Economics of Globalization

Sciences Po Saint-Germain-en-Laye

Last week

- Globalization is a multidimensional phenomenon.
- There exist different narratives about globalization.
- None of them is false *per se*: globalization has a variety of heterogeneous effects.
  - A society trades-off these effects and makes its choices according to the preferences of the population.

Globalization news

Trump tariffs + Add to myFT

US companies put brakes on hiring after Donald Trump's tariffs hit

Industries most exposed to rising costs caused by trade wars launch wave of job cuts

Policy topics

Policy topics

- Why and how to reform the institutions of globalization? **(23/09)**
- Should we sign new trade agreements? The case of EU-Mercosur **(30/09)**
- The return of Industrial Policies. Why and how to deal with them? **(07/10)**
- Should we keep going with Investor-State Dispute Settlements (ISDS) **(14/10)**
- How should we make multinational firms accountable? **(14/10)**
- The green transition in globalization rules: creating a Carbon Border Adjustment Mechanism or a Climate Club? **(04/11)**
- How to deal with the losers of globalization? **(18/11)**
- Should we tax the rich and/or provide them tax incentives? **(21/10)**
- Why and how to manage strategic dependencies? **(25/11)**
- Do trade sanctions work? Rationale and consequences of trade sanctions **(25/11)**

This week

- What is the state of globalization?
- How did we end up here?
- Who trade with whom?
- Reference for this course: Goldberg (2023).

This week

A lot a graphs but a few facts

- Fact 1: Globalization is an old phenomenon.
- Fact 2: It has grown rapidly in the post-WW2 era with changes in geography and in composition.
- Fact 3: ICT and transport technologies drove the rise of global integration. Trade policy also played an important role.
- Fact 4: Globalization relies on institutions.
- Fact 5: Global Value Chains (GVC) and value-added trade play a key role in today's globalization.
- Fact 6: Despite all of this, the world is not flat.

Globalization in the long run

- Globalization is a very old phenomenon.
- Humans constantly traveled and exchanged goods, ideas, knowledge, money.
- Large body of evidence about trade in ancient Mesopotamia.
  - Local trade from 5000 BC (Ubaid era) and long-distance trade from 4100 BC (Uruk era).
  - Excess supply in some goods and demand elsewhere generated these practices.
  - Ceramics, glass, grain, leather, oils, textiles, *etc.* where traded.
  - Some goods where coming from out of Mesopotamia: copper, ivory, pearls (Indus Valley), gold, silver, metals (Egypt and Minor Asia), *etc.*
  - According to some theories, trade (as well as the development of the State, of accounting, etc.) is associated to the birth and the diffusion of writing (see *e.g.* Schmandt-Besserat).
  - Trade is also associated with the rise of contracts (*e.g.* loans) between merchants.

Globalization in the long run

- Around 1BC, luxury goods from Asia appeared at the other end of the continent, moving through the Silk Road
- Spice trade then developed around the 7th century.
- A new era began with the when Europeans explorers reached the Americas. New goods where introduced in Europe (*e.g.* potatoes, tomatoes, coffee, or chocolate) and new trade, colonization, and slavery routes where set up.

Long run evidence about globalization

Mesopotamian Clay Tablet

Ennion Glass $\approx 0 - 50$

Long run evidence about globalization

Silk Roads (≈ 0-1500)

Globalization in the long run

TABLE 2.1. Interregional trade flows, ca. 1000.

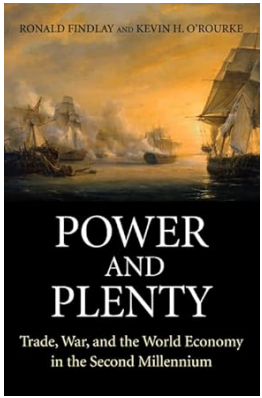
From \ To	Western Europe	Eastern Europe	Islamic World	Central Asia	Sub-Saharan Africa	South Asia	Southeast Asia	East Asia
Western Europe	⊠	Swords	Slaves, swords	—	—	—	—	—
Eastern Europe	Slaves, furs, silver	⊠	Slaves, furs, silver	Furs, swords	—	—	—	—
Islamic World	Pepper, spices, textiles, silk, silver	Textiles, silver	⊠	Textiles	Salt, textiles, manufactures, swords, horses	War horses	Gold	Spices
Central Asia	—	Silver	Paper, silver, slaves	⊠	—	Silver, reexports from China and Muslim world	—	Horses
Sub-Saharan Africa	—	—	Gold, slaves, ivory, rice	—	⊠	Timber, iron	—	—
South Asia	—	—	Pepper, spices, silk, teak, textiles	Pepper, textiles	Textiles	⊠	Textiles, pepper	Textiles
Southeast Asia	—	—	Spices, perfumes	—	—	Silk, spices, teak, rice, rubies	⊠	Perfumes, spices, sandal-wood
East Asia	—	—	Silk, porcelain	Silk, tea	—	Silk, porcelain	Silk, copper, cash	⊠

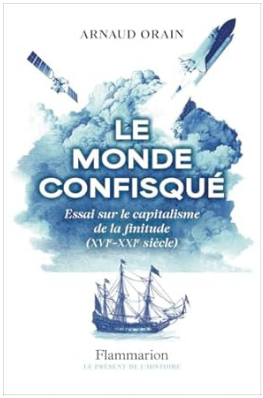
Long run evidence about globalization

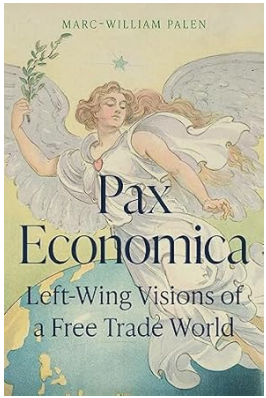
Steamship Routes around 1900

Long run evidence about globalization

Three great books







Long run evidence about globalization

Orders of magnitude

- During the period 1950-2011:
  - World trade in value has been multiplied by a factor of 290.
  - World GDP has been multiplied by a factor of 8.9.
  - It corresponds to an annual growth of 11% and 3%.

Long run evidence about globalization

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  - Side question: At the country level, can X>GDP?
    - Yes, because GDP is a value added concept and exports are not.
    - $GDP = C + I + G + (X - M)$.
    - If I import a lot, add few value and then re-export I boost my export-to-GDP ratio.

Long run evidence about globalization

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- Over this period:
  - Change in geography.
  - Change in composition.

Long run evidence about globalization

World exports over GDP

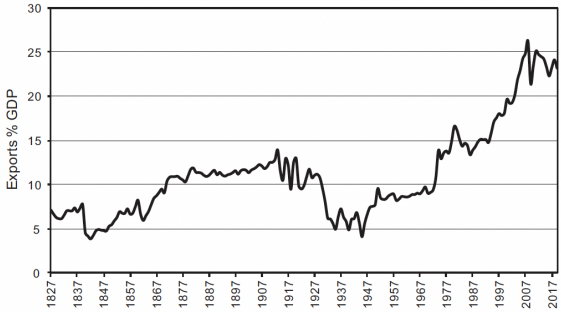
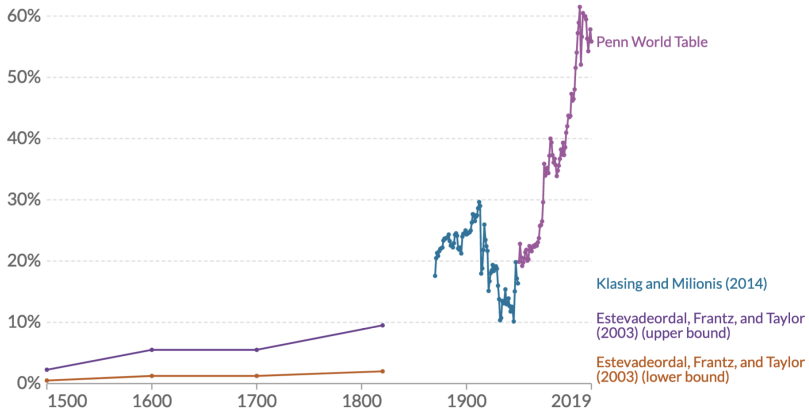


Figure 1.2
The age of globalization: World exports as percentage of GDP, 1827–2019. *Source:* Data from 1827 to 2014 from Michel Fouquin and Jules Hugot, "Two Centuries of Bilateral Trade and Gravity Data: 1827–2014" (CEPII Working Paper No. 2016–14, May 2016), http://www.cepii.fr/pdf_pub/wp/2016/wp2016-14.pdf. Data from 2015 to 2019 extends Fouquin and Hugot, "Two Centuries of Bilateral Trade and Gravity Data," using the author's estimates derived from World Bank, "Exports of Goods and Services (% of GDP)," World Bank Group, accessed July 25, 2022, https://data.worldbank.org/indicator/NE.EXP.GNFS.ZS.

Long run evidence about globalization

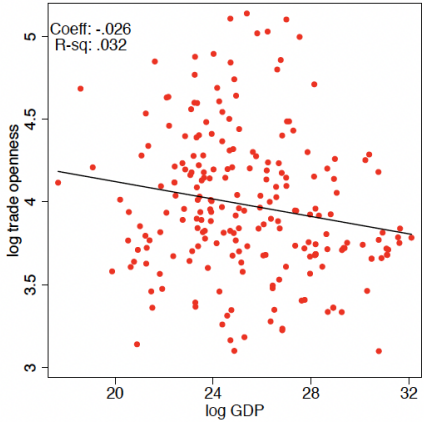
Openness rate: Exports + Imports over GDP

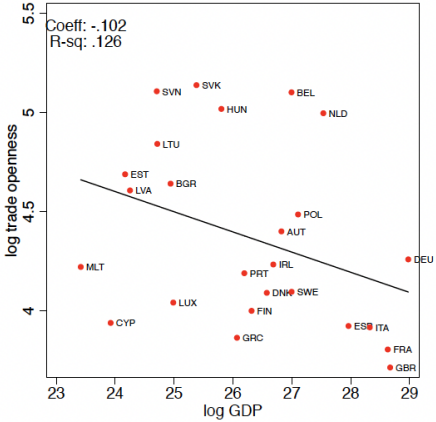


Source: Feenstra et al. (2015), Penn World Table (2021), Estevadeordal, Frantz, and Taylor (2003), Klasing and Milionis (2014)
OurWorldInData.org/trade-and-globalization • CC BY

Long run evidence about globalization

Globalization indexes





Long run evidence about globalization

Globalization: the multidimensional KOF globalization index

Globalisation Index, de facto	Weights	Globalisation Index, de jure	Weights
Economic Globalisation, de facto	***33.3***	***Economic Globalisation, de jure***	***33.3***
Trade Globalisation, de facto	*50.0*	*Trade Globalisation, de jure*	*50.0*
Trade in goods	38.8	Trade regulations	26.8
Trade in services	44.7	Trade taxes	24.4
Trade partner diversity	16.5	Tariffs	25.6
		Trade agreements	23.2
Financial Globalisation, de facto	*50.0*	*Financial Globalisation, de jure*	*50.0*
Foreign direct investment	26.7	Investment restrictions	33.3
Portfolio investment	16.5	Capital account openness	38.5
International debt	27.6	International Investment Agreements	28.2
International reserves	2.1		
International income payments	27.1		
Social Globalisation, de facto	***33.3***	***Social Globalisation, de jure***	***33.3***
Interpersonal Globalisation, de facto	*33.3*	*Interpersonal Globalisation, de jure*	*33.3*
International voice traffic	20.8	Telephone subscriptions	39.9
Transfers	21.9	Freedom to visit	32.7
International tourism	21.0	International airports	27.4
International students	19.1		
Migration	17.2		
Informational Globalisation, de facto	*33.3*	*Informational Globalisation, de jure*	*33.3*
Used internet bandwidth	37.2	Television access	36.8
International patents	28.3	Internet access	42.6
High technology exports	34.5	Press freedom	20.6
Cultural Globalisation, de facto	*33.3*	*Cultural Globalisation, de jure*	*33.3*
Trade in cultural goods	28.1	Gender parity	24.7
Trade in personal services	24.6	Human capital	41.4
International trademarks	9.7	Civil liberties	33.9
McDonald's restaurant	21.6		
IKEA stores	16.0		
Political Globalisation, de facto	***33.3***	***Political Globalisation, de jure***	***33.3***
Embassies	36.5	International organisations	36.2
UN peace keeping missions	25.7	International treaties	33.4
International NGOs	37.8	Treaty partner diversity	30.4

Long run evidence about globalization

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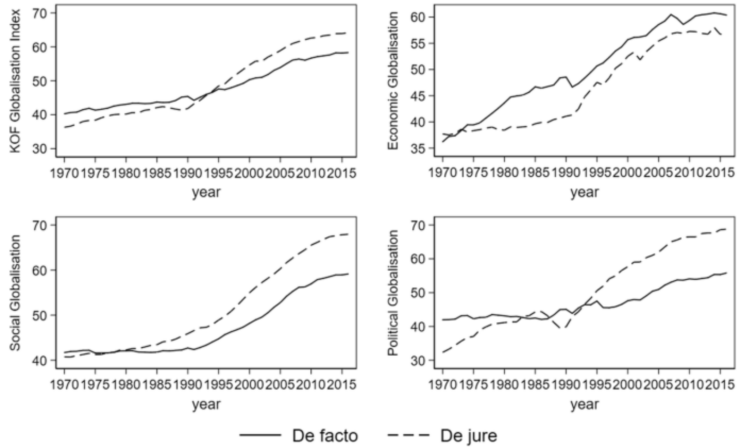
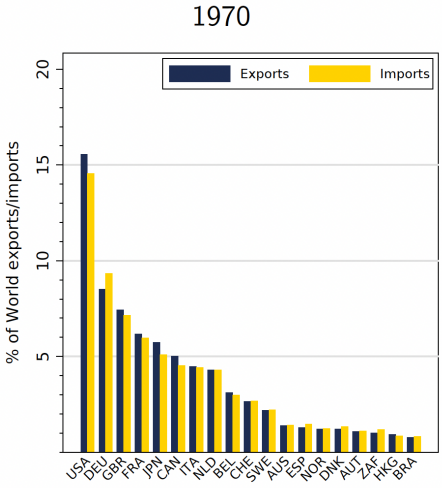


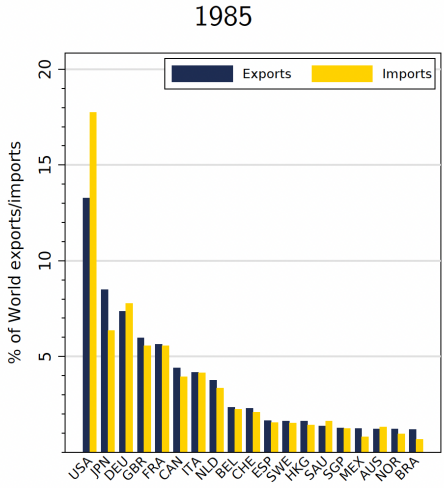
KOF Globalisation Index - de facto versus de jure globalization

Gygli et al. , 2019

Long run evidence about globalization

The evolving geography of trade





Long run evidence about globalization

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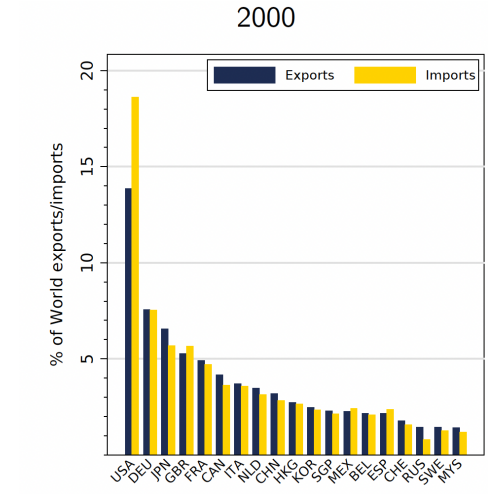

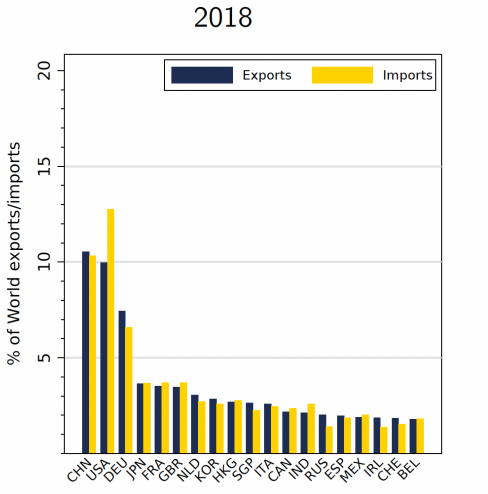

Recent trends in globalization

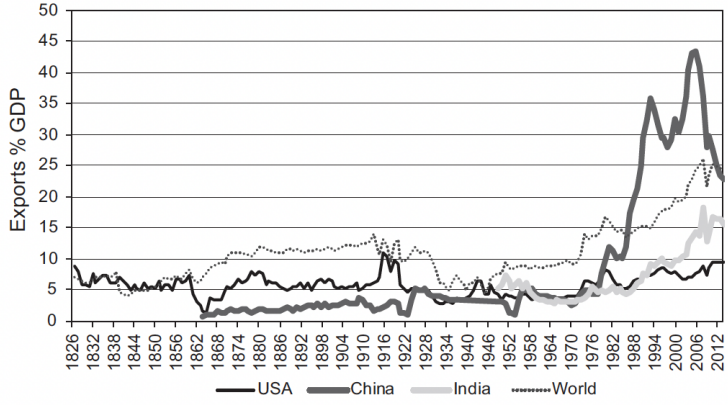

Figure 1.3
The age of globalization: Exports as percentage of GDP, 1827–2014. *Source:* Michel Fouquin and Jules Hugot, "Two Centuries of Bilateral Trade and Gravity Data: 1827–2014" (CEPII Working Paper No. 2016–14, May 2016), http://www.cepii.fr/pdf_pub/wp/2016/wp2016-14.pdf.

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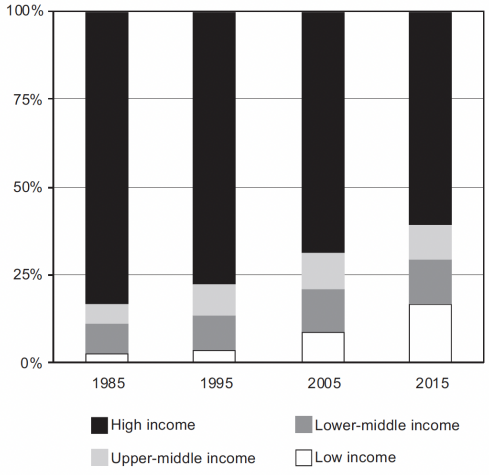
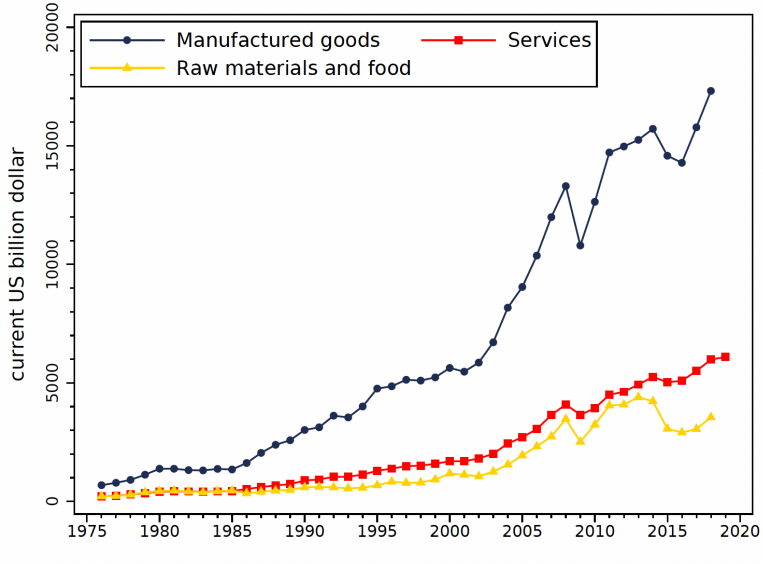


Figure 1.4
Composition of world exports by income group. *Source:* Nina Pavcnik, "The Impact of Trade on Inequality in Developing Countries," *Jackson Hole Economic Policy Symposium Proceedings* (Kansas City: Federal Reserve Bank of Kansas City, August 2017), 67.

Recent trends in globalization

What do country trade?



Recent trends in globalization

What do France trade, and with whom? Source: The Atlas of Economic Complexity

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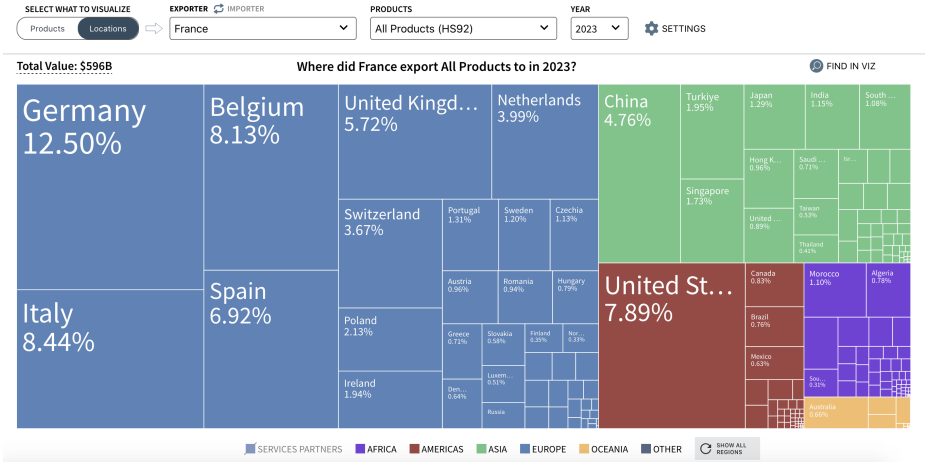

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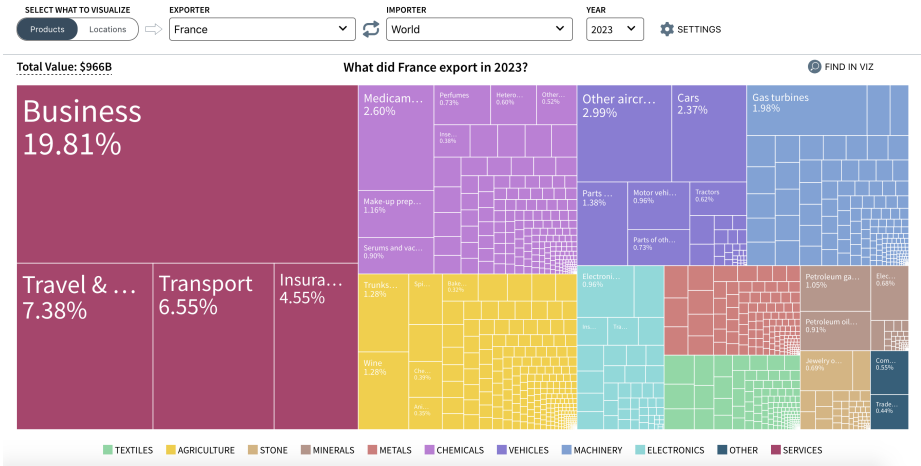

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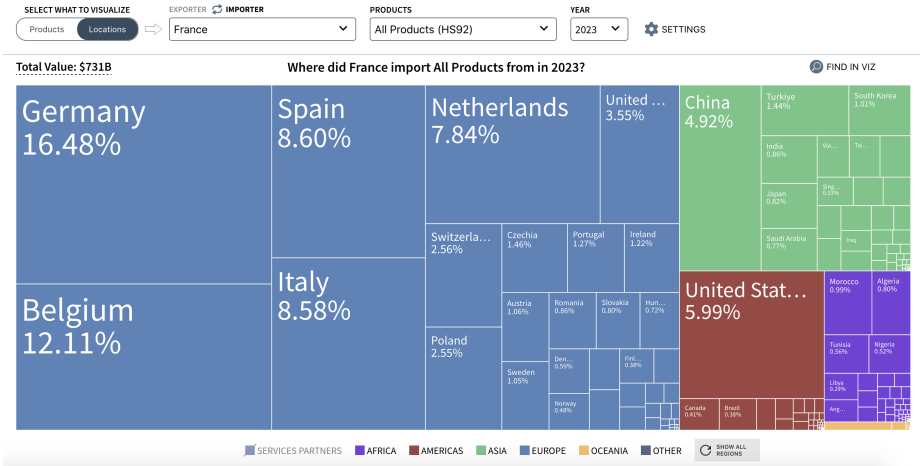

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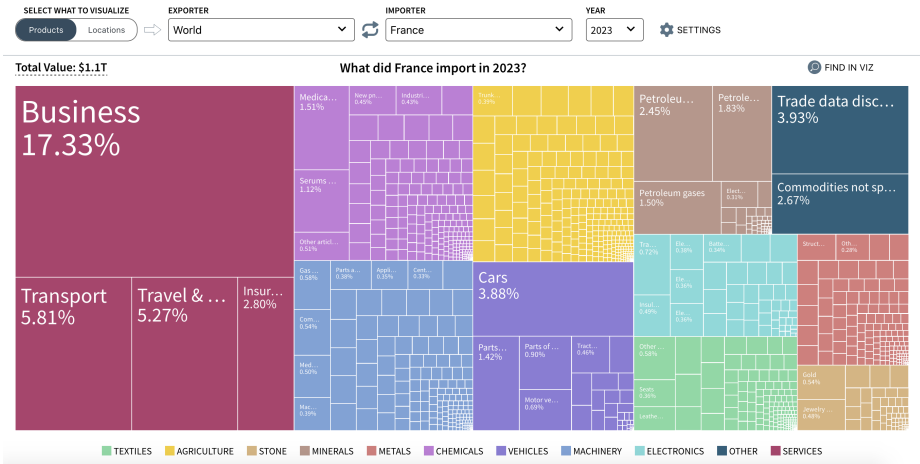


Recent trends in globalization

The fragmentation of production processes: Global Value Chains (GVCs)

- Trade is more and more fragmented. What does it mean?

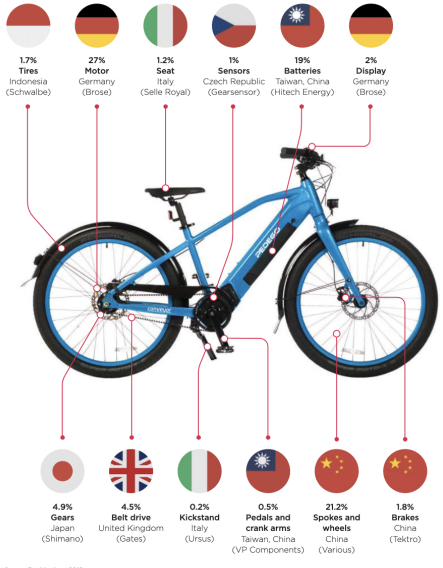
Recent trends in globalization

The fragmentation of production processes: Global Value Chains (GVCs)

- Trade is more and more fragmented. What does it mean?
- The production of a given good is more and more fragmented between firms and countries.
- Firms are looking for the best opportunities to produce: parts and components are then moving across the globe.

Recent trends in globalization

The fragmentation of production processes: Global Value Chains (GVCs)



Recent trends in globalization

Share of World Exports that flow through at least two borders

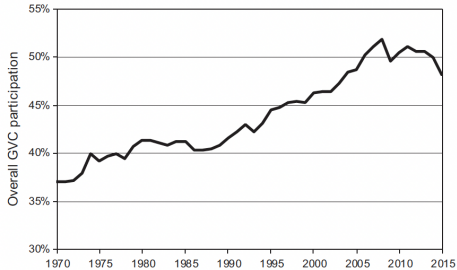


Figure 1.8
GVC trade, 1970–2015. *Note:* GVC participation measures used in this and subsequent figures throughout the monograph follow the methodology from Alessandro Borin and Michele Mancini, "Follow the Value Added: Bilateral Gross Export Accounting" (Temi di discussione [Economic Working Paper] 1026, Economic Research and International Relations Area, Bank of Italy, 2015); Alessandro Borin and Michele Mancini, "Measuring What Matters in Global Value Chains and Value-Added Trade" (Policy Research Working Paper 8804, World Bank, Washington, DC, April 2019), https://openknowledge.worldbank.org/handle/10986/31533. *Sources:* World Bank, *World Development Report 2020: Trading for Development in the Age of Global Value Chains* (Washington, DC: World Bank, 2019), 20 using data from Eora26 database; Borin and Mancini, "Measuring What Matters in Global Value Chains and Value-Added Trade"; Robert Johnson and Guillermo Noguera, "A Portrait of Trade in Value Added over Four Decades." *Review of Economics and Statistics* 99, no. 5 (December 2017):

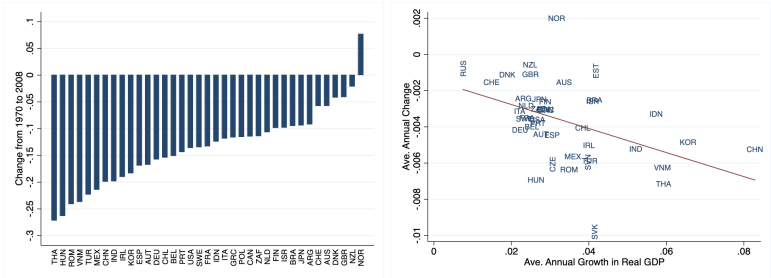
The fragmentation of production processes: Global Value Chains (GVCs)

Trade in value added

- Exports and imports do not measure the value added by the exporter.
- Studies suggest that the Chinese manufacturer of the Iphone only adds $\approx$ 3% of the value of the factory gate price ($\approx$ 200\$).
- The rest come from the value of inputs imported from other countries.
- However it still counts as 200\$ of exports from China to the U.S, increasing artificially China's trade.
- The OECD now tries to measure trade in value-added.
- Note that intermediate services add a lot a value added: distribution, transport, finance and insurance, business services, communication and information.

The fragmentation of production processes: Global Value Chains (GVCs)

Figure 3: Changes in Ratio of Value-Added to Gross Exports, by Country



(a) Cumulative Changes (1970-2008)

(b) Average Annual Change vs. Average Annual Real GDP Growth

Note: Real GDP data is from the UN National Accounts Database. Panel (a) includes 37 countries for which we have data back to 1970. All countries are included in Panel (b), and vertical labels denote countries with less than 40 years of data. Red line denotes least squares regression line.

Source: Johnson and Noguera, 2017

The drivers of the expansion of trade

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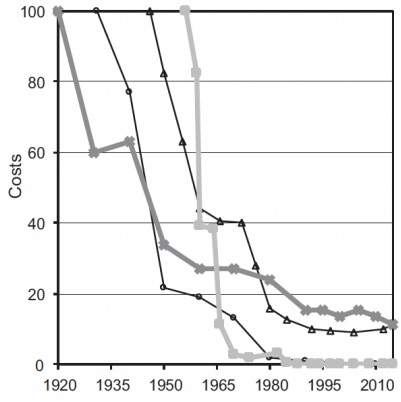
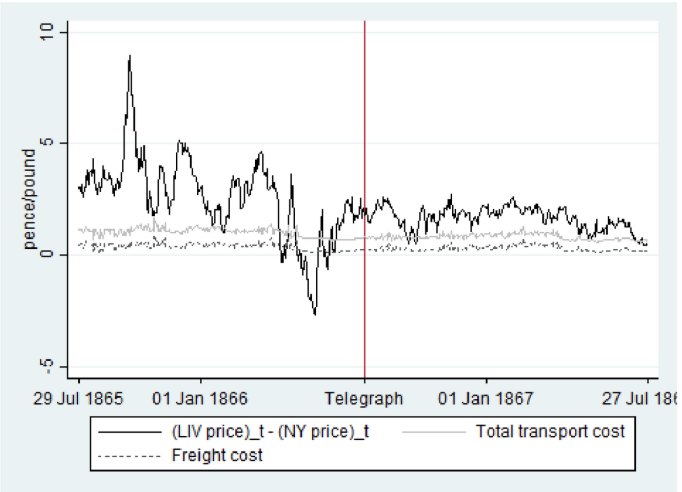
- Trade policy
  - Global organization of trade through GATT and WTO.
  - Regional integration (EU, NAFTA, Mercosur).
  - Political choices matter!

The role of technology



The role of technology

The introduction of the telegraph in the 19th century: effect on cotton prices



The role of technology: the case of transport

- Important innovations in terms of transport and transport infrastructures have always fueled trade.
  - e.g. Steamship, canals, maritime chronometer, etc.
  - Steamship reduced sailing time by one-half and might be responsible of half of the trade boom observed at the end of the 19th century.
- The invention of containers is key to understand the development of world trade.
  - Estimation of +700% of trade over 20 years (Bernhofen et al., 2016).
  - Way larger effect than trade agreements.
  - Effect on non-container goods.

The role of technology: the case of transport

Pascali, 2017

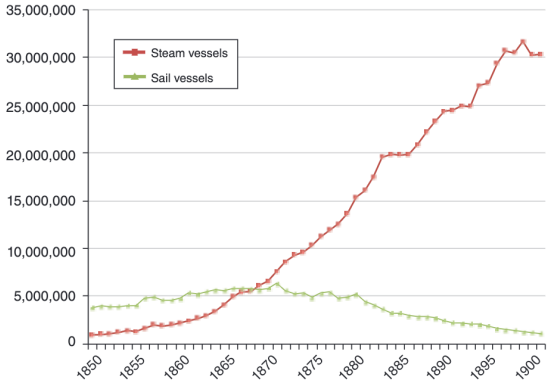


FIGURE 3. TOTAL TONNAGE OF BRITISH VESSELS ENTERED IN BRITISH PORTS FROM AND TO FOREIGN COUNTRIES AND BRITISH POSSESSIONS

Source: Statistical Abstract for the United Kingdom (various years from 1851 to 1901)

The role of technology: the case of transport

Containerization






Breakbulk shipping, 1950s

The role of technology: the case of transport

Containerization

The role of technology: the case of transport

Bernhofen et al. (2016)

The role of trade policy

- Trade policy consists in the set of tools a government can use to open (or close) its country to trade
    - More on this in a few classes.
- After WWII, institutions have developed to coordinate trade policies: the GATT and then the WTO but also regional trade agreements such as NAFTA or the EU.
- Countries have access to a varieties of tools such as tariffs (taxes on imports), export subsidy, export taxes, non-tariff barriers (norms for instance).
- View among economist that the reduction of trade barriers cannot be the only driver of trade expansion, in particular recent ones.

The role of trade policy

Figure 2. U.S. Average Effective Tariff Rate Since 1790

Customs duty revenue as a percent of goods imports

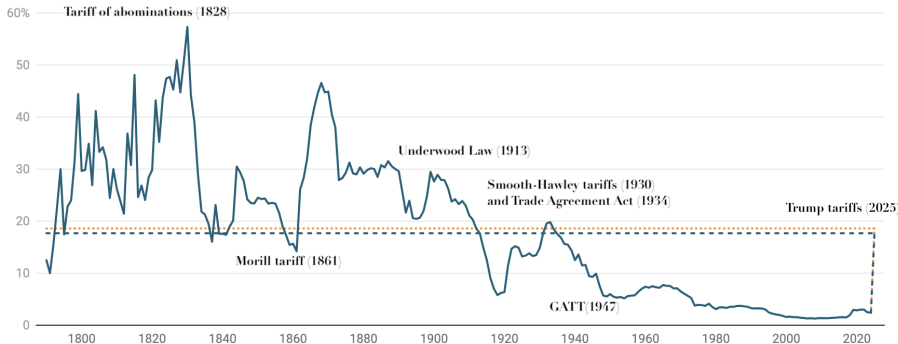
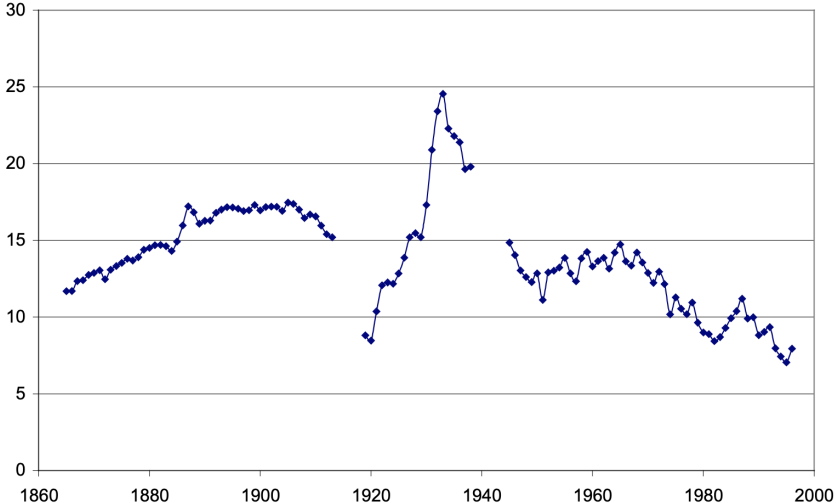


Chart: The Budget Lab • Source: Historical Statistics of the United States Ea424-434, Monthly Treasury Statement, Bureau of Economic Analysis, The Budget Lab analysis. • Created with Datawrapper

The role of trade policy

Figure 1: Unweighted World Average Own Tariff, 35 Countries, %



The role of trade policy

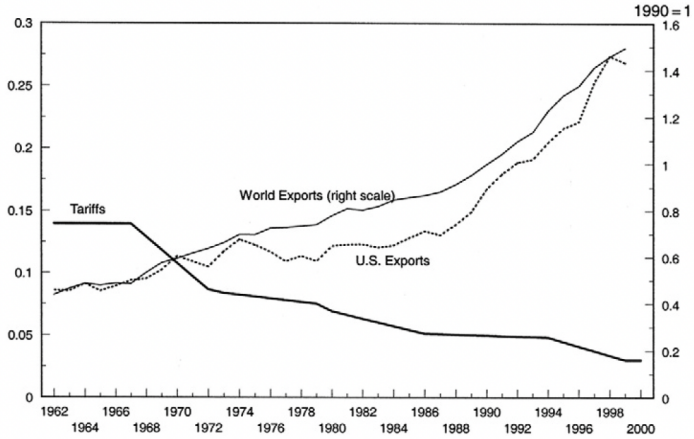


Figure 1.5
Manufacturing export share of GDP and manufacturing tariff rates. *Source:* Kei-Mu Yi, "Can Vertical Specialization Explain the Growth of World Trade?," *Journal of Political Economy* 111, no. 1 (February 2003): 54.

The role of trade policy

- Goldberg (2023) argues that reducing trade barriers matter a lot to boost trade.
  - If tariffs decrease slowly in developed countries in the recent periods, the decrease is more important in developing countries.
  - Global value chains (GVCs) magnify the impact of tariffs (because many frontiers need to be passed for one good to be made). Then it should magnify the elasticity of trade to tariffs: small tariff change can have big effects.
  - Non-trade barriers decreased a lot with standardization efforts of international institutions and regional agreements.

The institutions of globalization

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  - Free riding
  - Need of mutual trust
- Institutions must balance **legal** challenges, with **political** power and **economic** incentives.

The institutions of globalization

What is Game Theory?

- Game theory is the study of strategic decision-making among rational agents whose payoffs depend on the actions of others.

- Key elements
  - **Players:** Decision makers (countries, firms, individuals)
  - **Strategies:** Available actions for each player
  - **Payoffs:** Outcomes/utilities resulting from strategy combinations
  - **Information:** What players know about the game

$\longrightarrow$ We study models: simplifications of the reality to isolate mechanisms.

$\longrightarrow$ In International Economics, global coordination problems arise when countries' optimal individual choices lead to collectively suboptimal outcomes.

The institutions of globalization

Nash Equilibrium

- A Nash Equilibrium is a strategy profile where no player can unilaterally improve their payoff by changing their strategy, given the strategies of other players.

- Intuition
  - Each player's strategy is a best response to others' strategies.
  - No player has an incentive to deviate unilaterally.
  - Represents a stable outcome of strategic interaction.

- Nash equilibria predict likely outcomes of strategic interactions, but may not be socially optimal!

The institutions of globalization

How to Solve 2×2 Games

Step 1: Analyze the matrix

Player 1	Player 2	
	Strategy 1	**Strategy 2**
Strategy 1	(a, w)	(b, x)
Strategy 2	(c, y)	(d, z)

Step 2: Find best responses

- For each player, compare payoffs
- Mark best responses with *

Step 3: Identify equilibria

- Nash equilibrium = both players playing best responses simultaneously
- Look for cells where both payoffs are marked with *

Types of games:

- Zero equilibria (rare)
- One equilibrium
- Multiple equilibria

The institutions of globalization

Beggar-Thy-Neighbor: International Trade Wars

Context

Two major economies face recession and consider protectionist measures. Each can maintain free trade or impose tariffs to protect domestic industries at their trading partner's expense.

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Free Trade	$(3, 3)$	$(0, 5)$
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	Free Trade	**Impose Tariffs**
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Impose Tariffs	$(5, 0)$	$(1, 1)$

Analysis:

- Dominant Strategy: Each country prefers tariffs regardless of opponent's choice
- Nash Equilibrium: (Tariffs, Tariffs) with payoffs $(1, 1)$
- Social Optimum: (Free Trade, Free Trade) with payoffs $(3, 3)$

$\longrightarrow$ Need for policy coordination

The Institutions of Globalization: Historical Foundations

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  - First intergovernmental organization promoting global peace
  - Influential in international taxation and labor standards

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- **GATT/World Trade Organization (1947/1995)**
  - Trade liberalization and rules-based multilateral trading system
  - Dispute resolution and enforcement mechanisms

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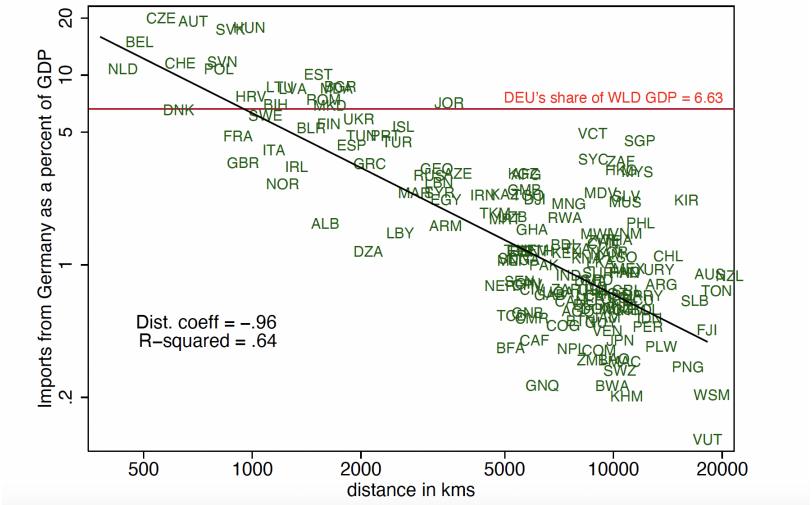
Germany in 2006



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Germany in 1976