International Trade

Lectures

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- **Fridays 30/01, 06/02, 13/02, 27/02, 6/03, 13/03, 27/03, 03/04, 10/04, 17/04 11:00-13:00**

Classes

Jocelyn Boussard

- **Fridays 24/04, 22/05 11:00-13:00**

- **Language**
  - ✓ **lectures in French, notes in English**
- **Grading**
  - ✓ **Final exam (90%): 1 essay question + 2 exercices, closed book**
  - ✓ **Class participation (10%)**
- **Lecture notes are downloadable from http://gregory.corcos.free.fr/ENSAE2a.html**
- **Classes: Jocelyn Boussard will discuss solutions to sample exams.**
- **Textbook:**
  - **J. Markusen, J. Melvin, W. Kaempfer and K. Maskus,** *International Trade - Theory and Evidence*, **1995, Mc Graw-Hill, downloadable at http://spot.colorado.edu/~markusen/textbook.html**
- **Alternative textbooks:**
  - **Feenstra R. and Taylor A. (2011)** *International Economics*, Worth Publishers.
  - **Krugman P., Obstfeld M., and Melitz M. (2010)** *International Economics: Theory and Policy*, Pearson Prentice Hall
- **Further reading: see bibliography at the end of the lecture notes**

Outline of the course

1. Introduction
2. Productivity Differences: Ricardian Trade Theory
3. Factor Proportions: Heckscher-Ohlin-Samuelson Theory
4. Specific Factors: Jones' Ricardo-Viner Model
5. Trade Policy Under Perfect Competition
6. Introduction to Trade Theory Under Imperfect Competition
7. Standard Trade Models Under Imperfect Competition
8. Strategic Trade Policy

Outline of Lecture 1

1. What are the Economics of International Trade?
2. A Brief History of Economic Thought
3. General Trends
   - Globalization
   - Trade by country
   - Trade by product
   - Fragmentation
   - Trade in Factors: FDI and Migration
   - Trade Costs and Trade Determinants
4. Two Introductory Theoretical Examples
5. Conclusions

I - Introduction

1. What are the economics of International Trade?

- Study and explanation of the
  - Location of production:

    what is produced, where?

  - Trade patterns:

    who exports / imports, what is traded?

    ✓ goods and services

    ✓ factors of production (labor, capital, knowledge)

- Impact of trade liberalization on
  - Prices of goods/services
  - Prices (returns) of production factors
  - Welfare: worldwide, in each country, by group (workers vs capital owners, skilled vs unskilled) in each country
- Typical questions:
  - Why do countries open to trade?
  - Does trade increase inequality within/between countries?
- Other questions
  - How is trade policy formed? role of lobbies, regional trade agreements, general trade agreements (GATT, WTO)
  - Trade and growth
  - Trade and regional disparities (agglomeration, urbanisation)
  - Trade and culture, wars, the environment...

- Barriers to Trade
  - physical: transport costs
  - trade policies: tariffs, production subsidies, non-tariff measures (quotas, standards)
  - informational barriers, cultural differences (language, law, institutions)
  - currency fluctuations (not studied in this course)
- Trade liberalization: reduction in barriers to trade in goods and services
- Globalization:
  - Free trade of goods and services
  - Free mobility of capital
  - Free mobility of people (migration)
  - Free mobility of knowledge (technological transfers)

2. History of Economic Thought

- Very old field of research, still very active. Why?
  - Economic and political questions that directly impact on the population
  - Different effects of trade depending on the group: positive for some people, negative for others
  - Large consensus among economists in favor of trade liberalization
  - Large consensus in the population against trade liberalization
  - Large number of wrong "intuitions"

⇒ Important debates

- First wave (from the 19th century to the 1970's): international trade under perfect competition
  - General equilibrium models
  - Explain many observed stylized facts:

    ✓ trade between countries that are different

    ✓ implementation of trade policies
  - Concludes that free trade is good

    ⇒ trade liberalization implementation (late 18th century, interwar period, after 1945)

- Second wave (mid 1970's-1990's)
  - Non-explained stylized facts

    (Leontieff paradox, intra-industry trade,…)
  - New tools: industrial organization, game theory

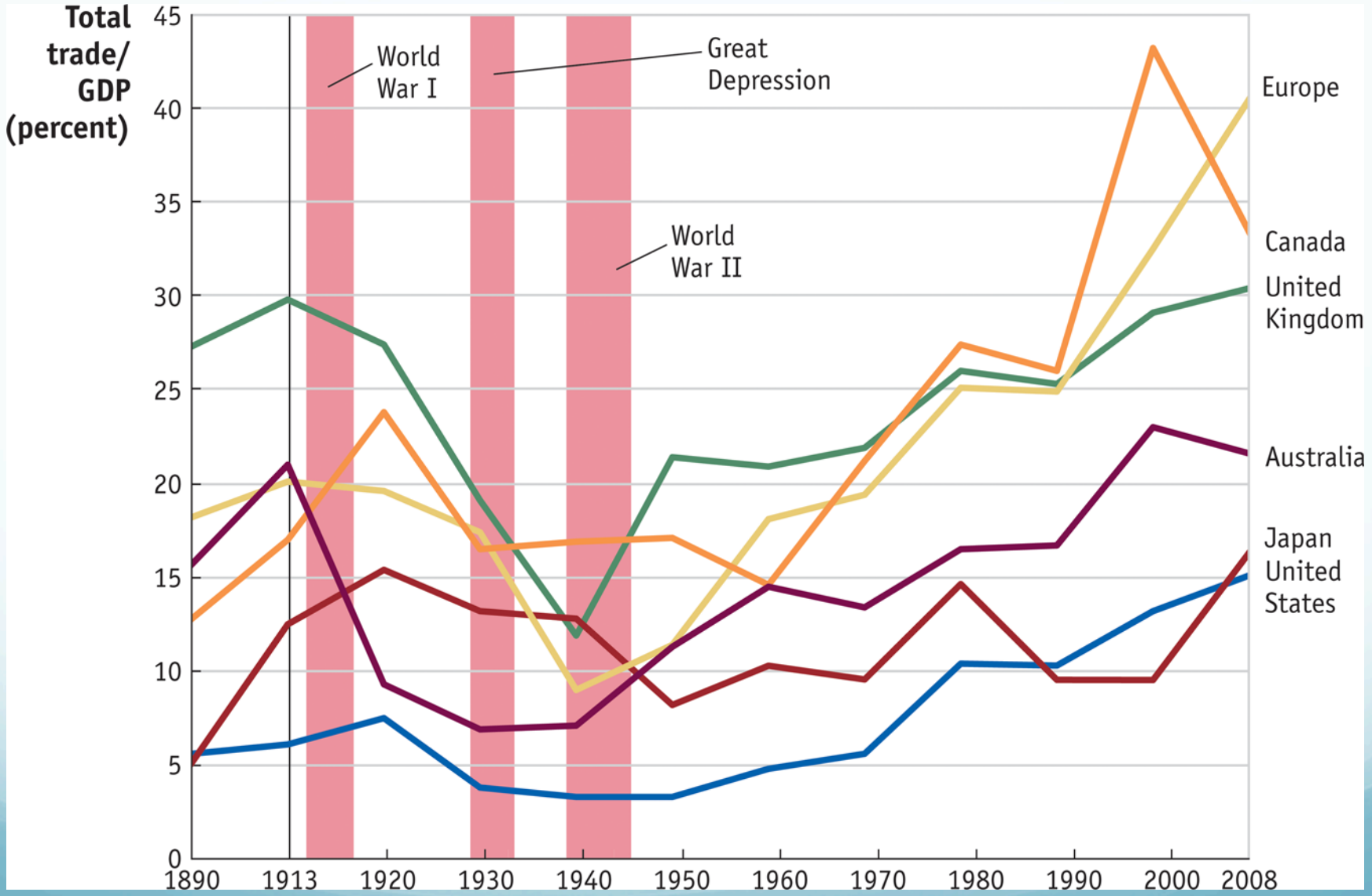
⇒ Partial equilibrium models with imperfect competition

- Third wave (since the 1990's)
  - Extension/generalization of the second wave models (e.g. general equilibrium)
  - Study of other phenomena: factor movements, foreign direct investment (FDI) and fragmentation, regional trade blocks, technology diffusion, political economy of trade liberalization
  - Structural estimations of some models, test of some models against others, largely with very disaggregated data

3. General Trends

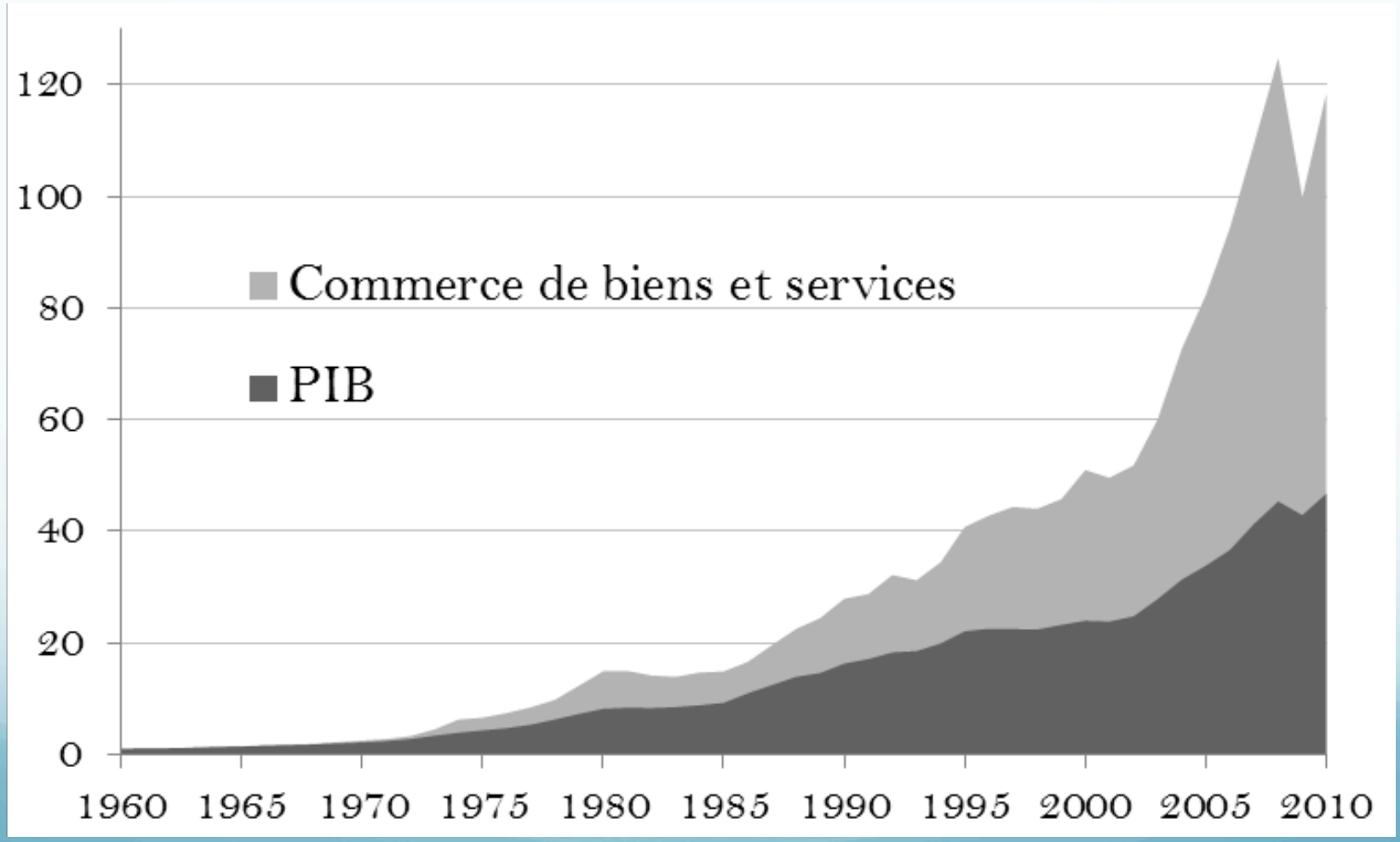
- Old phenomenon
  - 1 million people to feed in Rome at the Roman Empire time
  - Large commercial cities in the Middle Ages / the Renaissance (Venice, Genoa)
  - Disappearance of starvation periods thanks to the reduction of transport costs (cost + time) on agricultural goods
  - But:
    - XIVth - XVth c.: trade represents only 2-3% of world GDP (Bairoch, 1993)
    - 1850: 10% of World GDP (Krugman, 1995)

Global evolution for 120 years



- Global evolution for 60 years

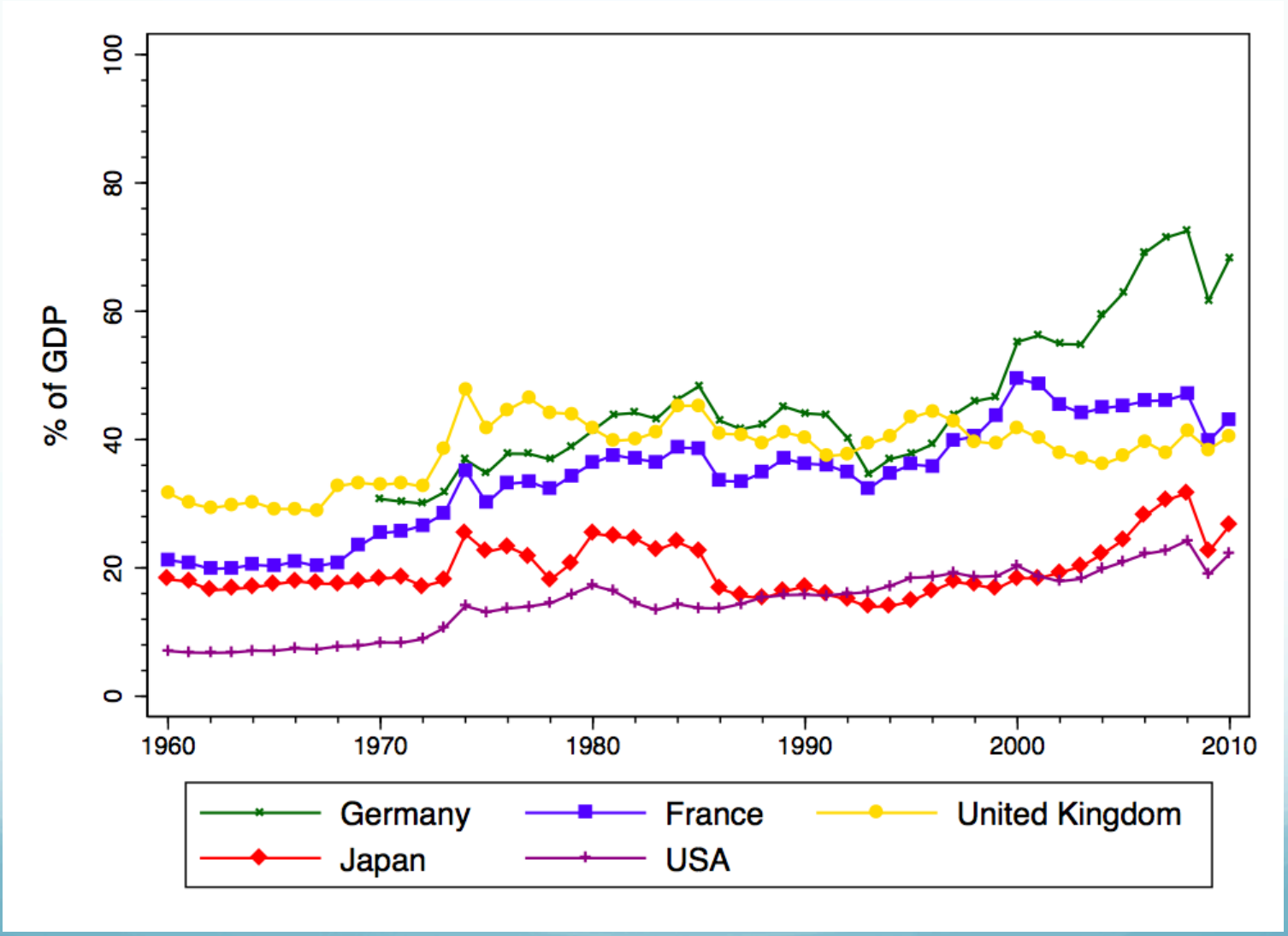
World GDP and trade growth since 1960 (World Bank, 2011)



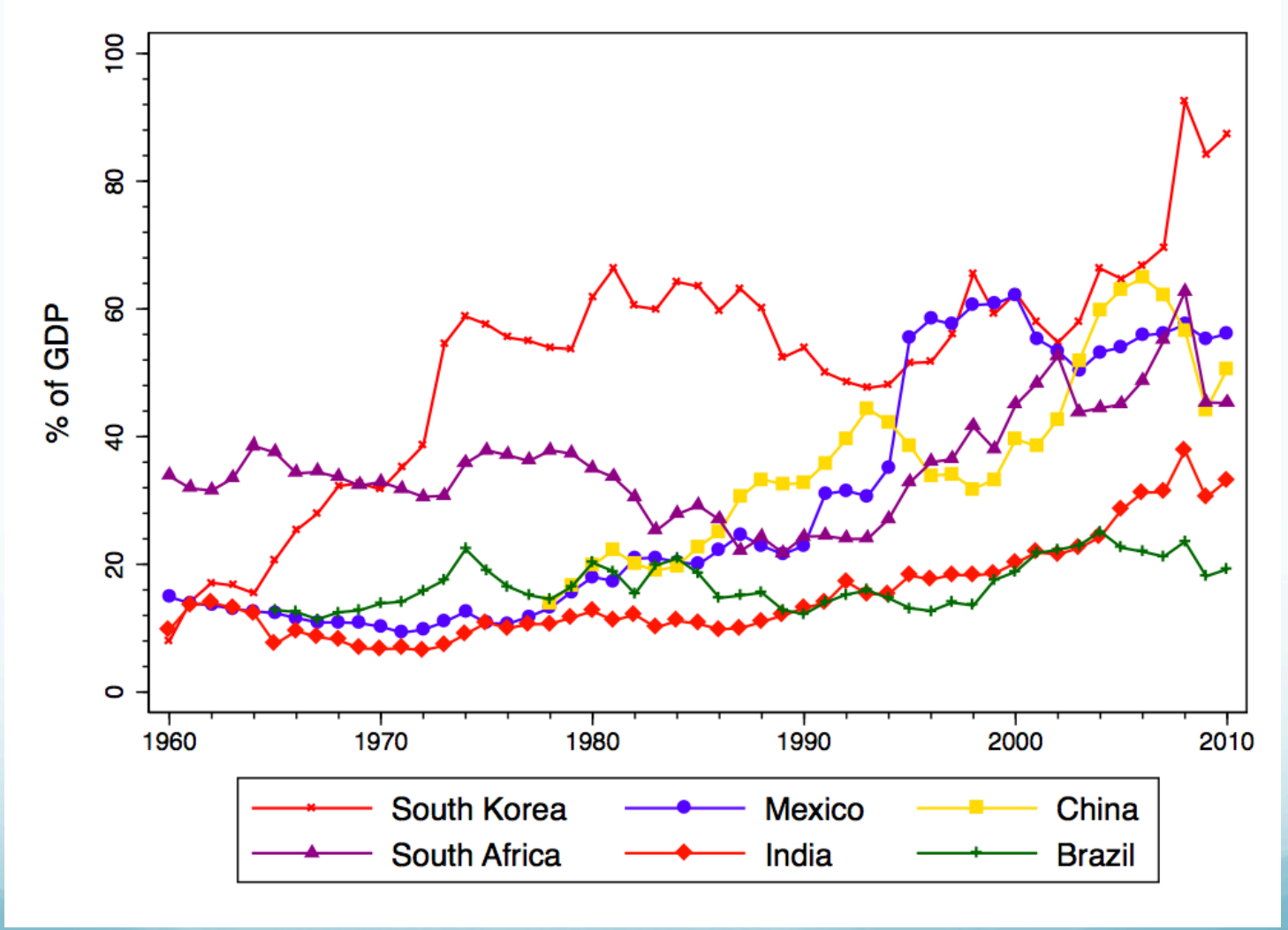
- Regular slow increase from first part of 18th century to 1913
- 1913 level again reached in mid-1970's only
- Small increase after WWI till 1929
- Large decrease due to great depression and WWII
- Increase from WWII till now, faster since
- World trade in value has been multiplied by a factor of 13 since 1960 (10.3% growth per year, 8% for World GDP)

Trade openness: (exports+imports)/GDP

Developed countries (World Bank/IMF, 2011)

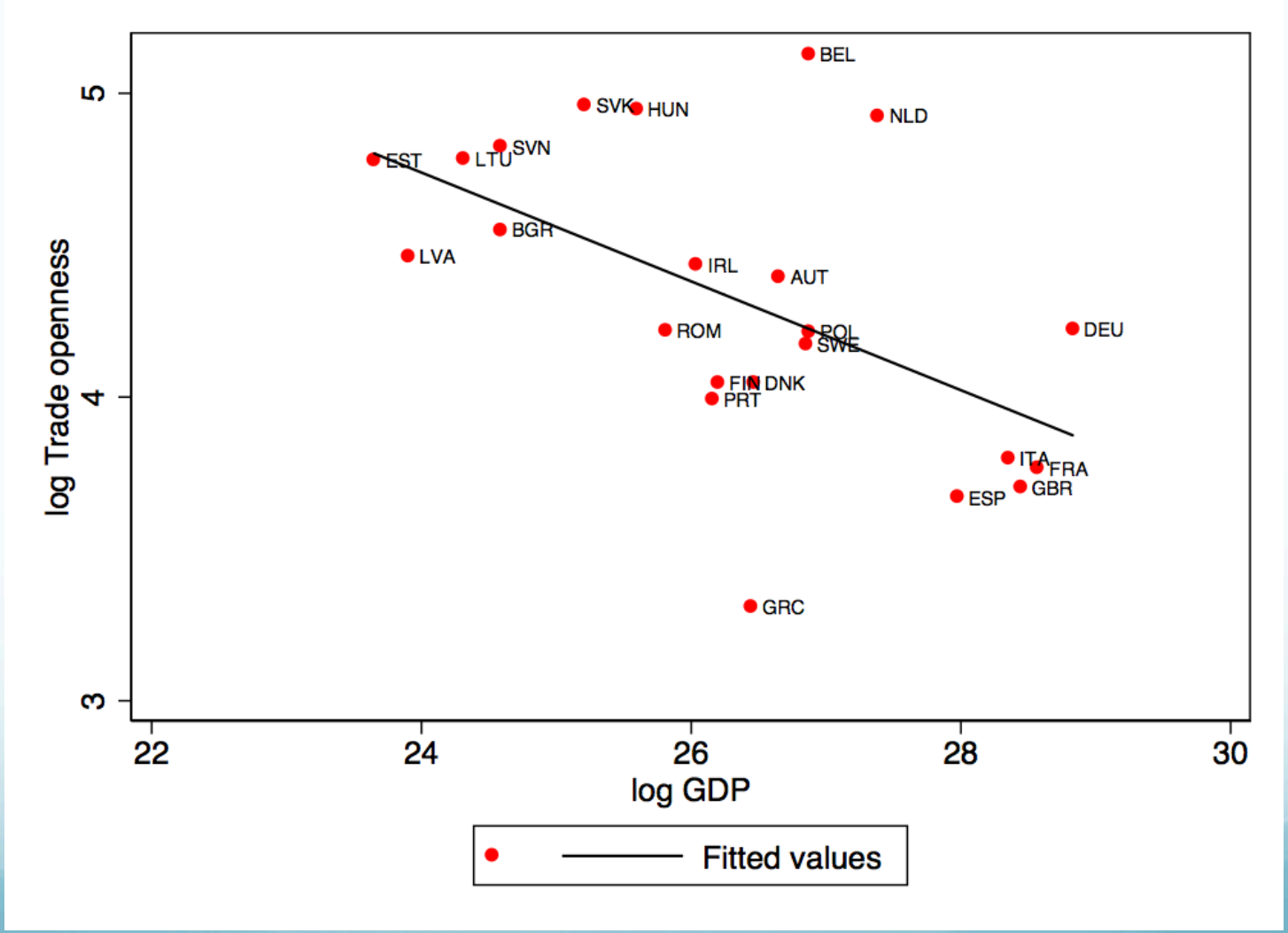


Emerging countries
(World Bank/IMF, 2011)



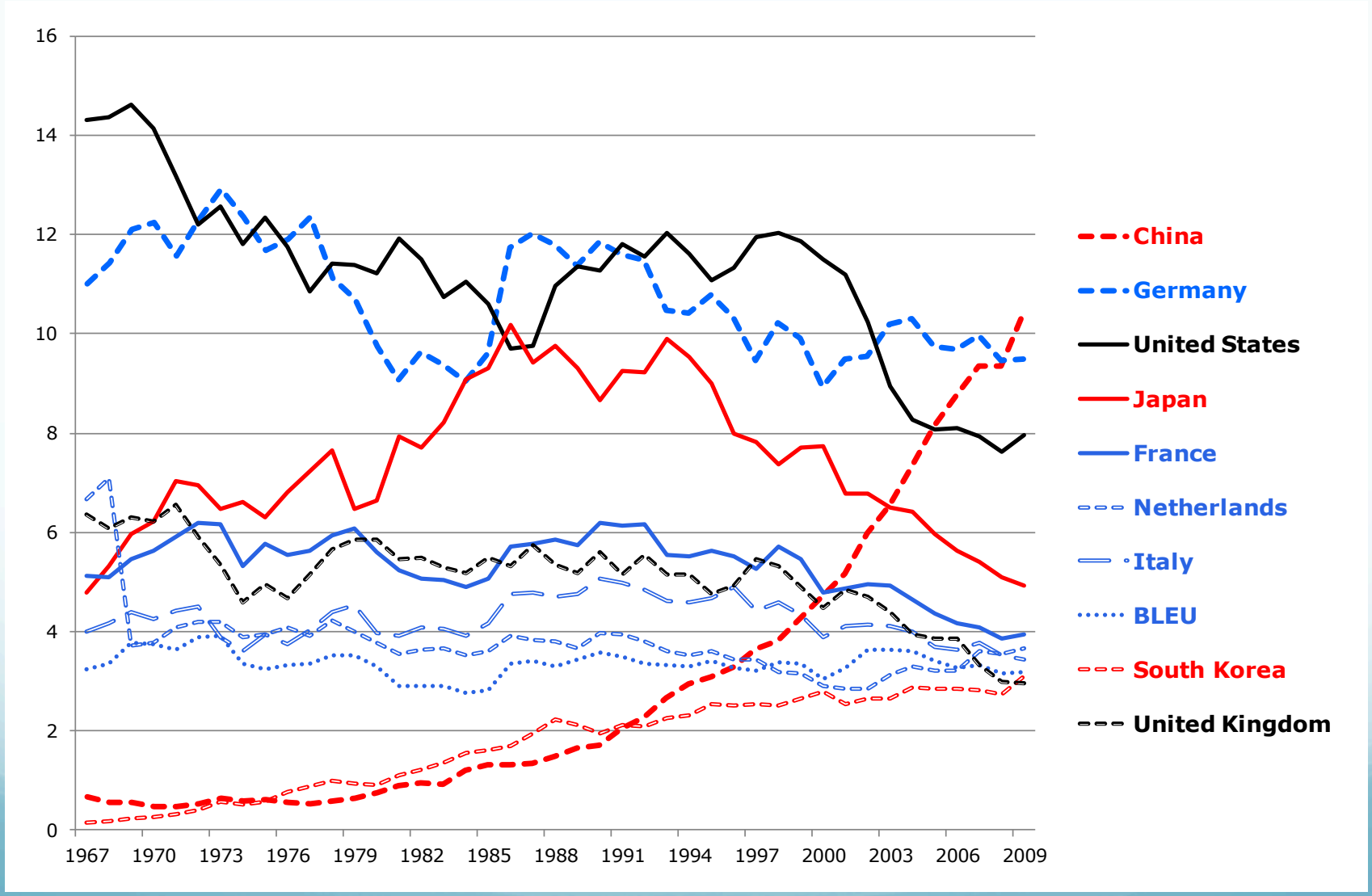
Trade openness and country size

(World Bank/IMF, 2011)



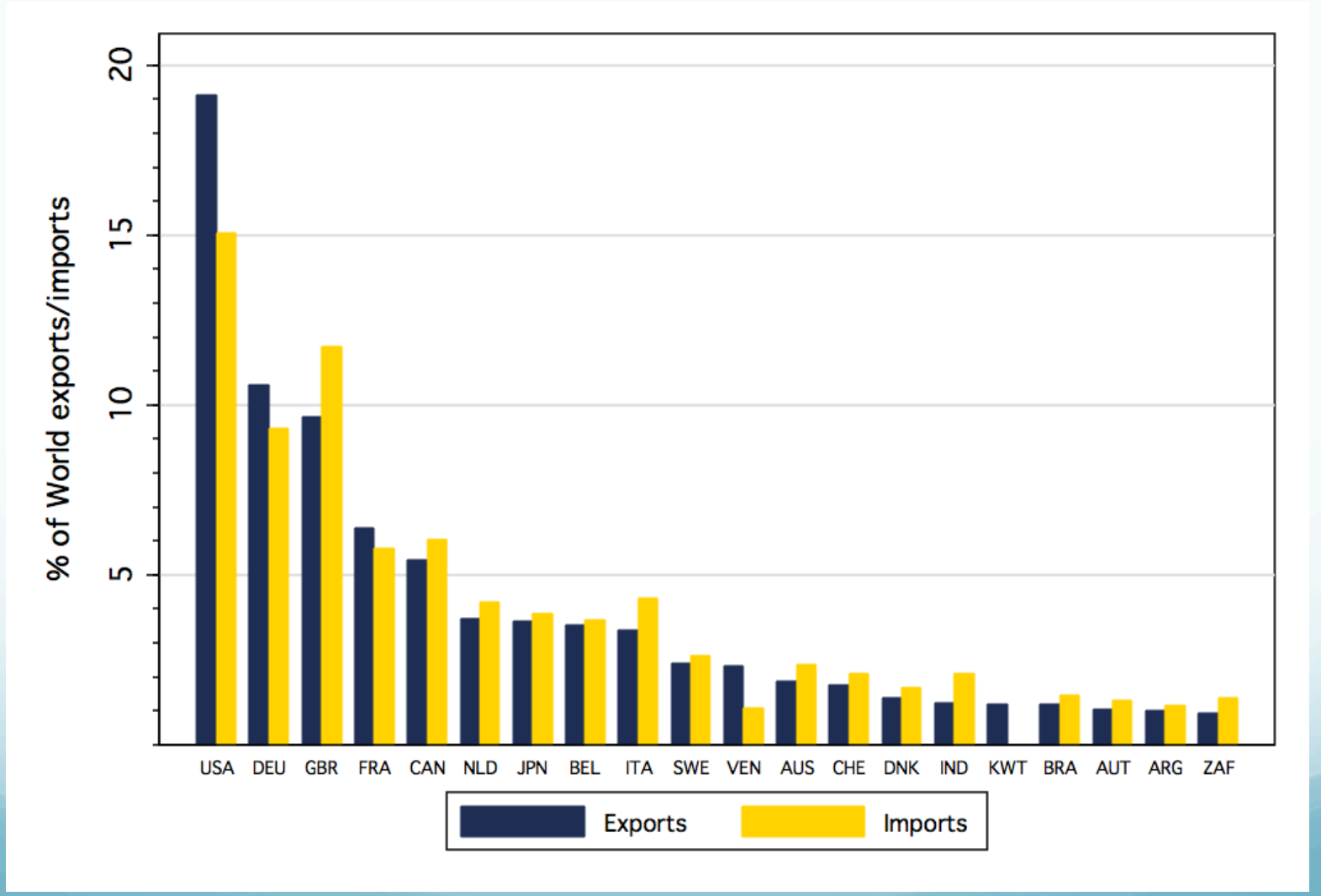
Ten leading merchandises' exporters, 1967 – 2009

(% of World Merchandise Trade, CEPII)

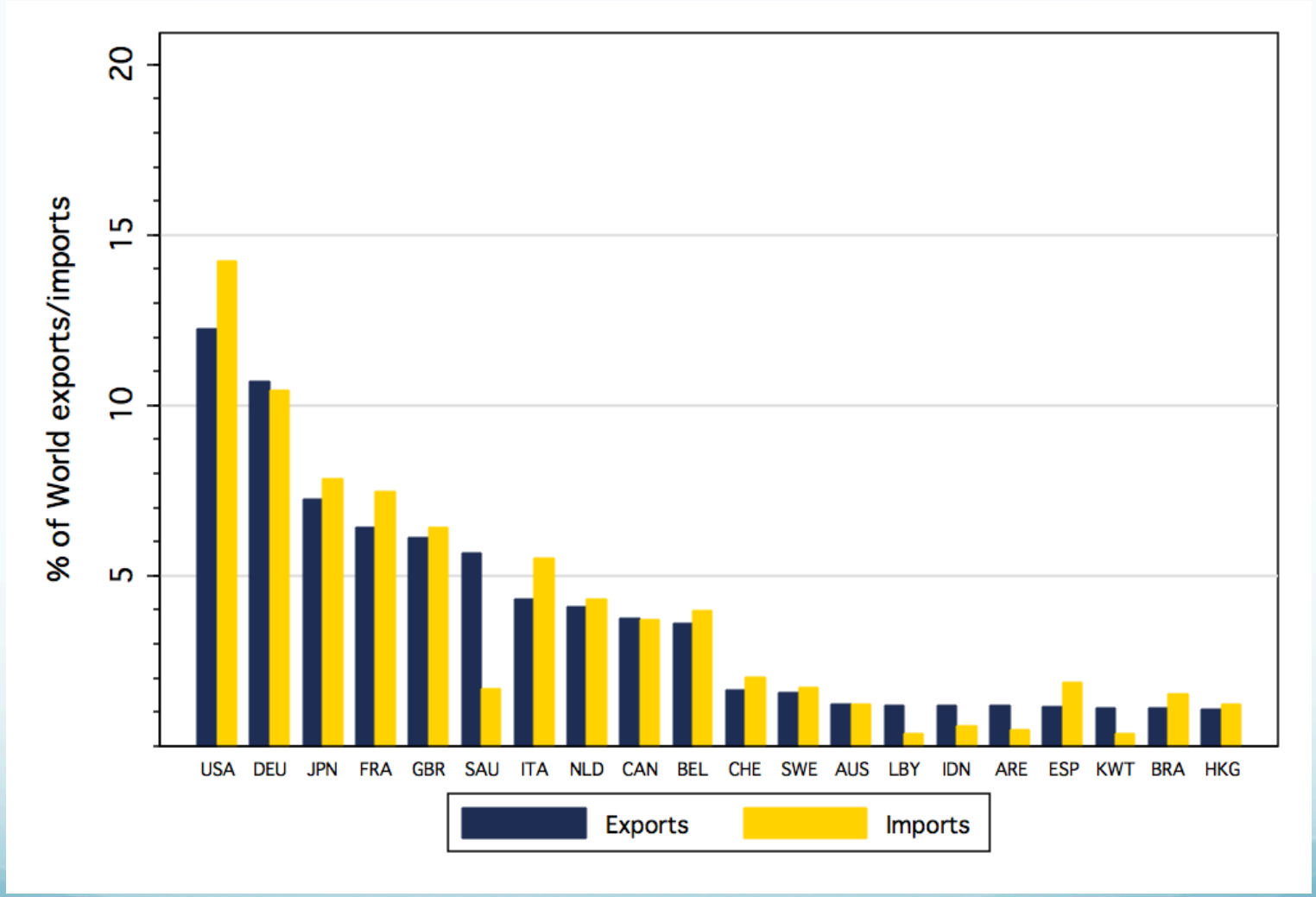


Main actors (World Bank/IMF, 2011)

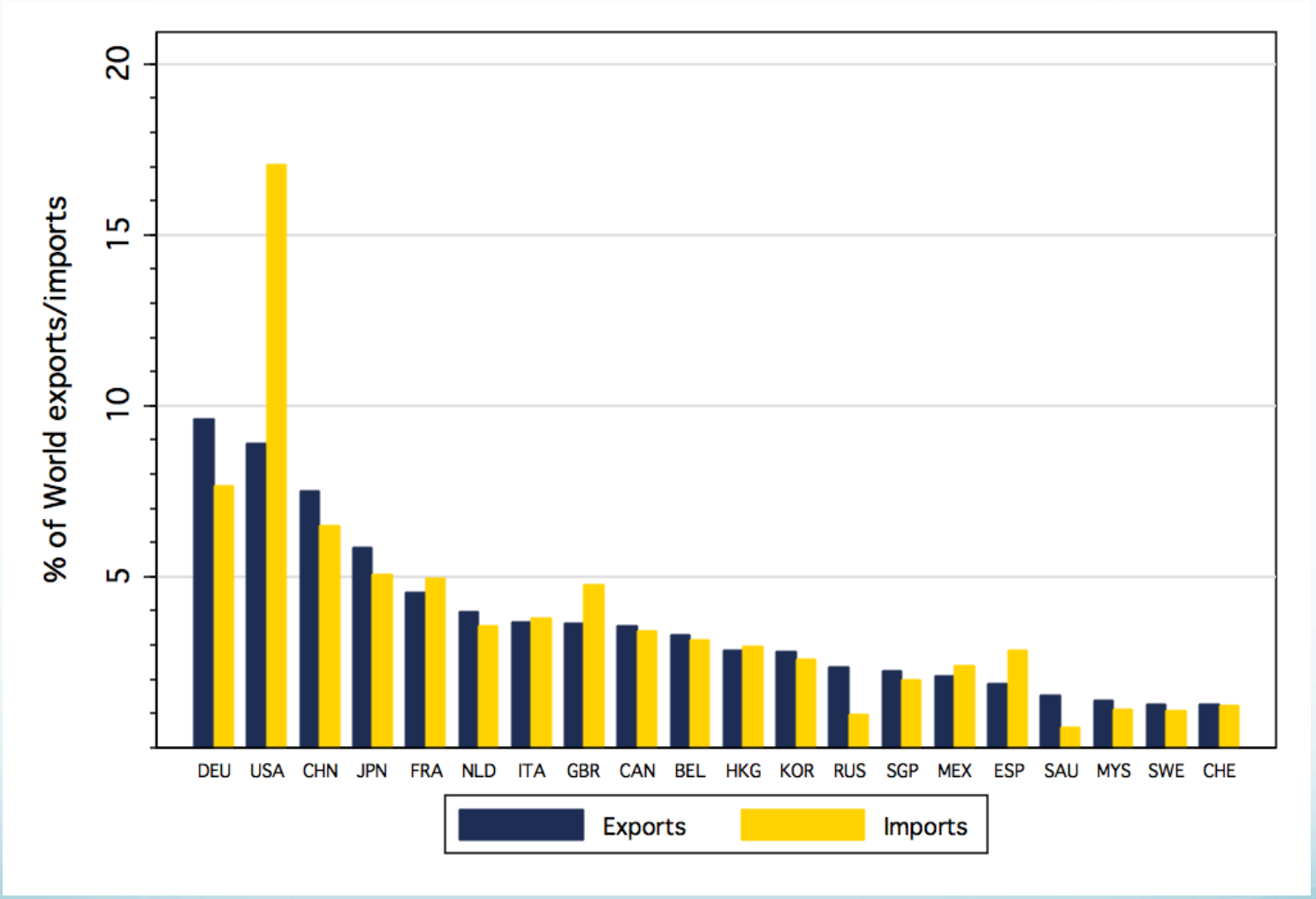
1960



1980


% of World exports/imports
5
10
15
20
USA
DEU
JPN
FRA
GBR
SAU
ITA
NLD
CAN
BEL
CHE
SWE
AUS
LBY
IDN
ARE
ESP
KWT
BRA
HKG
Exports
Imports

2005


% of World exports/imports
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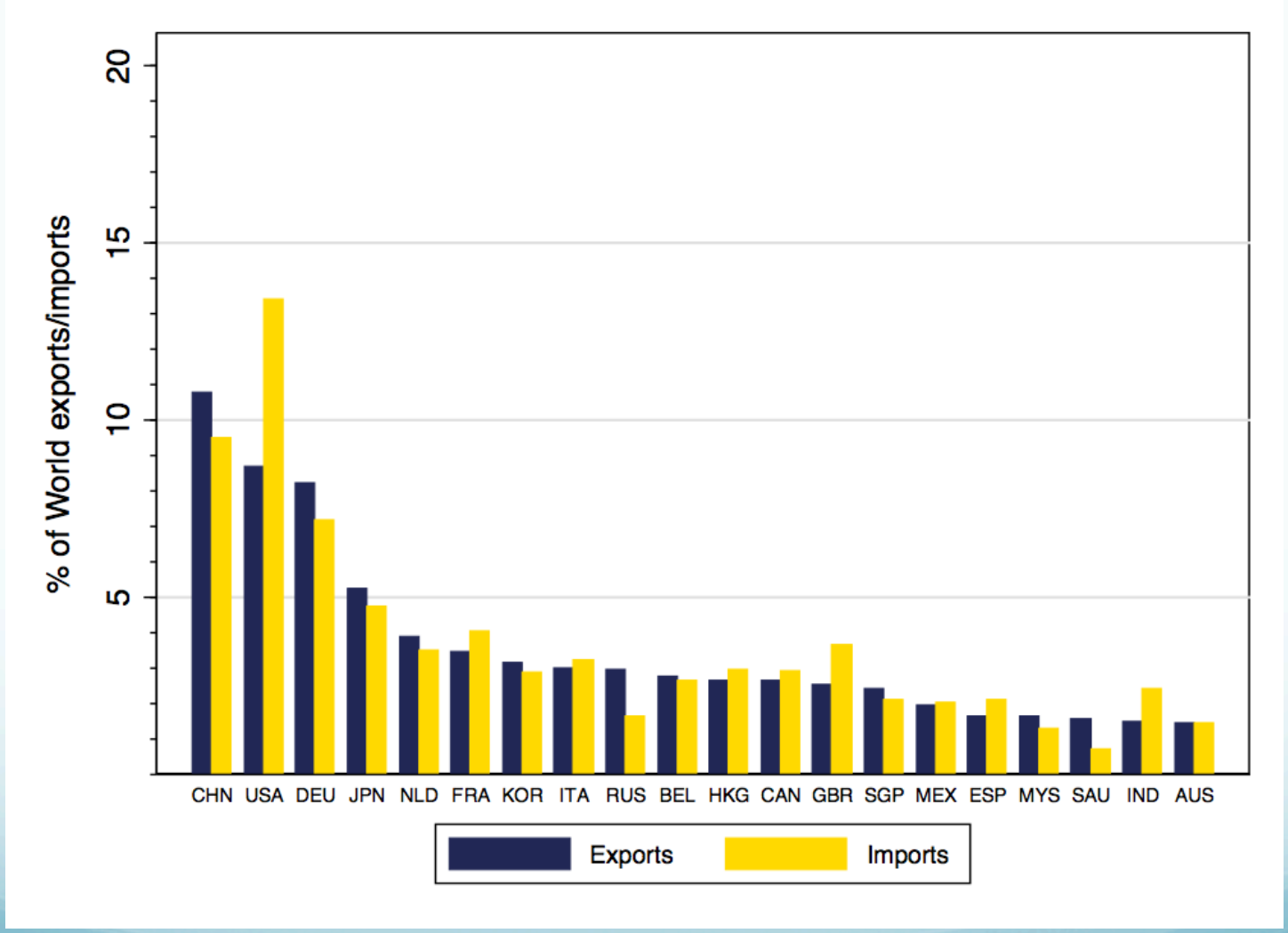
GBR
CAN
BEL
HKG
KOR
RUS
SGP
MEX
ESP
SAU
MYS
SWE
CHE
Exports
Imports

2010


% of World exports/imports
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KOR
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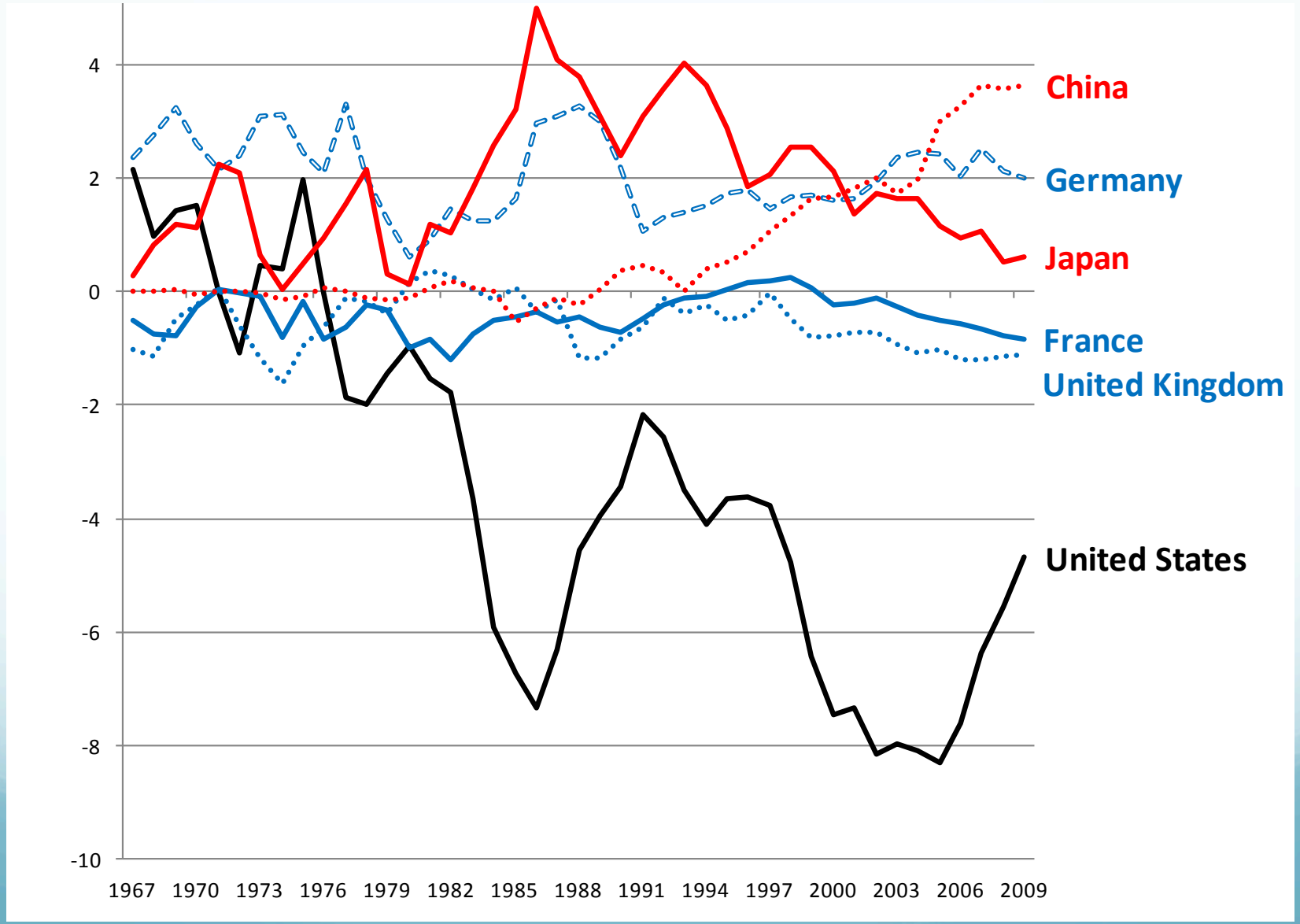
RUS
BEL
HKG
CAN
GBR
SGP
MEX
ESP
MYS
SAU
IND
AUS
Exports
Imports

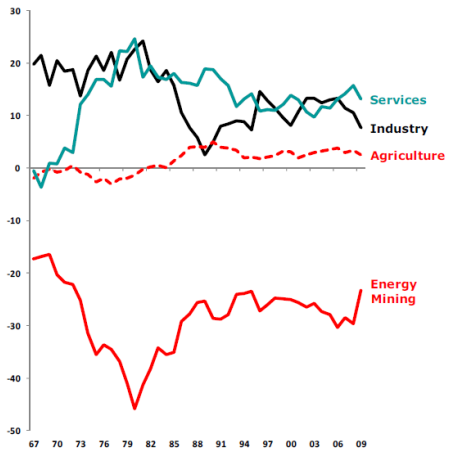
- Main exporters fall into 4 categories:
  - Large economies: USA, JPN, DEU, GBR, FRA, ITA
  - Small open economies: NLD, BEL, SWE, CHE, DNK, AUT, HKG, SGP
  - Raw material exporters: CAN, VEN, KWT, SAU, LBY, ARE, RUS (since the oil crisis of 1973 and 1979)
  - Large emerging economies: BRA, ARG, ZAF, KOR, MEX, RUS, IND (since the 1990s), CHN (since the 2000s)

Trade Balance in Six Major Countries (Fouquin et al., 2012)



Revealed comparative advantage

$RCA_{ik} = [X_{ik} - M_{ik} - (W_k / W)\Sigma_k (X_{ik} - M_{ik})] / Y_i$ *i: country, k: product* (Fouquin et al., 2012)



1967

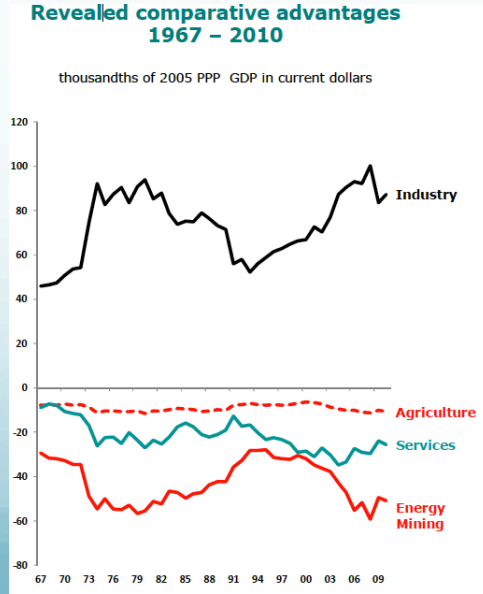
Strong points	thousandths of GDP in current dollars	Weak points	thousandths of GDP in current dollars
Cars and cycles	3,9	Crude oil	-17,9
Refined petroleum products	2,7	Coals	-1,5
Pharmaceuticals	2,1	Other edible agricultural prod	-1,4
Electrical apparatus	1,6	Furniture	-1,4
Beverages	1,4	Non ferrous metals	-1,2
Iron Steel	1,4	Meat	-0,9
Rubber articles (incl. tyres)	1,3	Electronic components	-0,9
Toiletries	1,2	Precision instruments	-0,7
Vehicles components	1,2	Paper	-0,6
Leather	1,1	Non-edible agricultural prod.	-0,6

2009

Strong points	thousandths of GDP in current dollars	Weak points	thousandths of GDP in current dollars
Aeronautics	10,8	Crude oil	-11,5
Pharmaceuticals	4,9	Natural gas	-3,4
Toiletries	4,6	Cars and cycles	-2,8
Beverages	3,8	Computer equipment	-2,5
Cereals	2,5	Knitwear	-2,0
Vehicles components	2,4	Refined petroleum products	-1,9
Engines	2,1	Clothing	-1,8
Fats	1,3	Furniture	-1,5
Electrical apparatus	1,2	Consumer electronics	-1,4
Precision instruments	0,9	Telecommunications equipme	-1,3

France

Germany



1967

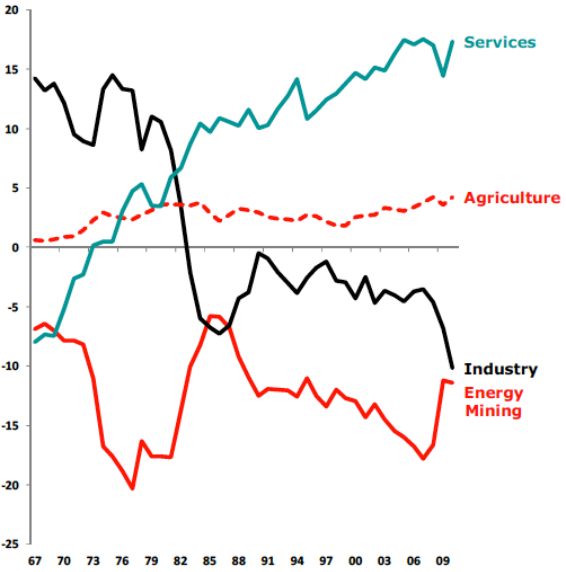
Strong points	thousandths of GDP in current dollars	Weak points	thousandths of GDP in current dollars
Cars and cycles	8,4	Crude oil	-18,3
Electrical apparatus	5,8	Other edible agricultural prod	-5,8
Specialized machines	5,5	Non ferrous metals	-4,6
Pharmaceuticals	5,0	Refined petroleum products	-4,6
Engines	4,7	Meat	-2,5
Plastic articles	4,4	Knitwear	-2,4
Miscellaneous hardware	4,4	Paper	-2,2
Vehicles components	3,3	Non ferrous ores	-2,2
Telecommunications equipment	2,6	Iron ores	-2,0
Basic organic chemicals	2,4	Clothing	-2,0

2010

Strong points	thousandths of GDP in current dollars	Weak points	thousandths of GDP in current dollars
Cars and cycles	22,9	Crude oil	-16,8
Specialized machines	8,0	Natural gas	-8,9
Engines	5,5	Other edible agricultural prod	-7,1
Precision instruments	4,8	Computer equipment	-5,2
Miscellaneous hardware	4,7	Refined petroleum products	-4,6
Commercial vehicles	3,5	Electronic components	-4,0
Plastic articles	3,5	Knitwear	-3,3
Vehicles components	3,4	Clothing	-2,9
Construction equipment	3,1	Non ferrous metals	-2,9
Pharmaceuticals	2,6	Leather	-2,7

Revealed comparative advantages 1967 – 2010

thousandths of 2005 PPP GDP in current dollars



1967

Strong points		Weak points	
thousandths of GDP in current dollars			
Vehicles components	1,9	Crude oil	-2,4
Computer equipment	1,4	Cars and cycles	-2,3
Engines	1,3	Refined petroleum products	-1,8
Aeronautics	1,1	Natural gas	-1,5
Electronic components	1,1	Consumer electronics	-0,8
Precision instruments	1,0	Non ferrous metals	-0,8
Plastic articles	0,8	Iron Steel	-0,7
Construction equipment	0,8	Leather	-0,6
Telecommunications equipment	0,7	Jewellery, works of art	-0,6
Pharmaceuticals	0,7	Meat	-0,6

2010

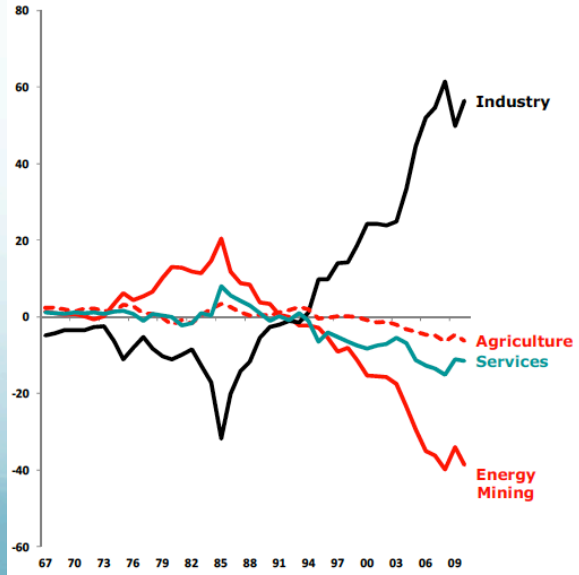
Strong points		Weak points	
thousandths of GDP in current dollars			
Plastic articles	2,7	Crude oil	-12,6
Precision instruments	2,3	Computer equipment	-3,5
Engines	2,1	Cars and cycles	-3,0
Refined petroleum products	1,8	Telecommunications equipment	-2,9
Other edible agricultural prod	1,8	Consumer electronics	-1,8
Cereals	1,7	Knitwear	-1,7
Electronic components	1,5	Leather	-1,4
Basic organic chemicals	1,3	Clothing	-1,4
Non ferrous ores	1,3	Furniture	-1,0
Construction equipment	1,3	Domestic electrical appliances	-0,5

?

?

Revealed comparative advantages 1967 – 2010

thousandths of 2005 PPP GDP in current dollars



1967

Strong points		Weak points	
thousandths of GDP in current dollars			
Other edible agricultural prod	1,3	Basic organic chemicals	-1,6
Miscellaneous manuf. articles	0,9	Iron Steel	-1,2
Meat	0,8	Tubes	-0,7
Yarns fabrics	0,6	Fertilizers	-0,6
Clothing	0,5	Precision instruments	-0,5
Preserved fruits	0,4	Plastic articles	-0,4
Leather	0,3	Non ferrous metals	-0,4
Non ferrous ores	0,3	Engines	-0,3
Coals	0,3	Machine tools	-0,3
Knitwear	0,3	Cereals	-0,3

2010

Strong points		Weak points	
thousandths of GDP in current dollars			
Computer equipment	21,9	Crude oil	-23,6
Telecommunications equipment	17,8	Electronic components	-14,2
Miscellaneous manuf. articles	9,9	Iron ores	-14,0
Leather	9,5	Non ferrous ores	-7,9
Knitwear	8,9	Non ferrous metals	-6,5
Clothing	8,0	Optics	-6,5
Consumer electronics	6,8	Plastic articles	-5,5
Furniture	5,1	Basic organic chemicals	-5,1
Miscellaneous hardware	4,5	Non-edible agricultural prod	-4,6
Electrical apparatus	4,3	Specialized machines	-4,1

Who trades with whom?

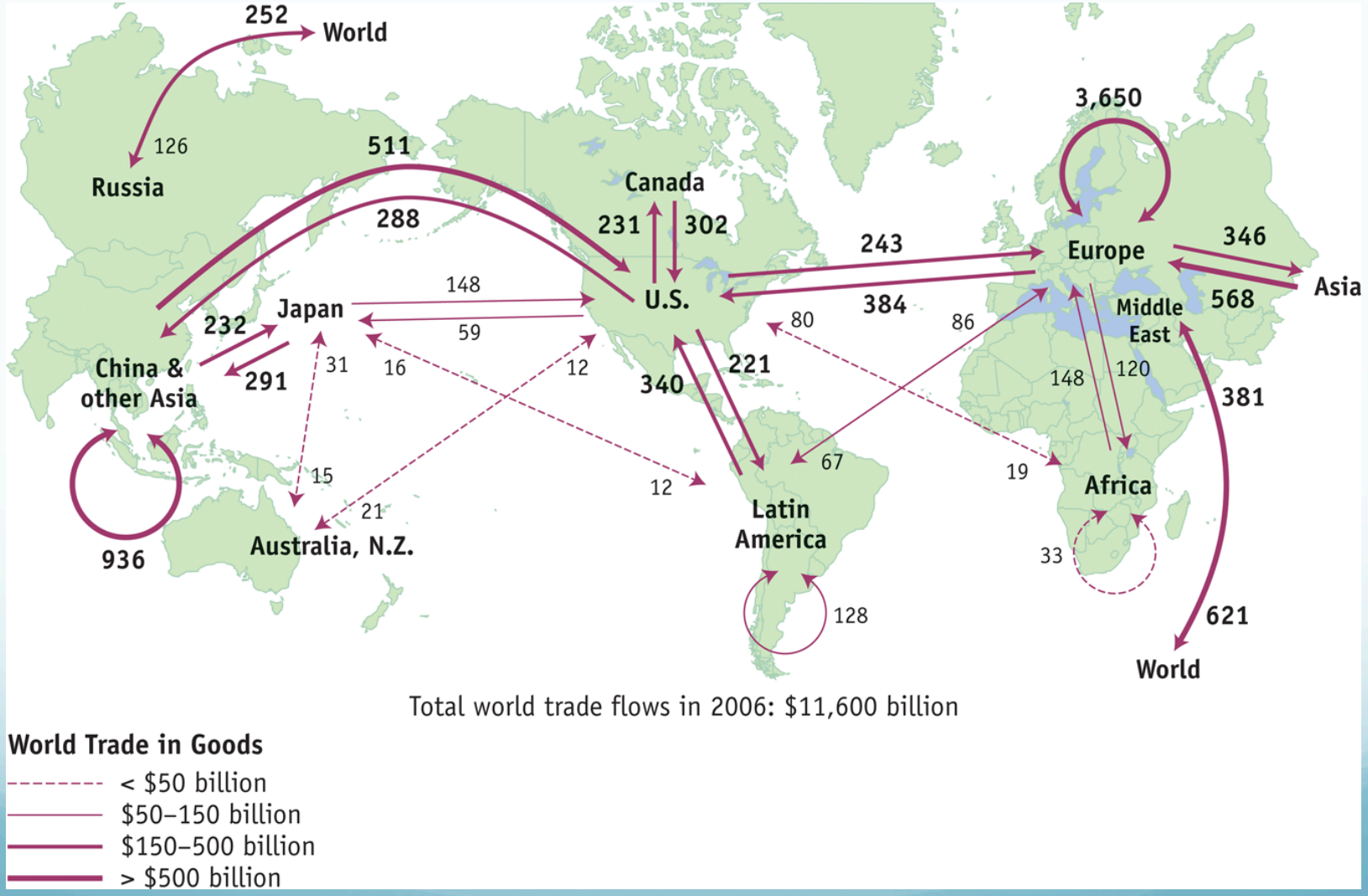
% of World Trade (Fouquin et al., 2012)

% flux 2010	Amérique du Nord	Amérique du Sud	Union européenne (a)	Autres Europe	CEI	Moyen-orient, Maghreb	Afrique sub-saharienne	Japon	Asie de l'Est et du Sud-Est	Océanie et Autres Asie	Monde*
Amérique du Nord	6,1	1,1	2,0	0,3	0,1	0,4	0,1	0,5	1,8	0,4	12,7
Amérique du Sud	1,1	1,1	0,7	0,1	0,1	0,1	0,1	0,1	0,7	0,1	4,2
Union européenne*	2,8	0,7	22,7	2,4	1,1	1,4	0,6	0,4	2,2	0,7	35,0
Autres Europe	0,4	0,1	2,2	0,2	0,1	0,3	0,0	0,1	0,3	0,1	3,7
CEI	0,3	0,0	1,8	0,3	0,7	0,2	0,0	0,1	0,5	0,1	3,9
Moyen-orient, Maghreb	0,6	0,3	1,2	0,1	0,0	0,4	0,2	0,8	1,7	0,6	6,1
Afrique sub-saharienne	0,5	0,1	0,5	0,0	0,0	0,1	0,3	0,1	0,5	0,2	2,2
Japon	1,0	0,2	0,6	0,1	0,1	0,2	0,1	0,0	2,9	0,2	5,5
Asie de l'Est et du Sud-Est	4,5	0,9	3,8	0,4	0,5	0,9	0,5	2,0	7,7	1,6	22,9
Océanie et Autres Asie	0,4	0,1	0,6	0,1	0,0	0,4	0,1	0,4	1,3	0,4	3,7
Monde*	17,6	4,6	36,0	3,9	2,7	4,4	2,0	4,6	19,7	4,4	100,0

exporters in rows, importers in columns

World Trade in Goods, 2006 ($ billions)

(Feenstra and Taylor, 2011, fig 1.2)



- High intra-regional trade flows in North America, EU, CIS (+Russia/ Ukraine), East and South-East Asia
- High inter-regional trade flows elsewhere: South America, Japan, Sub-Saharan Africa, Middle East (+Maghreb), Other Europe (+Turkey), Oceania
- Links between:
  - ✓ North and South America
  - ✓ Western and Eastern Europe, Western Europe and Africa (former colonies)
  - ✓ Oceania and Asia

  But small volumes

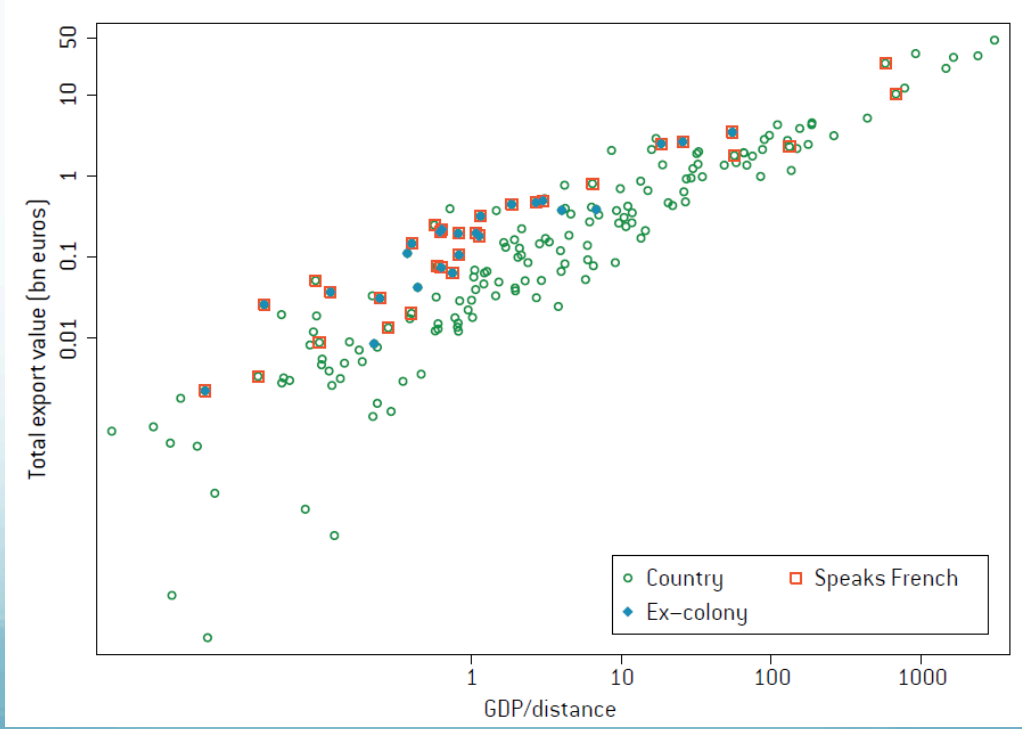
- Trade flows follow a 'gravity equation' : increasing in the size of the origin and destination countries, decreasing in the distance between countries:

$$T_{ij}=A.(Y_i)^{\alpha}.(Y_j)^{\beta}/(D_{ij})^{\delta}$$

with α, β, δ *positive, i: origin, d: destination*

Borders, language, history, networks also matter.

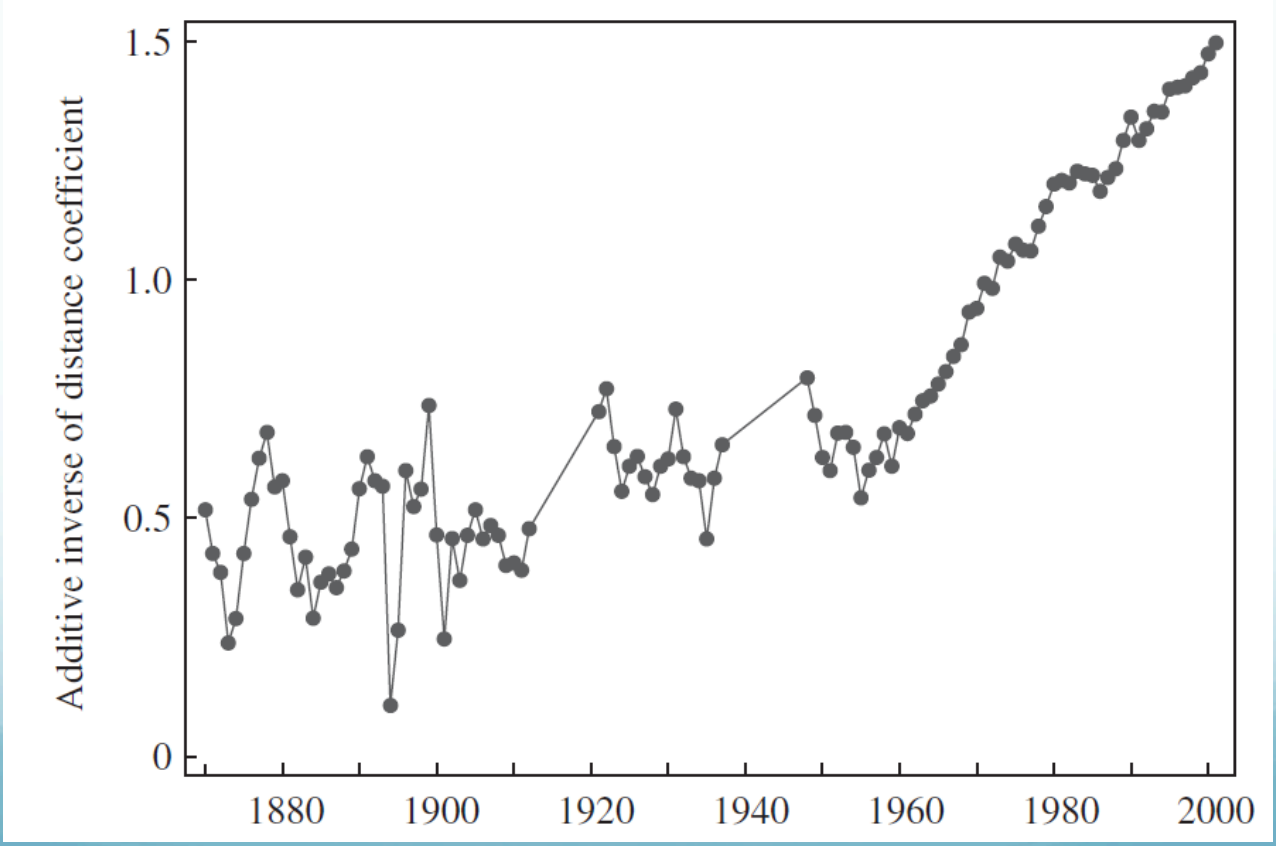
- Gravity for 2003 French exports (Mayer and Ottaviano, 2007)



- If anything, gravity patterns are getting stronger over time, despite advances in globalization

- Distance impact on trade flows at the World level

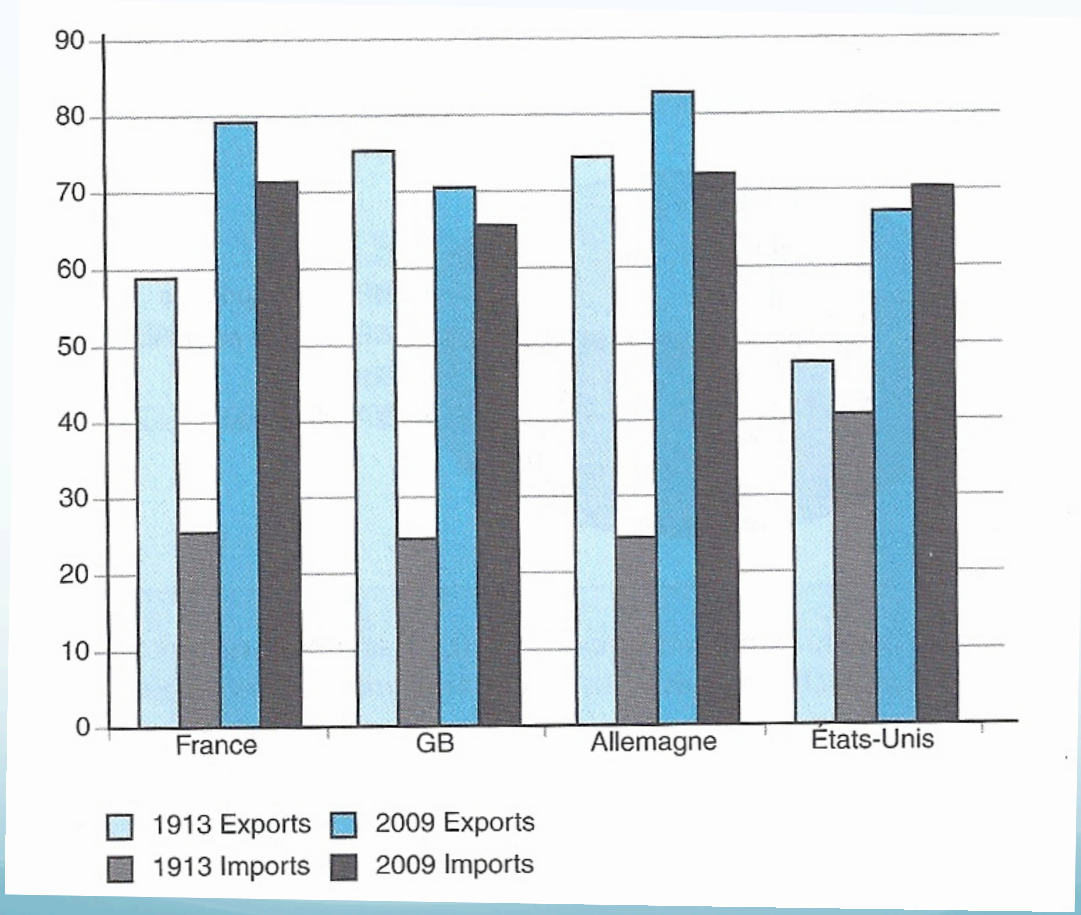
(Combes, Mayer and Thisse, 2008, fig. 5.1)



What is traded?

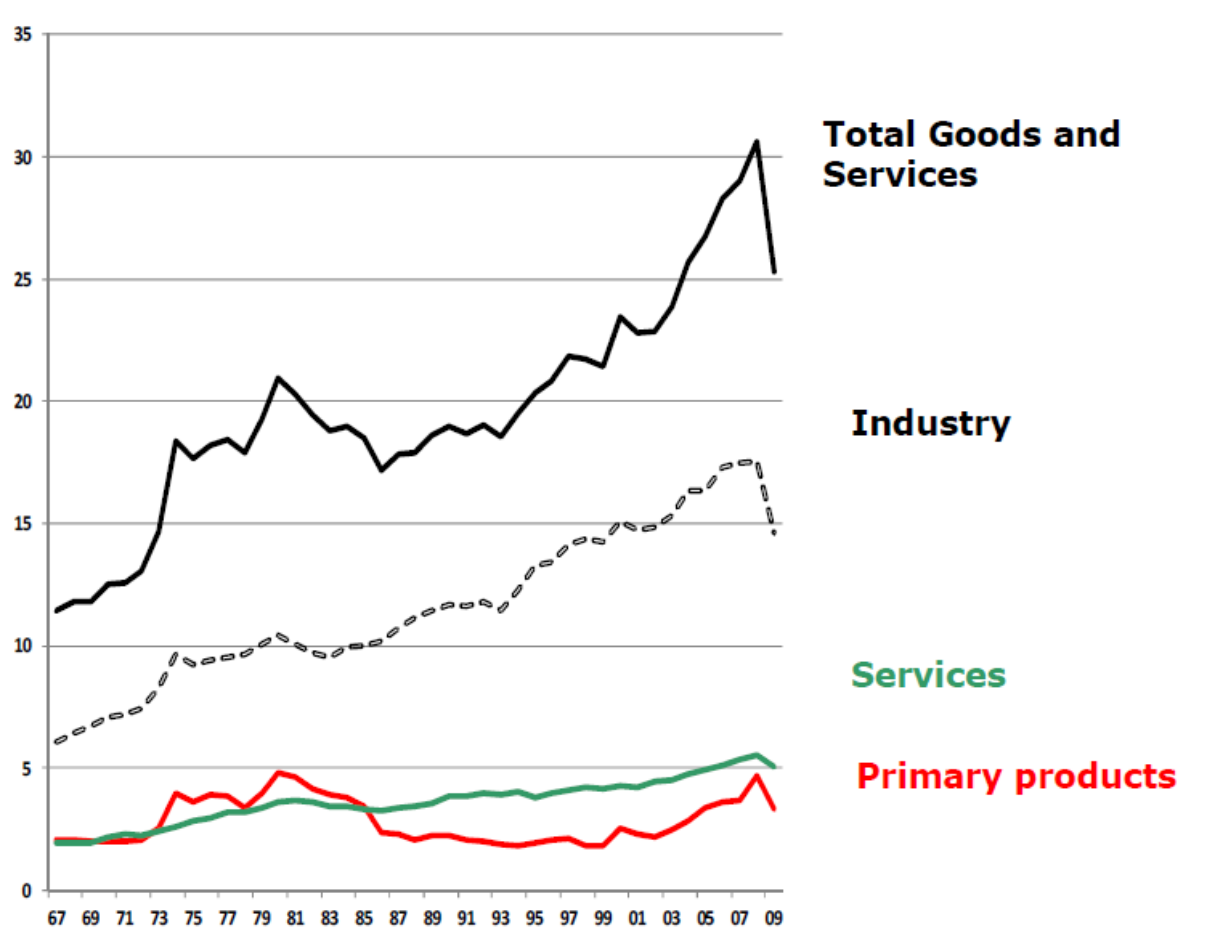
Share of manufactured goods in trade

(Krugman, Obsfeld, Melitz, 2011, fig. 2.8)

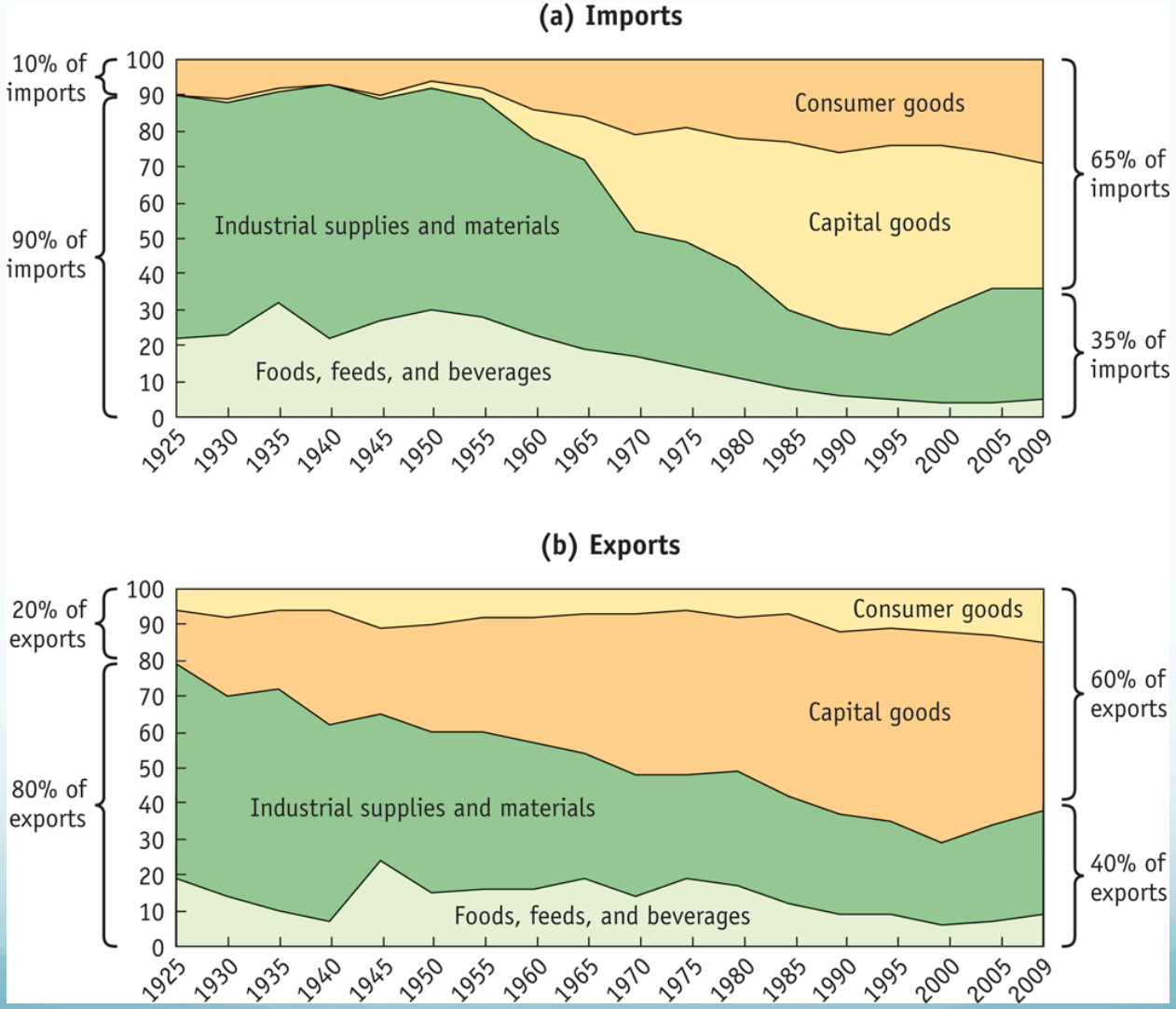


Trade by broadly defined sectors

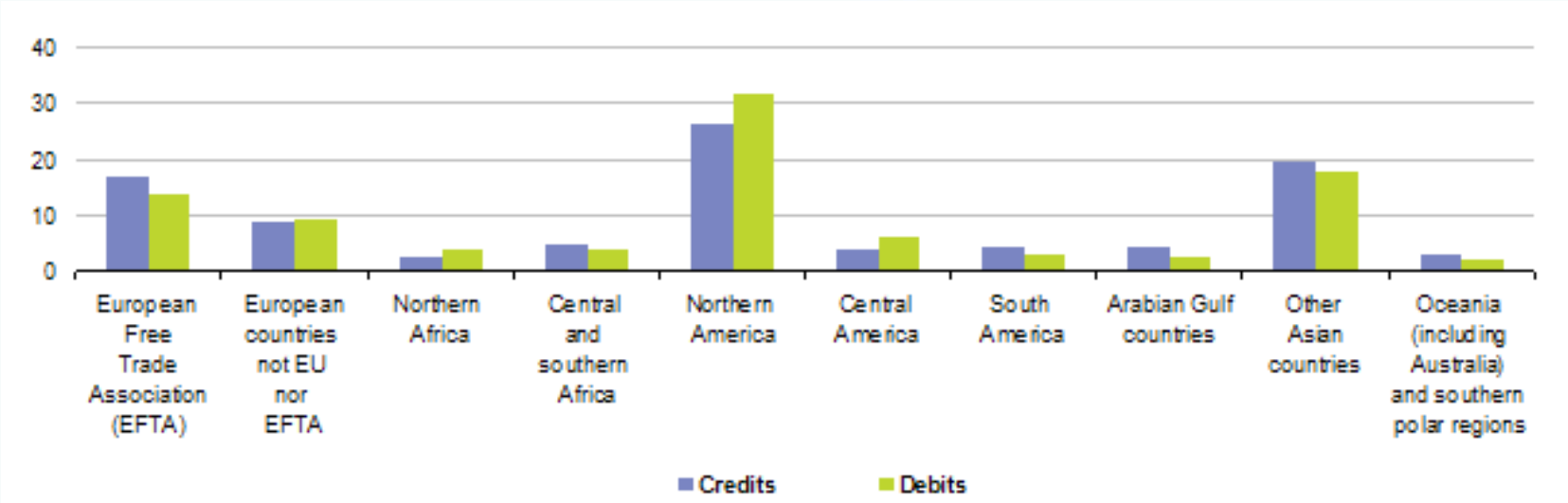
(Fouquin et al., 2012)



Within industry decomposition of US Trade (Feenstra and Taylor, 2011, fig. 1.1)



Share of services in Extra-EU trade, 2010 (%, Eurostat)

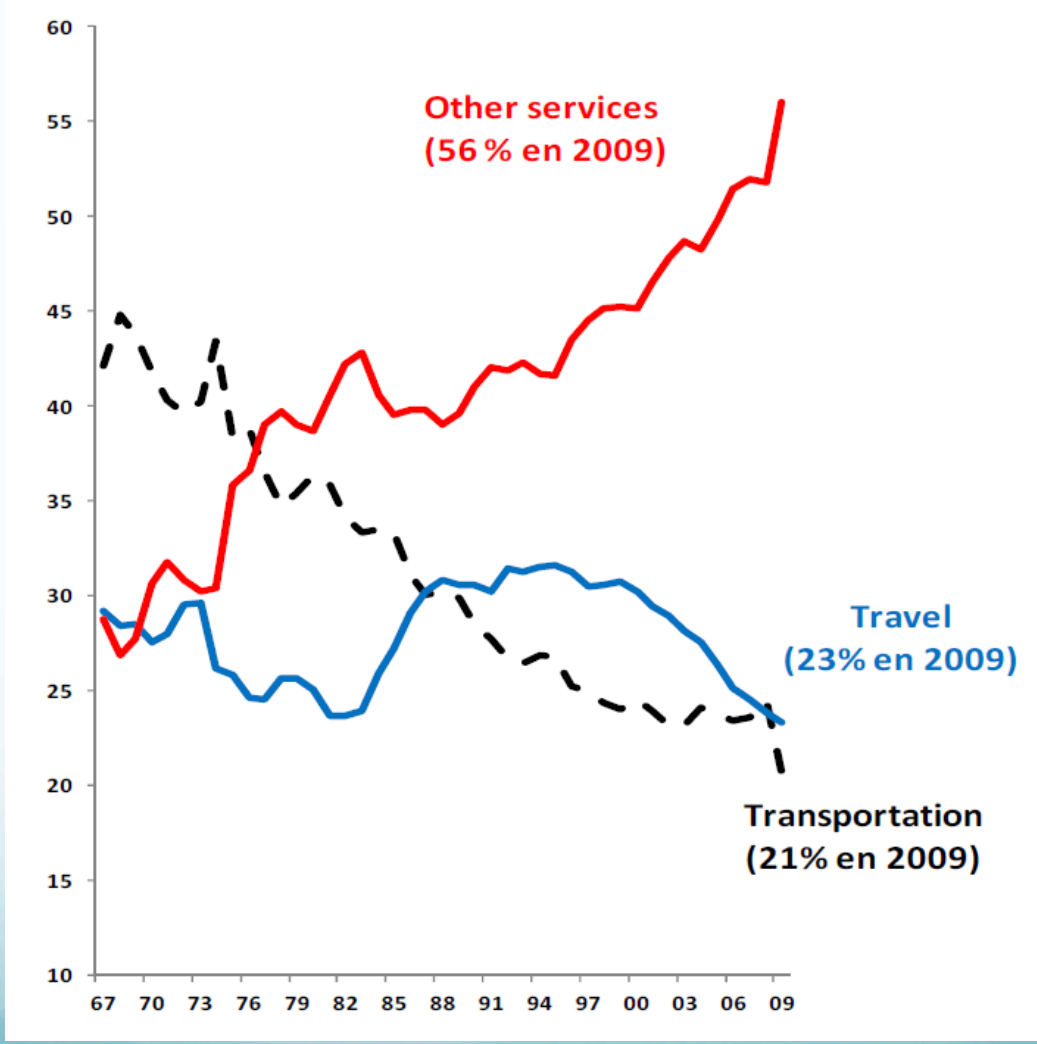


Variations of trade in services for EU
(€ billions, Eurostat)

Partner	2006			2010			2011		
	Credits	Debits	Net	Credits	Debits	Net	Credits	Debits	Net
Total	452.4	381.4	71.0	539.0	453.6	85.4	*579.5*	*470.4*	*109.1*
United States	133.3	124.7	8.6	128.8	132.6	-3.9	*137.4*	*135.3*	*2.0*
EFTA	71.5	49.8	21.8	89.9	63.3	26.6	:	:	:
Japan	19.3	13.6	5.6	19.6	14.9	4.6	*20.4*	*15.3*	*5.1*
Russia	14.8	10.7	4.1	23.2	14.1	9.1	*25.4*	*13.6*	*11.8*
China	14.5	12.5	2.0	22.4	16.4	6.0	*24.6*	*17.3*	*7.3*
Canada	10.6	8.5	2.1	13.2	9.4	3.9	*14.1*	*9.3*	*4.7*
India	7.5	5.8	1.6	10.9	8.7	2.2	*10.9*	*9.7*	*1.2*
Hong Kong	7.1	6.3	0.9	8.9	7.4	1.4	*9.6*	*8.0*	*1.6*
Brazil	5.6	4.7	0.9	9.8	5.7	4.1	*11.0*	*6.4*	*4.6*
Other countries	168.1	144.7	23.4	212.4	181.0	31.4	*326.1*	*255.4*	*70.8*

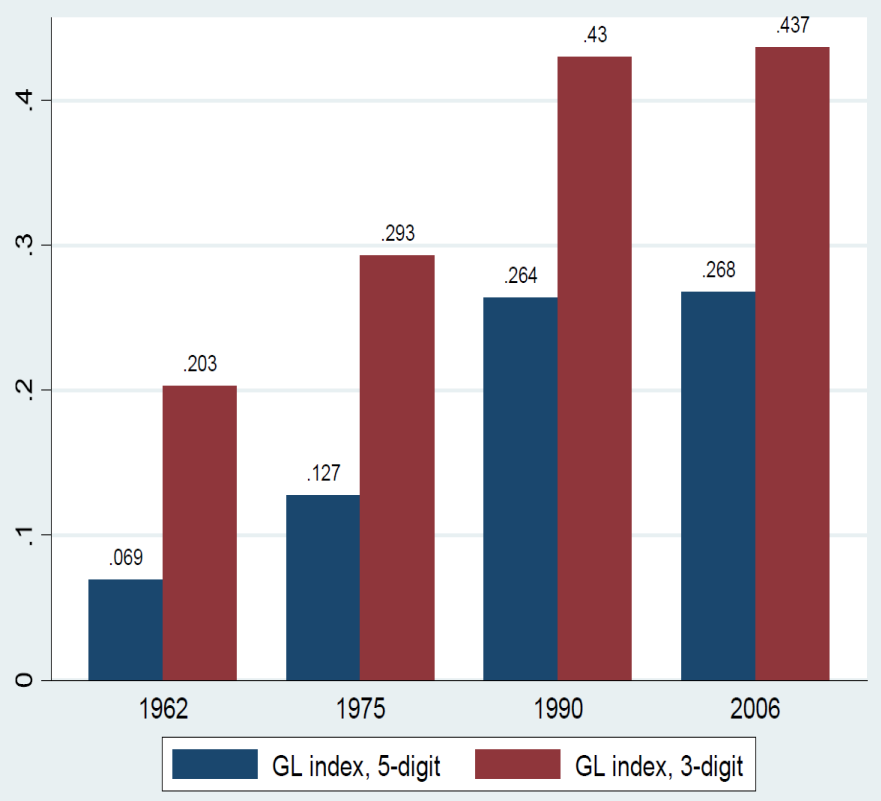
Decomposition of World Trade in Services

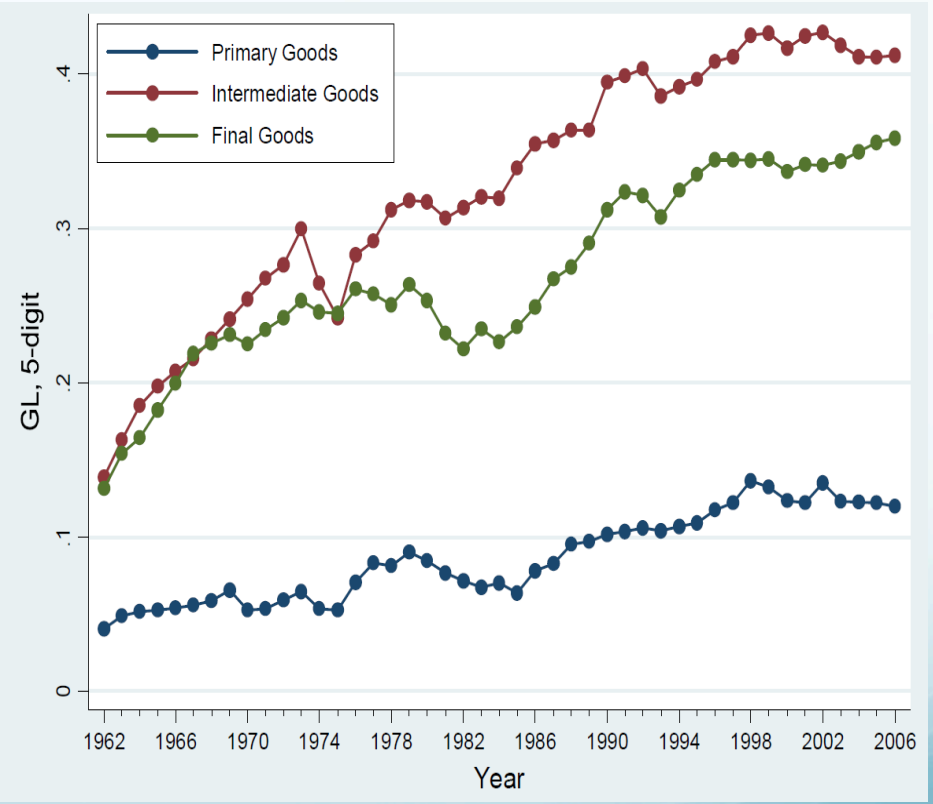
(Fouquin et al., 2012)



Intra-(industry) trade: Brülhart (2008)

Grubel-Lloyd Index $GL_s = [(X_s + M_s) - |X_s - M_s|]100/(X_s + M_s)$





- Late XIXth c.: "Inter-trade"

  Trade with the colonies: raw material, agricultural goods against manufactured goods

- Next, more and more "Intra-trade": Manufacturing goods against manufacturing goods

  Exchange of "identical" goods (cars for instance)

- Much more manufactured goods than services trade because trade cost much higher for services (banking, insurance, cleaning: non tradable) but increase in trade in services

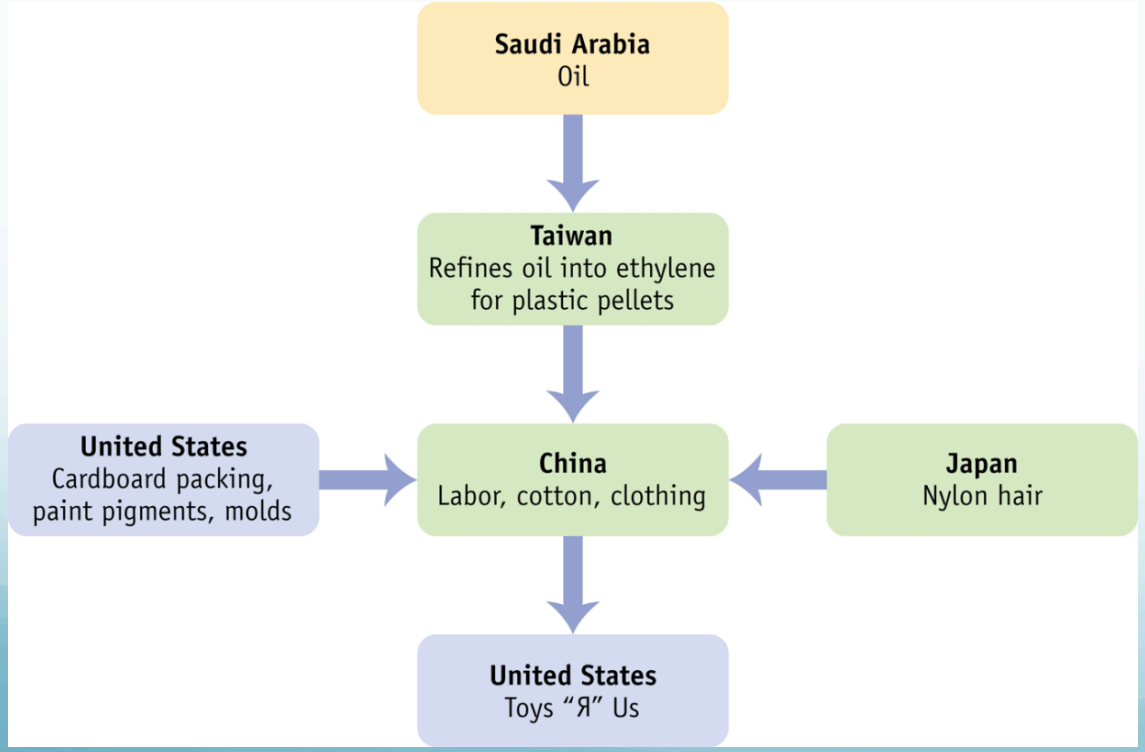
  ($\Rightarrow$ real trade increase even larger since share of services in GDP increases)

Fragmentation

- First stage in a country, next stage in another, final stage in another

⇒ very strong increases of FDI

- Famous Barbie doll example:



Intermediate consumptions for China: $1,65

Export price: $2, VA: $0.35

Trade costs, retail costs, marketing: $7

Final price: $10

German yoghurt example

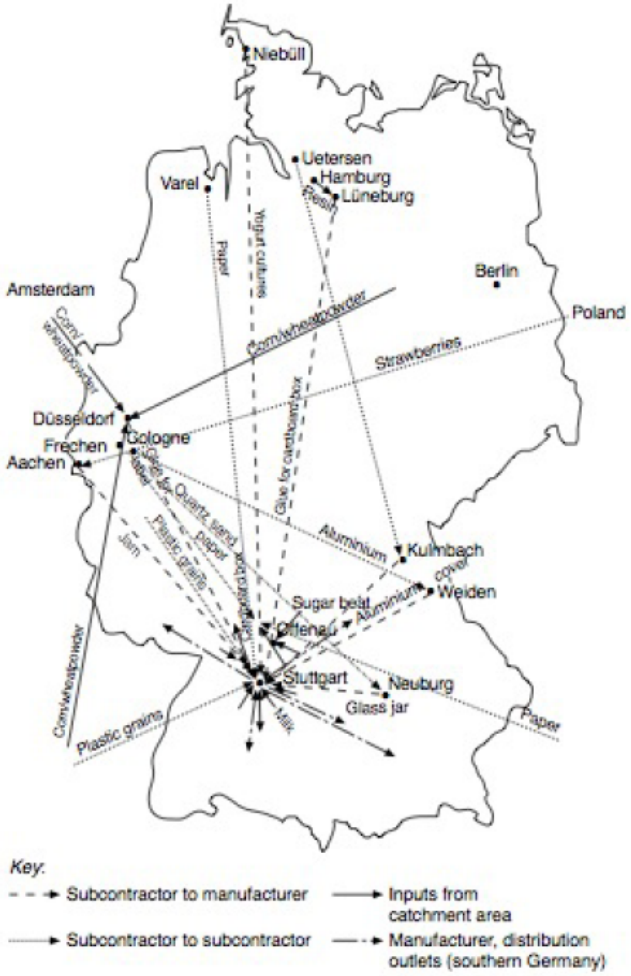


Figure: source: Stefanie Bge Wuppertal institut, 1993

- The components of a yogurt sold in Stuttgart traveled 9.115 km

Figure 1. Distribution of value for iPhone, 2010

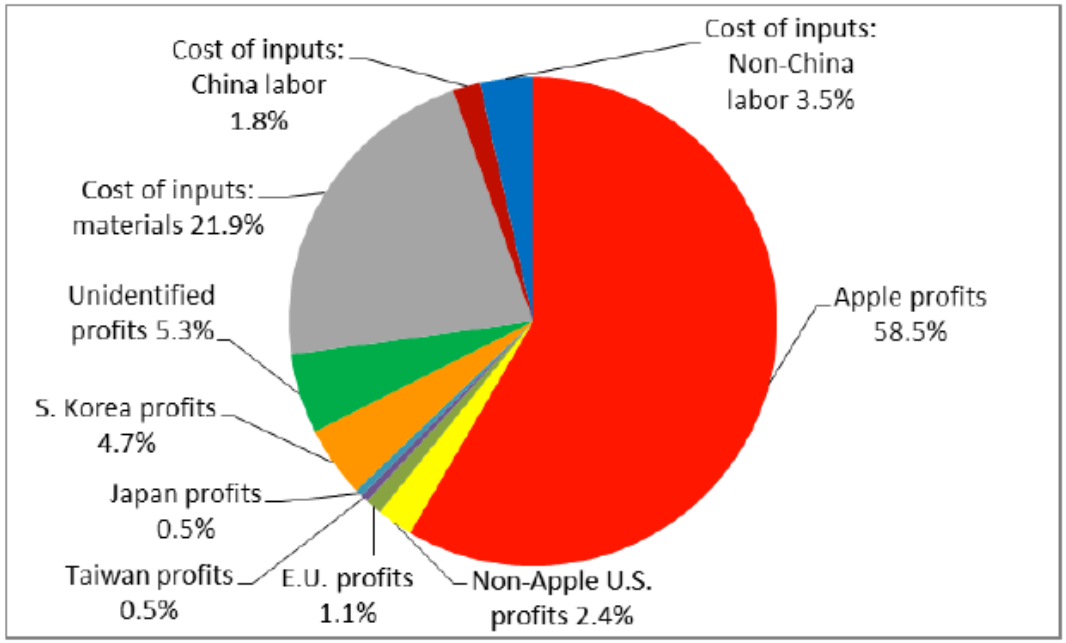
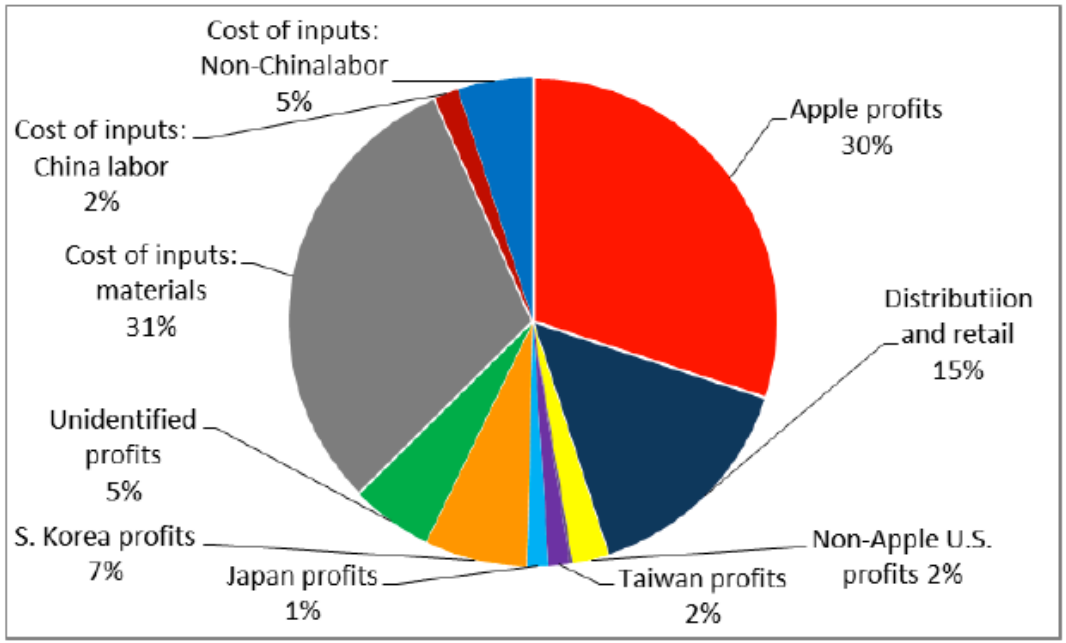


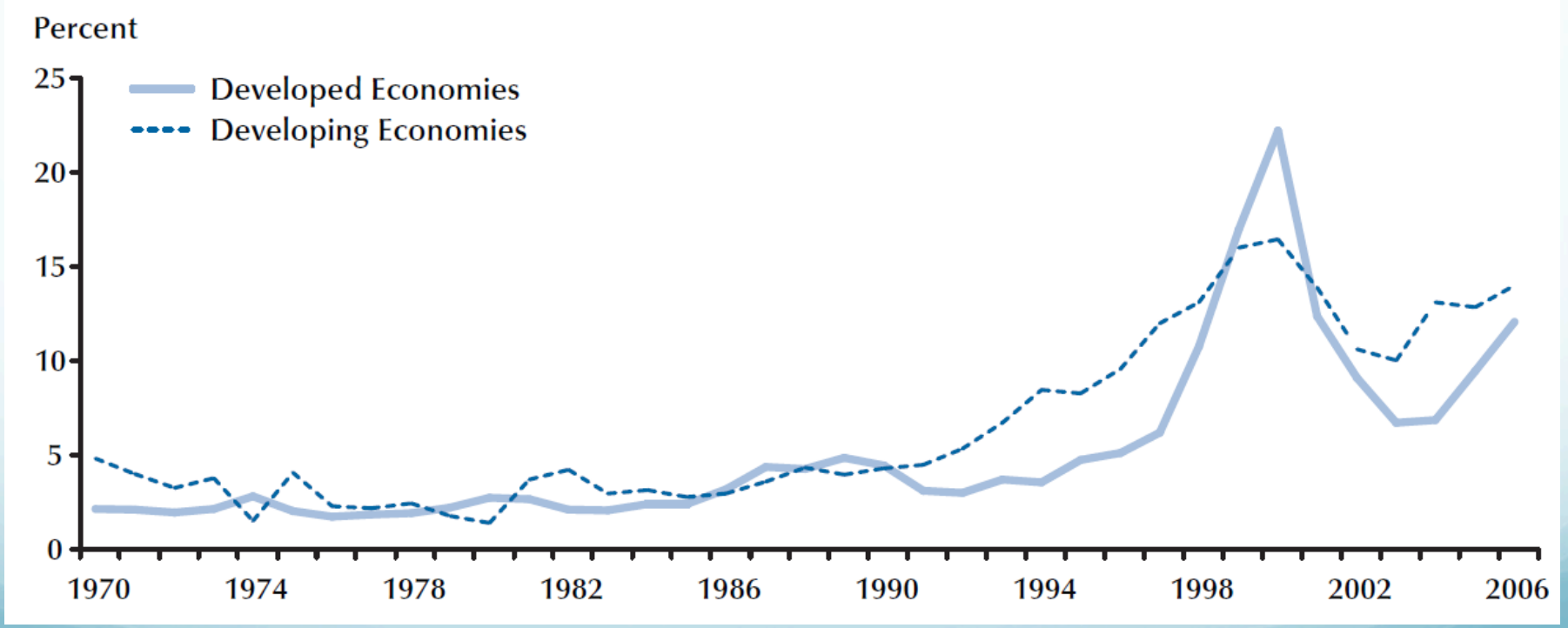
Figure 2. Distribution of value for iPad



Source: Kremer, Linden, Dedrick (2011)

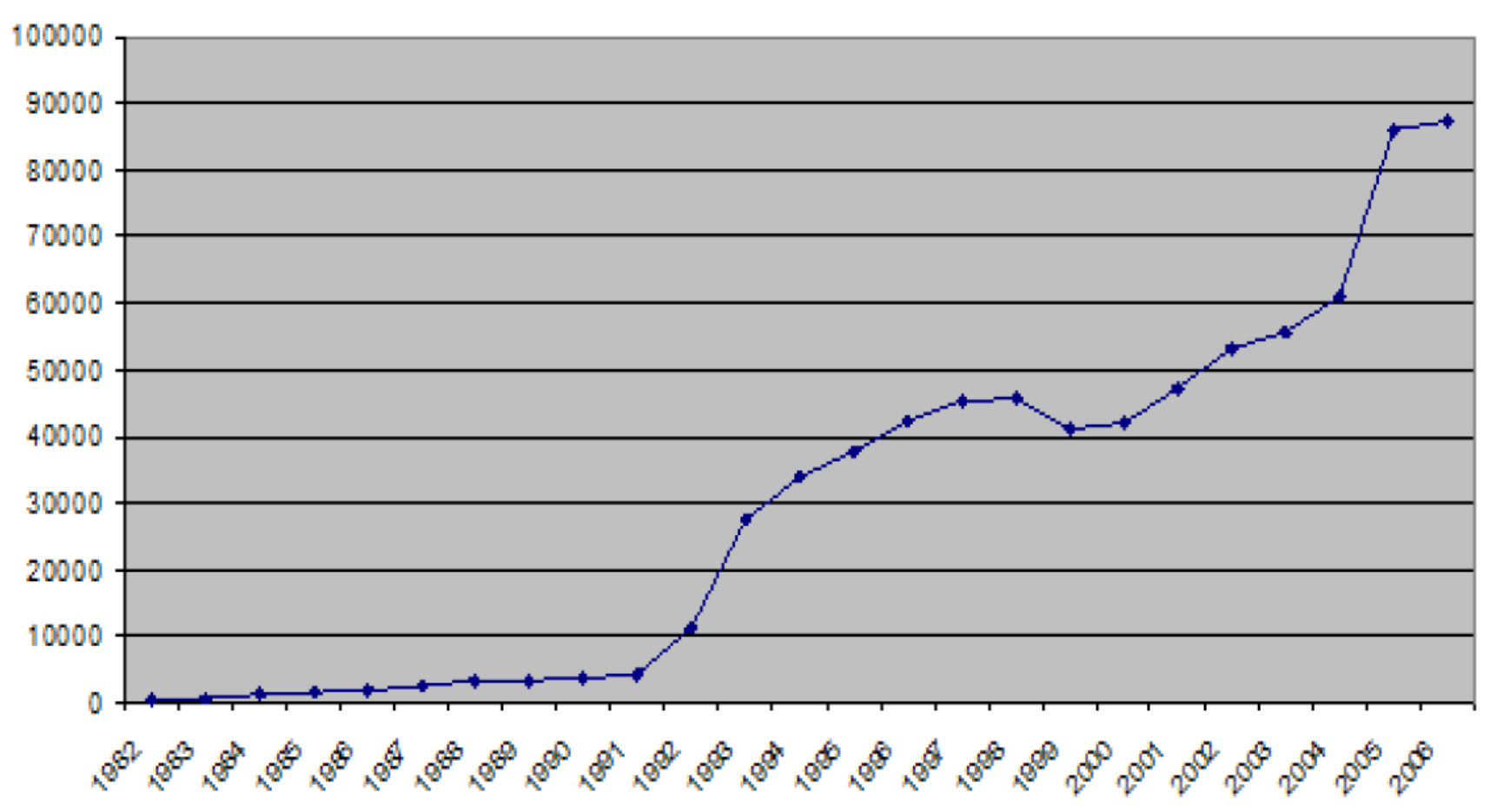
Share of FDI in Gross Fixed Capital Formation

(%, Source: UNCTAD)



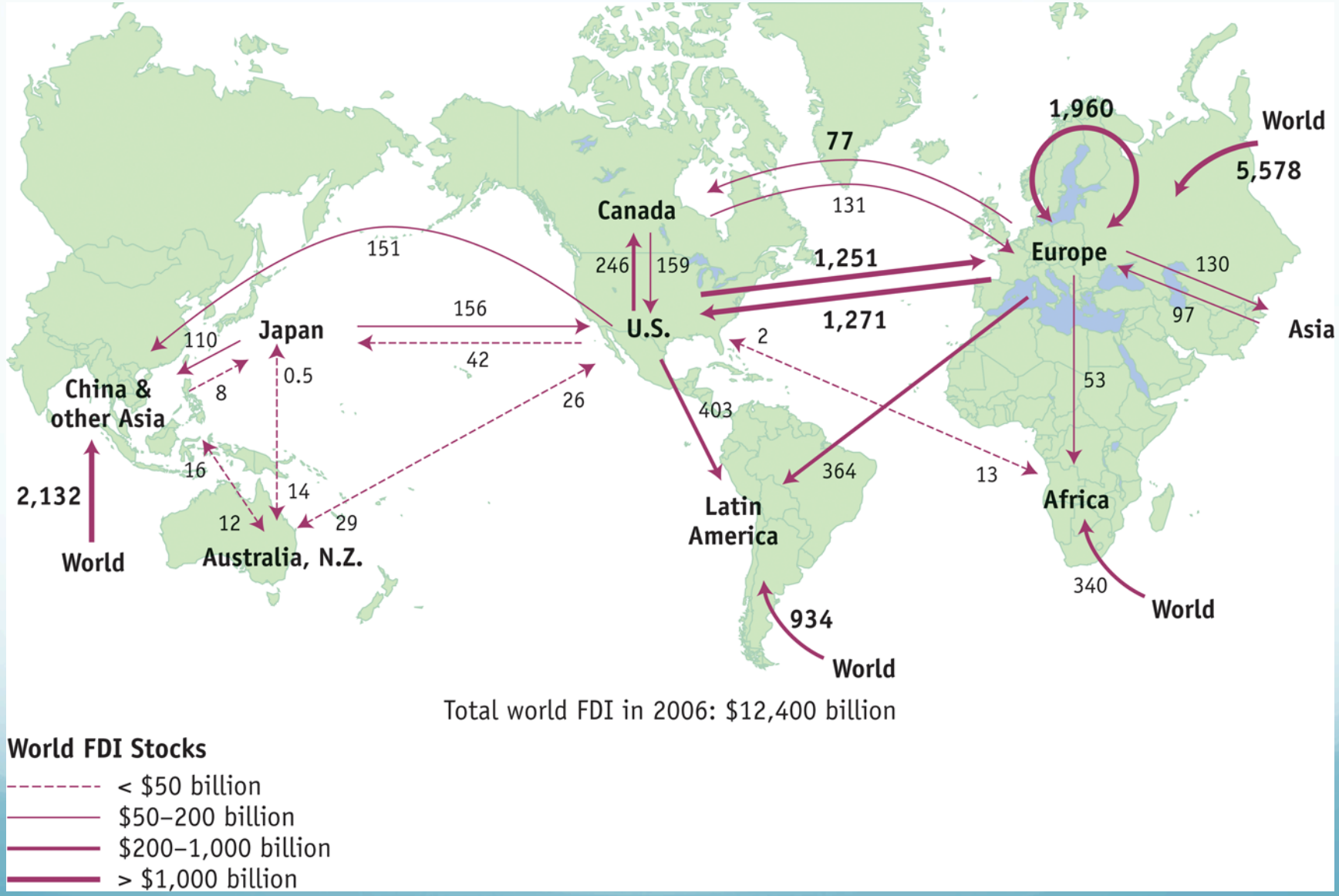
FDI in China

($ millions, Statistics Bureau of China)



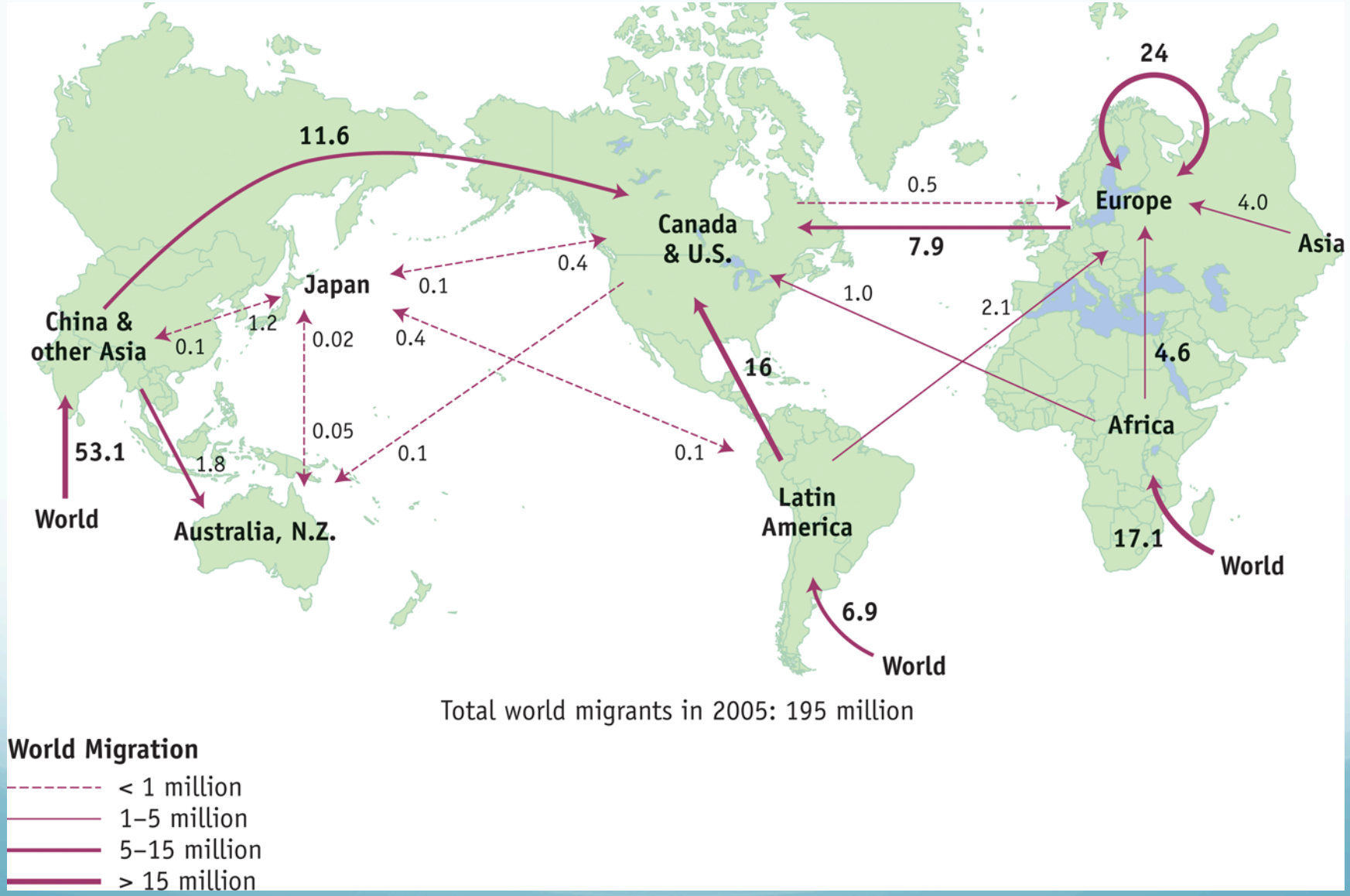
Stock of FDI in 2006 in USD bn

(Feenstra and Taylor, 2011, fig 1.7)



Migration, 2005

(Feenstra and Taylor, 2011, fig 1.6)



Trade determinants

- **Trade costs : transport, information, trade barriers**
- **The transport cost decline**

Table 6: Transport Costs, 1830-1910 .

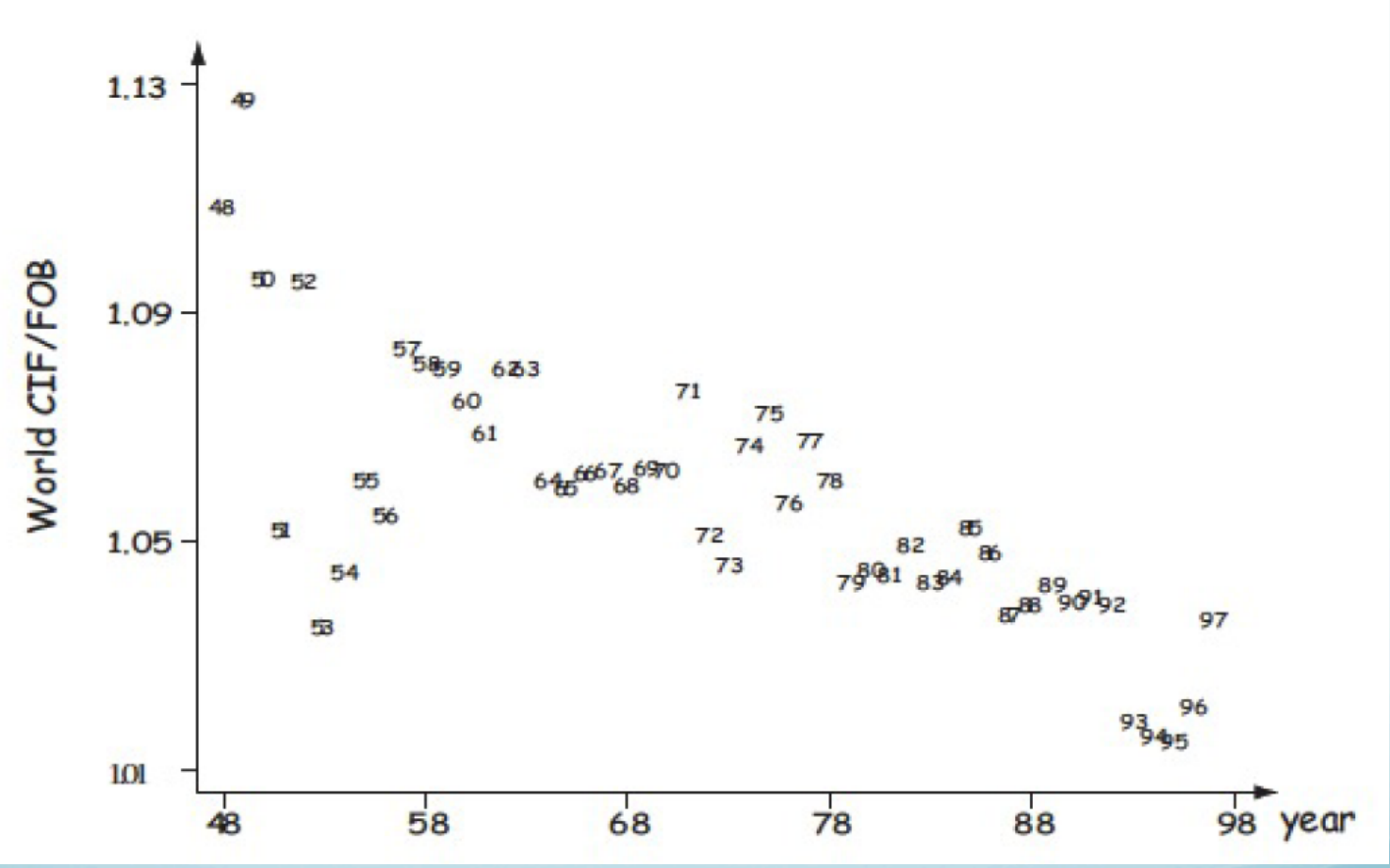
% of Production costs	*1830*	*1850*	*1880*	*1910*
Wheat	79	76	41	27.5
Bar Iron	92	71	33	19
Manuf'd Iron Goods	27	21	10	6
Cotton Thread	11	8.5	3.5	2.5
Cotton Textile	9.5	8	4.5	2

Note: Figures for Hypothetical 800 km Shipment.

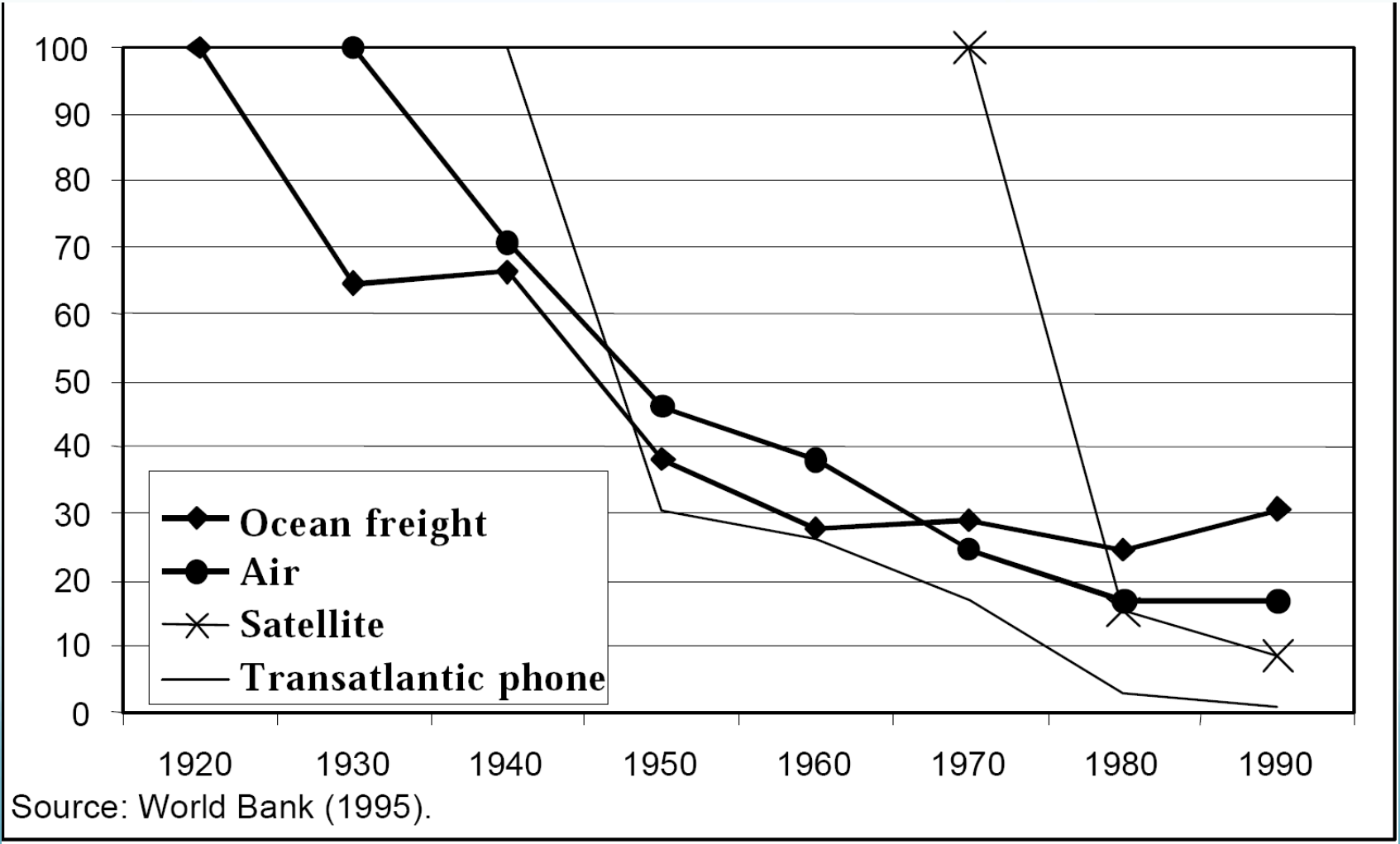
Source: Bairoch (1989:56-7).

CIF/FOB ratios at World level

(Source: IMF)



Transportation and Communication costs over the 20th century (Source: IMF)

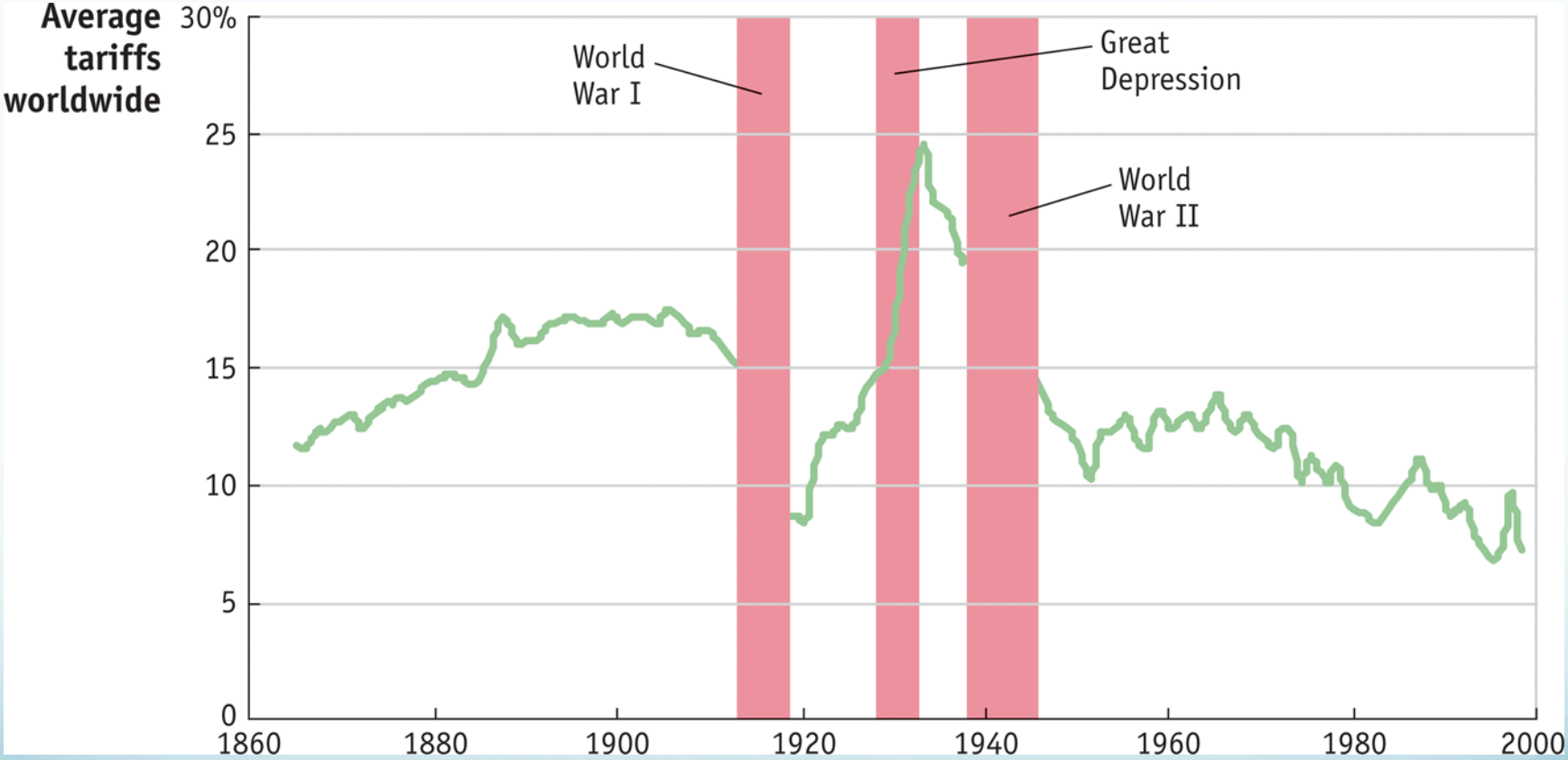


Trade determinants

tariffs, quotas and non-tariffs barriers decrease

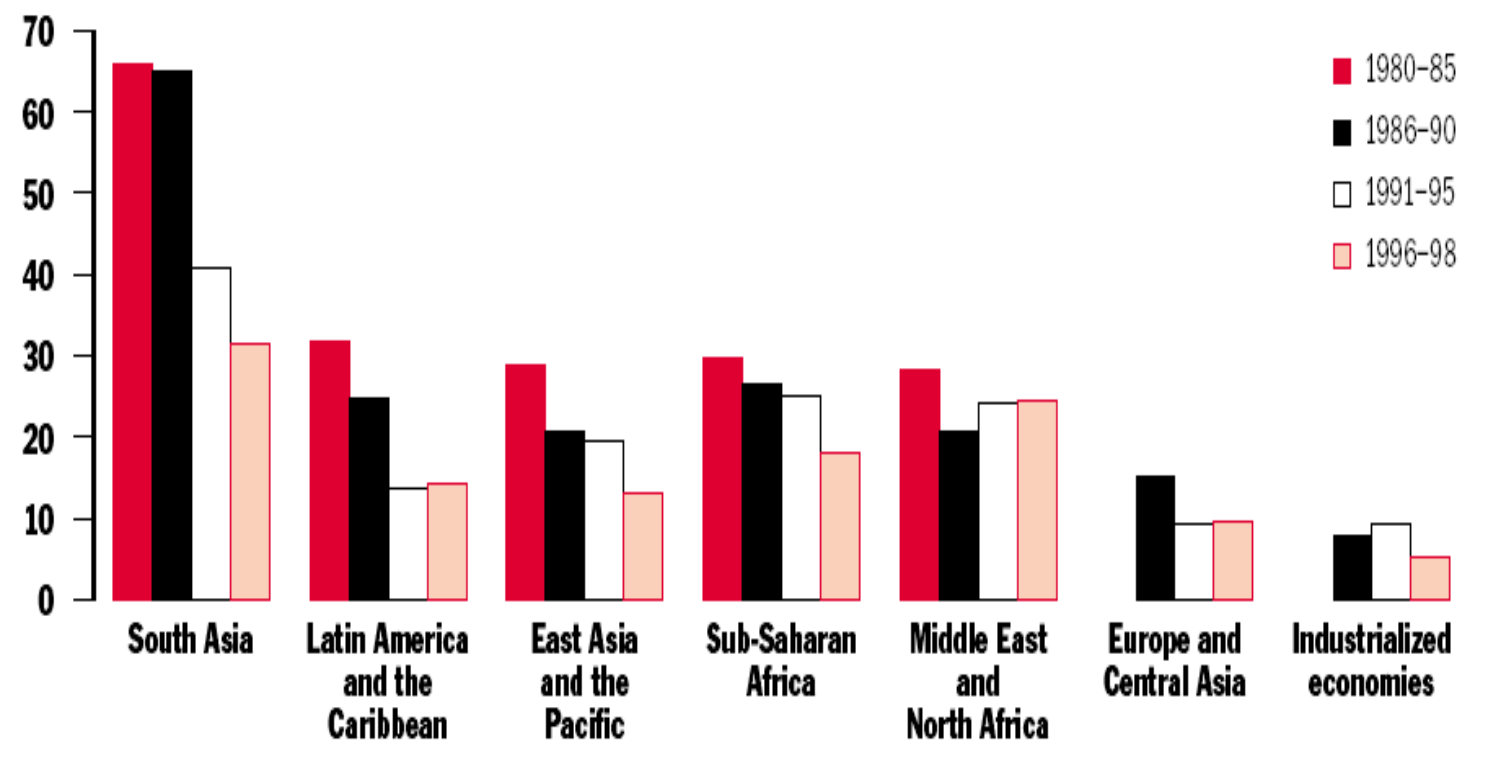
- GATT negociations round, WTO conferences
- All countries largely decrease their tariffs for 50 years
- But some industries remains very problematic: agriculture, textile
- New kinds of protection (non-tariffs barriers), problems of cultural goods, intellectual property
- Increase of regional trade agreements

Unweighted average tariff: 1860-2000, 35 countries (Feenstra and Taylor, 2012, fig. 1.4)



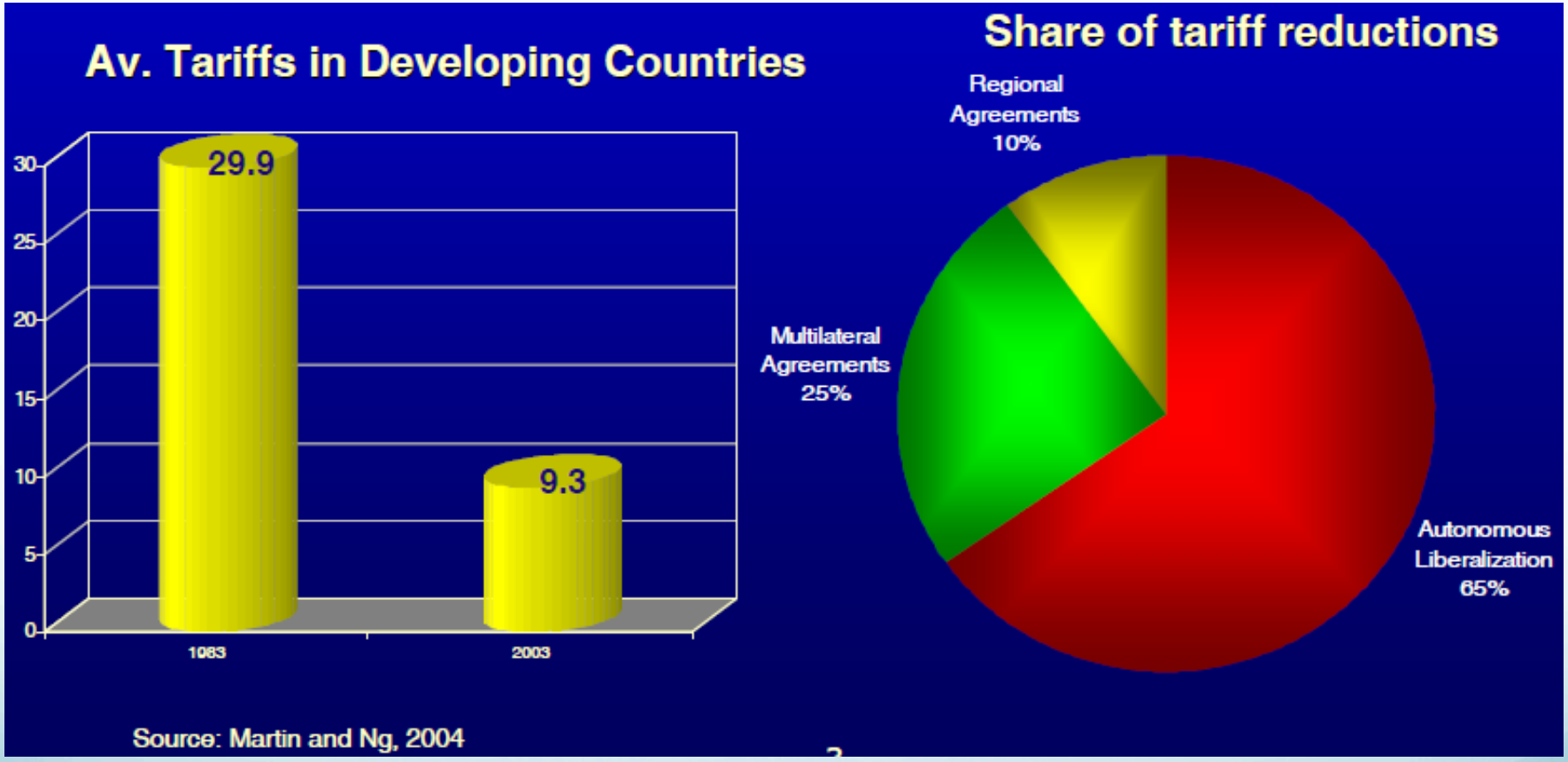
Tariff by large regions: 1980-1998

(IMF, International Financial Statistics Yearbook)

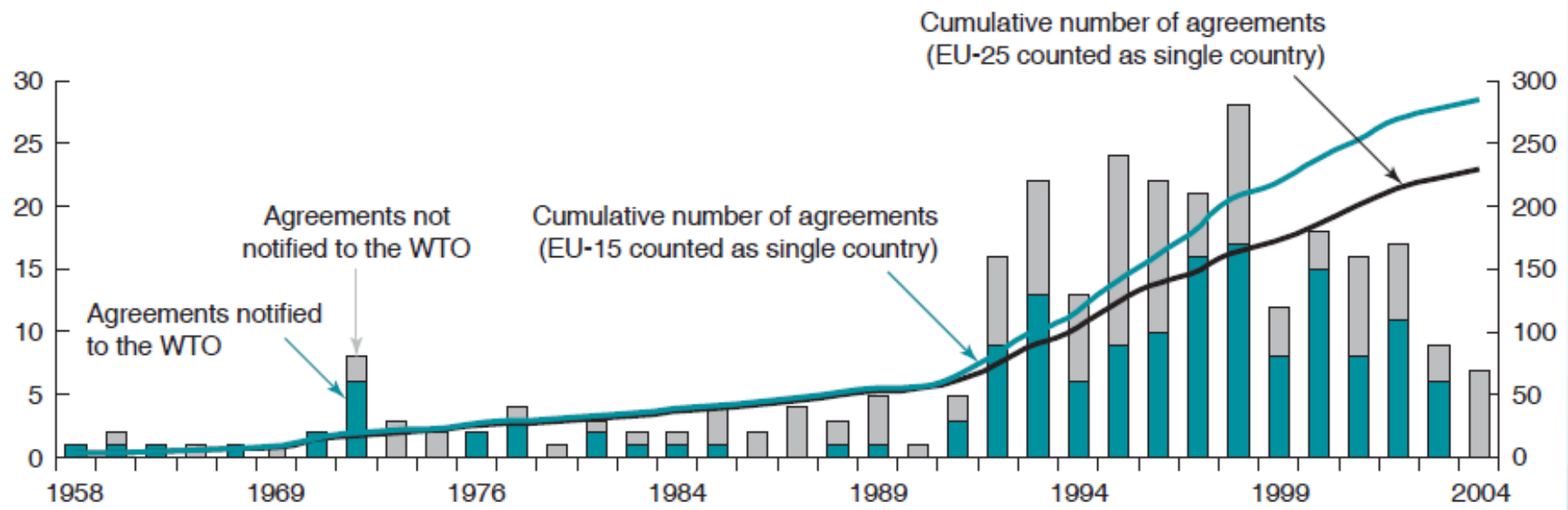


The sources of tariffs decline, 1983-2003

(Martin and Ng, 2004)



Number of trade agreements per year and cumulated (WTO, 2005)

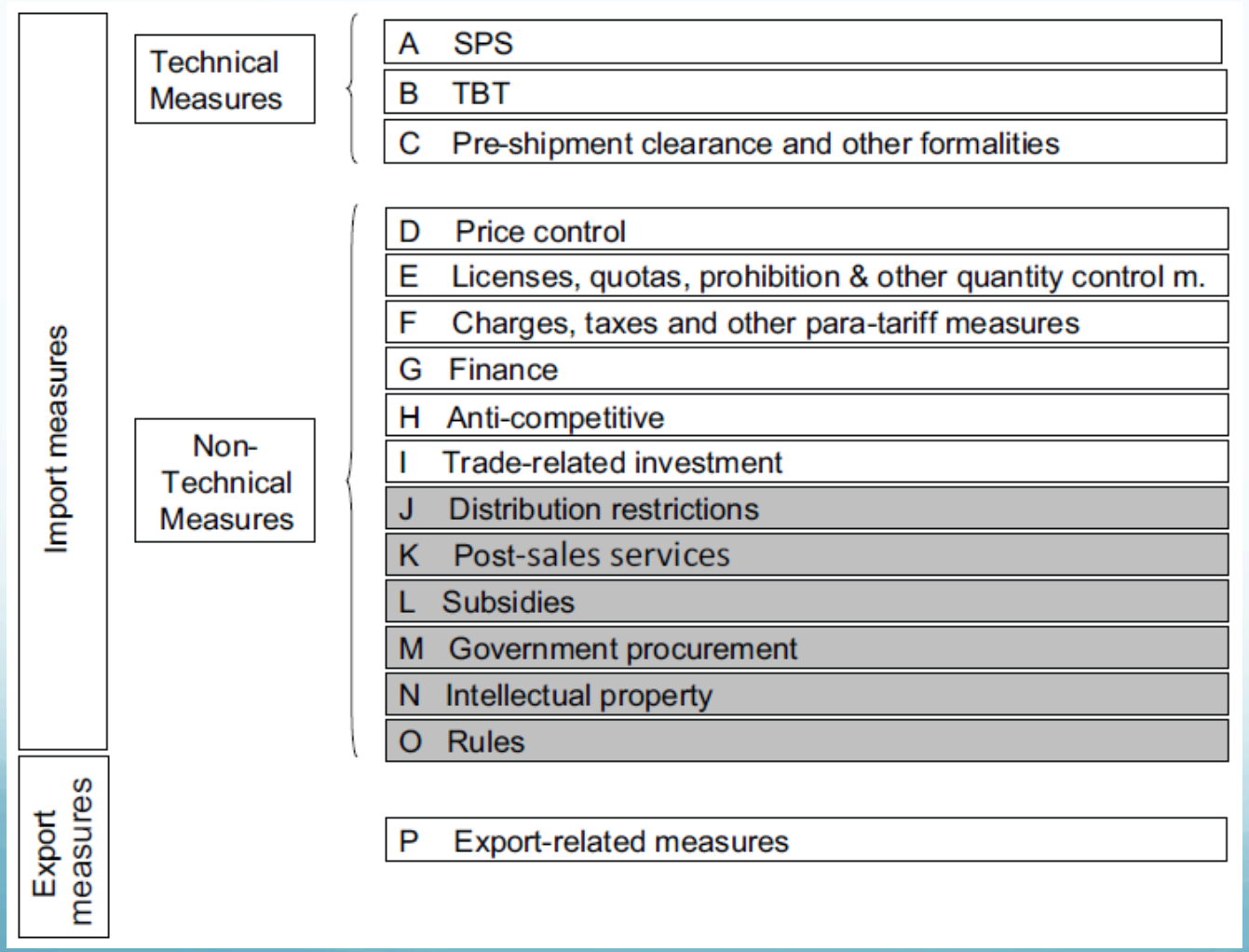


Sources: WTO data and WTO staff.

Trade determinants: Non-Tariffs Barriers

Non-Tariffs Barriers description

(Gourdon, J. and Nicita, 2012)



SPS: Sanitary

TBT: Technical

Non-Tariffs Barriers description

(Gourdon, J. and Nicita, 2012)

Chapter A, on sanitary and phytosanitary measures, refers to measures affecting areas such as restriction for substances, restrictions for non eligible countries' hygienic requirements, or other measures for preventing dissemination of diseases, and others. Chapter A also includes all conformity assessment measures related to food safety, such as certification, testing and inspection, and quarantine.

Chapter B, on technical measures, refers to measures such as labelling, marking, packaging, restrictions to avoid contamination or other measures protecting the environment, standards on technical specifications, and quality requirements.

Chapter C classifies the measures related to customs formalities.

Chapter D, price control measures, includes measures that have the intention to change the prices of imports, such as minimum prices, reference prices, antidumping or countervailing duties.

Chapter E, licensing, quotas and other quantity control measures, groups the measures that have the intention to limit the quantity traded, such as quotas. Chapter E also covers licences and import prohibitions that are not SPS or TBT related.

Chapter F, on charges, taxes and other para-tariff measures, refers to taxes other than custom tariffs. Chapter F also groups additional charges such as stamp taxes, licence fees, statistical taxes, and also decreed customs valuation.

Chapter G, on finance measures, refers to measures restricting the payments of imports, for example when the access and cost of foreign exchange is regulated. It also includes measures imposing restrictions on the terms of payment.

Chapter H, on anticompetitive measures, refers mainly to monopolistic measures, such as state trading, sole importing agencies, or compulsory national insurance or transport.

Chapter I, on trade-related investment measures, groups the measures that restrict investment by requesting local content and thus restricting imports, or requesting that investment should be related to export in order to balance imports.

Chapter J, on distribution restrictions, refers to restrictive measures related to the internal distribution of imported products. These measures would hinder trade from taking place because there would be difficulty in distributing the products once entering the country.

Chapter K, on the restriction on post-sales services, refers to difficulties in allowing technical staff to enter the importing country to install or repair technological goods imported.

Chapter L contains measures that relate to the subsidies that affect trade.

Chapter M, on government procurement restriction measures, refers to the restrictions bidders may find when trying to sell their products to a foreign government.

Chapter N, on intellectual property measures, refers to the problems arising from intellectual property rights.

Chapter O, on rules of origin, groups the measures that restrict the origin of products so that they could benefit from reduced tariffs according to certain rules often set in multiple simultaneous agreements with different countries.

Chapter P, on export measures, groups the measures a country applies to its exports. It includes export taxes, export quotas or export prohibitions, etc.

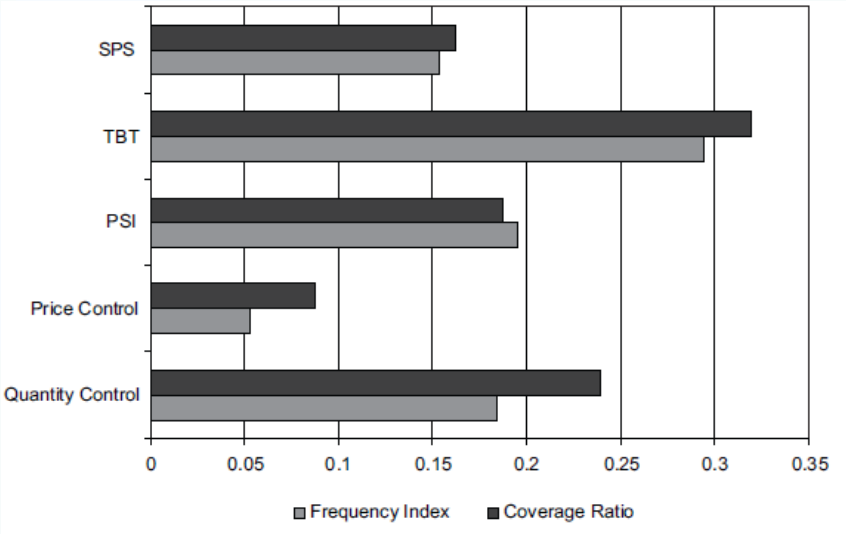
Non-Tariffs Barriers by broad type

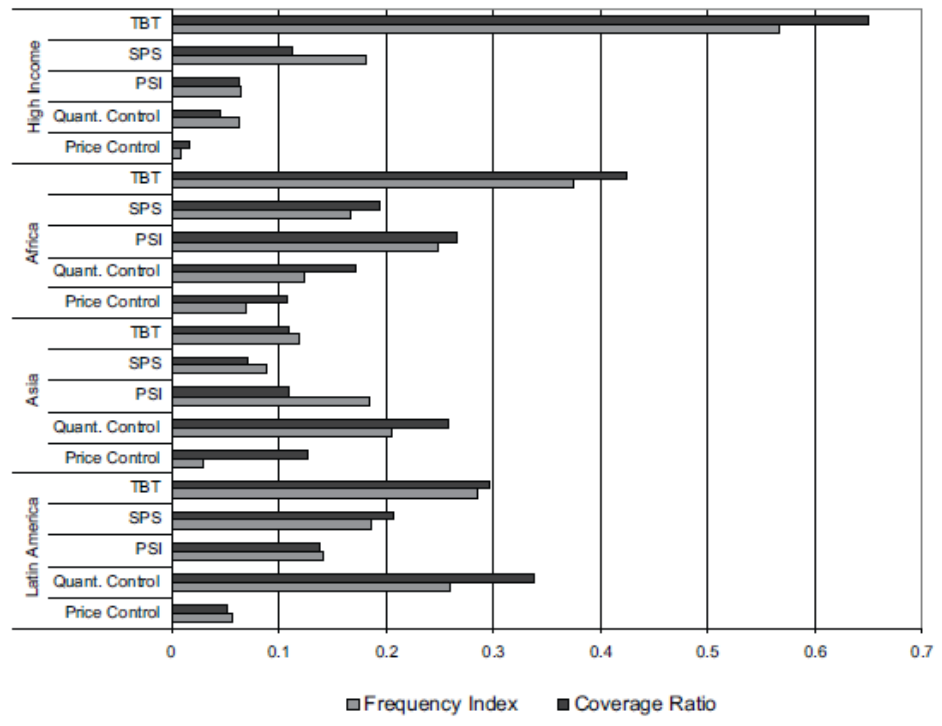
(Gourdon, J. and Nicita, 2012)

SPS: Sanitary

TBT: Technical

PSI: Pre-shipment customs formalities





1966-1986 variations in Non-Tariffs Barriers

(Gourdon, J. and Nicita, 2012)

Table 8: The Growth of Non-tariff barriers

	Frequency Index		Coverage Ratio	
Country	**1966**	**1986**	**1966**	**1986**
EC	15	58	21	54
Belgium-Luxembourg	19	61	31	74
Denmark	11	54	5	37
France	17	66	16	82
Germany	16	60	24	41
Greece	NA	49	NA	26
Ireland	NA	47	2[(a)]	39
Italy	13	62	27	30
Netherlands	19	59	31	78
UK	10	52	16	38
Finland	NA	41	15[(a)]	51
Japan	34	50	31	43
Norway	14	30	31	23
Switzerland	12	42	19	50
USA	27	57	36	45

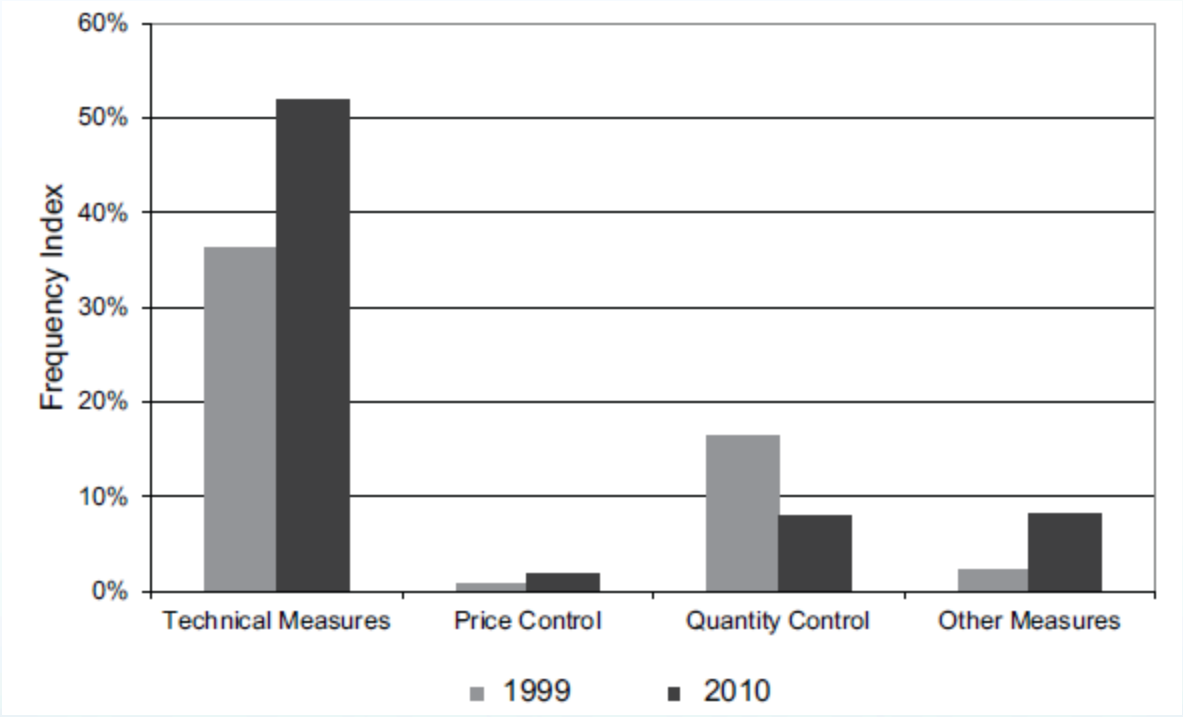
Note: this table covers imports from all sources in SITC (Standard International Trade Classification System) 0-8.

[(a)] Barriers on food excluded.

Source: Table 2.7, Bowen, H *et al.* (1998) *Applied International Trade Analysis*, Macmillan.

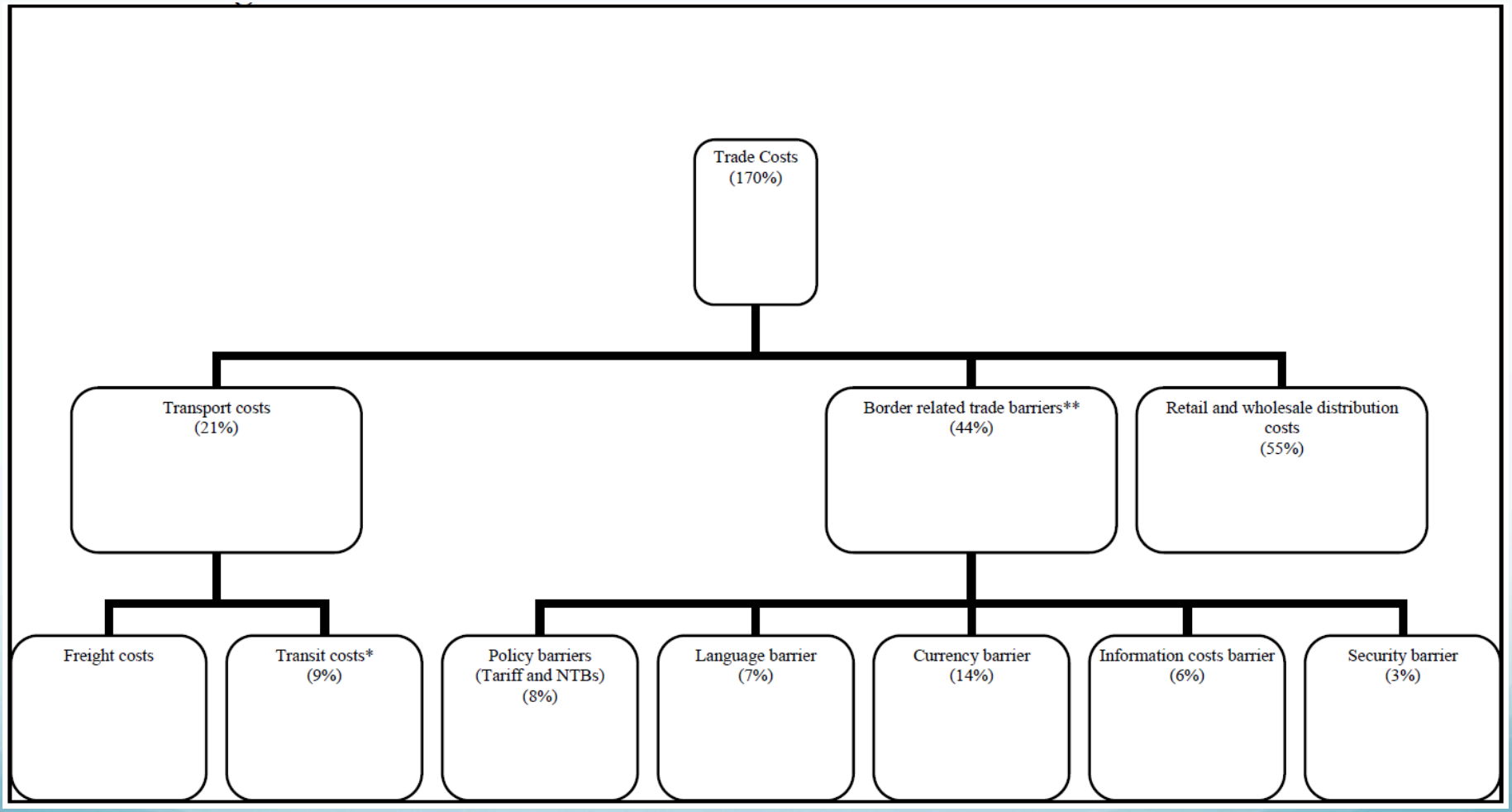
1999-2010 variations in Non-Tariffs Barriers

(Gourdon, J. and Nicita, 2012)



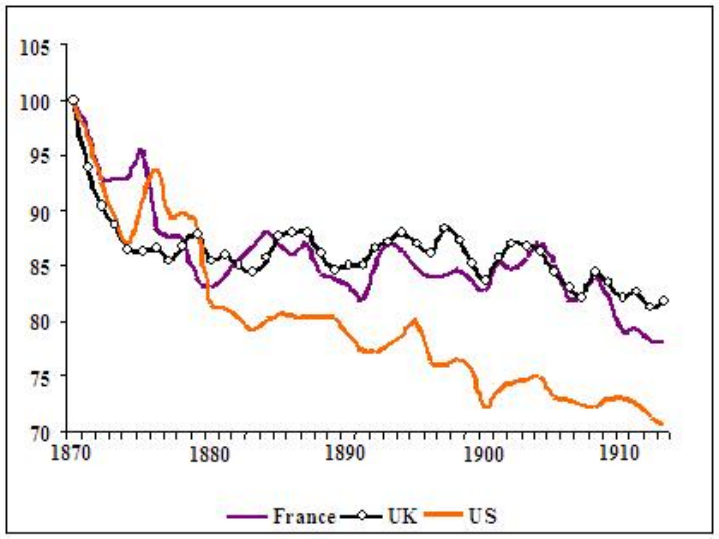
Overall decomposition of Trade Costs

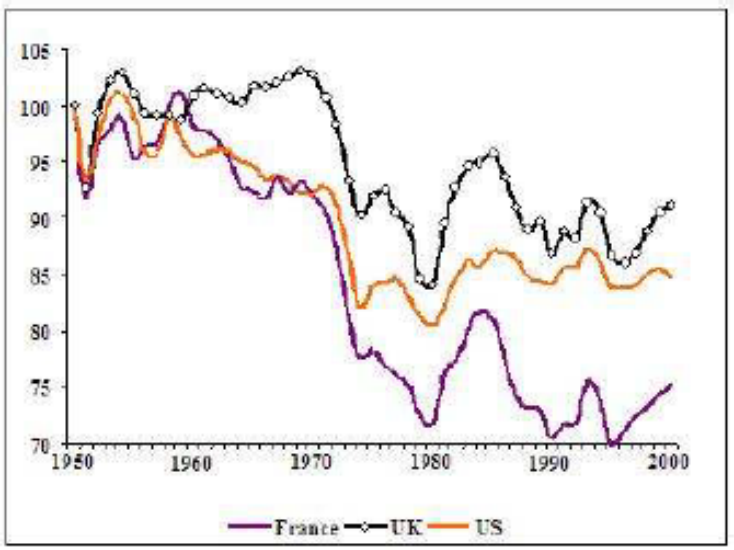
(Anderson and van Wincoop, 2004)

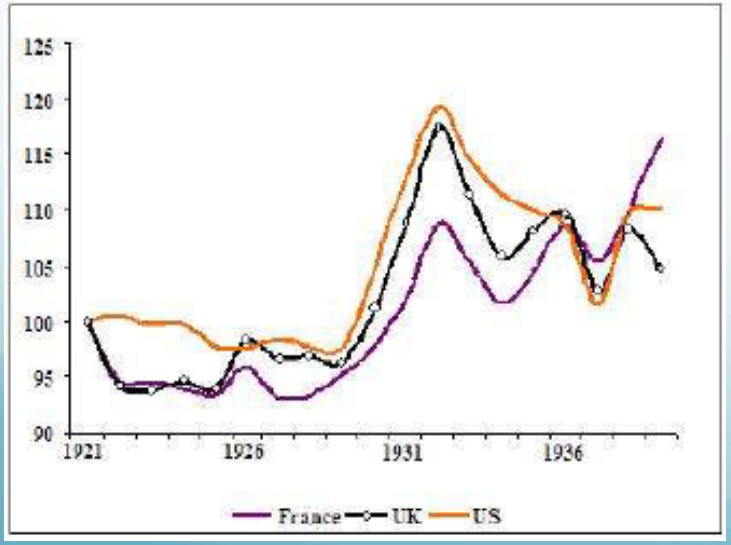


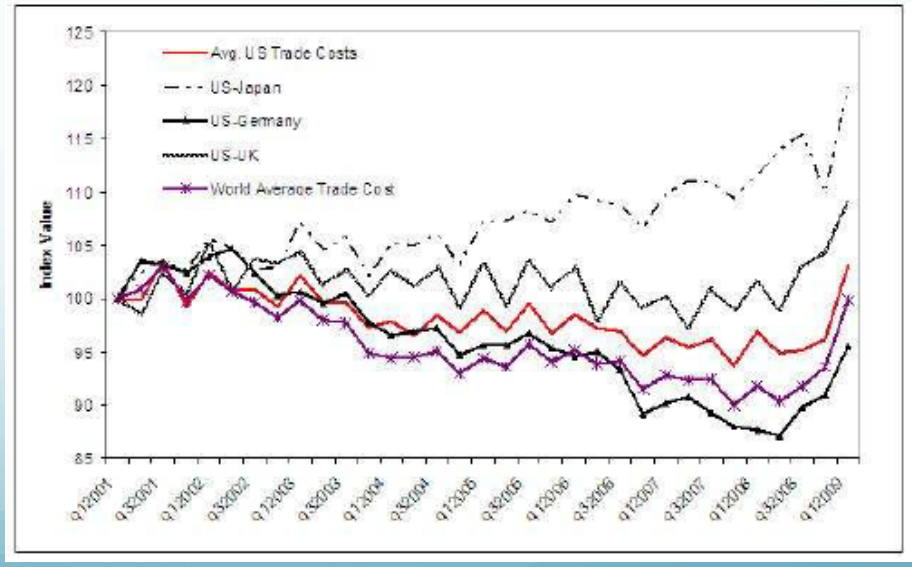
Time variation of overall trade costs

(Jacks, Meissner, and Novy, 2008, 2009)









4. Two Illustrative Examples

4.1 Ricardo and Comparative Advantage

- **2 countries (North and South)**
- **2 goods (machine tools and clothes), 1 input (labor)**
- **Number of labor hours needed to produce:**

	1 machine tool	1 batch of clothes
North	80	90
South	120	100

⇒ **North employs fewer workers in the production of both goods:**
absolute advantage

- Chapter 2 will show that
  - ✓ trade and full specialization are efficient
  - ✓ both countries increase consumption possibilities by trading

- Assume that North has 8,000 hours of labor
  - It can produce: machine tool batch of clothes

1/	100	0
2/	90	800/90=8.8
etc…		

⇒ in the second case it sacrifices 10 machine tools to produce 8.8 extra batches of clothes

⇒ North will accept to sell 10 machine tools against **at least** 8.8 batches of clothes.

- **But in South, in order to produce 10 machine tools, one needs 1 200 hours of labor, which is equivalent to 12 batches of clothes**

⇒ South agrees on buying 10 machine tools against at most 12 batches of clothes

⇒ *any transaction of 10 machine tools against between 8.8 and 12 batches of clothes is acceptable to both countries*

⇒ if this transaction takes place

North and South gain jointly 3.2 batches of clothes.

Each country is at least as well-off and at least one gains strictly.

Example: if 10 machine tools are exchanged against 10 batches of clothes, North gains 1.2 and South gains 2 batches of clothes

- Both countries gain, even though North has absolute advantage

⇒ gains come from specialization

- Comparative Advantage
  - cost to produce a machine tool in North: 80/90 batch of clothes: lower than 120/100 in South
  - cost to produce a batch of clothes in North: 90/80 machine tool: higher than 100/120 in South

⇒ North has a *comparative advantage* in producing machine tools

South has a *comparative advantage* in producing clothes

- **Remarks**
  - there are gains from trade for *any* unit labor requirements such that productivity differs between countries in at least one sector
    - ✓ independent of absolute advantage
    - ✓ independent of labor costs

  ⇒ there is <u>always</u> comparative advantage to exploit
  - the more different the countries, the larger the gains from trade
  - critical assumptions
    - ✓ both countries want to consume both goods
    - ✓ labor is perfectly mobile between sectors

4.2 Trade Liberalization and the Prisoner's Dilemma

- **2 countries choose whether or not they open to trade**
- **Suppose gains from free trade are such that**

Country 2	Closed	Open
Country 1		
Closed	(**2**, **2**)	(**7**, 0)
Open	(0, **7**)	(5, 5)

- **Consider country 1's choice:**
  - **if 2 chooses Closed, country 1 chooses Closed (2>0)**
  - **if 2 chooses Open, country 1 chooses Closed (7>5)**

⇒ country 1 chooses Closed no matter what

⇒ by symmetry country 2 chooses Closed too

⇒ both choose Closed although they would both gain from trade

- even if they agree on liberalizing trade, it is always optimal to unilaterally deviate

⇒ sub-optimal equilibrium

⇒ free trade never occurs without upper-level constraining organization

(⇒ in an infinite-horizon game a trigger strategy may also sustain the free trade equilibrium...)

5. Conclusions

- Trade economics studies trade patterns, the location of production and factors, trade liberalization, the consequences of trade on factor prices and inequality...
- 3 stages in the history of trade economics:
  - perfect competition, general equilibrium: Ricardo, HOS, Jones
  - imperfect competition: Krugman, Brander & Spencer
  - other topics: factor movements, fragmentation, intrafirm trade, regional trade blocks, technology diffusion, political economy...
- Trade flows follow a gravity equation: they depend on economic mass at origin and destination and trade frictions (costs).
- We are living through the 2nd wave of globalization.

6. References

Many Thanks to Céline Carrère, Thierry Mayer, Pierre-Philippe Combes and Steve Redding for sharing their slides.

- **Anderson, J., and E. van Wincoop (2004)**. Trade costs. *Journal of Economic Literature* 42:691–751.
- **Baldwin, R. and P. Martin (1999).** "Two Waves of Globalization: Superficial Similarities, Fundamental Differences", *NBER Working Paper*, 6904.
- **Bairoch, P. (1993)**. *Economic and World History*, Harvester-Wheatsheaf, London.
- **Brülhart, M. (2008)**. An Account of Global IntraIndustry Trade, 1962–2006. *World Development report, Reshaping Economic Geography*, World Bank.
- **Combes, P.-P., T. Mayer, and Thisse, J.-F. (2008)**. *Economic Geography. The integration of Regions and Nations*, Princeton University Press.
- **Fouquin, M., H. Guimbard, C. Herzog and D. Ünal (2012)**. In *World Economic Overview*, CEPII.
- **Gourdon, J. and Nicita, A. (2012)**. NTMs: Interpreting the New Data 57, in *Non-Tariff Measures A Fresh Look at Trade Policy's New Frontier*, O. Cadot and M. Malouche (eds.), CEPR.
- **Mayer, T. and G. Ottaviano (2007)**. *The Happy Few: The internationalisation of European firms*, Bruegel Blueprint 3.
- **Novy, D., Meissner, C., and Jacks, D. (2008)** . Trade Costs, 1870-2000 *American Economic Review* 98, 529-534

Useful links:

- **Data: CEPII, CIA** World Factbook, **IMF, World Bank, World Trade Organization**
- **Nontechnical research summaries: VoxEU**
- **Alan Deardorff's Glossary or International Economics Terms and Concepts**