

ECONOMICS Lecture 5

World Trade: Facts & Models

Biwei Chen

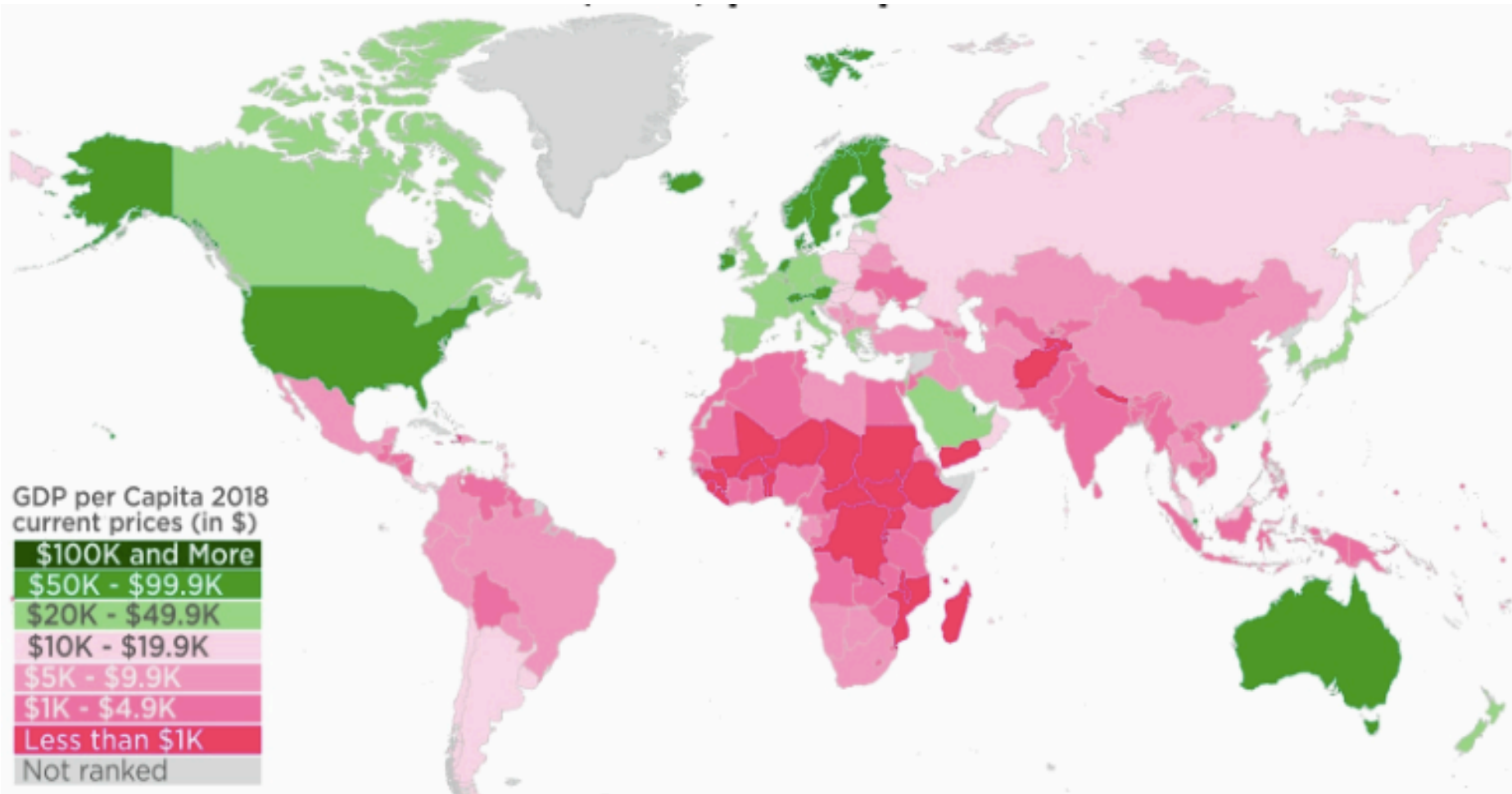
Topics

- 2018 World Trade Fact Charts
- World Trade Historical Trends
- Summary of Key Observations
- Setting PPF Model to Explain Trade
- Absolute and Comparative Advantage

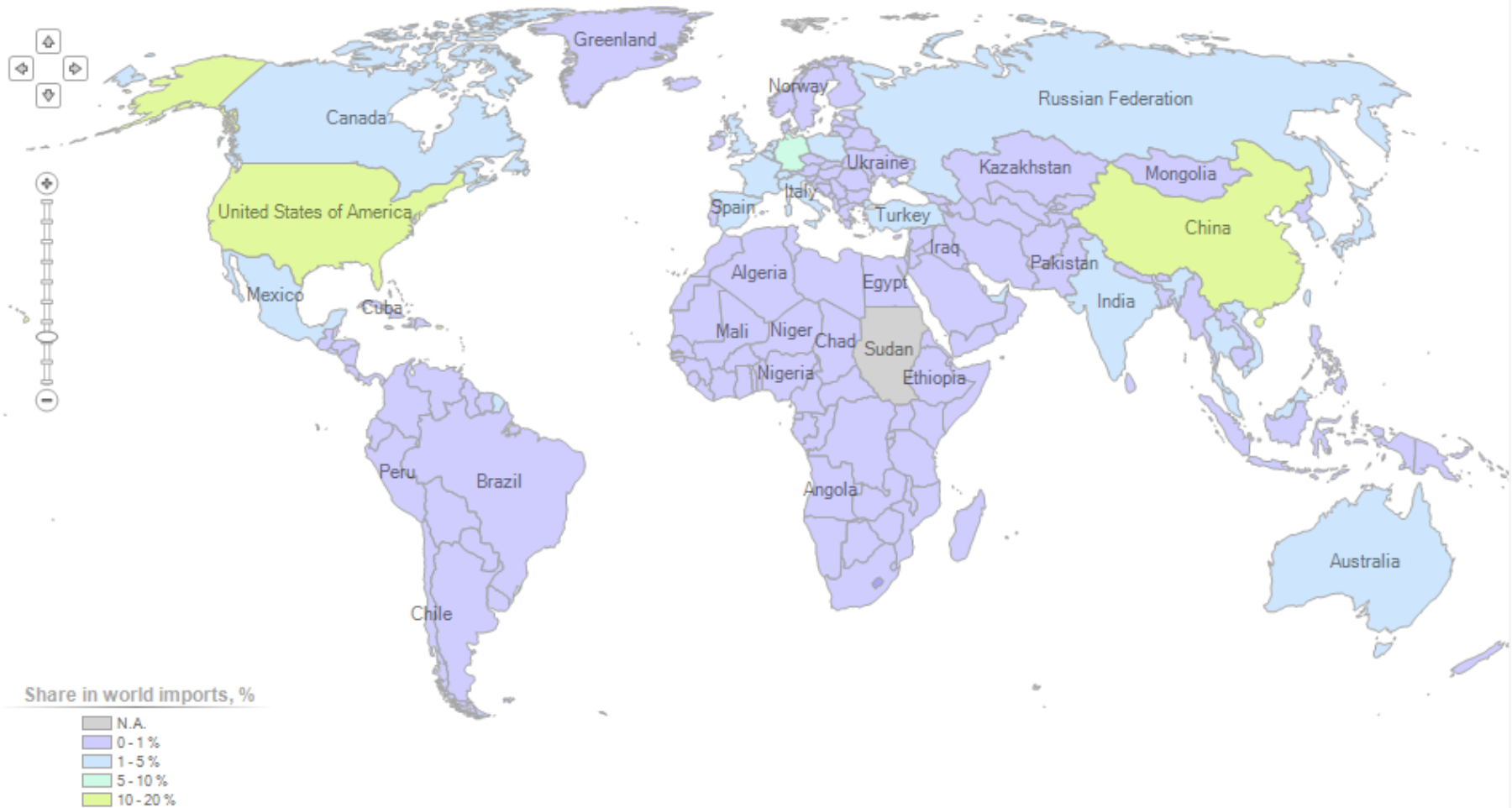


In this lecture, we will examine global trade patterns and learn how to apply the concept of opportunity cost in the PPF model to explain international trade between countries. More important, appreciate economic explanation and enjoy the beauty of science!

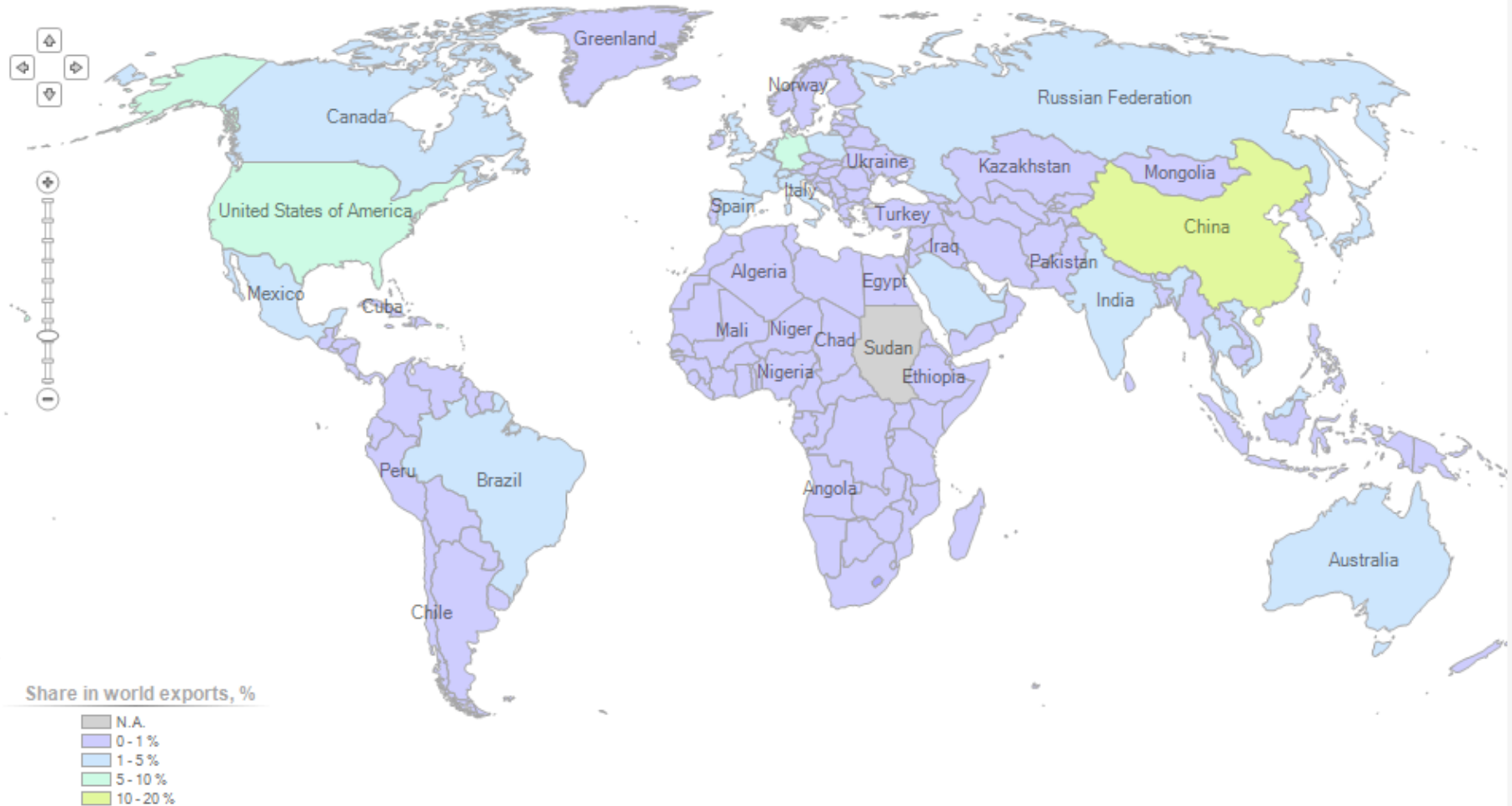
2018 World Income Map (GDP per capita)



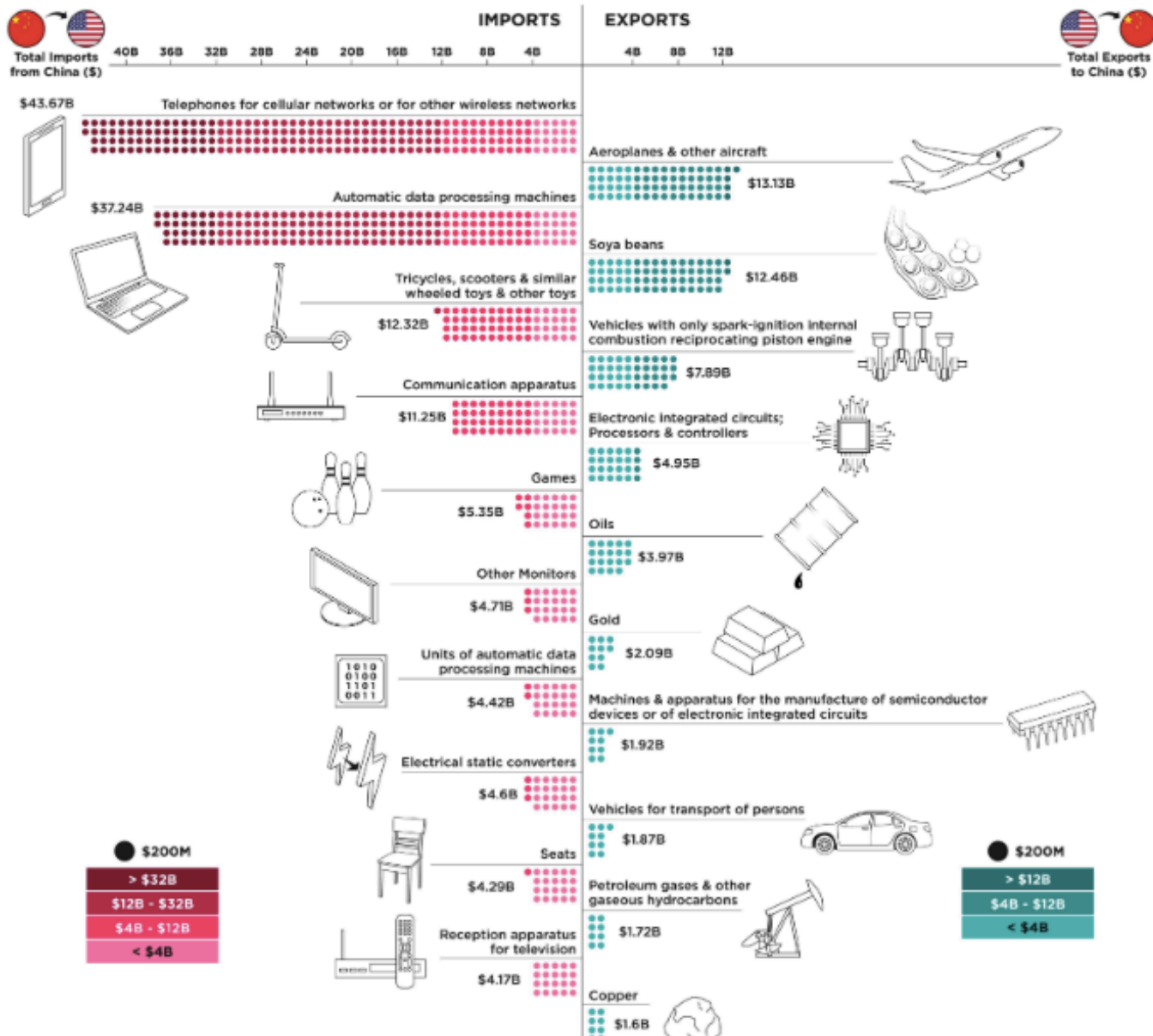
2018 Country Import Share in World Merchandise Trade



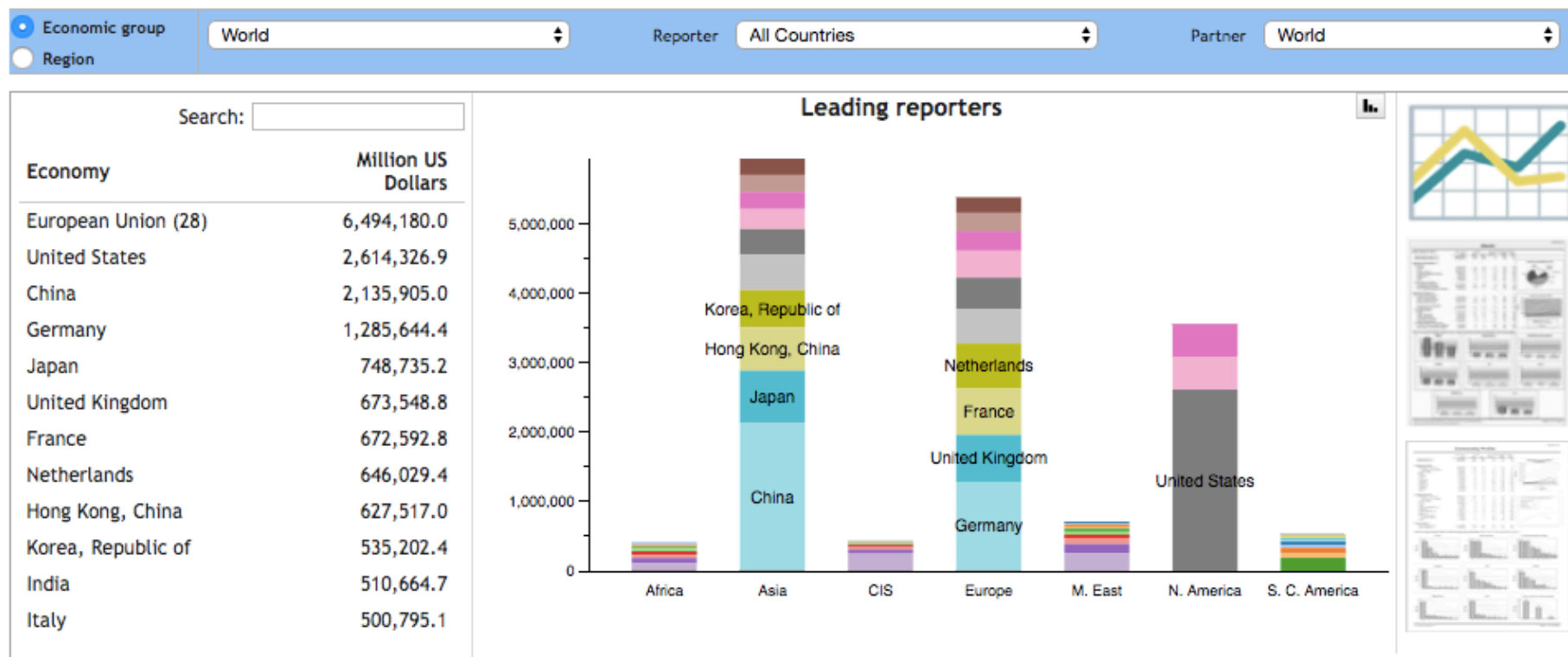
2018 Country Export Share in World Merchandise Trade



Most Traded Goods Between US & CH



2018 Country Import Share in World Merchandise Trade



COMPOSITION OF GEOGRAPHICAL AND ECONOMIC GROUPINGS

DEFINITIONS AND METHODOLOGY

SPECIFIC NOTES FOR SELECTED ECONOMIES

STATISTICAL SOURCES

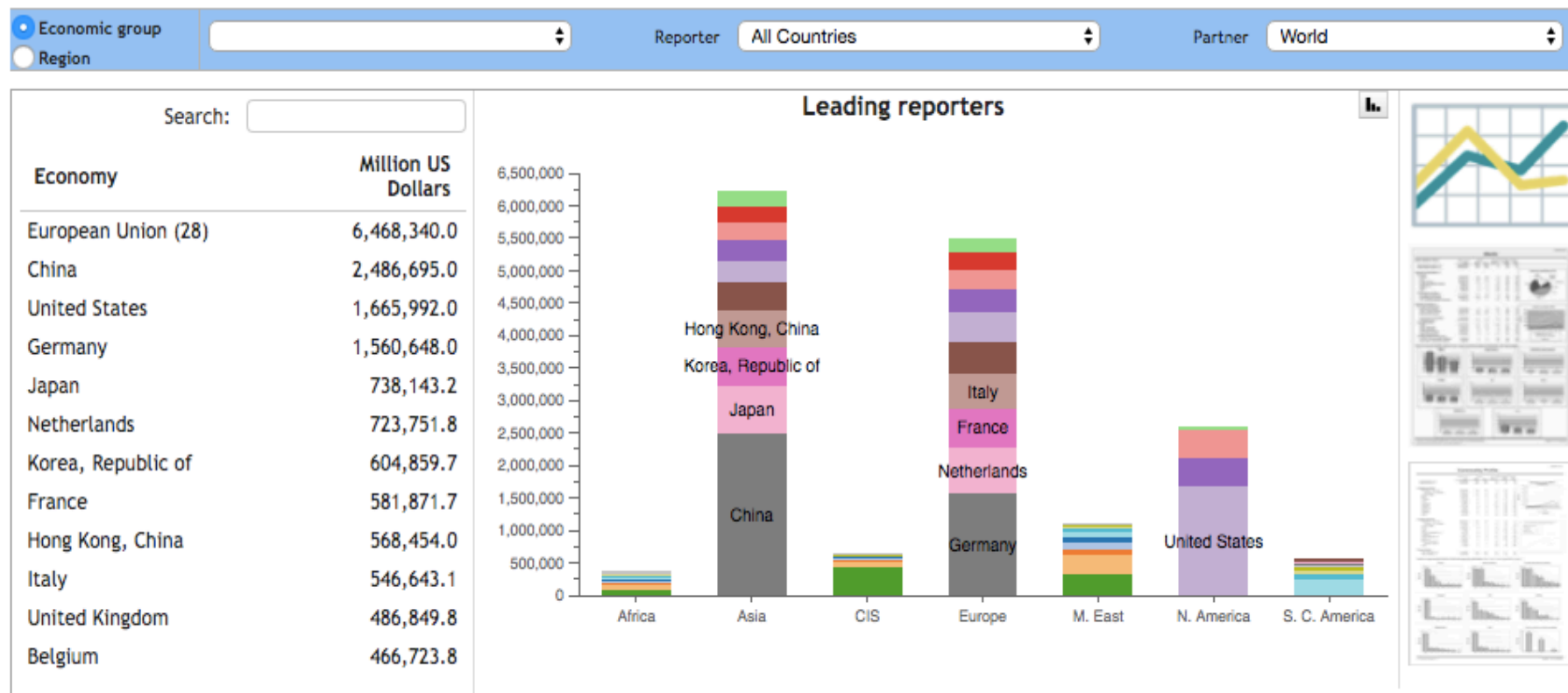
ABBREVIATIONS AND SYMBOLS

Economy: World

Type of trade: Merchandise trade
 Commodity/Sector: Total merchandise
 Trade flow: Imports
 Year: 2018
 Trade with: World

Value: US\$ 19,866,000 million

2018 Country Export Share in World Merchandise Trade



COMPOSITION OF GEOGRAPHICAL AND ECONOMIC GROUPINGS

DEFINITIONS AND METHODOLOGY

SPECIFIC NOTES FOR SELECTED ECONOMIES

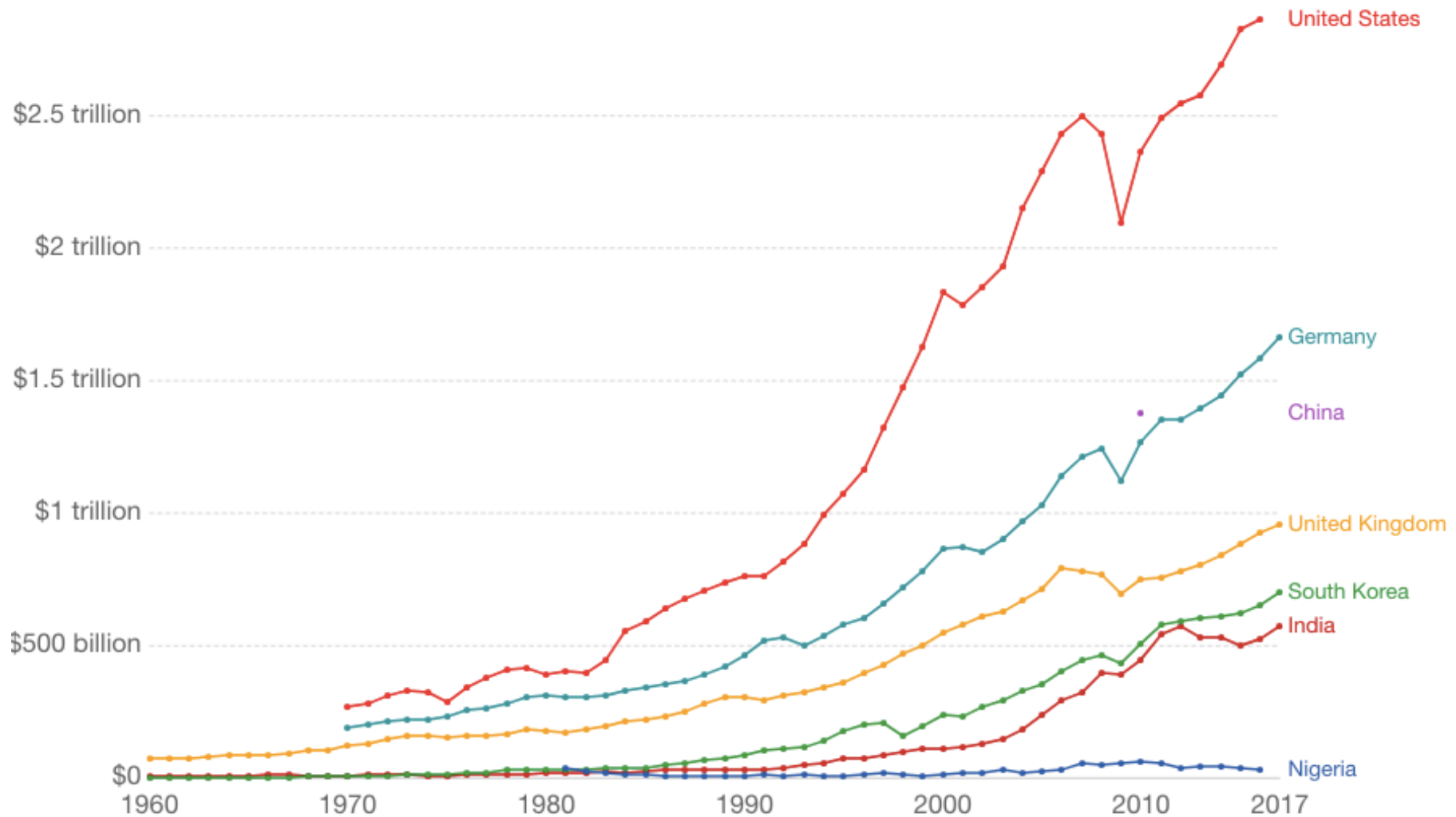
STATISTICAL SOURCES

ABBREVIATIONS AND SYMBOLS

Economy:

Type of trade: Merchandise trade
 Commodity/Sector: Total merchandise
 Trade flow: Exports
 Year: 2018
 Trade with: World

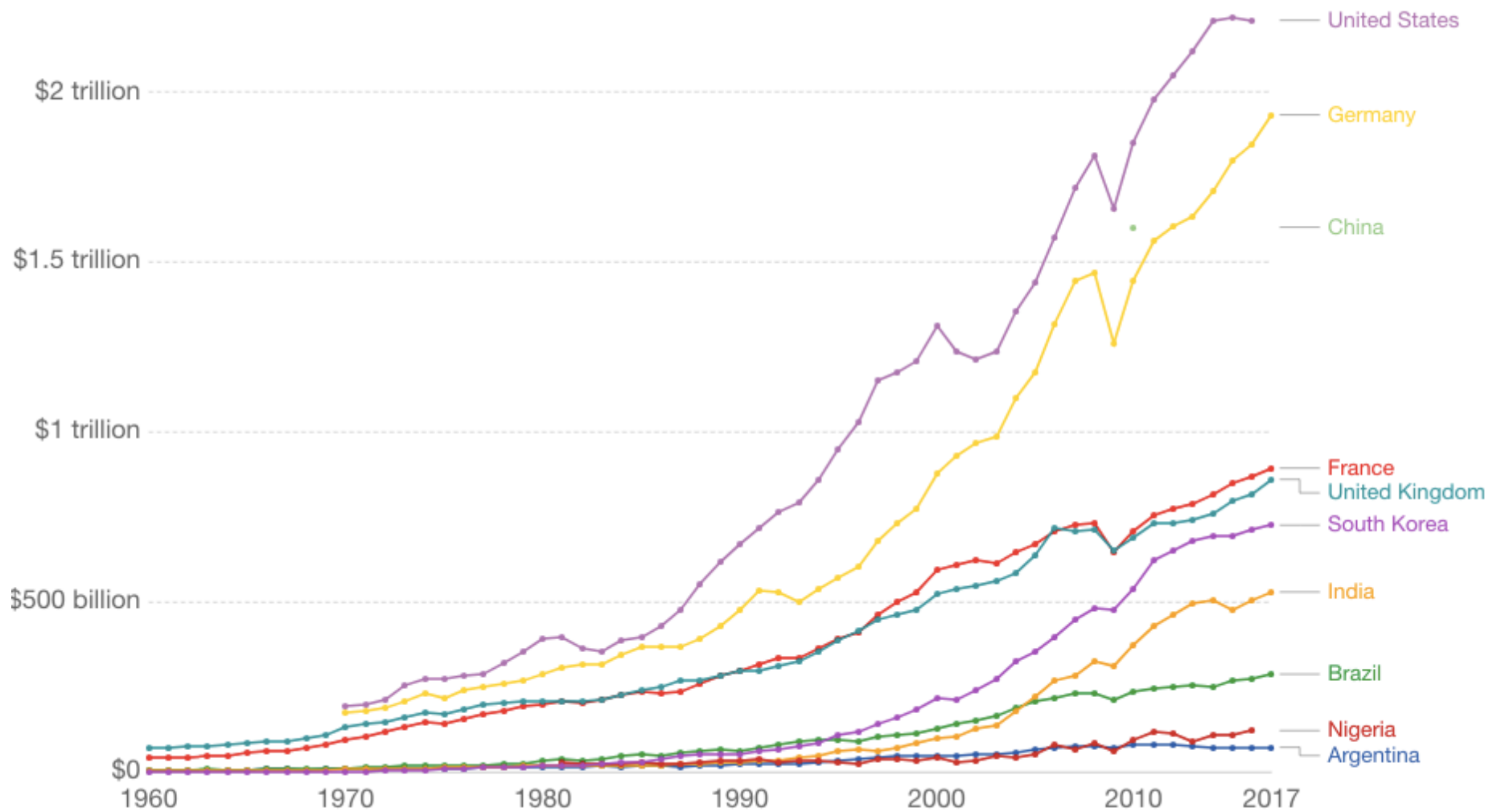
1960-2017 Countries' Imports of Goods and Services



Source: World Bank

CC BY-

1960-2017 Countries' Exports of Goods and Services

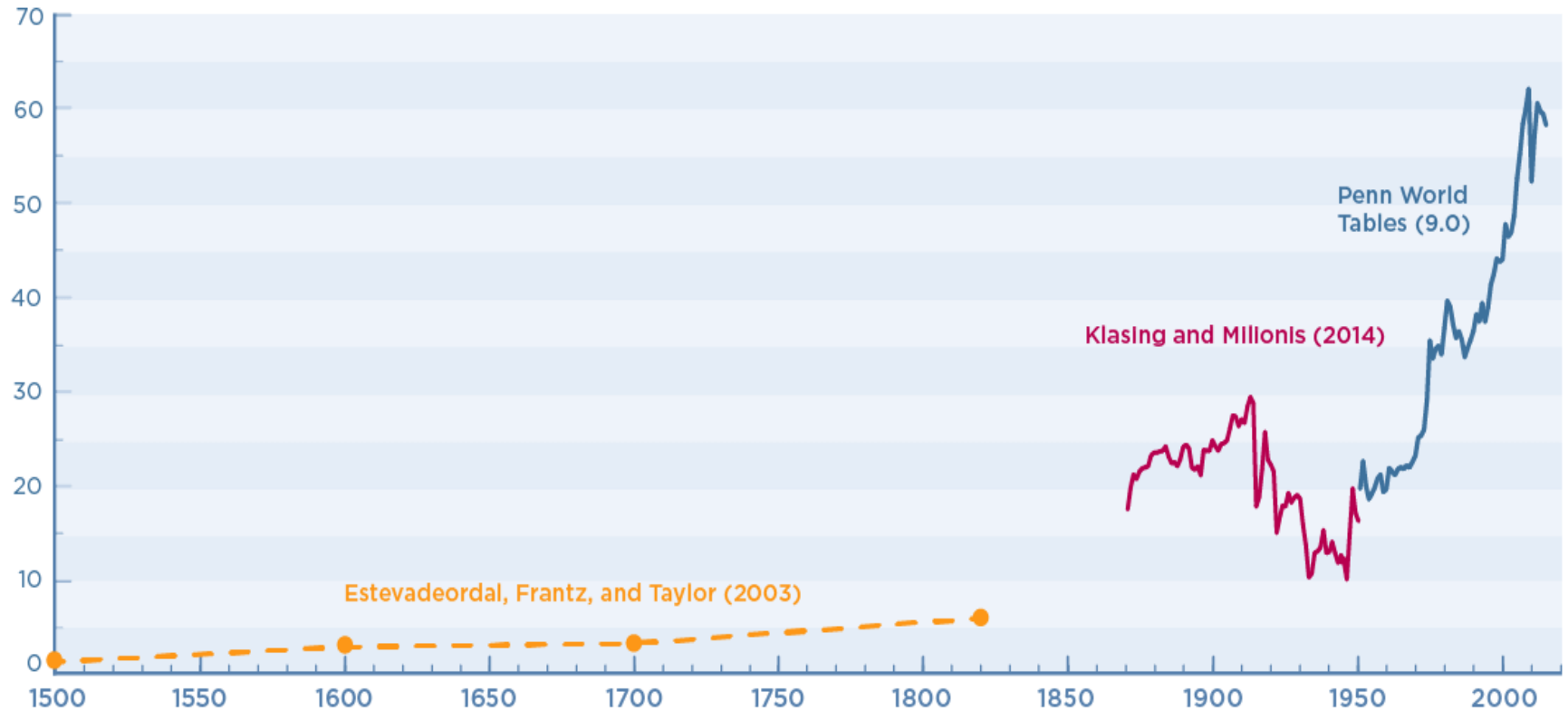


Source: World Bank

CC BY-SA

Trade has skyrocketed in the past century

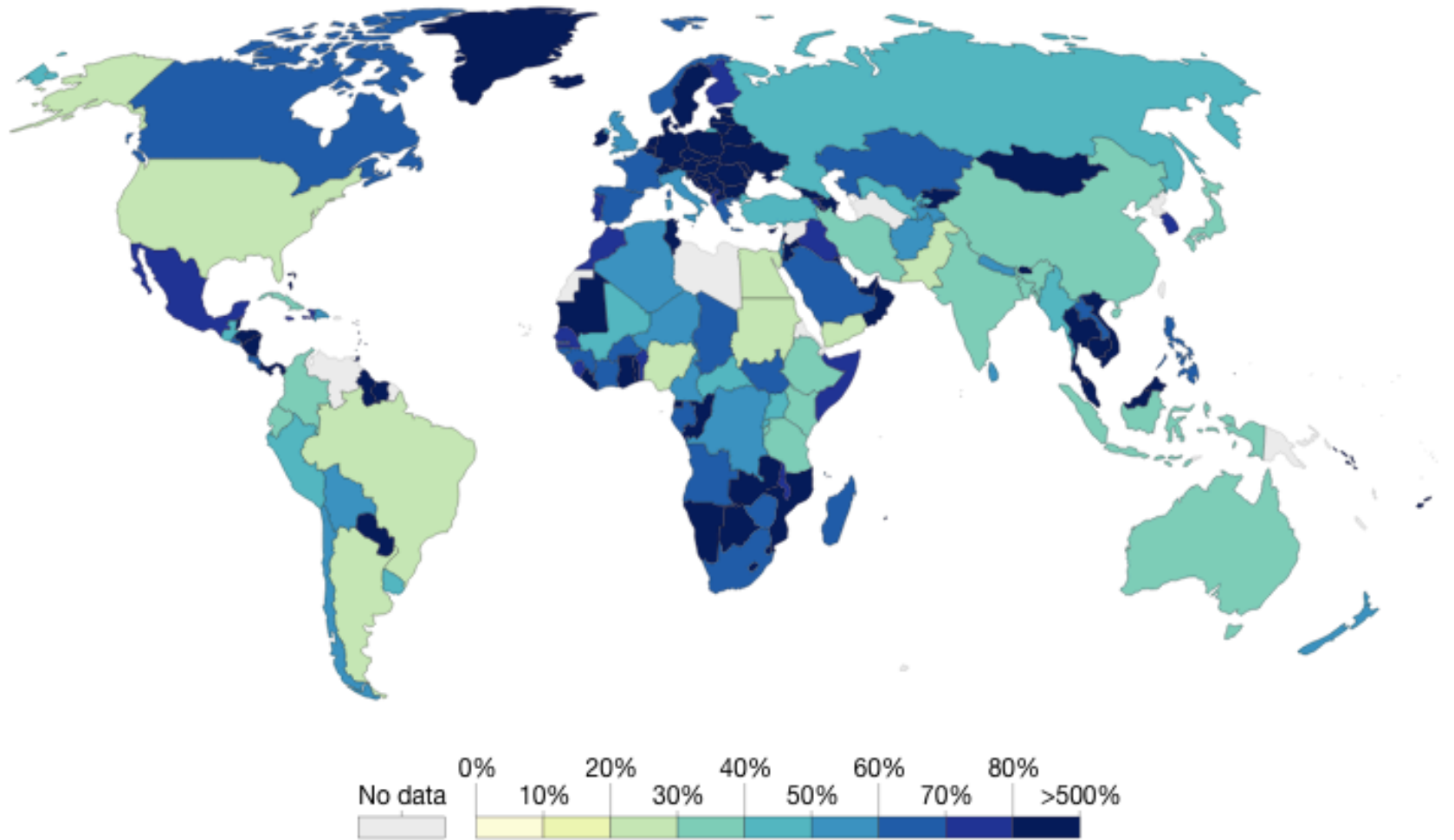
World trade as percent of world GDP (1500–2014)



Note: This chart displays data from three sources. Data from 1500 to 1820 is the average of the upper and lower bound and only includes the years 1500, 1600, 1700, and 1820. Data not available from 1821-1869.

Sources: See chart, "Globalization over 5 centuries," at <https://ourworldindata.org/trade-and-globalization> for full citations.

International Trade as share of GDP in 2017

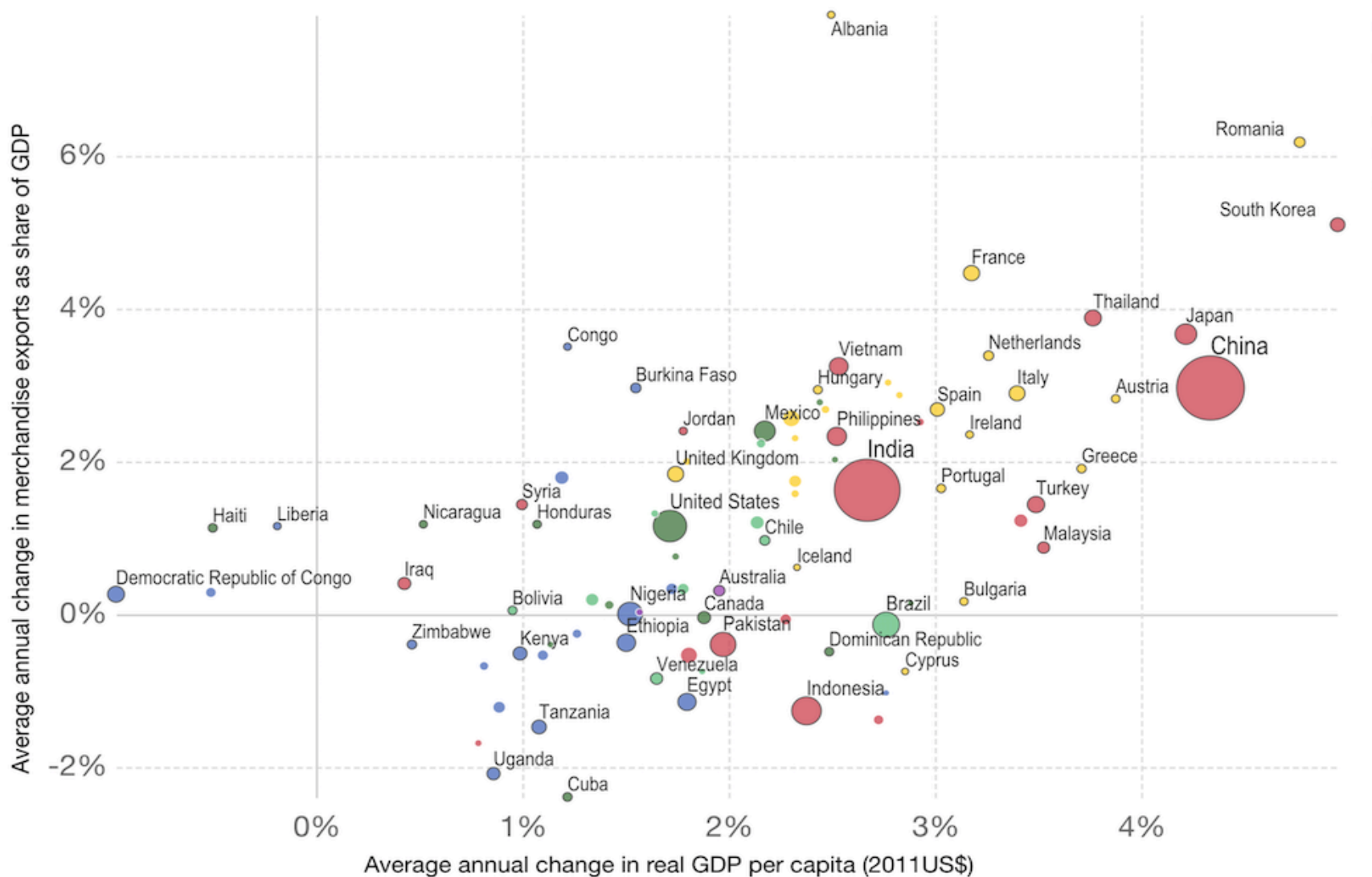


Source: World Bank – WDI

CC BY-SA

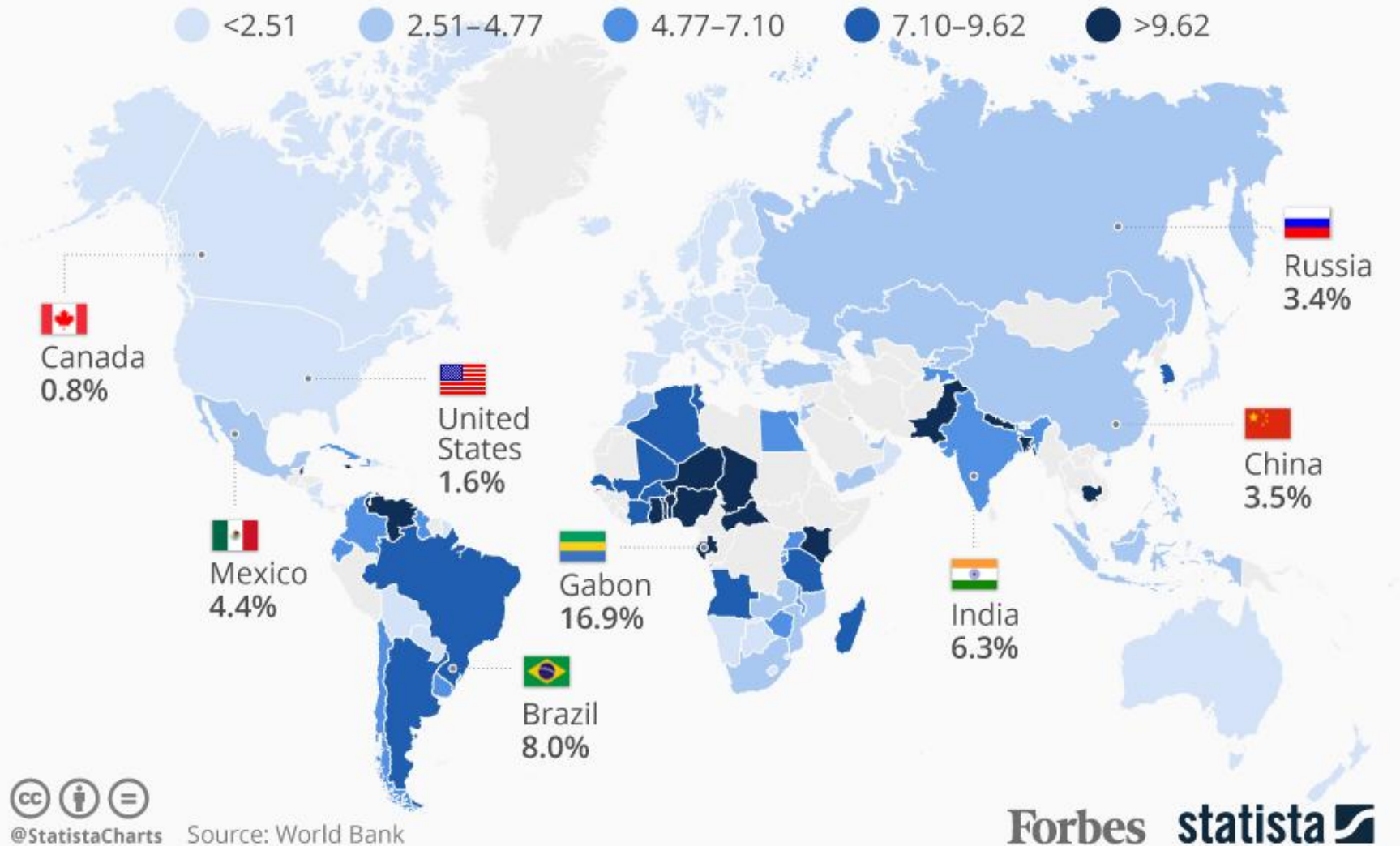
Flash play <https://ourworldindata.org/grapher/trade-as-share-of-gdp>

Economic Growth and Trade, 1945-2014

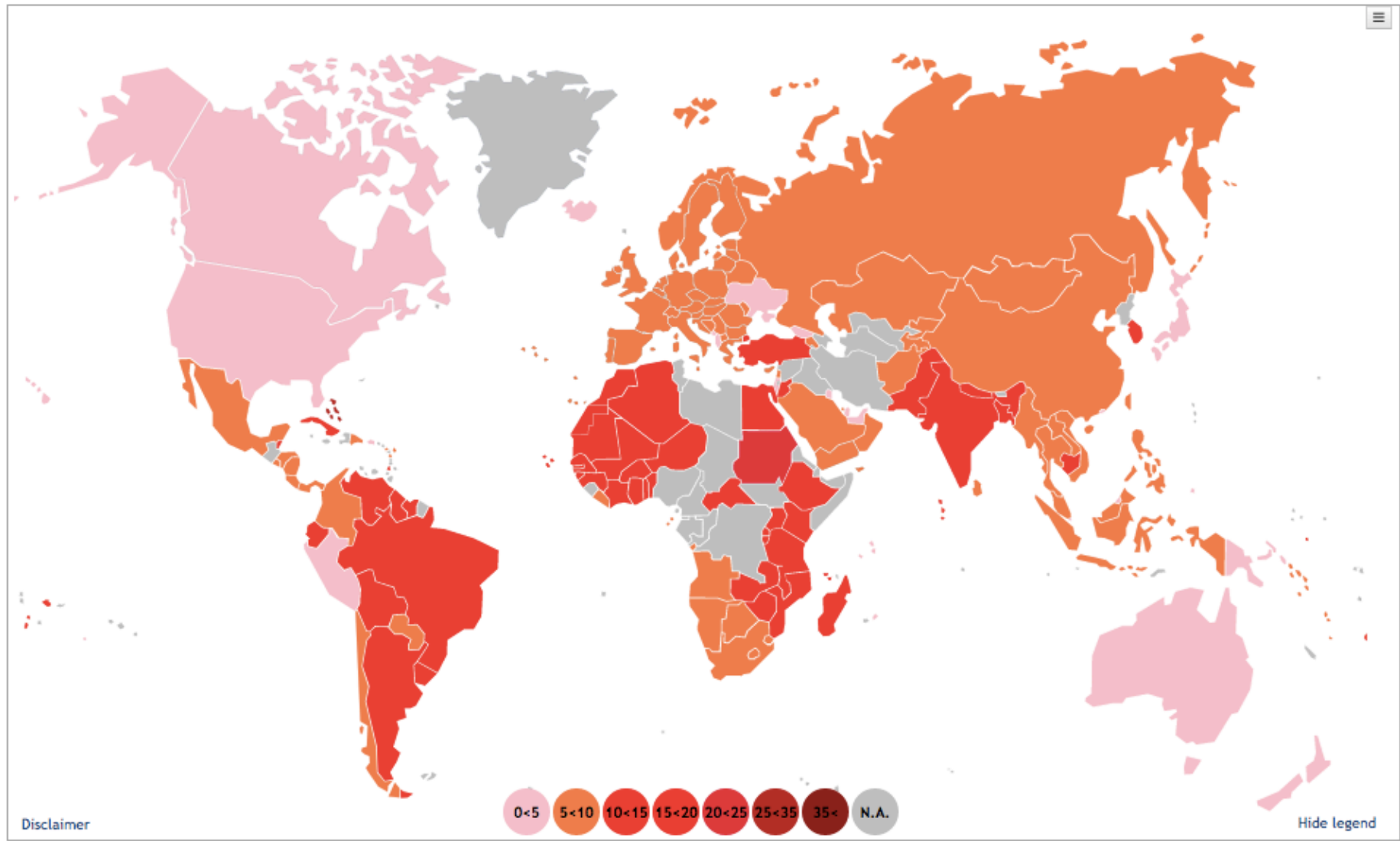


Where Global Tariffs Are Highest And Lowest

Average weighted tariff rate applied across all products in 2016 (%)

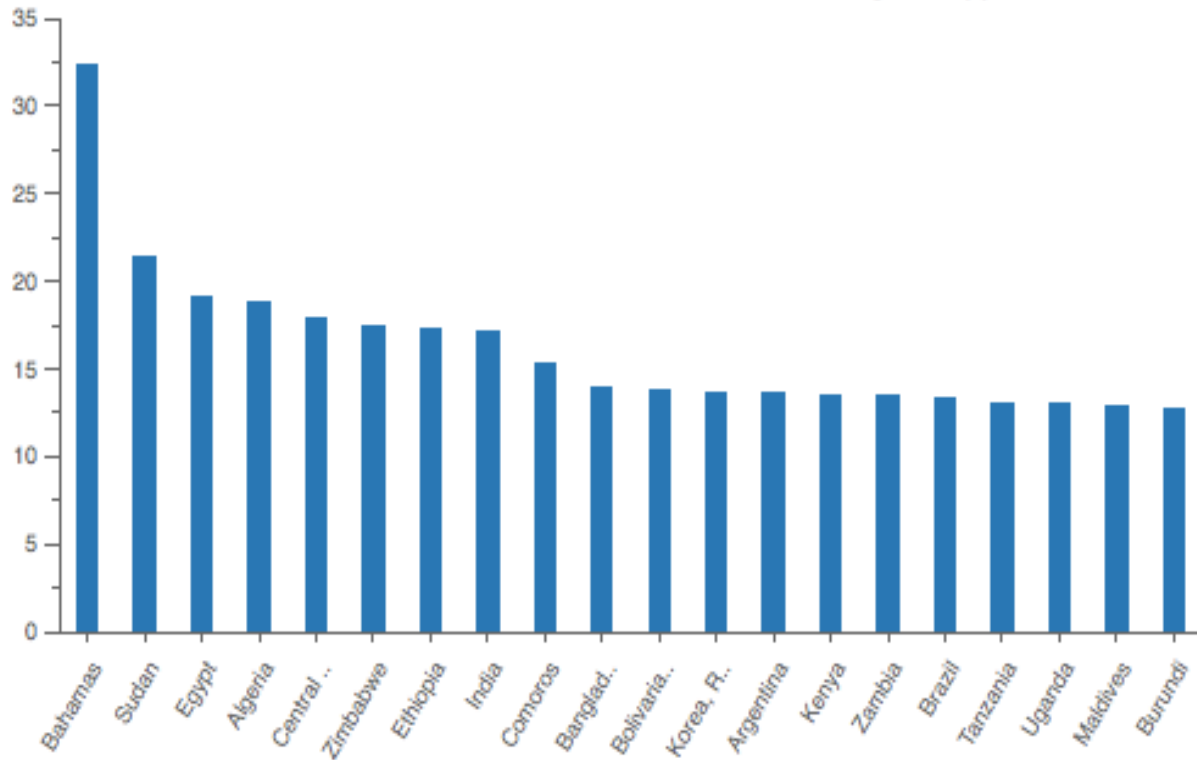


2018 Simple Average Applied MFN Tariff – All Products



2018 Simple Average Applied MFN Tariff – All Products

- What are those highest-tariff countries?
- How is their economic performance?
- How is people's living standard in these countries compared with Americans?
- Are these countries rich or poor? Why?
- Do you think it is related to trade?



Summary: Key Facts on World Trade

- Fact 1: CH and US are the largest trade countries in the world.
- Fact 2: After WWII, world trade has experienced the most spectacular growth in human history.
- Fact 3: High tariff countries are usually at low income levels.
- Question: Why can we observe such patterns in world trade?
How can we explain these phenomena in economic theory?

Setting up the PPF Model

Assumptions:

- 1) Two countries, two goods, one production factor (labor)
- 2) US can either produce 4 apples per hour or 6 bananas per hour
- 3) CH can either produce 6 apples per hour or 4 bananas per hour
- 4) Both countries prefer average consumption (equal time allocation in production) on both goods.
- 5) No transportation and transaction cost (searching, bargaining and contracting; currency conversion, tariff, insurance...)

Now, you can draw the PPF for both countries.

Draw the PPF for US and CH

Production Measure		US	CH
Productivity (output/hour)	apple	4	6
	banana	6	4
Unit product input requirement (hours/output)	apple		
	banana		
Opportunity cost of production	apple		
	banana		

- PPF for US

- PPF for CH

Describing Autarky Equilibrium

Production & Consumption		US	CH
Productivity (products/hour)	apple	4	6
	banana	6	4
Autarky equilibrium (C=P)	apple		
	banana		

- PPF for US

- PPF for CH

Will Trade Occur between US and CH?

- Suppose US would trade **1 banana for 1 apple**.
- What if US trades out 1, or 2, or 3 bananas?
- Derive US consumption possibilities frontier (CPF)

• PPF for US

• PPF for CH

Will Trade Occur between US and CH?

- Starting from the autarky equilibrium (closed economy when consumption equals production), we can trace out a new consumption possibilities frontier (CPF) under the exchange rate of 1 apple for 1 banana.
- The question is whether both countries are willing to trade under such arrangement. Why?
- To answer this question, we would need to understand the incentive facing the economic agents—will trade improve their welfare compared with autarky equilibrium?
- An easy way to compare is simply looking at the new CPF and the autarky equilibrium on the PPF. Which is more efficient?

Can Countries Gain from Pure Exchange?

- Trade will be preferred if it can enrich both parties.
- Actually, more can be done to improve the outcome.
- Recall the implication of rationality, what does it say?
- Check which country has lower cost in producing apple?
Which countries has lower cost in producing banana?
- What are they going to do as a rational economic agent?
- In other words, based on cost minimization, who should produce what?
- After division of labor (specialization), suppose both countries would still trade at 1 apple for 1 banana.

Specialization and Trade (1a:1b)

		US	CH
Opportunity Cost of production	apple	1.5b	0.67b
	banana	0.67a	1.5a
Specialization Pattern	apple		
	banana		

- PPF for US

- PPF for CH

Specialization Driven by Productivity

- Based on the cost-minimization principle, both countries will tend to produce the good of their own advantage.
- US will specialize in producing only bananas since its production cost is lower than that of CH; CH will specialize in producing only apples.
- Intuitively, in this model setup, the specialization pattern between the two countries is driven by their respective productivity, or absolute advantage in production.
- Specialization requires concentration and commitment. Specialization makes production more efficient as both countries can learn and improve the process by doing.

Trade Equilibrium: Most Efficient

- After specialization, US and CH will begin to trade.
- What are the possible trade solutions if they agree with an exchange rate of one apple for one banana?
- After complete specialization, US produces 6 bananas and can at most import 6 apples from CH; vice versa for CH.
- The new possibilities frontier after trade is called trade possibilities frontier TPF. Trace them out for US and CH.
- **In terms of efficiency, $TPF > CPF > PPF$. Show it graphically.**
- How many apples and bananas will US consume after trade? In the trade equilibrium, US and CH both must satisfy two conditions: consumption=production and total import value=total export value. US (3a, 3b) and CH (3a, 3b).

Summary Table: Benefits from Trade

		US	CH	Total
Autarky Equilibrium	apple	2	3	
	banana	3	2	
Specialization in production	apple	0	6	
	banana	6	0	
Trade equilibrium	apple			
	banana			
Net Gain from trade	apple			
	banana			

- Why do countries favor trade? Why is each country willing to trade?
- What is the economic basis for trade? What determines specialization pattern?
- Is trade fair to both countries? Which country gains more from trade?
- What determines the exchange rate or terms of trade (TOT)?

Take-home Question:

Production Measure		US	CH
Productivity (products/hour)	apple	4	3
	banana	6	2
Unit product input requirement (hours/product)	apple		
	banana		
Opportunity cost of production	apple		
	banana		

- What are the differences between this model and the previous one?
- Which country is absolutely more productive?
- Could trade take place in this setup?
- The answer hinges on the opportunity cost.

Mercantilism vs Smith & Ricardo

- **Mercantilism** is economic nationalism for the purpose of building a wealthy and powerful state. This system dominated Western European economic thought and policies from the 16th to the late 18th centuries.
- Mercantilists believed that exporting was good because it generated gold and importing was bad because it drained gold from the national treasury. **Mercantilists favored high tariffs to ensure high exports and low imports.**
- Mercantilism as a major system of thought lost dominance after the harsh treatment it received in Book IV of Adam Smith's *Wealth of Nations* in 1776. According to Smith, international trade happens and is beneficial because of countries' difference in **Absolute Advantage**.
- More insightfully, David Ricardo (1800s) showed that, based on the principles of **Comparative Advantage**, countries could benefit from international trade without having to use tariffs.

Absolute and Comparative Advantage

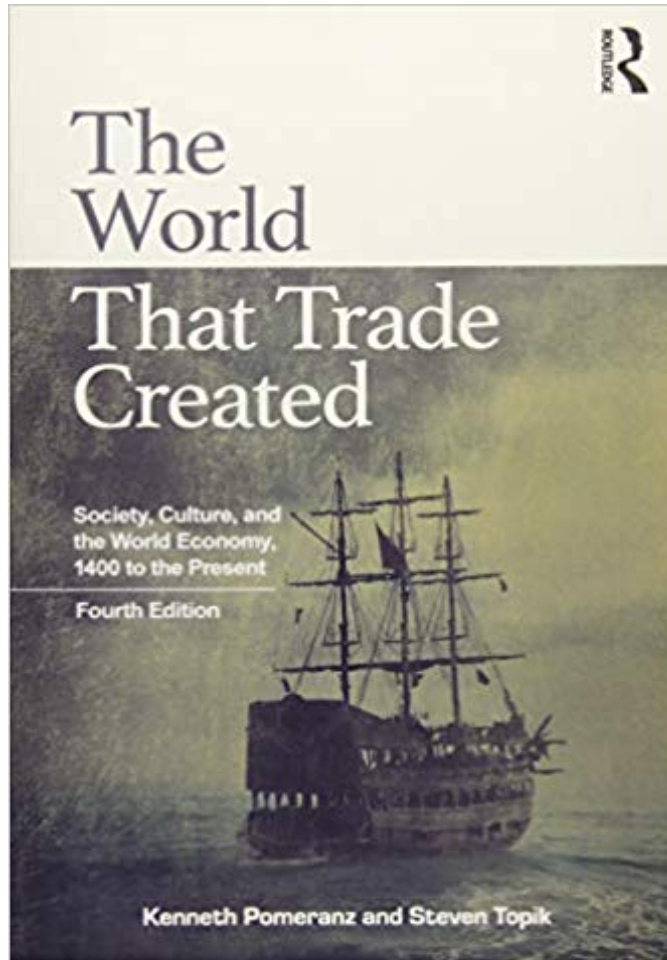
- The main concept of **Absolute Advantage** is generally attributed to Adam Smith (1776) *The Wealth of Nations* in which he countered mercantilist ideas.
- The principle of **Absolute Advantage** refers to the ability of a party to produce more of a good or service than competitors, using the same amount of time or resources.
- Since absolute advantage is determined by a simple comparison of labor productivities, it is possible for a party to have no absolute advantage in anything; in that case, according to the theory of absolute advantage, no trade will occur with the other party.
- It can be contrasted with the concept of **Comparative Advantage** which refers to the ability to produce specific goods at a lower **Opportunity Cost**. The comparative advantage theory of David Ricardo became the most influential theory in economics and international trade.

Smith on the Benefit from Specialization

It was the division of labour which probably gave occasion to the invention of the greater part of those machines, by which labour is so much facilitated and abridged. When the whole force of the mind is directed to one particular object, as in consequence of the division of labour it must be, the mind is more likely to discover the easiest methods of attaining that object than when its attention is dissipated among a great variety of things.

This quote from an early draft of the Wealth of Nations is interesting for not only making the point that the division of labor creates greater productivity but also for stating clearly that it stimulates technological innovation as well. <https://oll.libertyfund.org/quotes/316>

The World That Trade Created 4E



Covering over seven hundred years of history, this book, now in its fourth edition, takes the reader around the world from the history of the opium trade to pirates, to the building of corporations and migration to the New World. It includes ten new essays, on topics ranging from the early modern ivory and slave trades across the Indian Ocean, to the ways in which the availability of new consumer goods helped change work habits in both Europe and East Asia, and from the history of chewing gum to that of rare earth metals.

Reference

- [1] <https://www.trademap.org/Index.aspx>
- [2] https://www.wto.org/english/res_e/statis_e/statis_bis_e.htm
- [3] https://www.wto.org/english/res_e/statis_e/statis_maps_e.htm
- [4] <https://ourworldindata.org/trade-and-globalization>
- [5] http://en.wikipedia.org/wiki/Absolute_advantage
- [6] http://en.wikipedia.org/wiki/Comparative_advantage
- [7] <https://howmuch.net/articles/trade-goods-us-china>
- [8] Pierce, Justin R., and Peter K. Schott. 2020. "Trade Liberalization and Mortality: Evidence from US Counties." *American Economic Review: Insights*, 2 (1): 47-64. DOI: 10.1257/aeri.20180396 <https://www.aeaweb.org/research/deaths-despair-trade-liberalization-china>

Videos

201701 What would a U.S.-China trade war look like? | CNBC 4:23

<https://www.youtube.com/watch?v=gZFINBUxf6Y>

201907 What's happening with Trump's trade fights? | WSJ 5:41

<https://www.youtube.com/watch?v=o8VqwxJYTU0>

201911 America v China: why the trade war won't end soon | The Economist 9:17

https://www.youtube.com/watch?v=ErwIlvQ_RVk

201808 How do tariffs work? | CNBC Explains 4:57

<https://www.youtube.com/watch?v=LKCMnCZyxiQ>

201801 Why cities exist? 13:03 (specialization and trade)

<https://www.youtube.com/watch?v=IvAvHjYoLUU>

201110 Empires of Trade 5:51

<https://www.youtube.com/watch?v=ZgP7EEEIMM0>