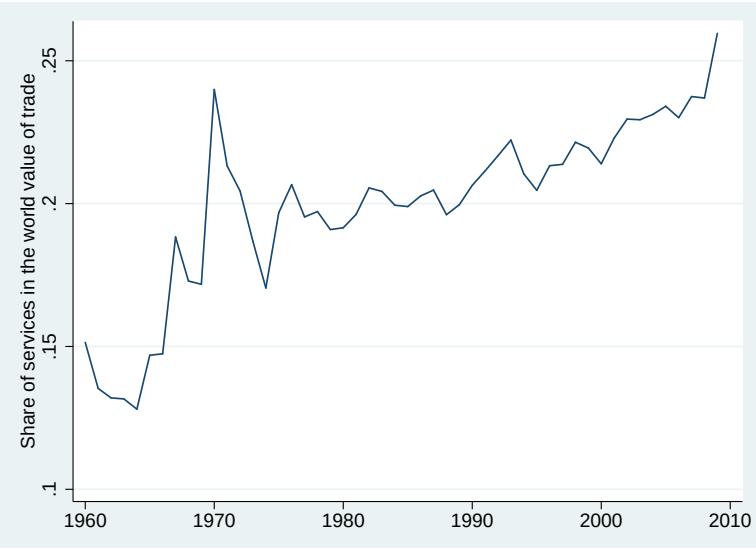


Source : WTO

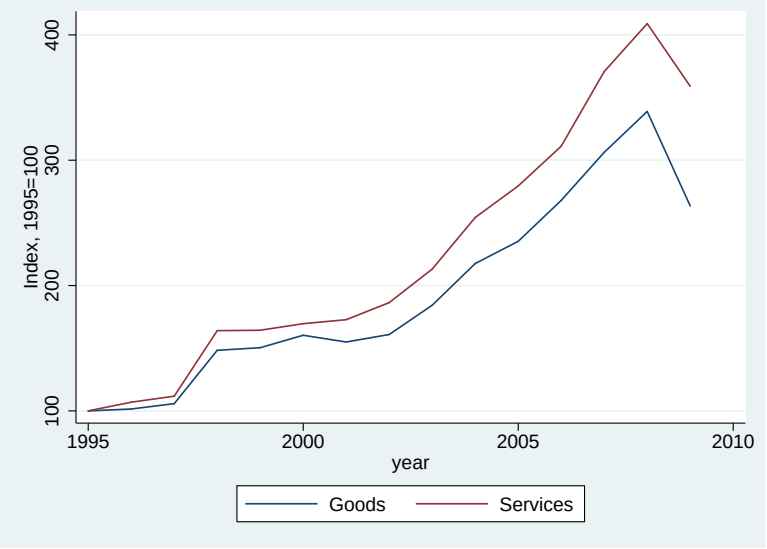
- Expected to rise in the future (land resources, climate change)

Composition of Trade : Services lagging as well

Share of services



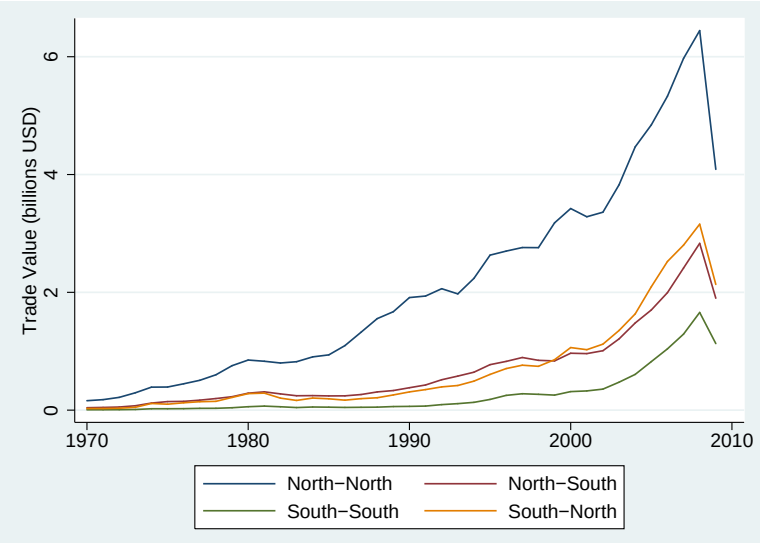
Growth of trade in goods and services

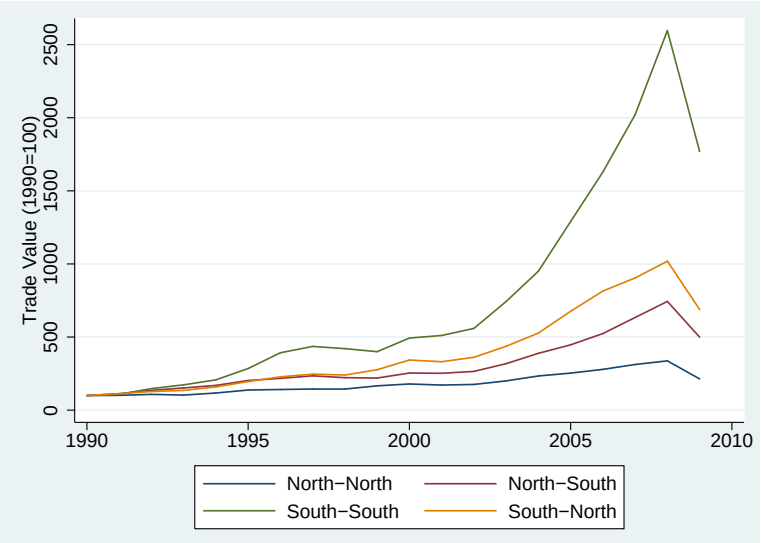


Source :IMF-IFS

- Expected to rise in the future (increase share in consumption and tradable services)

Geography of Globalization



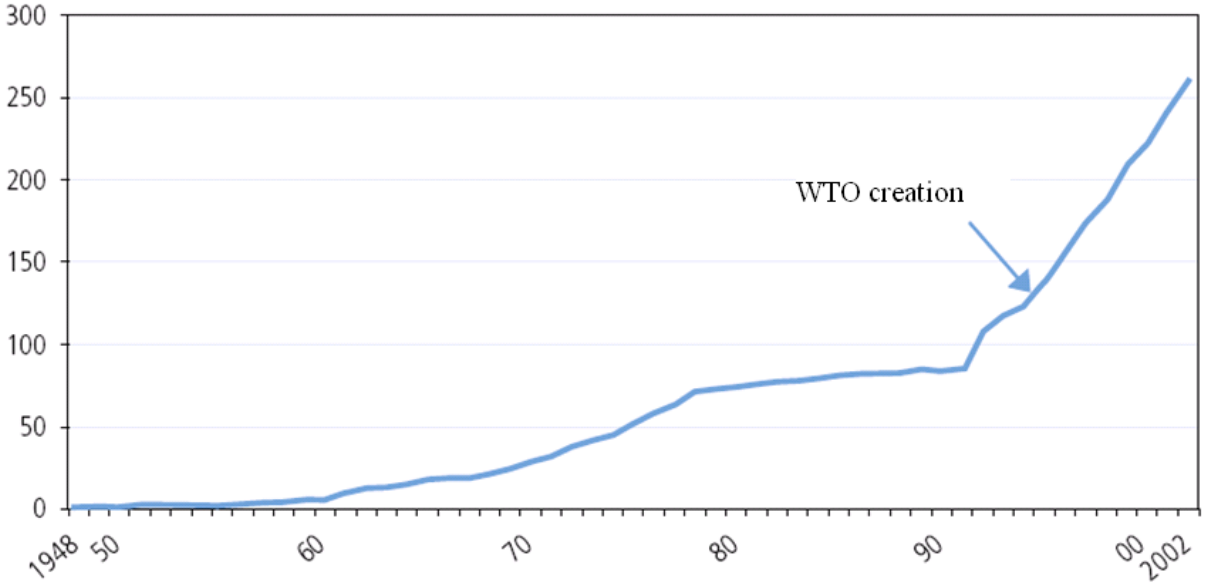


Source : UN ComTrade

- High income countries dominate world trade
- But strong growth of low/middle income countries trade since the beginning of the 90s

Geography of Globalization : Regionalization

Number of regional trade agreements in the world



Source : WTO

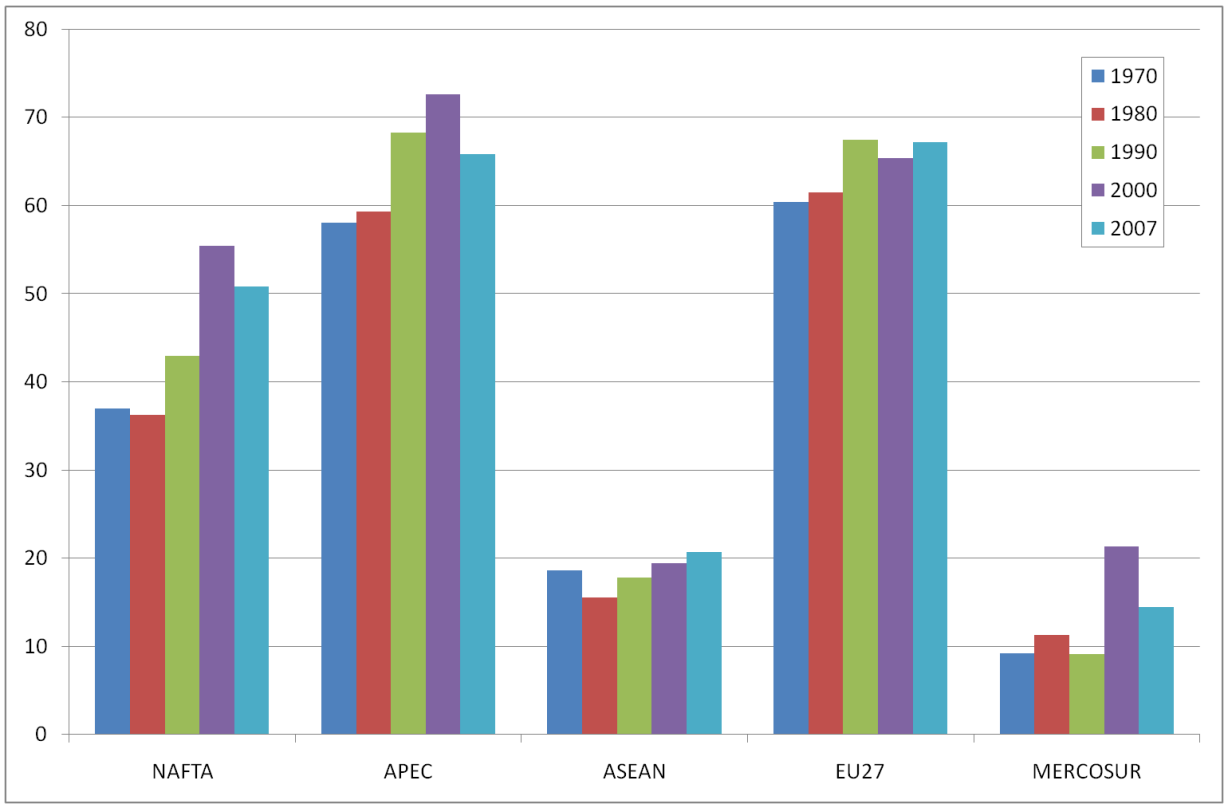
- RTAs supervised by GATT/WTO : Countries are bound to notify the RTAs in which they participate since RTAs are not covered by the "Most Favored Nation's Clause"

⇒ 1948-1994 : the GATT received 123 notifications/ Since 1995, over 300 additional arrangements covering trade in goods or services have been notified to the WTO

⇒ Nearly all WTO members have notified participation in one or more RTAs (more than 20 for some countries)

Geography of Globalization : Regionalization (2)

Intra-bloc trade (% total)



Source : CEPII-Chelem

- Modern RTAs have wider networks of participants

$\Rightarrow$ APEC will cover 40% of the world's population, NAFTA + EU (extended to East Europe and the Mediterranean) emcompasses more than 500 millions people

Geography of Globalization : Regionalization (3)

- Does regionalization pose a threat to the multilateral trading system ?

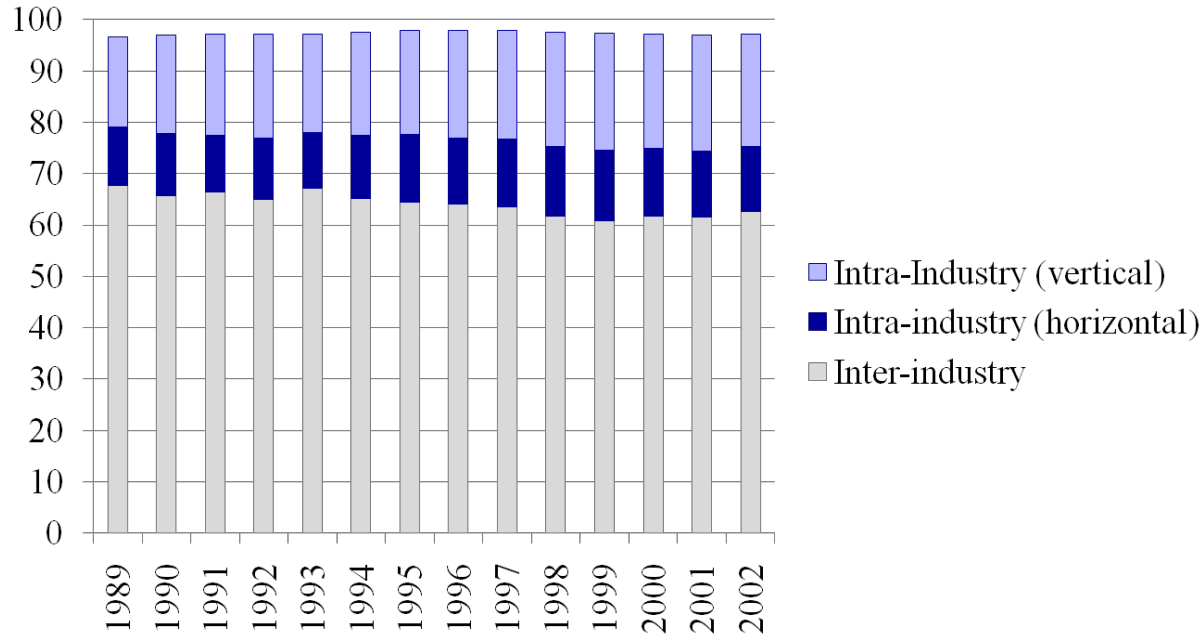
$\Rightarrow$ Tendency for the new blocs to fall into the sphere of influence of the EU or the US $\rightarrow$ A world of "trading megablocs" ? (Crawford and Laid, 2000)

- What are the impact of regionalization on welfare ? (eg Optimal Currency Area Theory)

$\Rightarrow$ A number of RTAs are formed based on political and security considerations rather than economic ones (eg ECC)

Inter-Industry vs Intra-Industry Trade

Decomposition of trade (% total)



Source : Fontagné L., Freudenberg M., Gaulier G. (2006)

- Inter-industry trade : Exchange of different *types* of products → Based on comparative advantages
- Intra-industry trade : Exchange of different *varieties* of the *same* product → Based on imperfect competition
- Intra-industry trade is particularly important in the trade in manufactured goods among advanced economies

Inter-Industry vs Intra-Industry Trade (2)

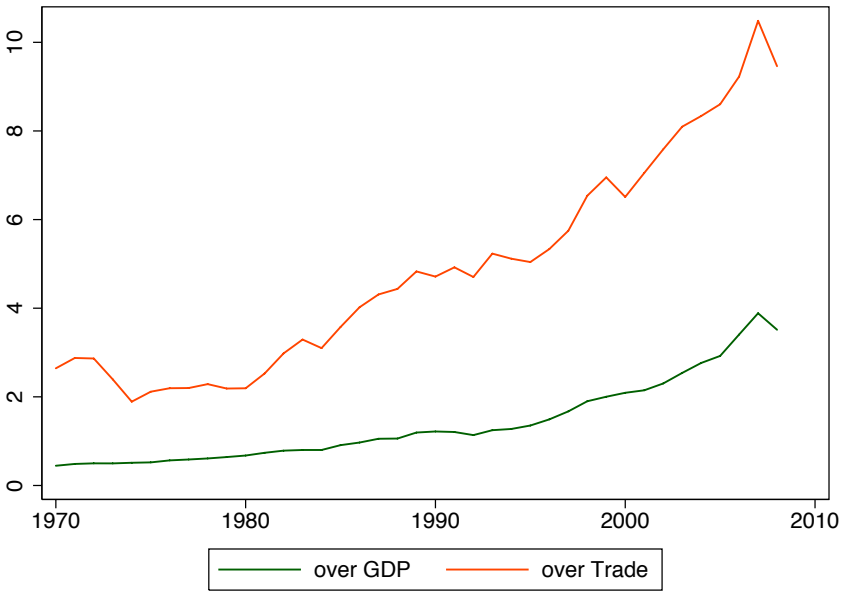
Table: Indexes of Intraindustry Trade for US industries, 1993 (Source : Krugman and Obstfeld)

Inorganic chemicals	.99
Power-generating machinery	.97
Electrical machinery	.96
Organic chemicals	.91
Medical and pharmaceutical	.86
Office machinery	.81
Telecommunications equipment	.69
Road vehicles	.65
Iron and steel	.43
Clothing and apparel	.27
Footwear	.00

$$\textit{Definition of the index : } I = 1 - \frac{|exports - imports|}{exports + imports}$$

International Financial Integration

International Financial Integration in Advanced countries

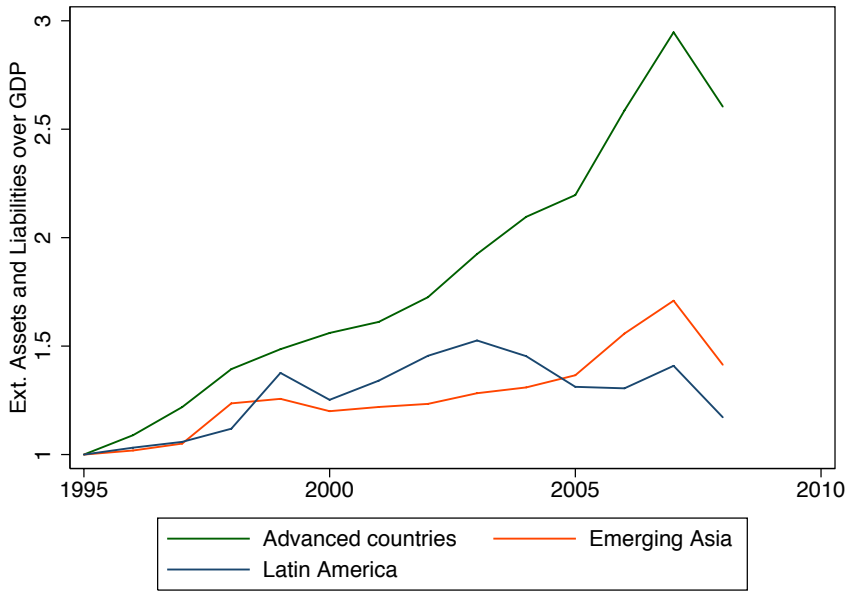


Source : Lane P. & Milesi-Ferretti G.M. (2006), Advanced countries include Austria, Belgium, Germany, Italy, Netherlands, Norway, Sweden, Switzerland, Canada, Japan, Finland, Spain, United Kingdom and the US. The numerator is the stock of aggregate assets and liabilities.

- Financial integration especially strong from the 90s
- Increase in financial openness stronger than trade growth

International Financial Integration (2)

International Financial Integration by regions

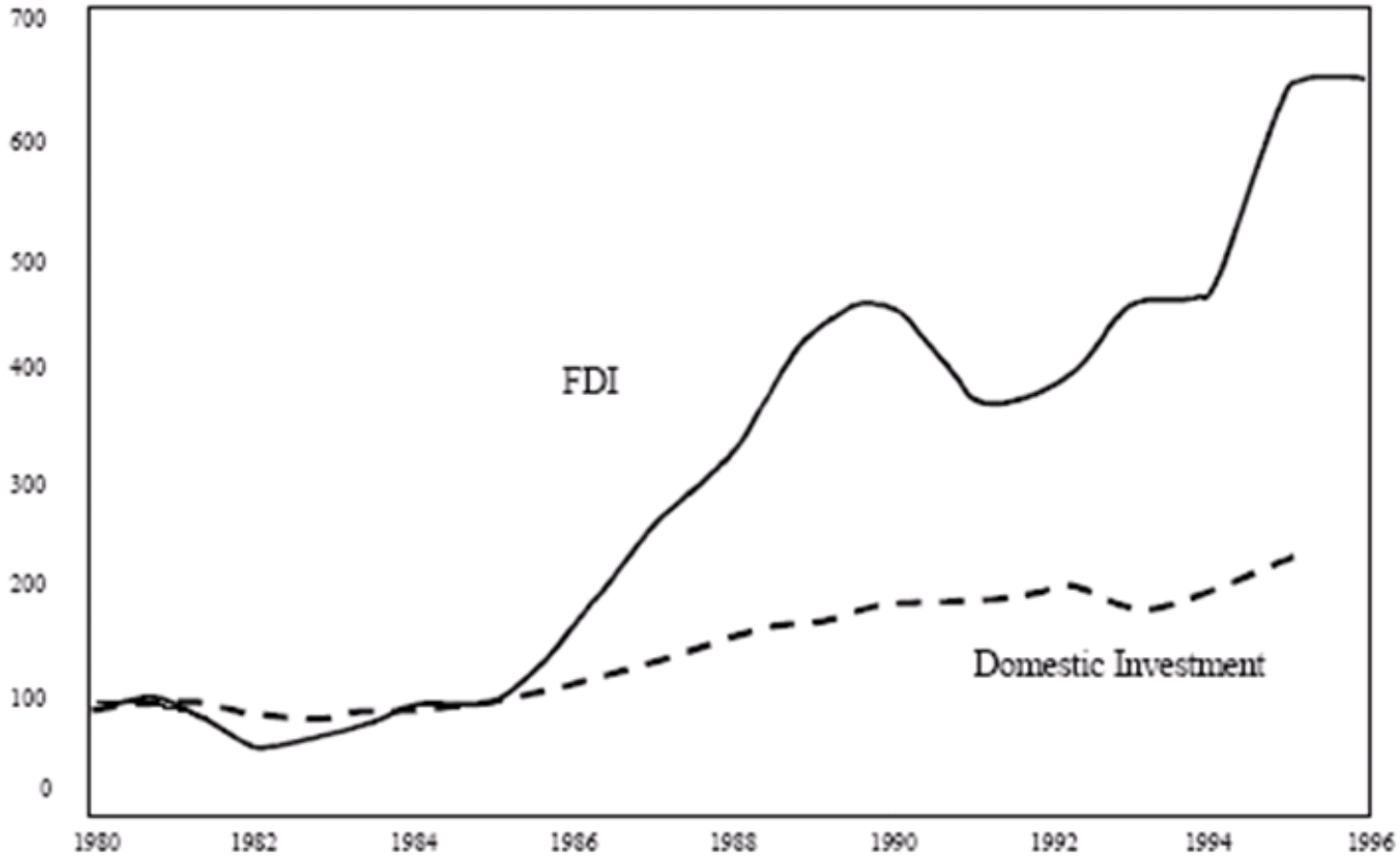


Source : Lane P. & Milesi-Ferretti G.M. (2006)

- Financial integration heterogeneous across countries

Growth in FDI

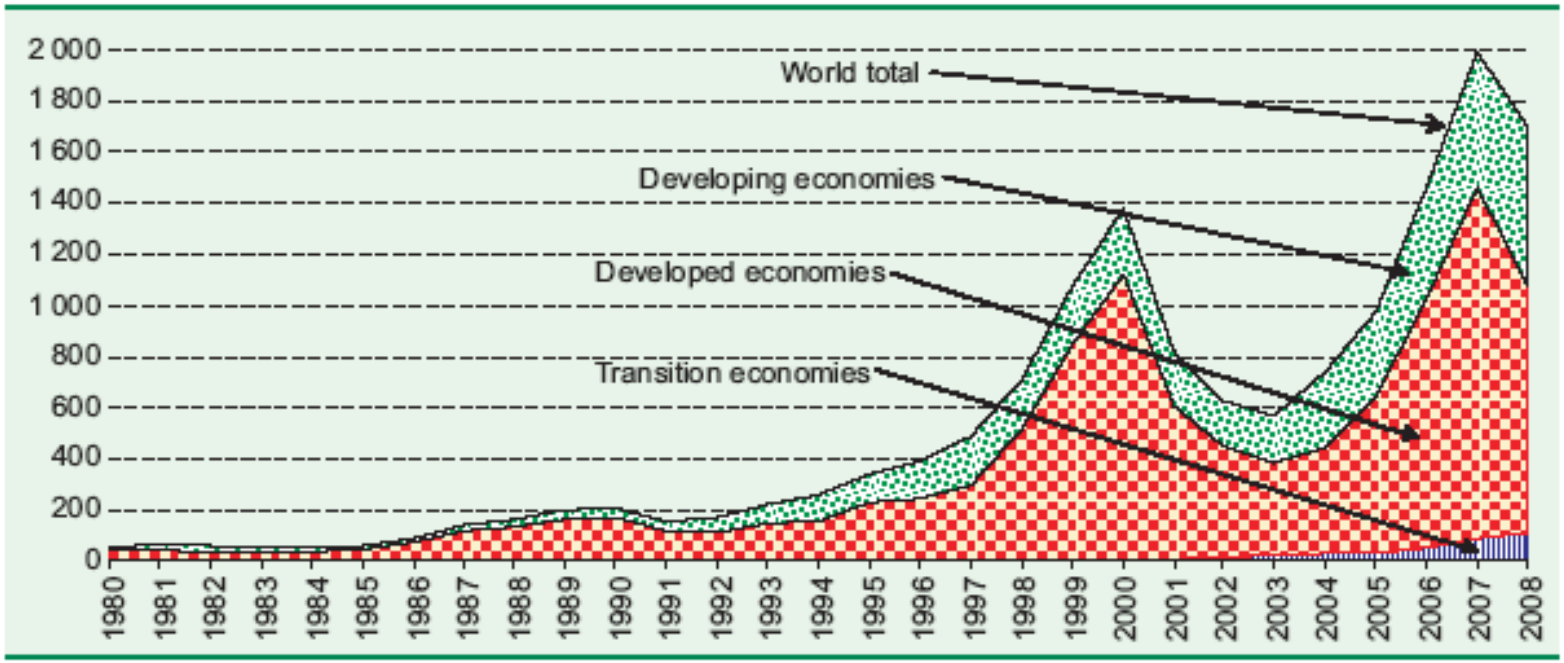
Domestic versus Foreign Investment



Source : UNCTAD

Growth of FDI : still mainly North-North

Figure I.1. FDI inflows, global and by groups of economies, 1980–2008
(Billions of dollars)



Source: UNCTAD FDI/TNC database (www.unctad.org/fdistatistics) and UNCTAD Secretariat estimates.

Source : UNCTAD, World Investment Report 2009

Migrations

Decadal migrations, % of initial population

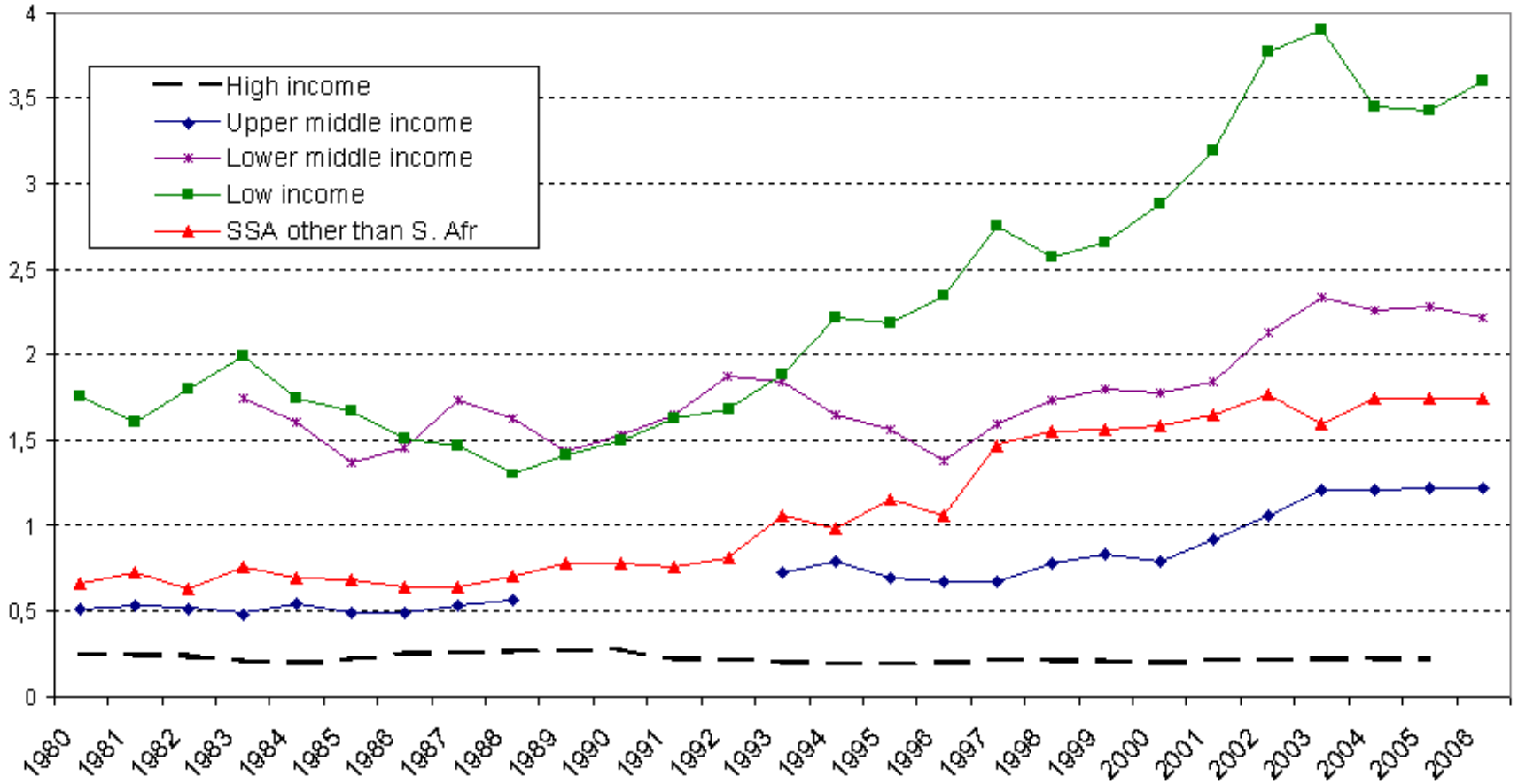
% of Initial population	*1880s*	*1890s*	*1900s*
Senders:			
UK	-3.05	-5.20	-2.04
Italy	-1.65	-3.37	-4.87
Spain	-1.51	-6.01	-5.18
Sweden	-2.90	-7.20	-3.51
Portugal	-3.52	-4.16	-5.94
Receivers:			
US	5.69	8.94	4.02
Canada	2.27	4.89	3.71
Australia	11.28	16.59	0.77
Argentina	4.50	25.60	9.5
Brazil	1.98	3.82	8.44
N. Zealand	53.52	4.08	4.15

Notes : UK includes Ireland, dates vary slightly according to data available. Source : Green and Urqhart (1976)

- Migration waves
- Today : 200 million migrants in the world (3% of world population) (Source : Withol de Wenden ,2006)

Migrations : an important source of financing for LDCs

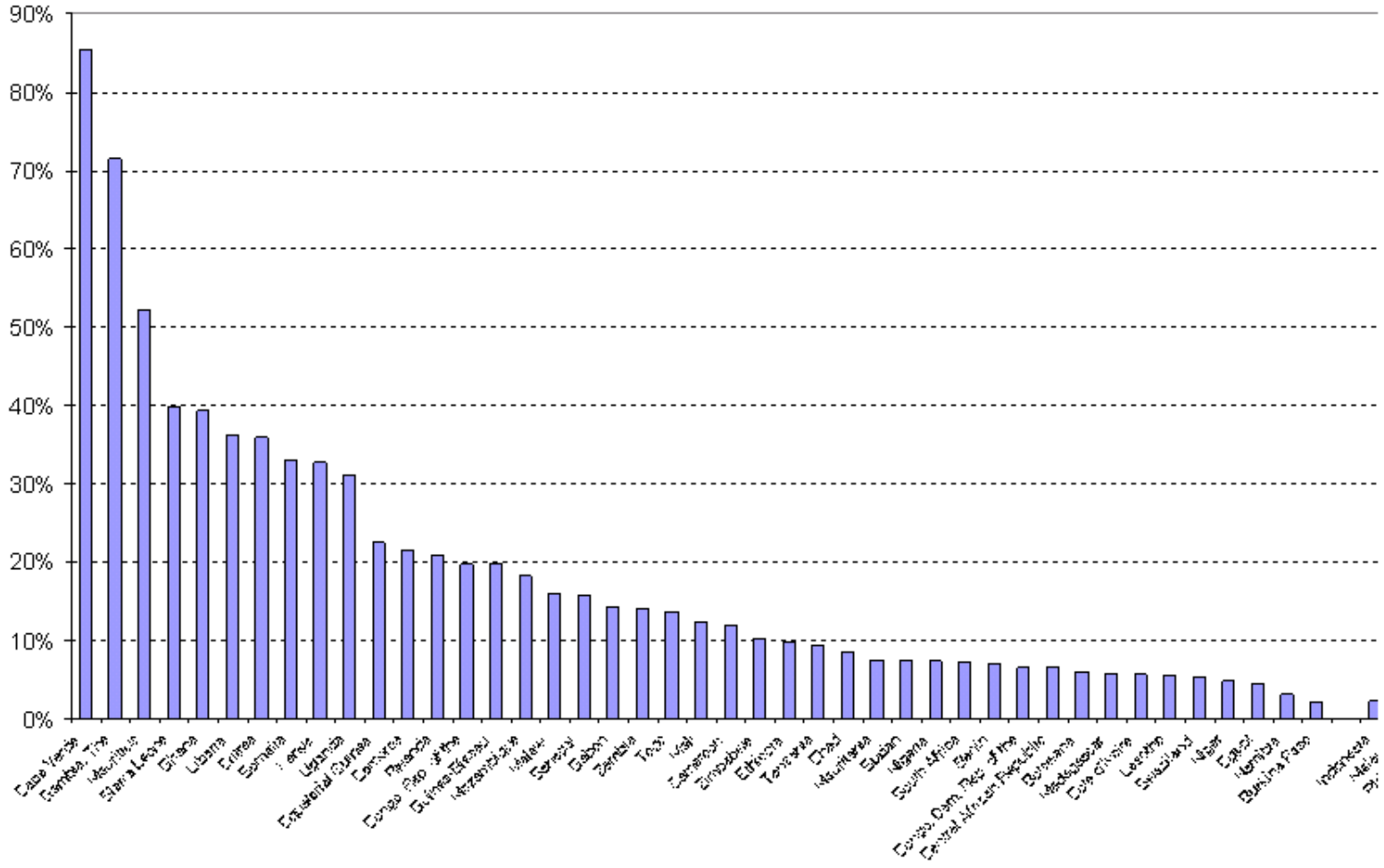
Remittance received, % of GDP



Source : World Bank, WDI

Migrations : a brake to development ?

Migration rates of high skill males to OECD countries, in %



Source : Docquier et al. (2007)

Questions raised by globalization

At the macro level

- Gains from trade in goods and services
  - Global gains ? Distribution across countries and production factors ?
  - Compensation of losers ?
- Trade policies
  - Multilateral versus regional and bilateral ("noodle bowl") agreements
  - Tariffs versus non-tariff barriers (Agriculture and services)
- Gains from financial integration
  - Efficiency (?) cum instability
  - Transmission of (positive and negative) shocks across countries
  - Needs for global governance (ex. 2007-2009 global crisis)

At the micro level

- Impact on firms' strategy
  - Participation to international markets ? Export versus FDI ?
  - Internationalization of supply chains
  - Policy interventions ? (export subsidies, fiscal harmonization, etc)
- Organization of financial institutions
  - Diversification of portfolio holdings
  - Regulation (eg Basel agreements)
- Migration decisions

Gains from Trade

- Popular skepticism about the benefit that importing rather than producing domestically may induce
- Though, the range of circumstances under which international trade is beneficial is much wider than most people imagine
- In particular, international trade :
  - allows you to consume goods that can't be produced domestically (eg oranges in Norway)
  - releases resources that can be used to produce something else more efficiently
  - increases the range of varieties available to consumers
  - ...
- Despite aggregate welfare gains, most models also display inequalities in the distribution of these gains

Gains from trade : partial equilibrium

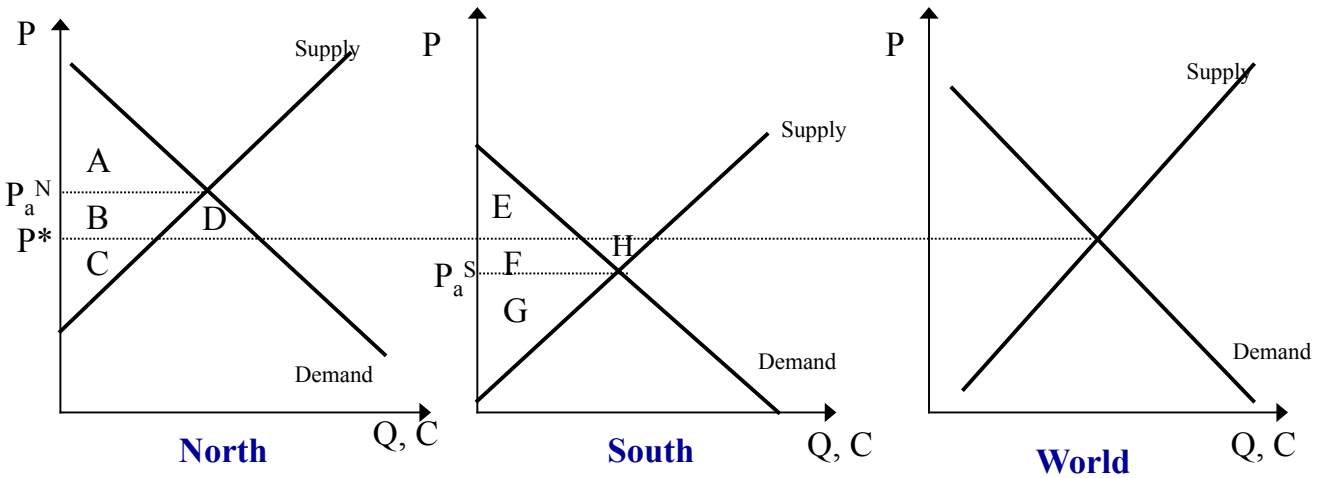
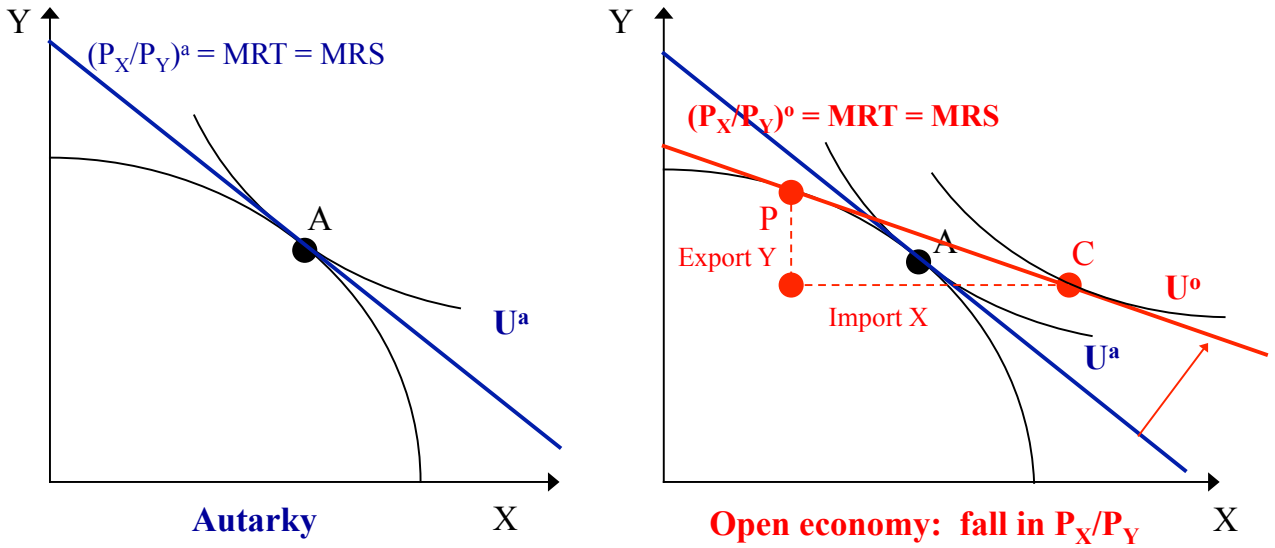


Table: Surplus

	North		South	
	Consumers	Firms	Consumers	Firms
Autarky	A	B+C	E+F	G
Open eco	A+B+D	C	E	G+F+H
Gains from trade	B+D	-B	-F	F+H

Gains from trade : General equilibrium



- MRT or marginal rate of transformation = number of units of Y which need to be given away to produce one additional unit of X = ratio of production costs of X to Y.
- MRS or marginal rate of substitution = forgone consumption of Y that compensates, in terms of utility, the consumption of one additional unit of X = ratio of marginal utilities of X to Y.

Distribution of the gains

1st globalization

Old world : rise in wages relative to land yield

New world : rise in land yield relative to wages

Possible explanations :

- International trade
- Migrations
- Biased technological change

2nd globalization

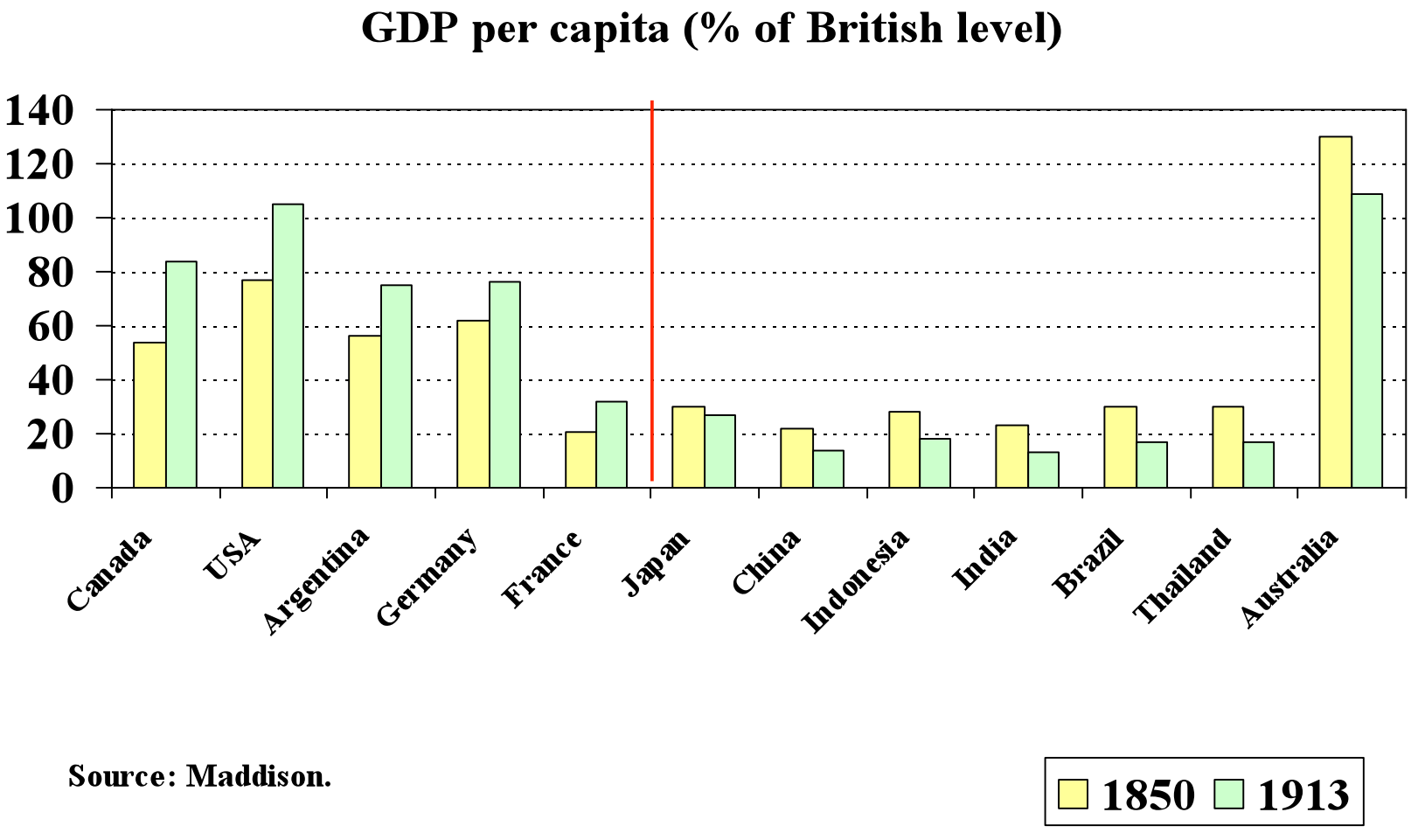
Rise in wage inequalities in Anglo-Saxon countries

Rise in employment inequalities in Continental Europe

Possible explanations :

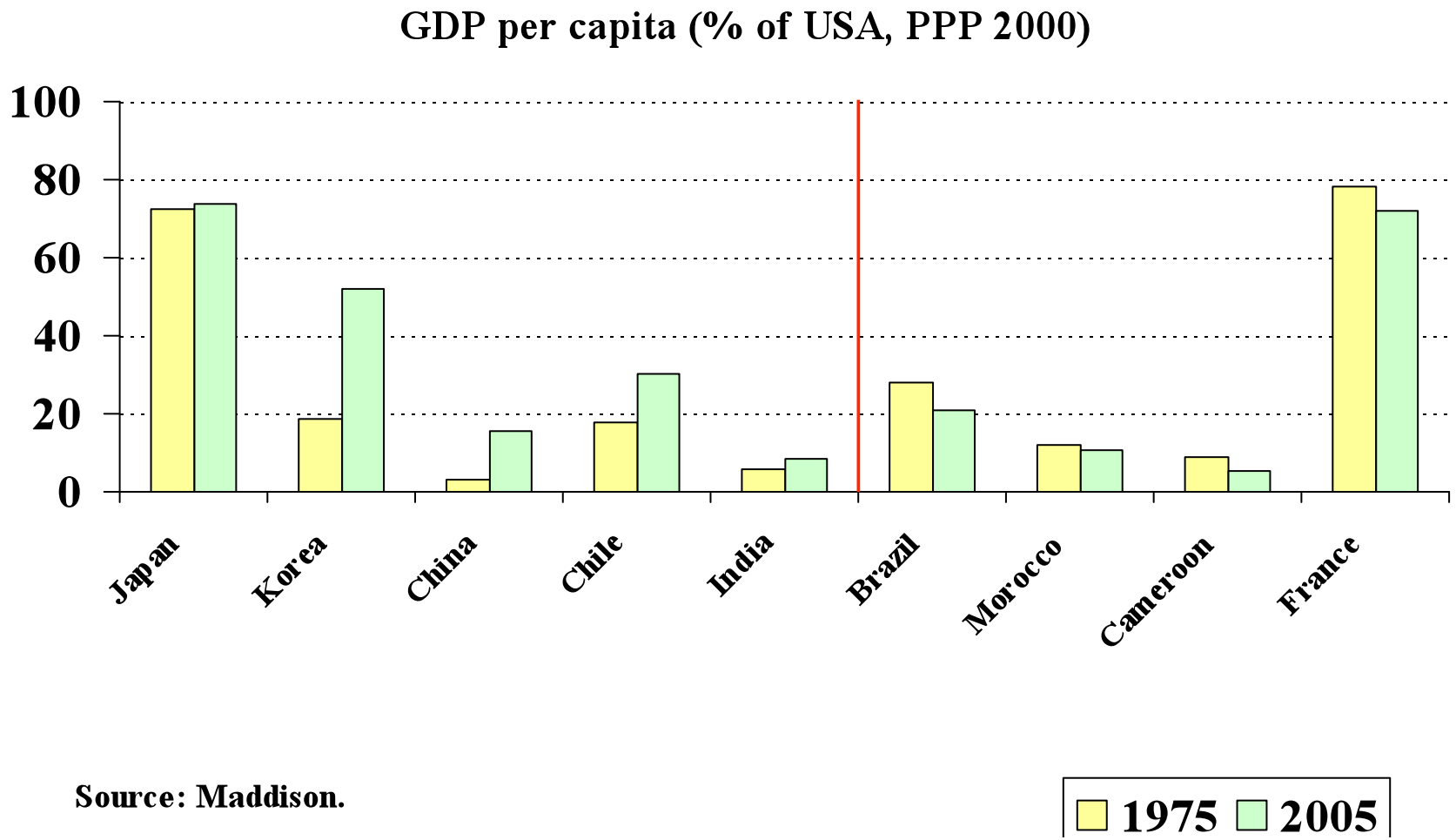
- International trade
- Decline in unionization
- Relocations
- Migrations (US)

Distribution across countries in the first wave of globalization



Source: Maddison.

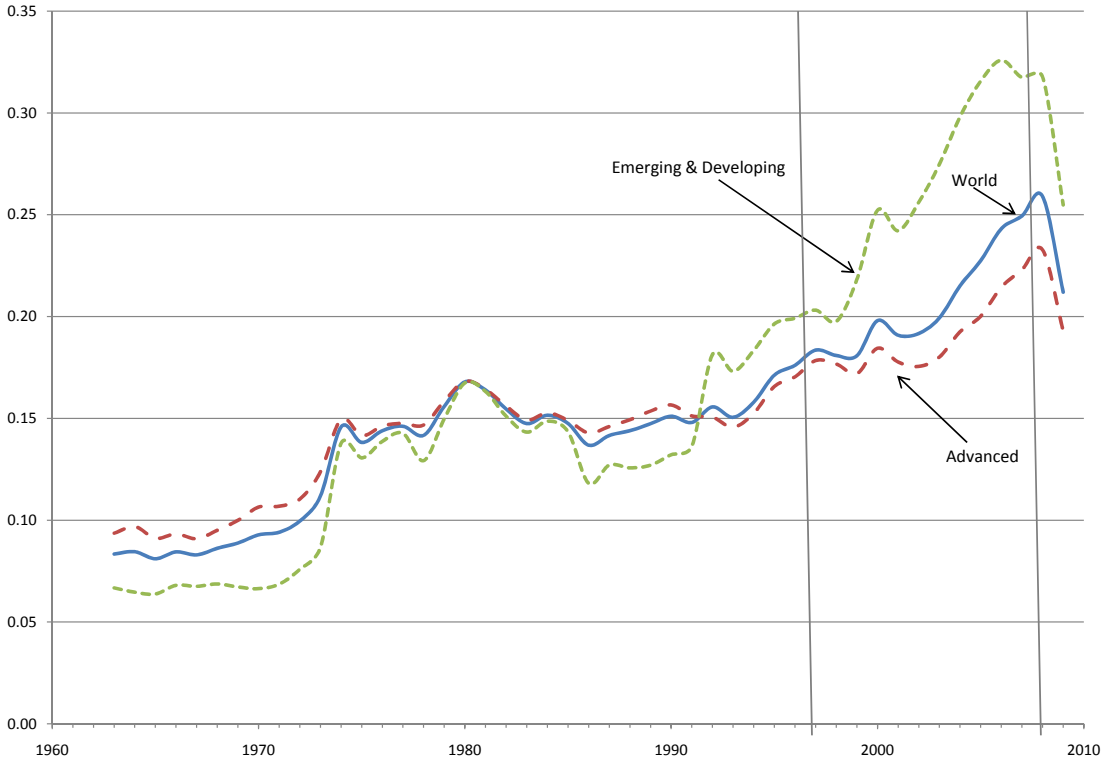
Distribution across countries in the second wave of globalization



Source: Maddison.

Interdependence between countries

Evolution of exports before and after the financial crisis



Source : IFS

- Financial crisis started from high income countries (US)
- But impact on aggregate trade especially pronounced for emerging countries

Theories of International Trade

- **Trade based on differences :**
  - in technologies : Ricardo
  - in factor endowments : Hecksher-Ohlin-Samuelson (HOS)

  $\Rightarrow$ Inter-industry trade
- **Trade based on economies of scale and product differentiation :**
  - Krugman and others

  $\Rightarrow$ Intra-industry trade

The theory of comparative advantages

Outline

- Absolute versus comparative advantage
- Ricardo's model of international trade
- Extensions and limitations

David Ricardo (1772-1823)

English broker, political economist, member of Parliament

Promotes free trade against Corn Laws

On the Principles of Political Economy and Taxation (1817, 1819, 1821).

- Labor theory of value
- Differential rent (land)
- "Ricardian" equivalence
- Theory of comparative advantages

"The theory of comparative advantage is the only result in social science that is both true and non-trivial"

Attributed to Paul A. Samuelson

Ricardo simple example

Source : *On the Principles of Political Economy and Taxation*, ch.7, 1817

- With a given number of hours worked, Portugal can produce either 20 meters of cloth or 300 liters of wine, while England can produce either 10 meters of cloth or 100 liters of wine. England thus has an **absolute disadvantage** in both productions.
- Still, England should specialize in cloth, where it has a comparative advantage : with 10 meters of cloth, it can obtain 150 liters of wine ($10 \times 300/20$) in Portugal, instead of 100 liters at home.
- In turn, Portugal should specialize in wine : with 300 liters of wine, it can get 30 meters of cloth in England ($300 \times 10/100$), instead of only 20 meters at home.
- England has a **comparative advantage** in the production of cloth.

Absolute advantage

Monthly production per worker (units of goods)

	China	Europe
Shirts	200	50
Cars	5	10

China has an absolute advantage for shirts and Europe for cars
China should specialize in shirts and import cars
Europe should specialize in cars and import shirts
World output would then increase thanks to a more efficient use of labor

Comparative advantage

Monthly production per worker (units of goods)

	China	Europe
Shirts	400	50
Cars	20	10

China has an absolute advantage in both industries
Europe has a comparative advantage for cars

Specialization is again efficient

Note that **absolute advantages** are determined by the comparison of technological coefficients across countries, **for each industry** while the condition under which a country has a **comparative advantage** involves the four unit labor requirements relative to **both industries**

Gains from Trade

Autarky

Denote by L the total volume of labor per month

Each country produces and consumes its own goods :

- **China** produces and consumes S shirts and C cars, with :
  $L = S/400 + C/20$ hence
  $C = 20L - S/20$
  Maximum production : 400 L shirts or 20 L cars ; $1/20$ = opportunity cost of producing one additional shirt in terms of forgone cars.*
- **Europe** produces and consumes S shirts and C cars, with :
  $L = S/50 + C/10$ hence $C = 10L - S/5$
  Maximum production : 50 L shirts or 10 L cars ; $1/5$ = opportunity cost of producing one additional shirt in terms of forgone cars

  $1/5 > 1/20$: the opportunity cost of shirts is higher in Europe than in China

Full Specialization

Assume that , on the world market, the relative price of shirts in terms of cars is 1/10

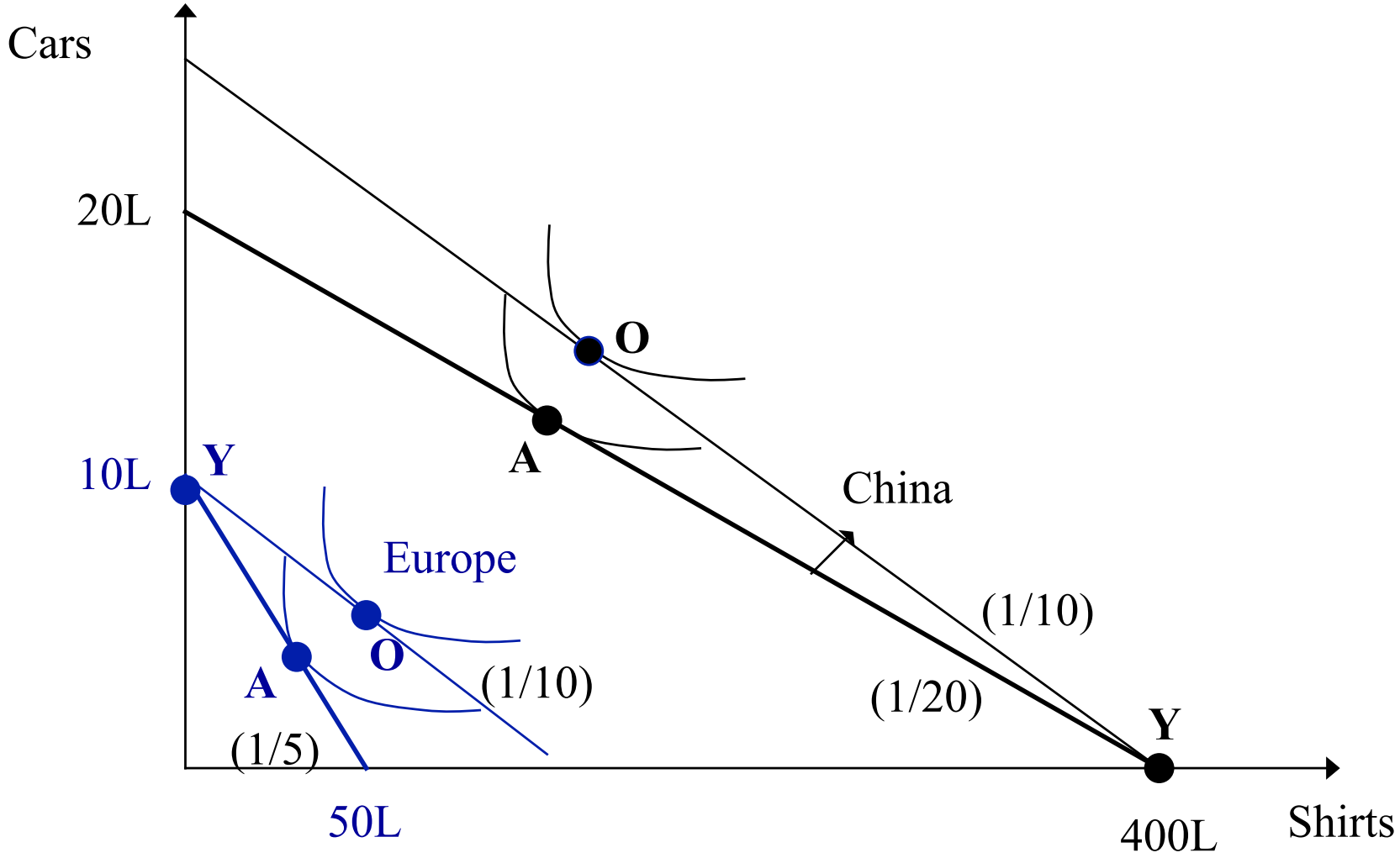
Countries specialize in one good and import the other one :

- **China** specializes in shirts : produces 400 L shirts, exchange part of the production against cars at the world price $1/10$, i.e. at a higher price than the opportunity cost $(1/20)$
- **Europe** specializes in cars : produce 10 L cars and exchange part of the production against shirts at the world price $10/1$, i.e. at a higher price than the opportunity cost $(5/1)$

  Trade allows each country to consume more of at least one good : utility is higher (Trade is Pareto-improving)

* To produce one shirt in China, you need 1/400 persons-month of labor. Each person-month used in the production of shirts implies 20 less cars produced. The opportunity cost of a shirt thus is 20/400=1/20 car

Gains from Trade (2)



The Ricardian Basic Model

Assumptions

- 2 countries : Home and Foreign $(^*)$
- 2 goods X and Y
- 1 production factor L : **mobile** across industries, **constant returns to scale**
- **Different technologies** : Technical coefficients (quantity of labor to produce one unit of good) : a_X, a_X^*, a_Y, a_Y^* with $a_X/a_Y > a_X^*/a_Y^*$ i.e. the foreign country has a comparative advantage in producing X

Model

- **Home** : $L = a_X X + a_Y Y$
- **Foreign** : $L^* = a_X^* X^* + a_Y^* Y^*$
- $a_X/a_Y > a_X^*/a_Y^*$: the opportunity cost of X in terms of Y is higher in Home than in Foreign.*

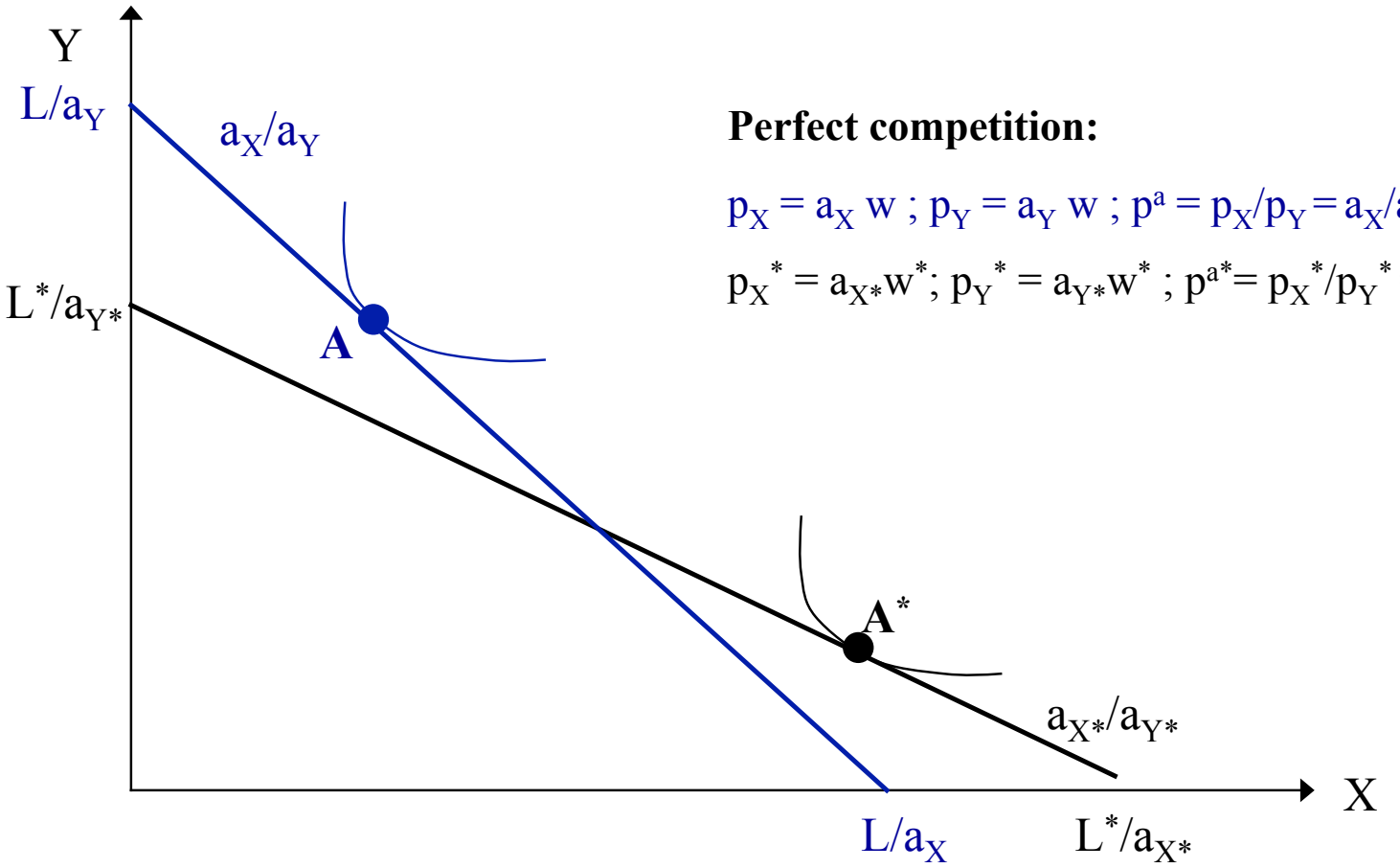
  Home specializes in Y and imports X if $p_X/p_Y < a_X/a_Y$

  Foreign specializes in X and imports Y if $p_X/p_Y > a_X^*/a_Y^*$

  Both interests are consistent since $a_X/a_Y > a_X^*/a_Y^*$. There is a relative price p_X/p_Y in between the two boundaries

* In order to produce one additional unit of X, you need a_X units of labor, which implies forgone production of a_X/a_Y units of Y

Equilibrium in Autarky



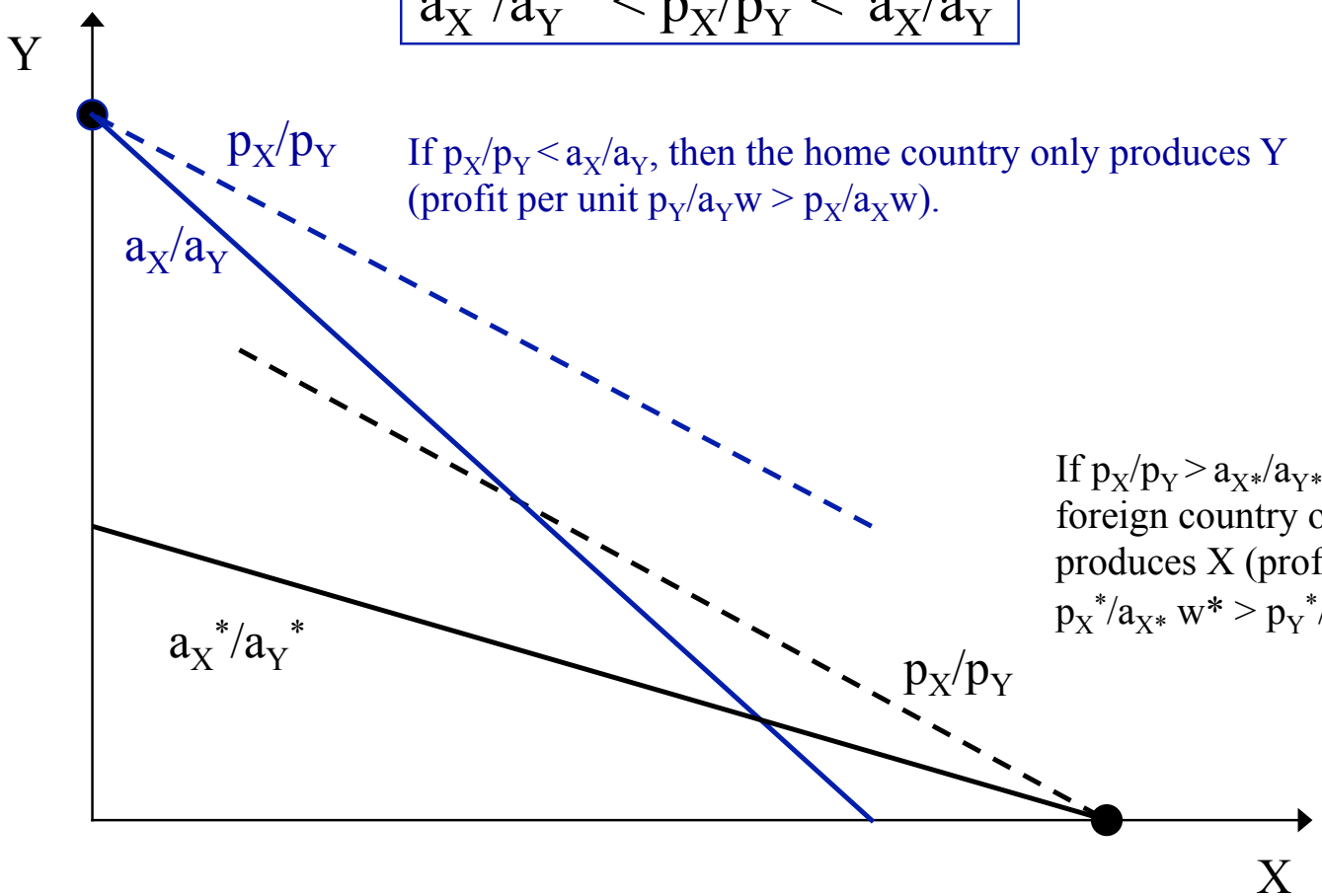
Perfect competition:

$p_X = a_X\, w$; $p_Y = a_Y\, w$; $p^a = p_X/p_Y = a_X/a_Y$

$p_X^* = a_{X*} w^*$; $p_Y^* = a_{Y*} w^*$; $p^{a*} = p_X^*/p_Y^* = a_{X*}/a_{Y*}$

Full Specialization

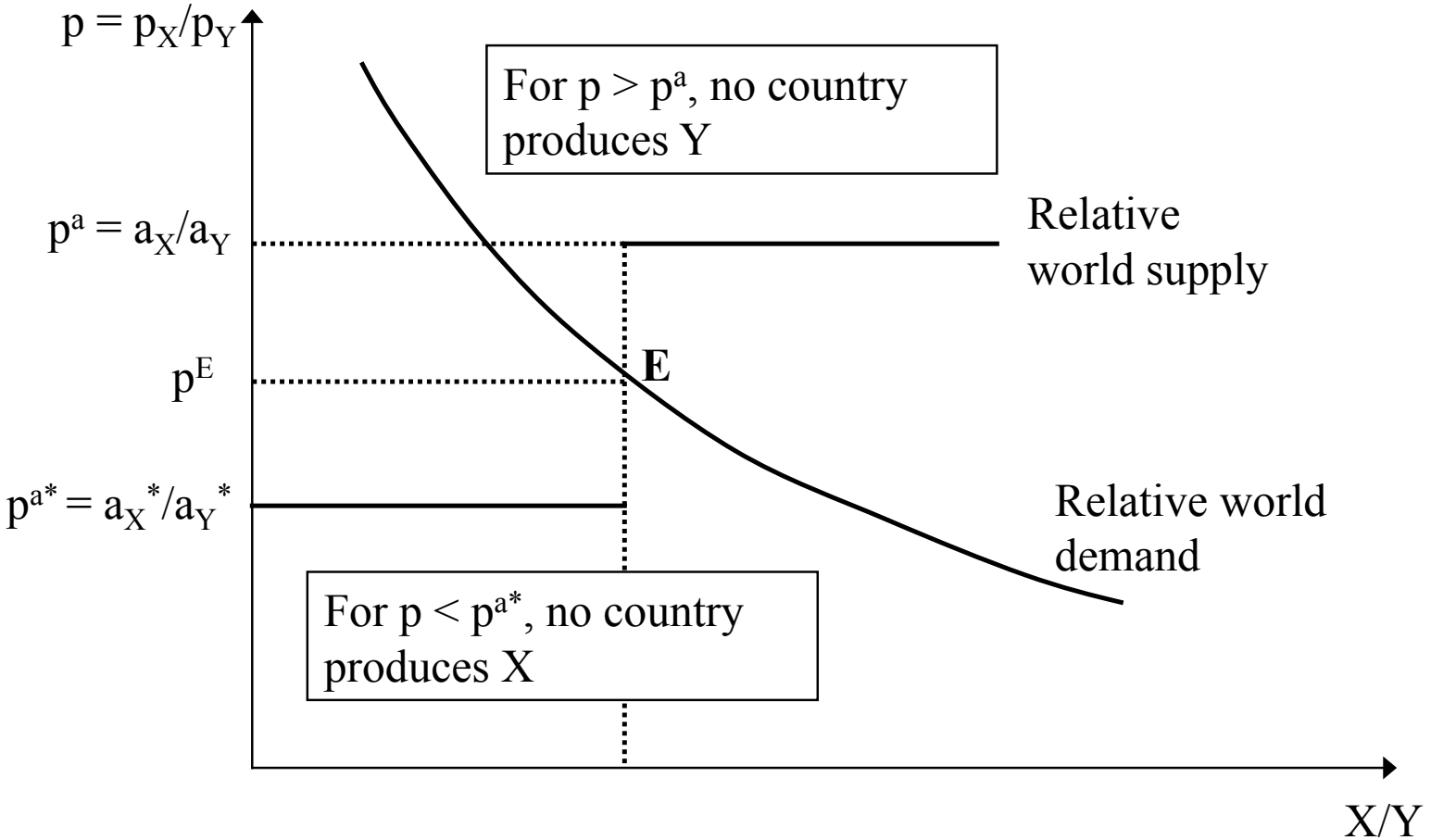
$$a_X^*/a_Y^* < p_X/p_Y < a_X/a_Y$$



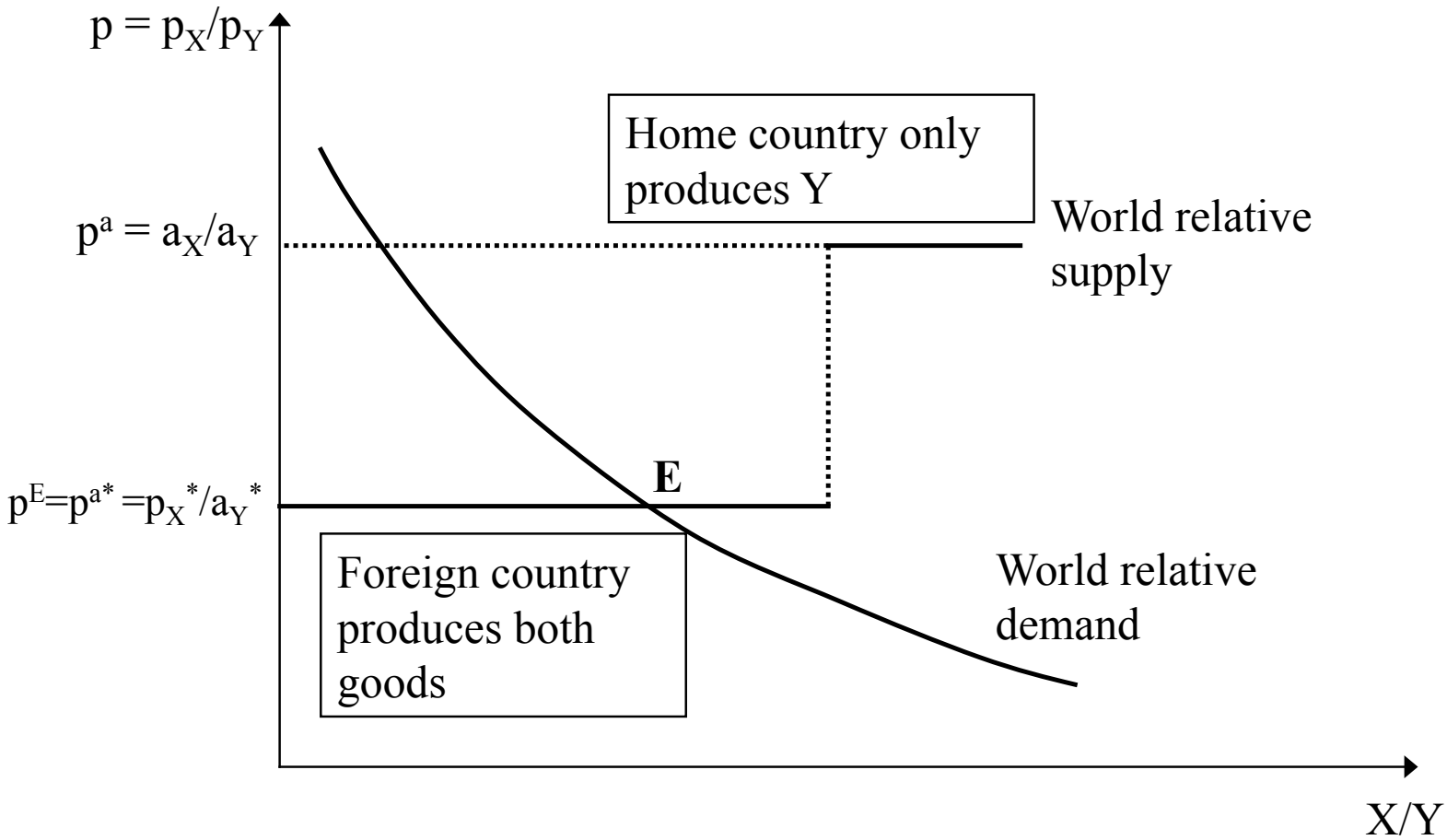
If $p_X/p_Y < a_X/a_Y$, then the home country only produces Y (profit per unit $p_Y/a_Y w > p_X/a_X w$).

If $p_X/p_Y > a_{X*}/a_{Y*}$, then the foreign country only produces X (profit per unit $p_X^*/a_{X*}\, w^* > p_Y^*/a_{Y*}\, w^*$).

World Equilibrium with Full Specialization



World Equilibrium with Incomplete Specialization

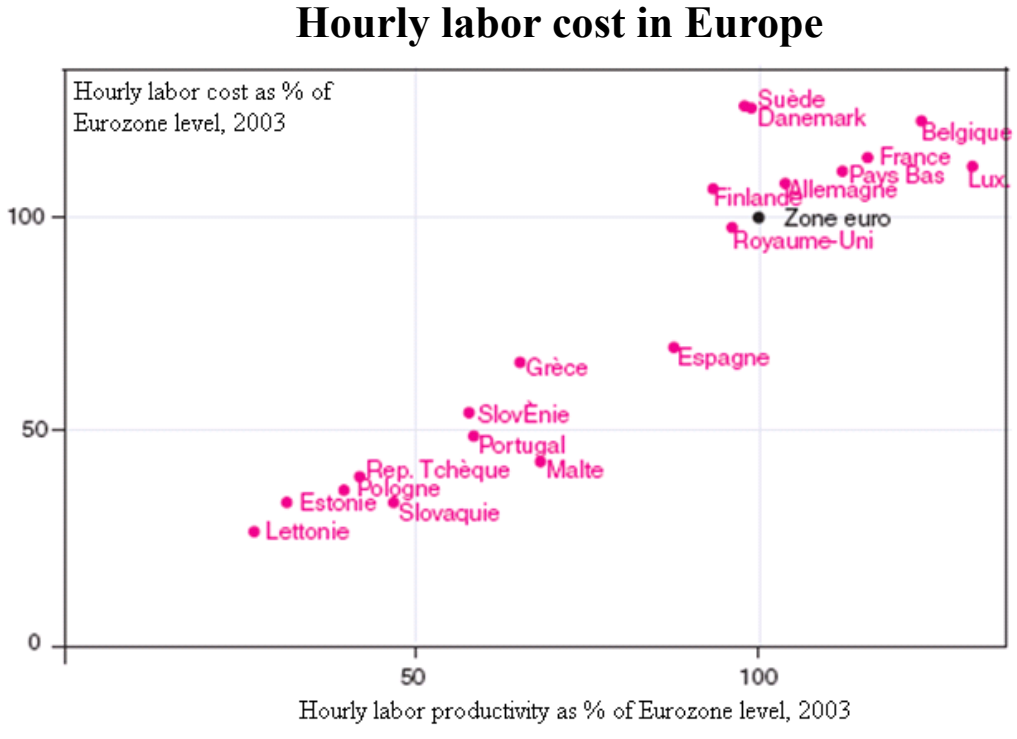


Wages

- **Gains from trade do not depend on wages** in both countries because wages are assumed the same in both sectors (labor mobility) $\Rightarrow$ No impact on comparative advantages
- **Autarky** : $p_X^a = wa_X$, $p_Y^a = wa_Y$, $p_X^{*a} = w^* a_X^*$, $p_Y^{*a} = w^* a_Y^*$
- **Full specialization** : $w = p_Y/a_Y$, $w^* = p_X/a_X^*$
- Since opening up economy raises the price of the product in which the country specializes, **wages increase** in both countries
- Relative wages : $w/w^* = (p_Y/p_X)(a_X^*/a_Y)$
  - Because $a_X^*/a_Y^* < p_X/p_Y < a_X/a_Y$
  - We have $a_Y/a_X < p_Y/p_X < a_Y^*/a_X^*$
  - Replace p_Y/p_X by $(w/w^*)(a_Y/a_X^*)$
  - To get : $a_X^*/a_X < w/w^* < a_Y^*/a_Y$ ***Factorial terms of trade***

$\Rightarrow$ **Relative wage w/w^* depends on absolute advantages**

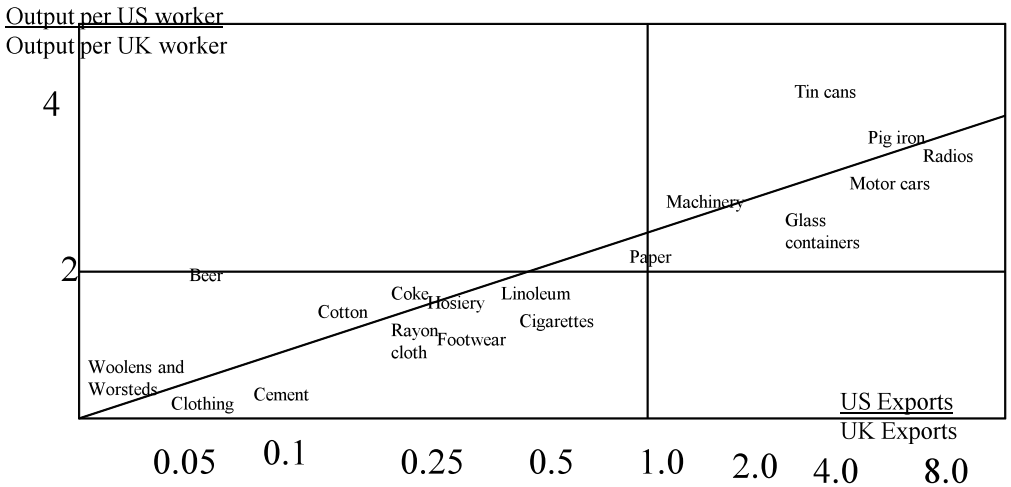
Wages and productivity



Source : Eurostat

- The previous theory assumes that relative wages reflect relative productivities
- Confirmed within Europe

Conclusion



- **Gains from trade** only depend on **comparative advantages**
- **Relative wages** between countries only depend on **absolute advantages** : a low-productive country will pay less

Extensions

More than two goods

- Rank all goods based on relative productivity

  $a_1^*/a_1 < a_2^*/a_2 < ... < a_n^*/a_n$

- Locate w/w^* in this chain
- Those products such as $a_i^*/a_i > w/w^*$ are exported by the home country because the disadvantage in terms of wages is more than compensated by an advantage in terms of productivity

Transport costs

- Assume a proportional transport cost τ
- If $wa_i < w^*a_i^* < wa_i(1+\tau)$, then good i is not traded
- Non-traded goods represent around 50% of GDP in advanced economies.

Limits

- Where does relative advantage come from ?
- Only one production factor
  $\longrightarrow$ Everyone gains from trade
- Constant opportunity cost
  $\longrightarrow$ Full specialization
- Does not explain intra-industry trade
- Does not account for market size
- Does not account for non-price competitiveness