A BRIEF HISTORY OF GLOBAL TRADE EVOLUTION AND ECONOMIC GROWTH

Technology, spatial distribution of resources and paradigm shift of economics have been driving economic integration since 1800s.

EE406: Contemporary Economic Issues
Semester 1/ 2021
Faculty of Economics, Thammasat University

Main contents

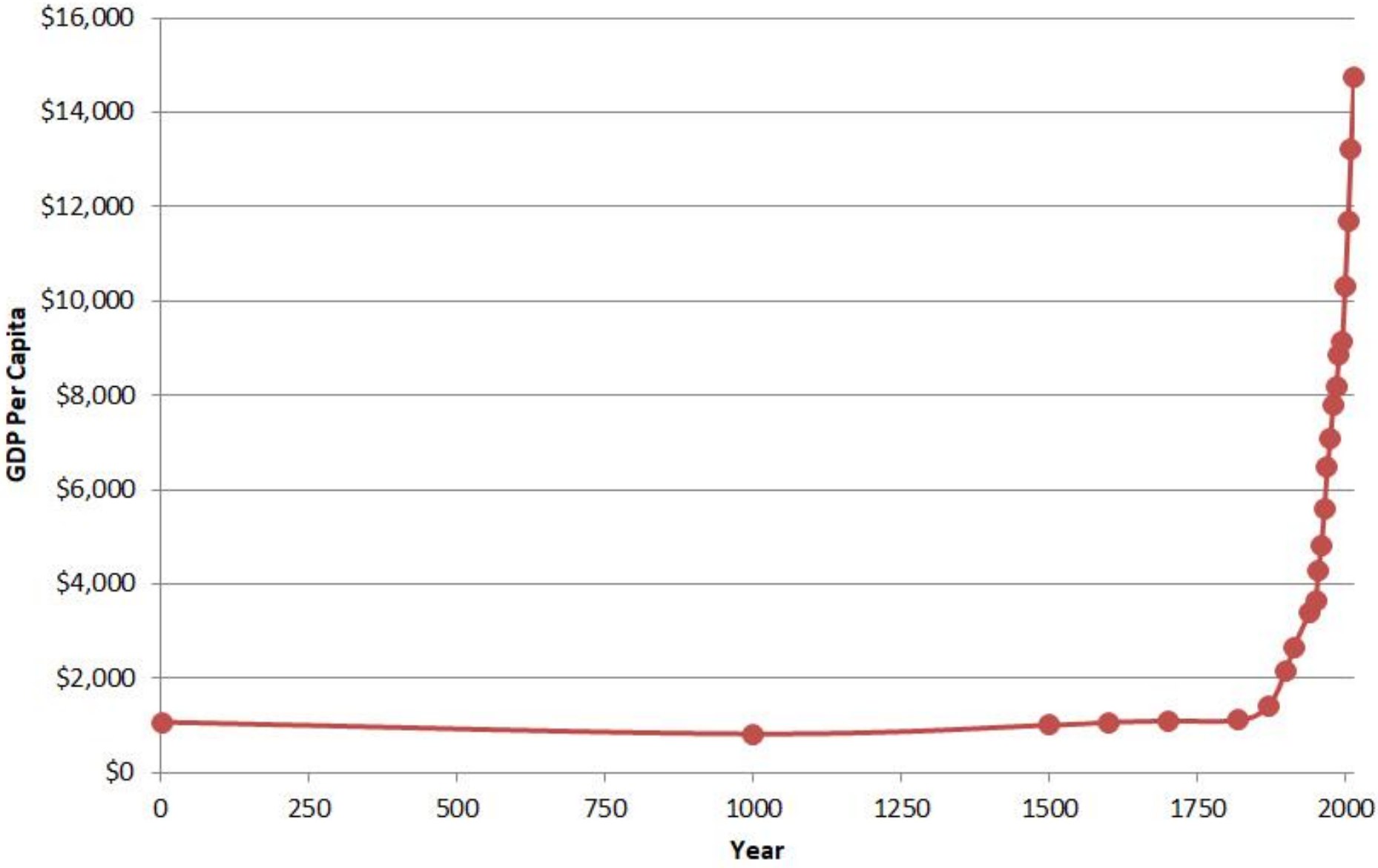
Part 1: First Unbundling Revolution

Part 2: Second Unbundling Revolution

Part 3: Quantifying the Impact of Technological Progress

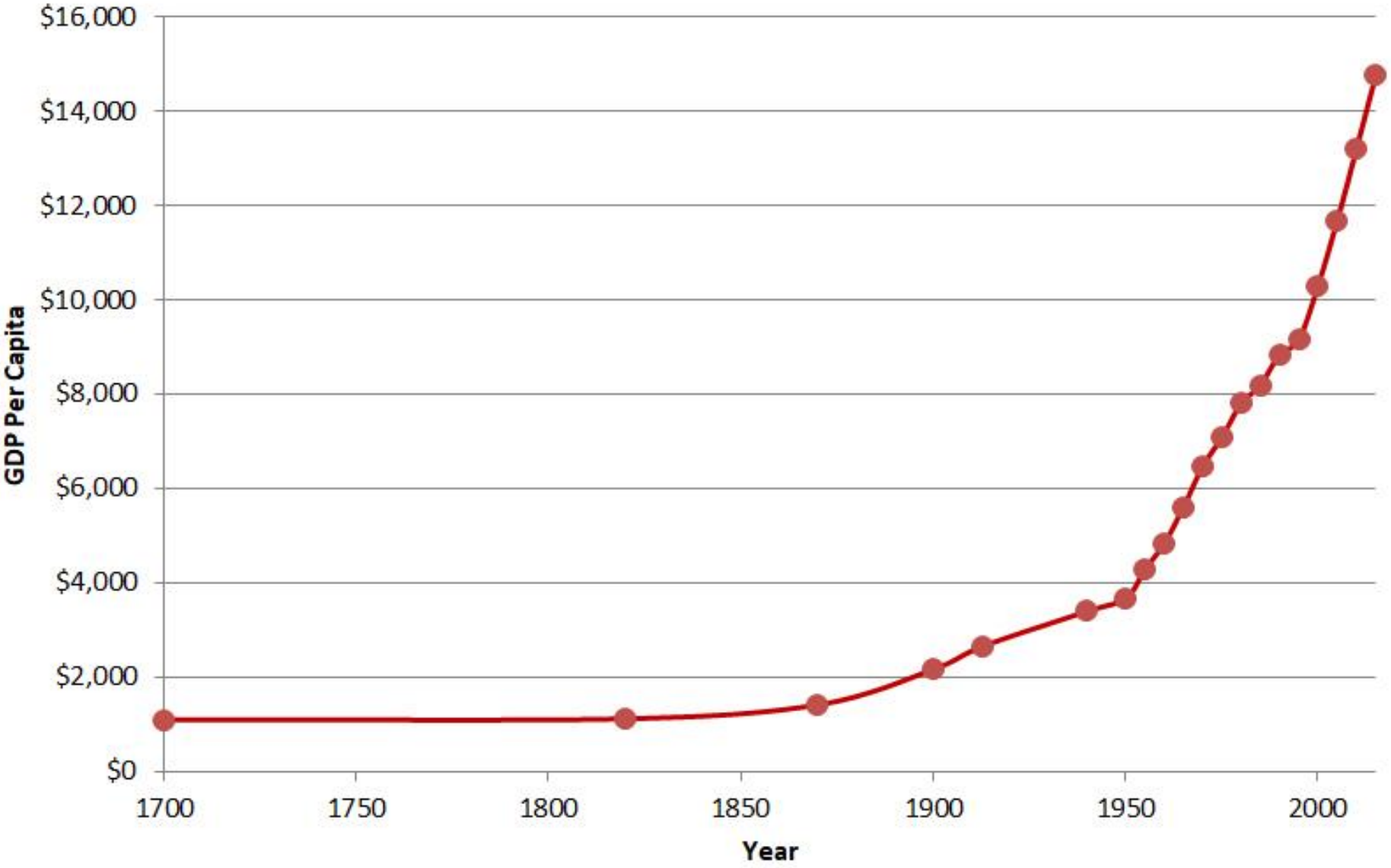
Part 1: First Unbundling Revolution (i.e. The Industrial Revolution)

Global GDP Per Capita, 1-2015
2011 International Dollars



Source: GDP data from ourworldindata.org. Population data from worldpopulationhistory.org

Global GDP Per Capita, 1700-2015
2011 International Dollars



Source: GDP data from ourworldindata.org. Population data from worldpopulationhistory.org

Indonesia: Archaeologists find world's oldest animal cave painting

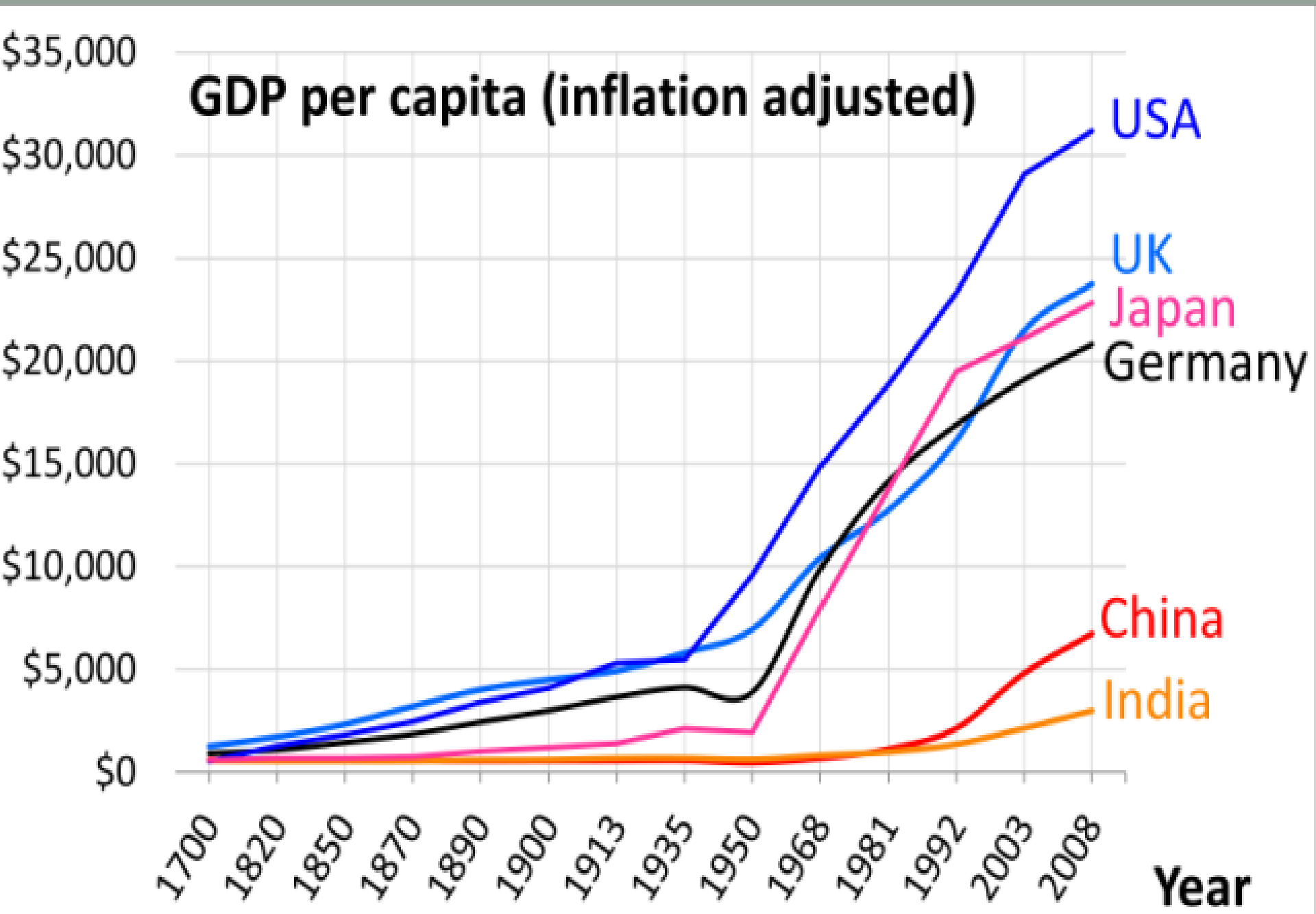
4 days ago

There are two hand prints above the back of the pig

Source: https://www.bbc.com/news/world-asia-55657257

- Archaeologists have discovered the world's oldest known animal cave painting in Indonesia - a wild pig - believed to be drawn **45,500 years ago**.
- Painted using dark red ochre pigment, the life-sized picture of the **Sulawesi warty pig** appears to be part of a narrative scene.
- The picture was found in the **Leang Tedongnge cave** in a remote valley on the **island of Sulawesi**.
- It provides the **earliest evidence of human settlement** of the region.
- "The people who made it were fully modern, they were just like us, they had all of the capacity and the tools to do any painting that they liked," said Maxime Aubert, the co-author of the report published in Science Advances journal.

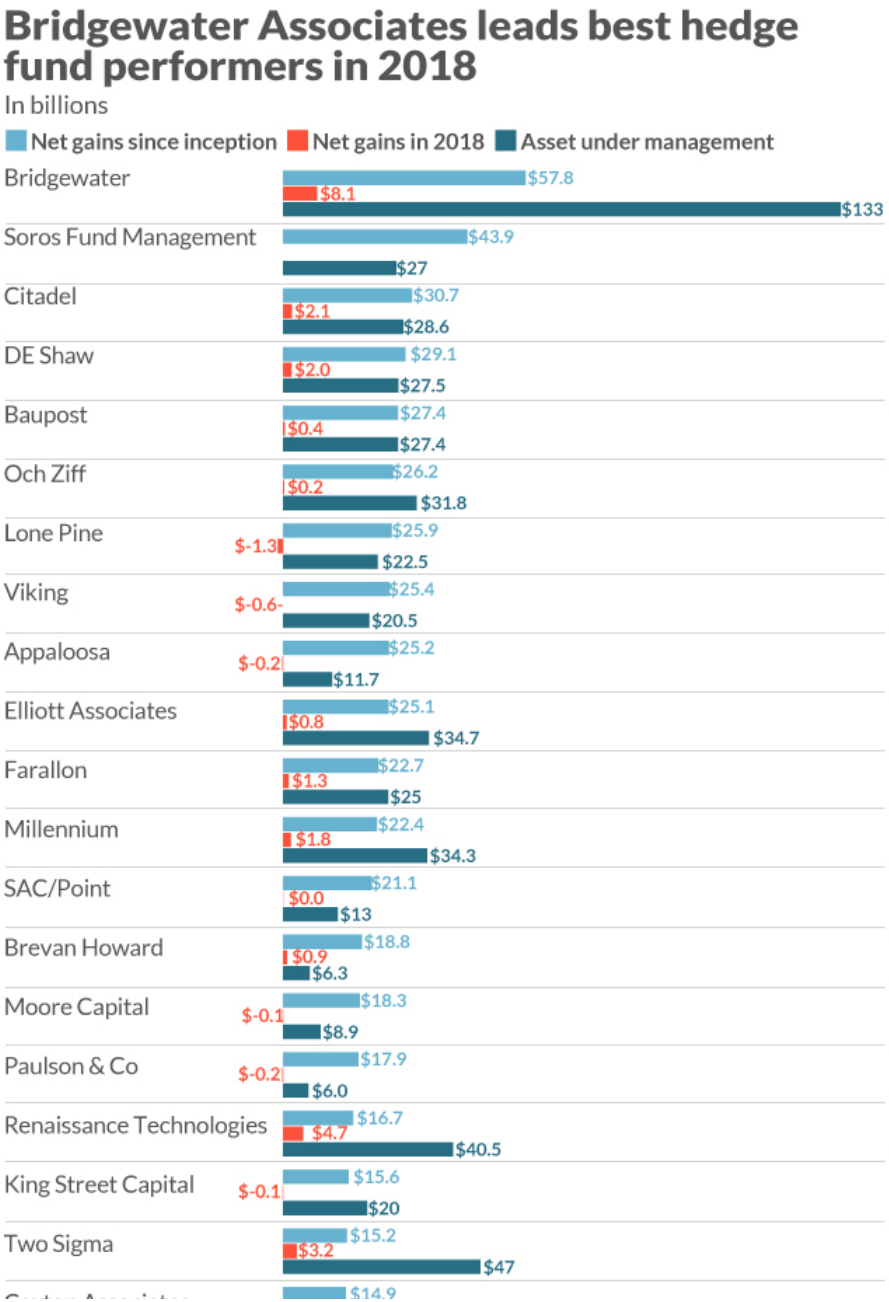
Source: https://www.bbc.com/news/world-asia-55657257



Source : https://www.forbes.com/sites/goncalodevasconcelos/2015/03/04/the-third-industrial-revolution-internet-energy-and-a-new-financial-system/2/#7ec16dd7167e

Bridgewater's Ray Dalio Discusses the Impact of China's Growth on the World ...

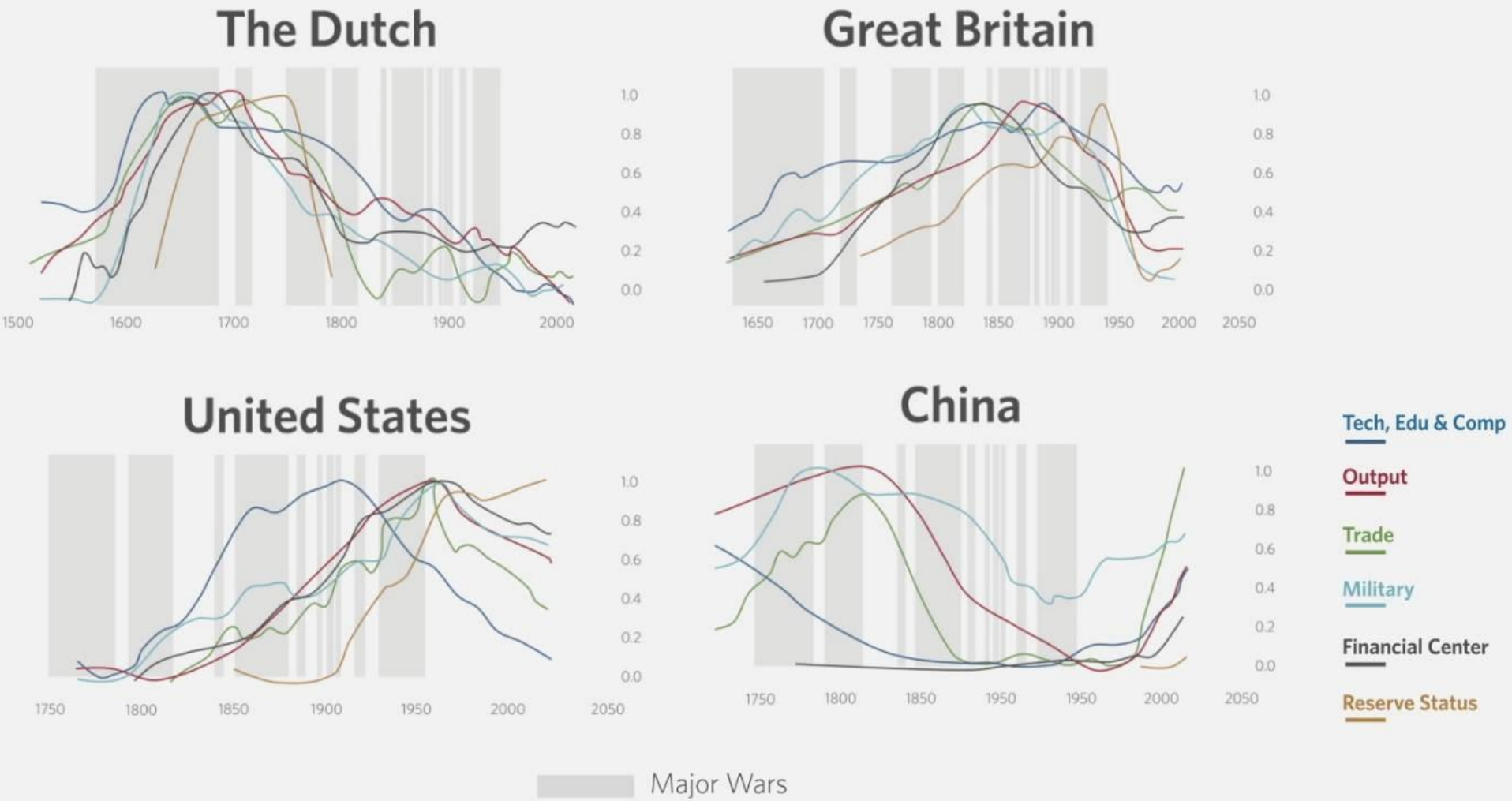
Source: https://www.youtube.com/watch?v=Mh0vEaac78U and https://www.bridgewater.com/china/



Source: https://www.youtube.com/watch?v=Mh0vEaac78U and https://www.bridgewater.com/china/

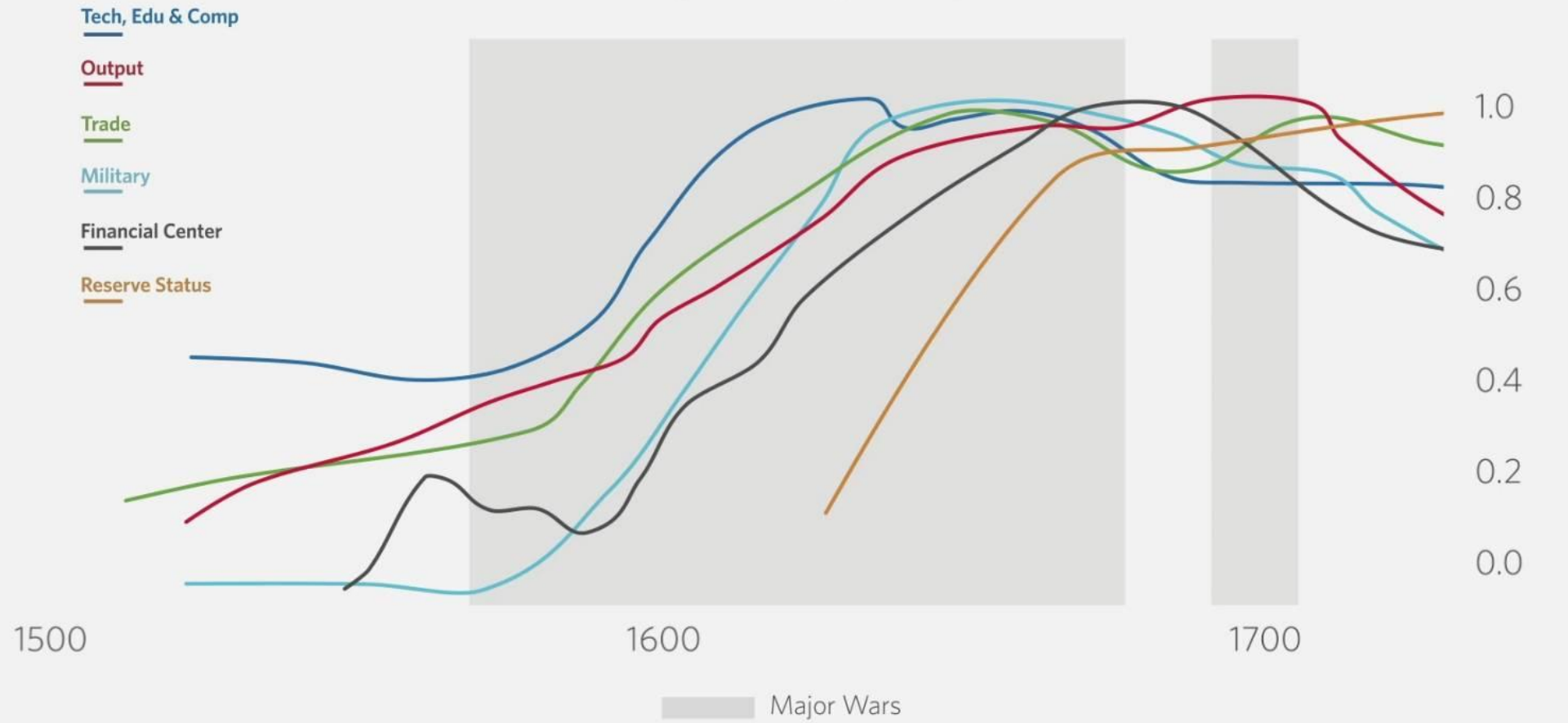
Reserve Currency Empires

(Centered 30yr Average)



Source: https://www.youtube.com/watch?v=Mh0vEaac78U and https://www.bridgewater.com/china/

The Dutch



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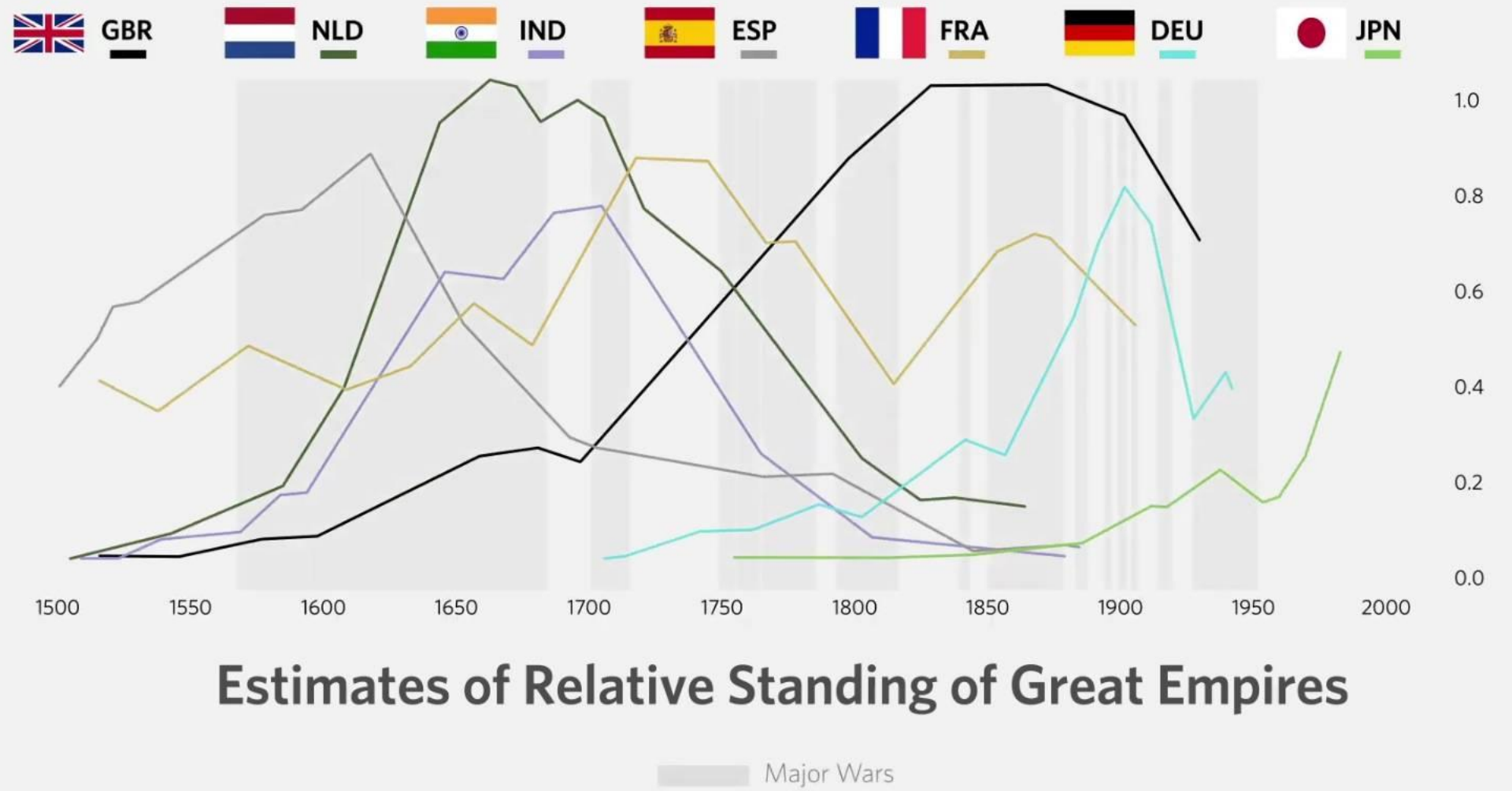

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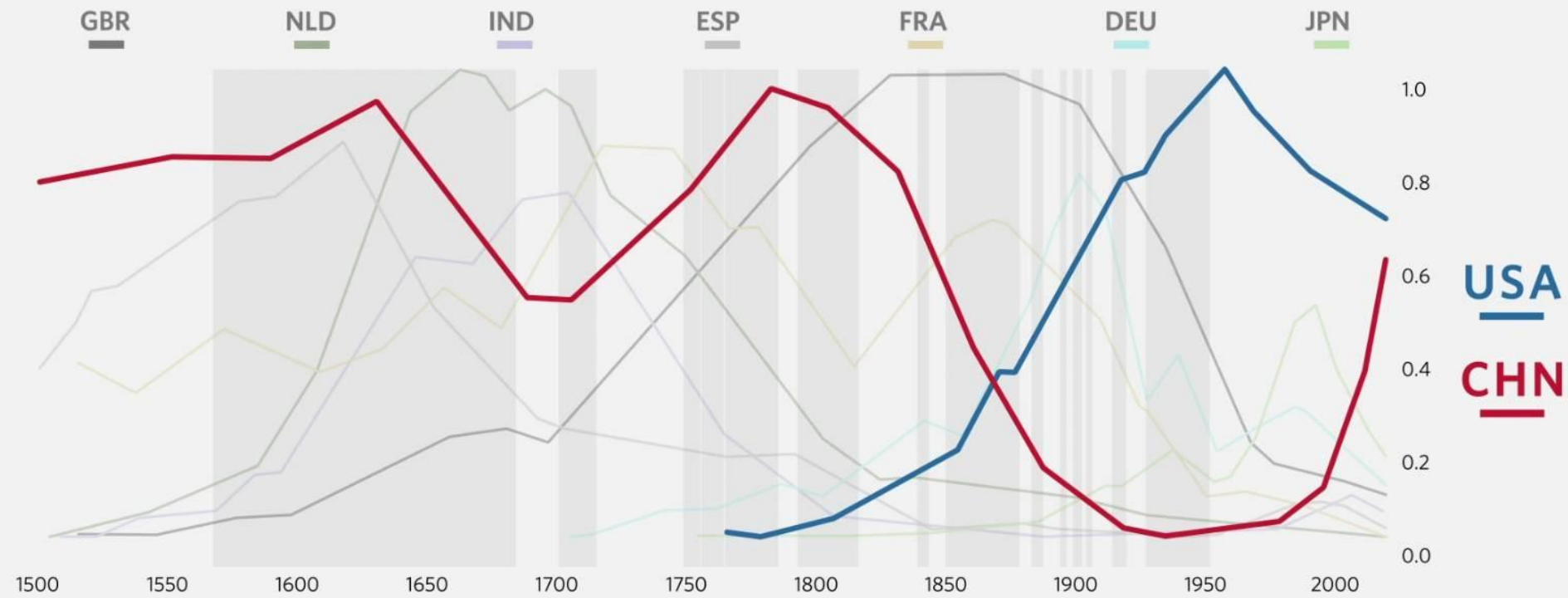
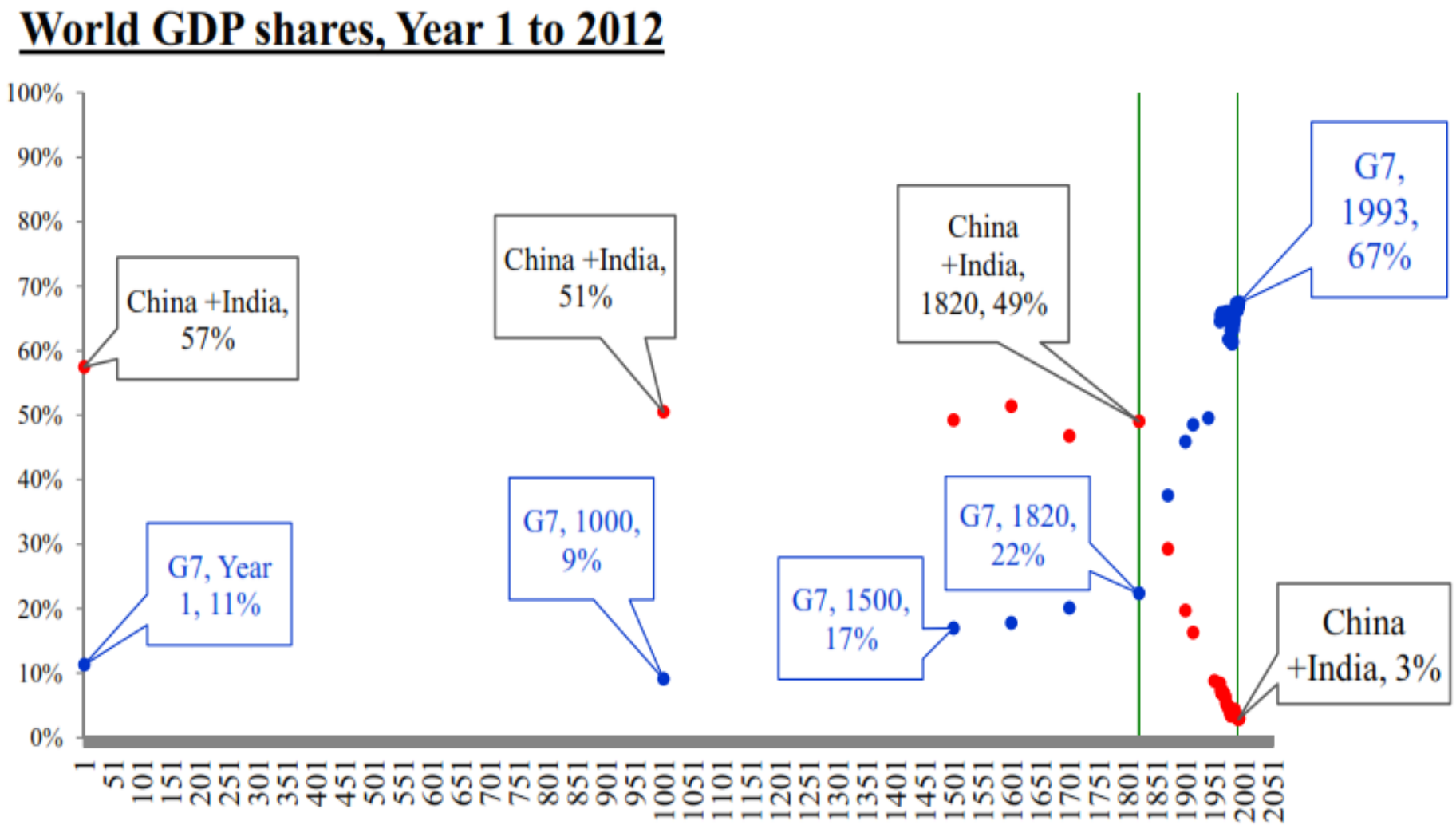


Estimates of Relative Standing of Great Empires

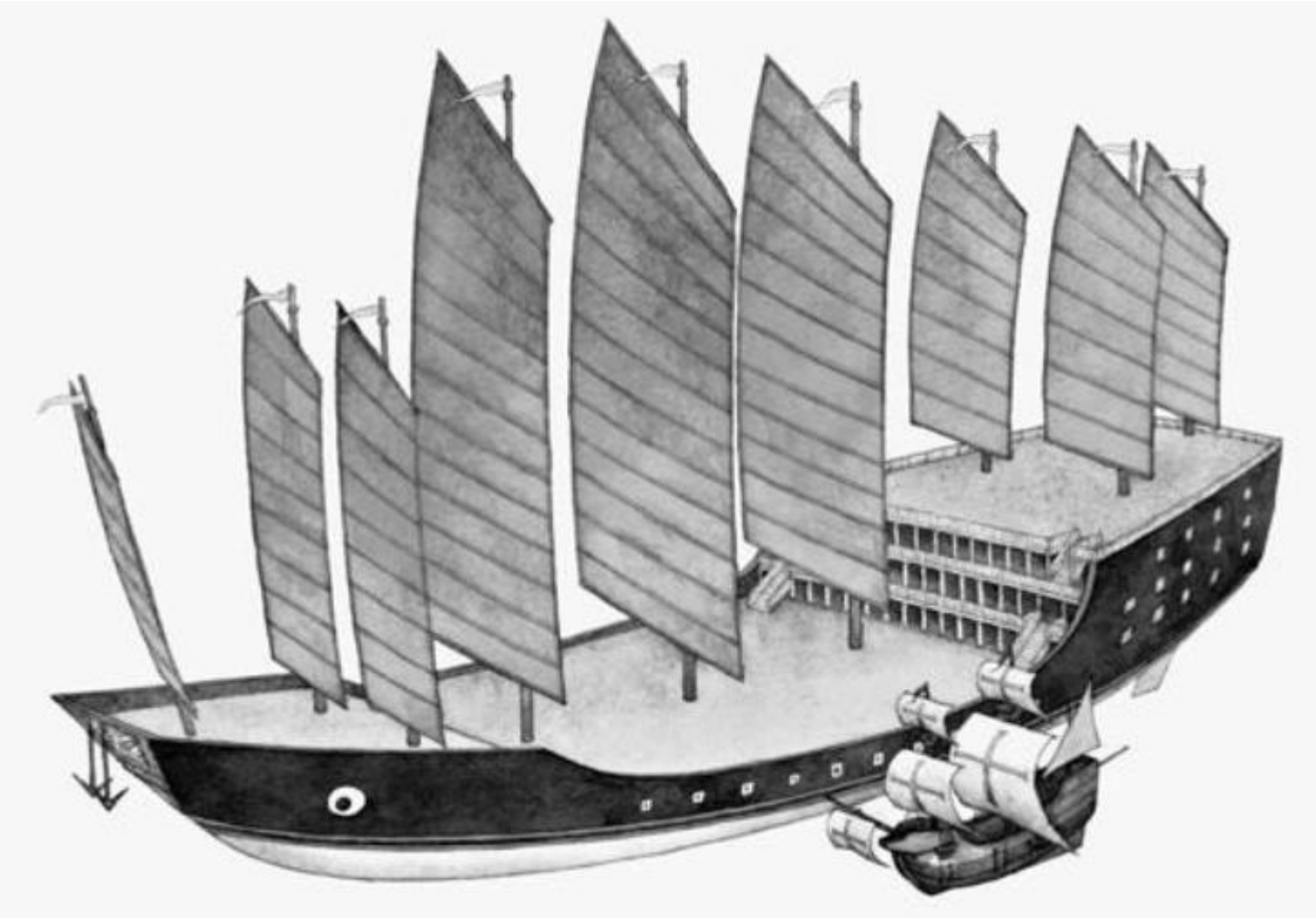
Major Wars

Source: https://www.youtube.com/watch?v=Mh0vEaac78U and https://www.bridgewater.com/china/

Part 1: First Unbundling Revolution



Source: Baldwin (2011)



Zheng He's ship alongside Columbus's Santa Maria

Source: Gregory A. Harlin/National Geographic Stock

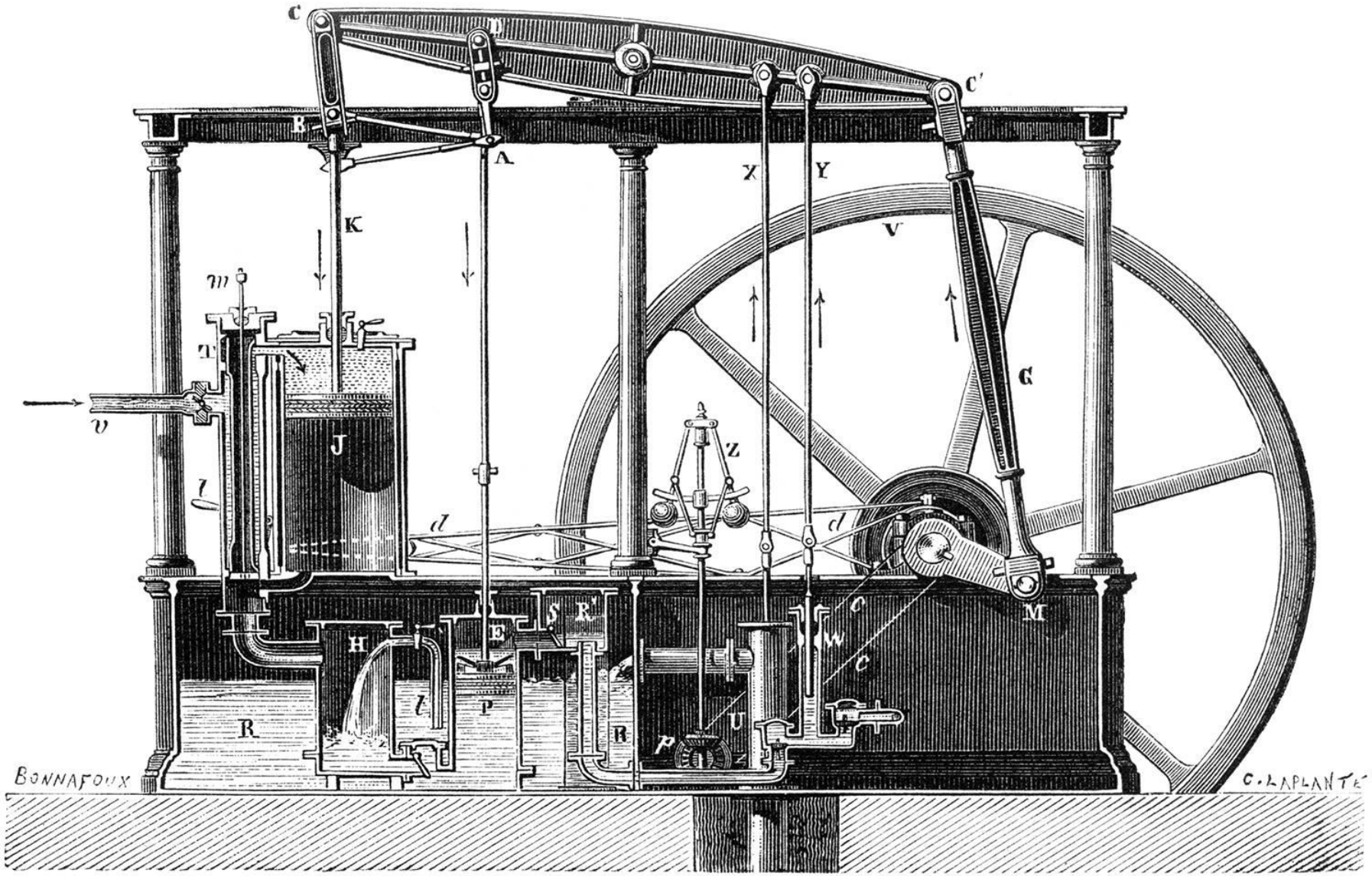
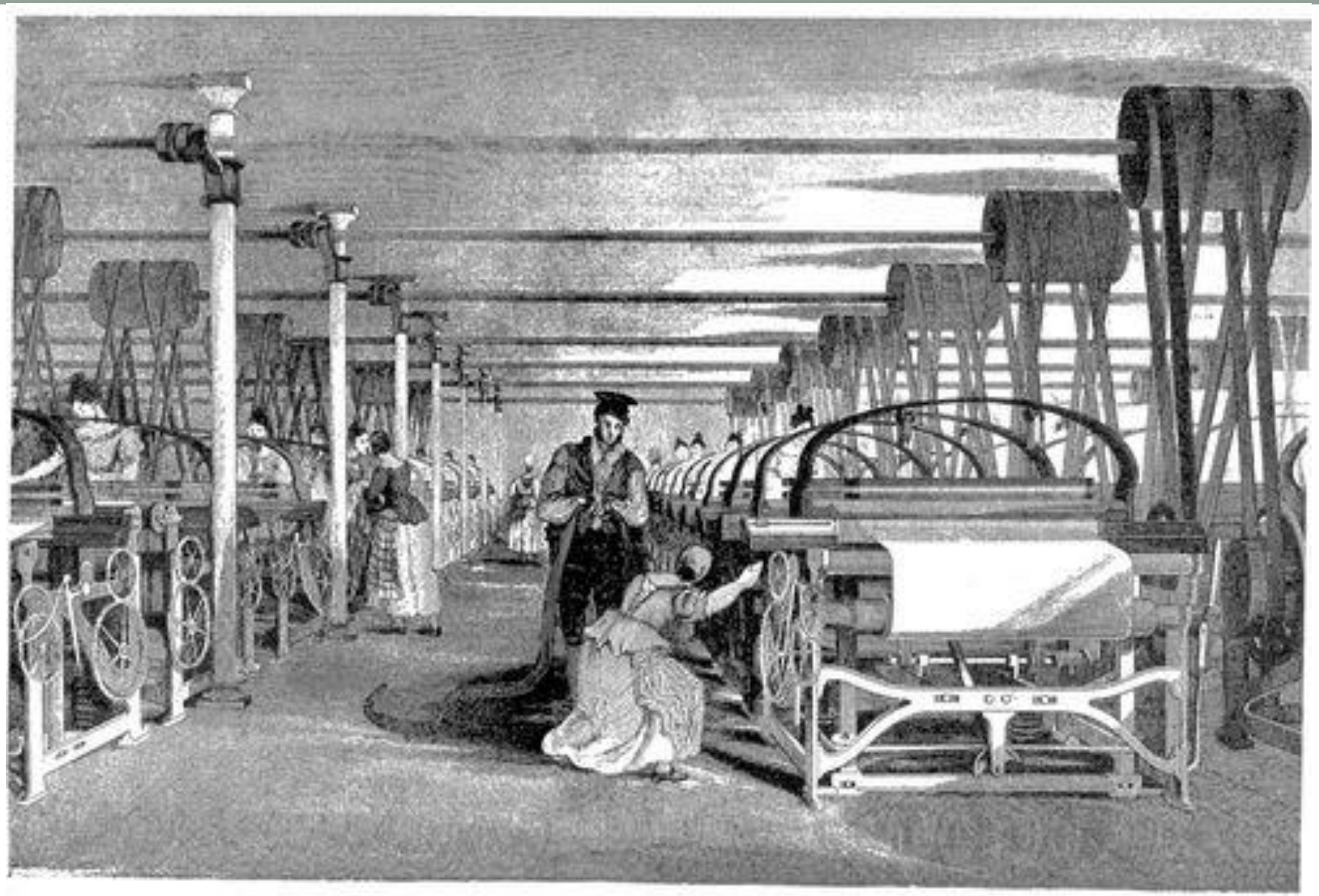


Fig. 59. — Machine à balancier de Watt.

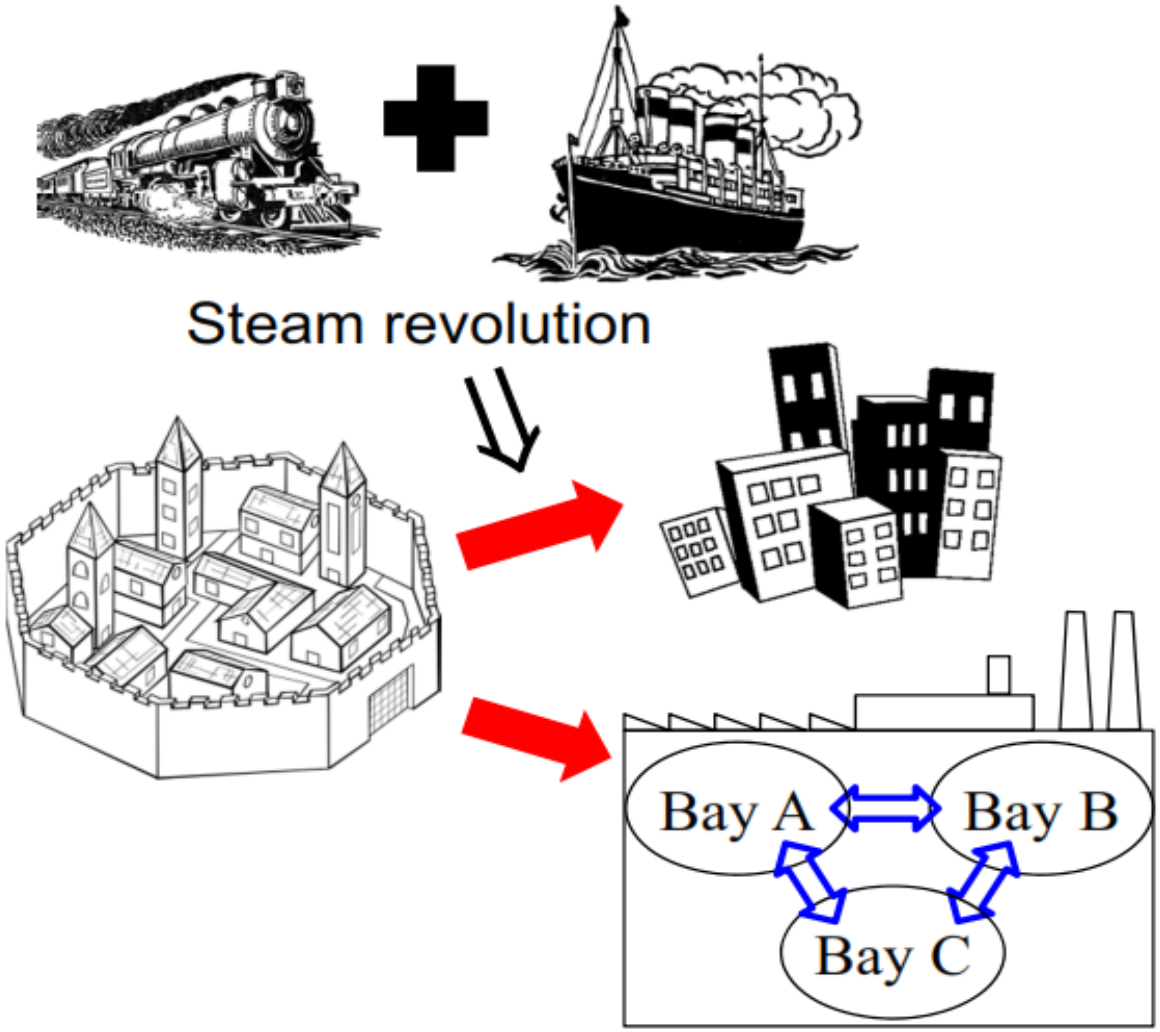
v. Tuyau de prise de vapeur; T, tiroir; J, cylindre; H, condenseur; PE pompe d'épuisement; WY pompe alimentaire de la chaudière UX pompe d'alimentation de la bâche R; *p* Z régulateur; *dd* excentrique; ABCD parallélogramme; GM bielle et manivelle; V volant.



A Roberts loom in a weaving shed in 1835. Textiles were the leading industry of the Industrial Revolution, and mechanized factories, powered by a central water wheel or steam engine, were the new workplace.

Source: https://commons.wikimedia.org/wiki/File:Powerloom_weaving_in_1835.jpg

1st unbundling

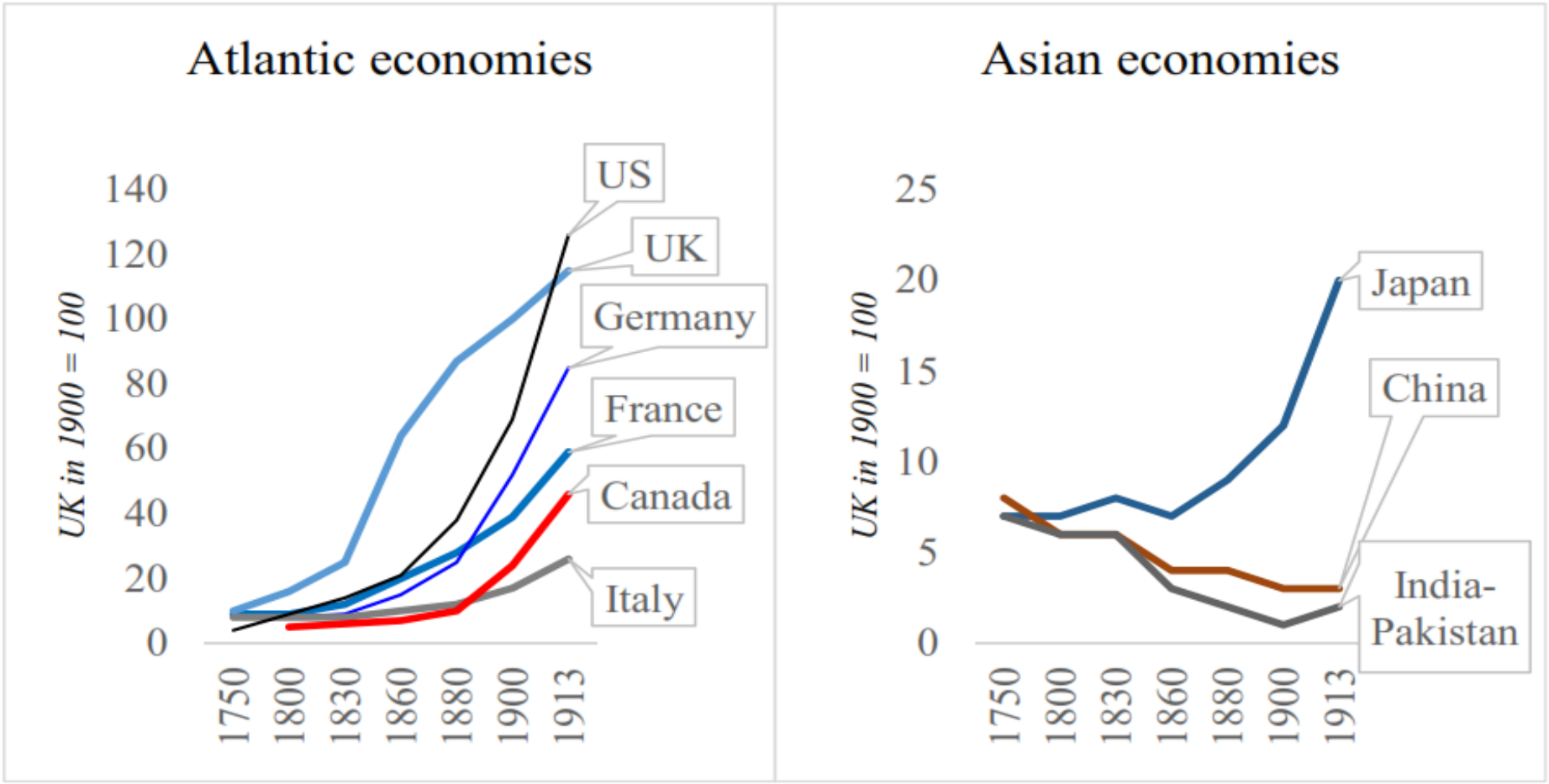


Source: Baldwin (2011)

Carcassonne, France

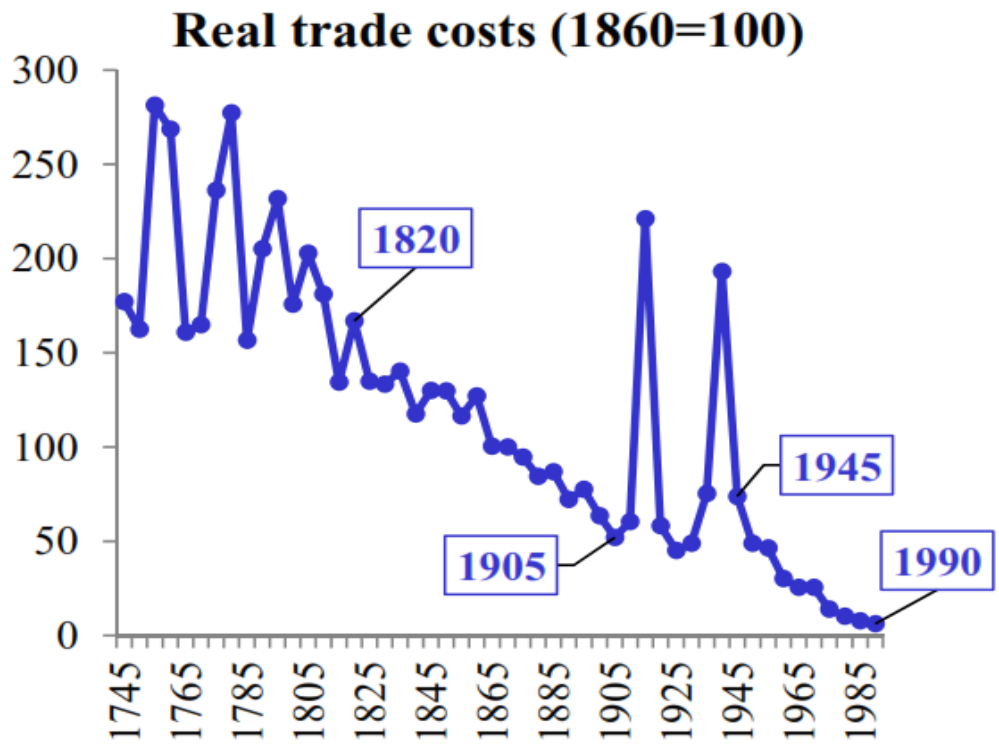
Source: https://en.wikipedia.org/wiki/Carcassonne#/media/File:1_carcassonne_aerial_2016.jpg

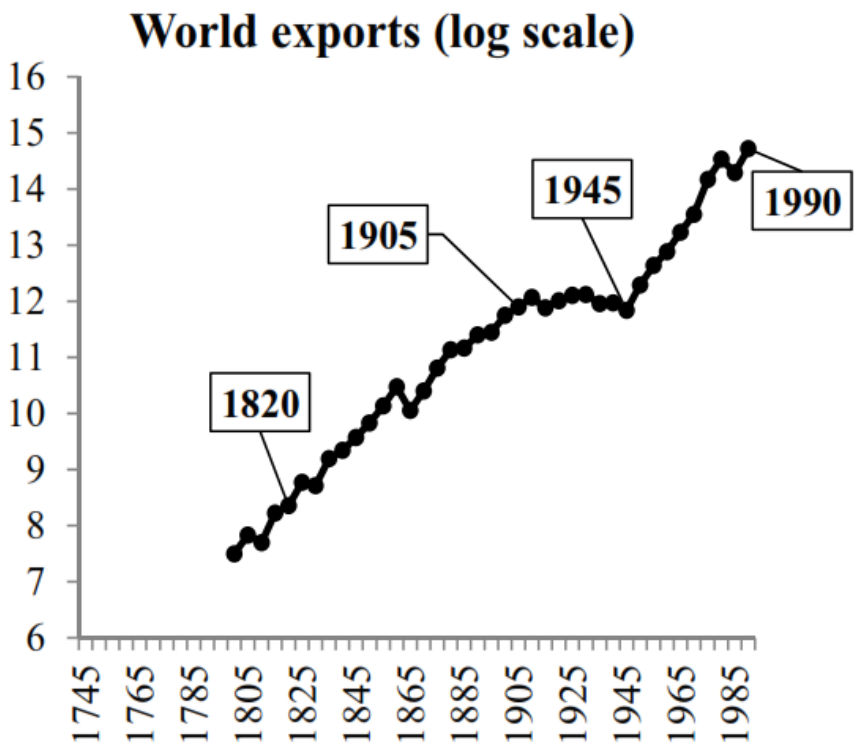
Part 1: First Unbundling Revolution



Source: Baldwin (2011)

Part 1: First Unbundling Revolution





Source: Baldwin (2011)

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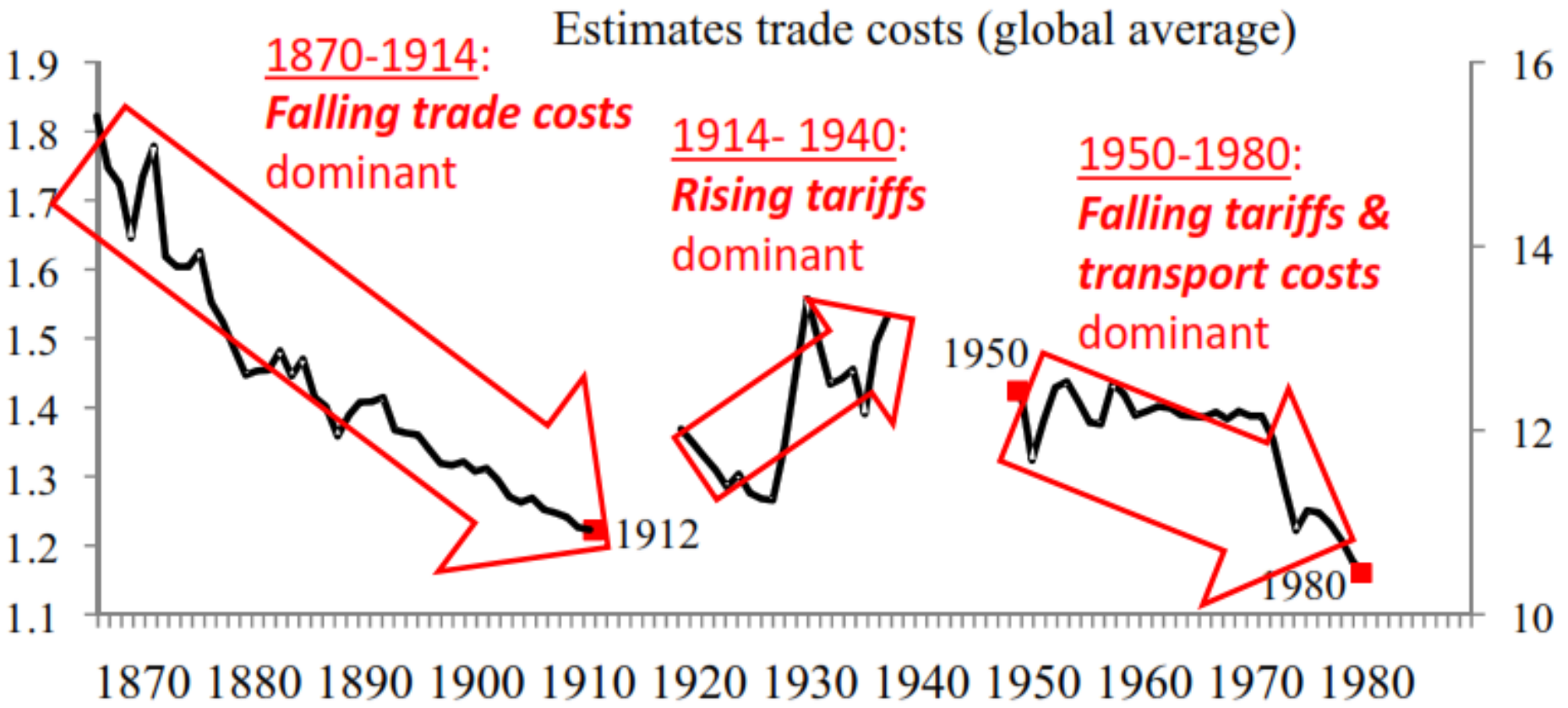

Source: Gravity model based estimates of trade costs (Jacks, Meissner, Novy 2011).

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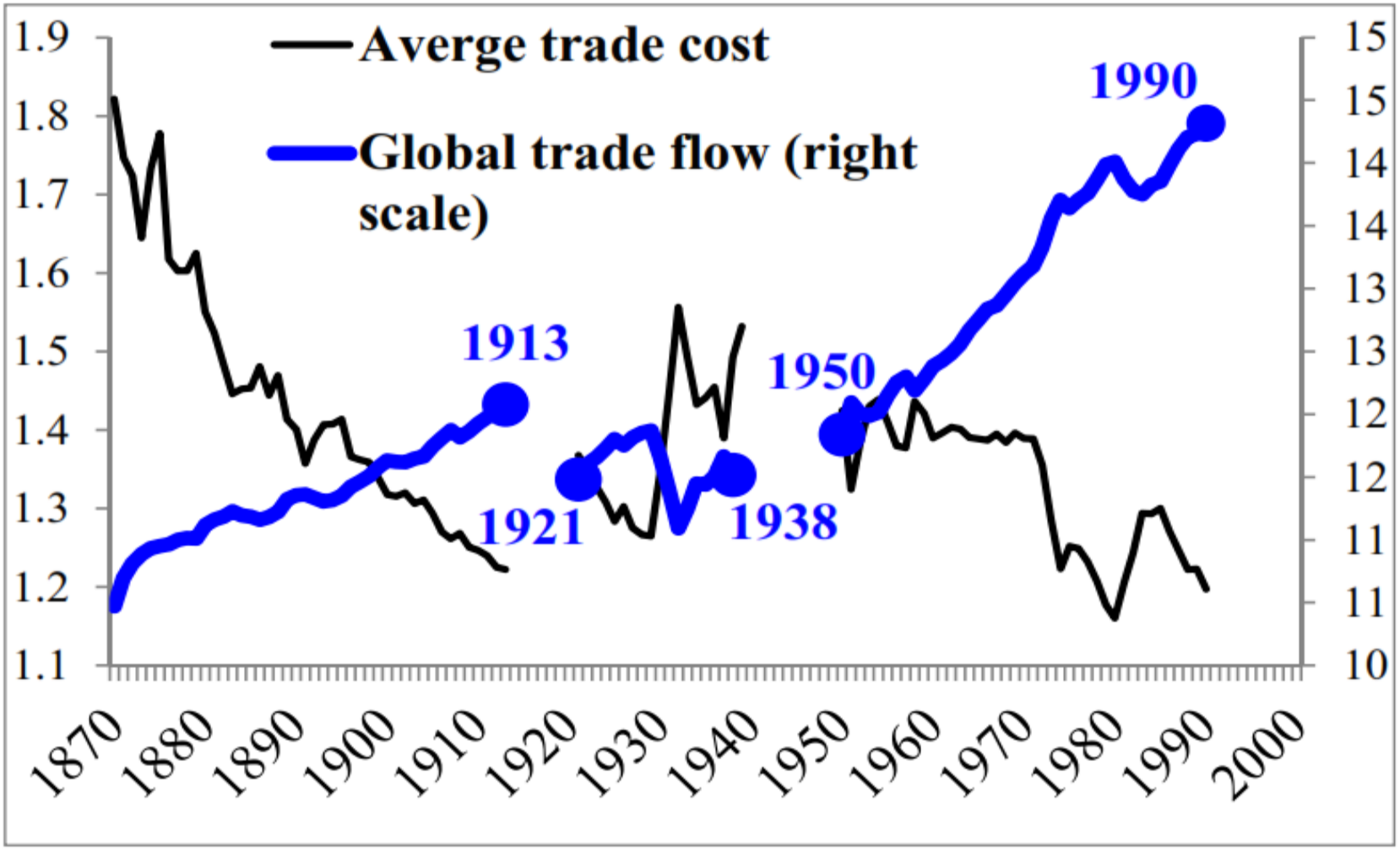

Source: Gravity model based estimates of trade costs (Jacks, Meissner, Novy 2011).

Part 2: Second Unbundling Revolution

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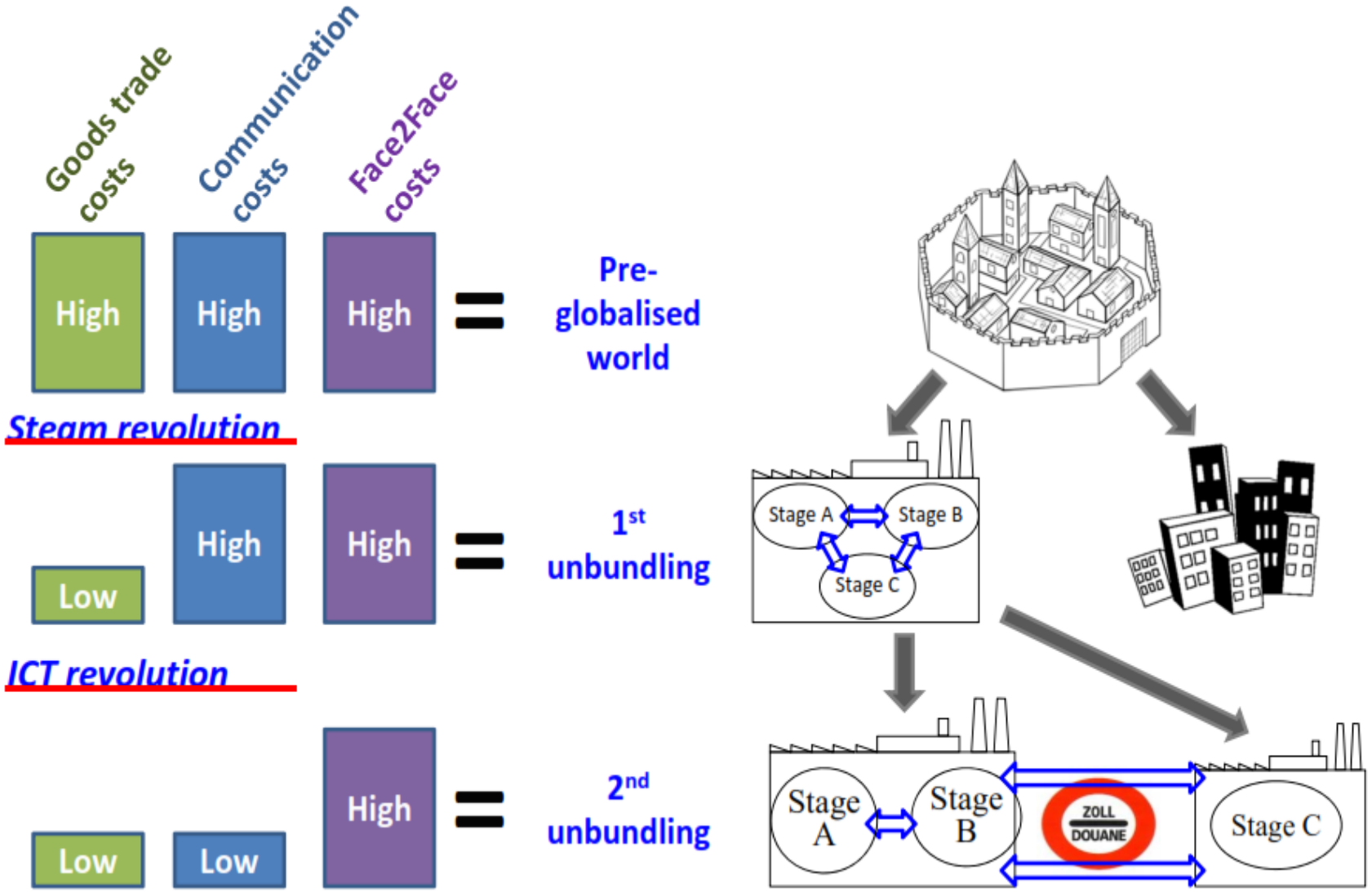
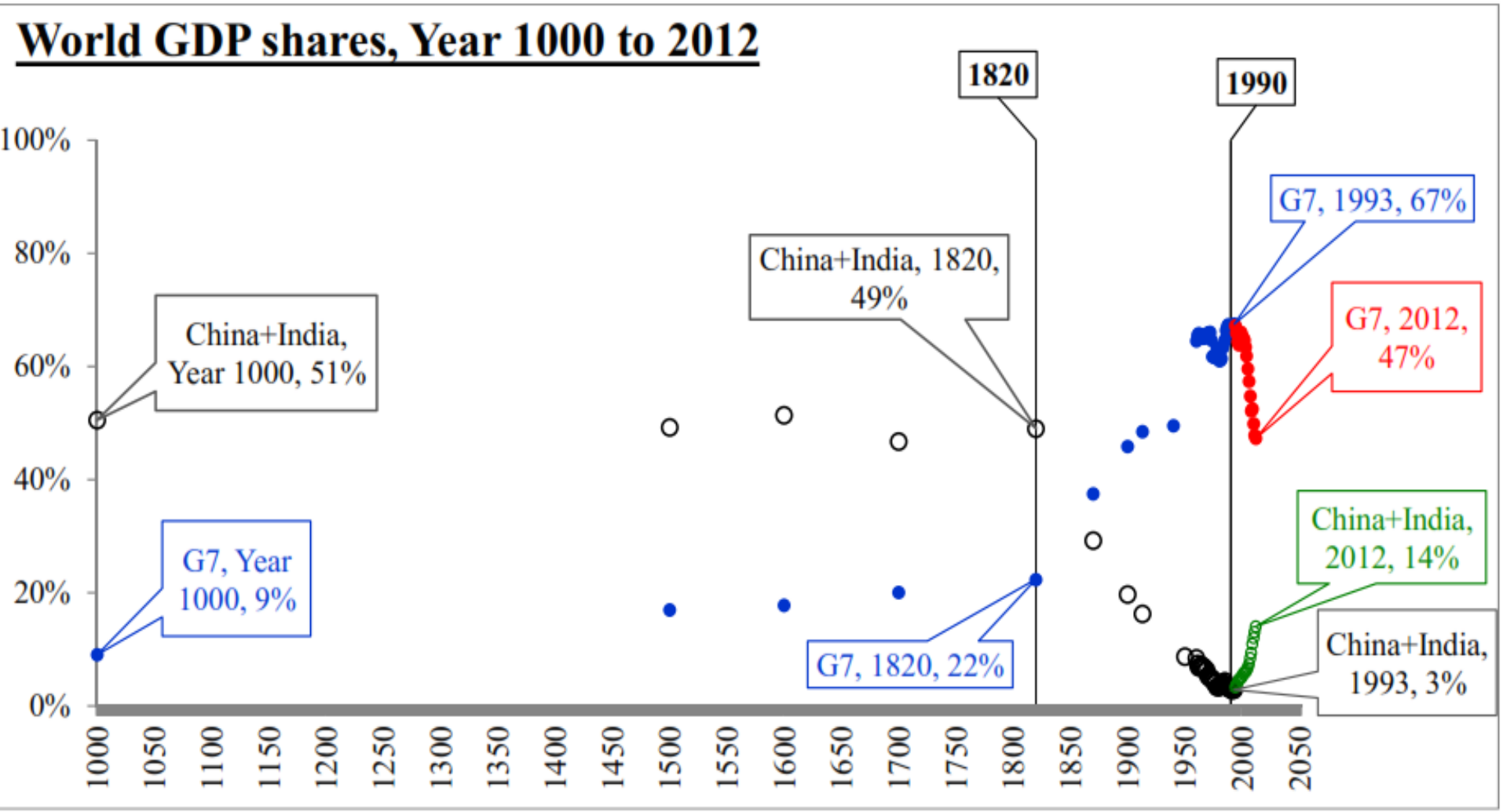


Source: Baldwin (2011)

Part 2: Second Unbundling Revolution



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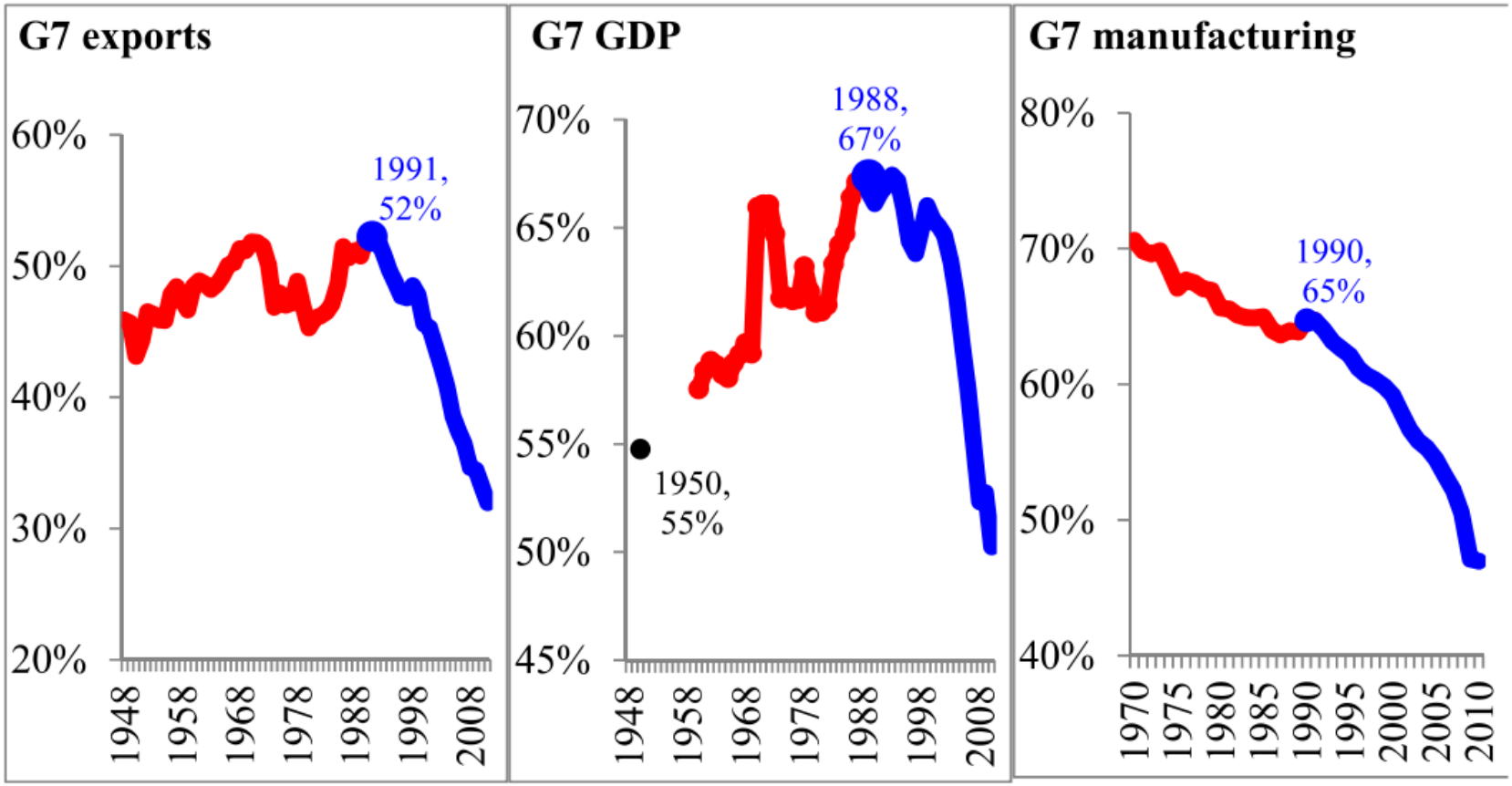

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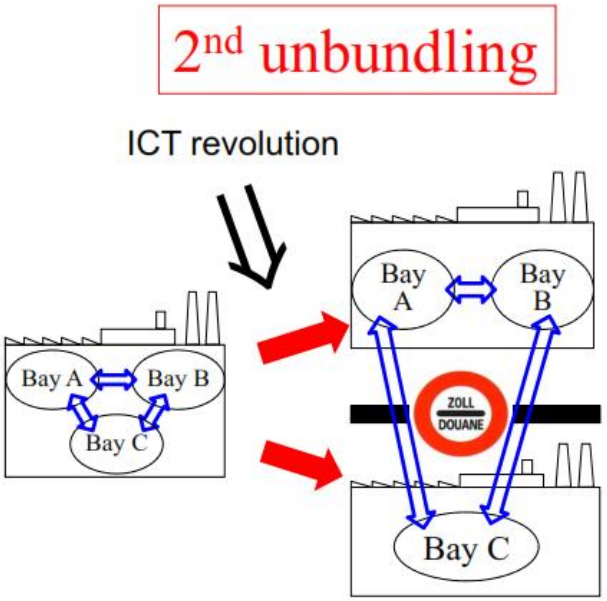
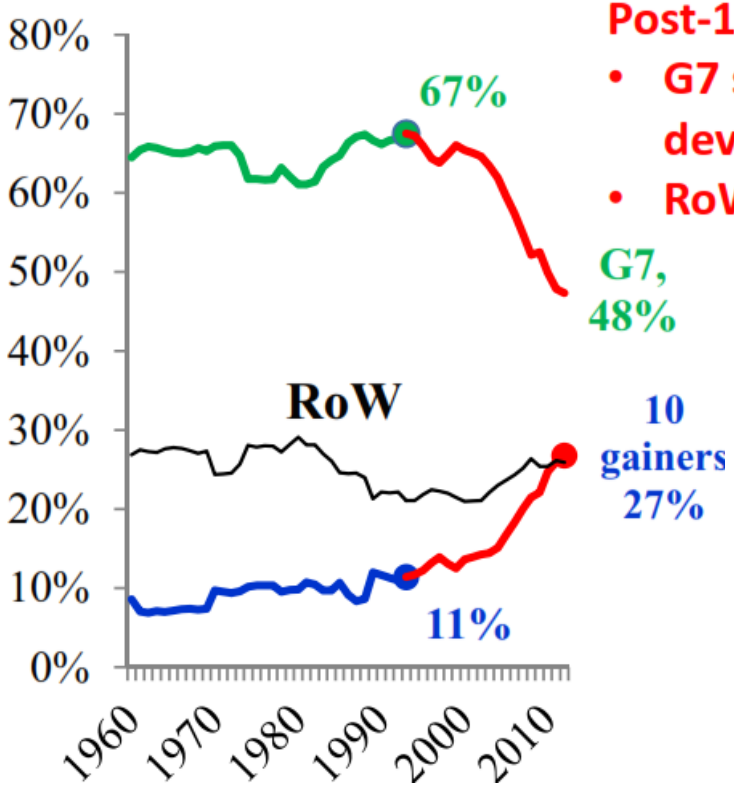


Dispersion of production stages, but regional clustering ('factory Asia', 'factory EU', etc.)



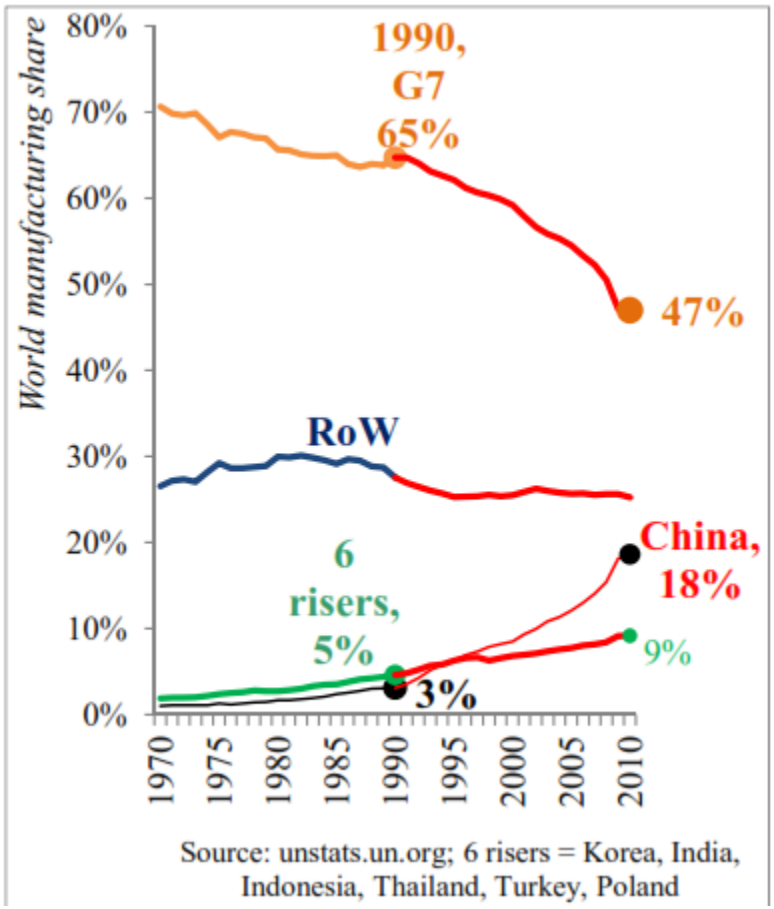
China, Brazil, Mexico, Poland, India, Turkey, Russia, Korea, Indonesia, Venezuela

Post-1990:

- **G7 share loss goes to 10 developing nations.**
- **RoW see little change.**

Source: Baldwin (2011)

Part 2: Second Unbundling Revolution

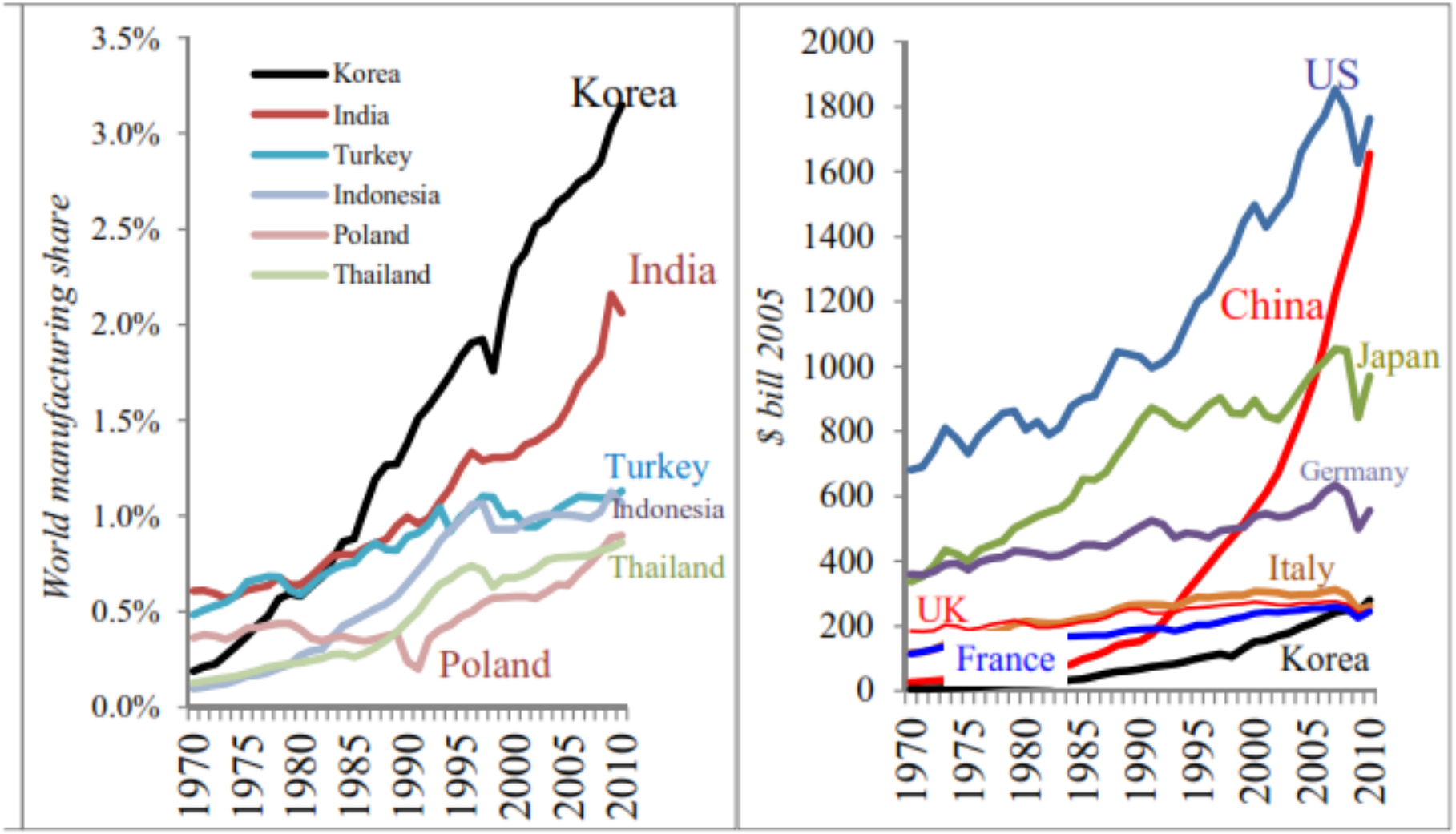


From 1990:

- **G7 share loss plummets.**
- **RoW see little change.**
- **'7 risers' gain all of G7's loss.**

Source: Baldwin (2011)

Part 2: Second Unbundling Revolution



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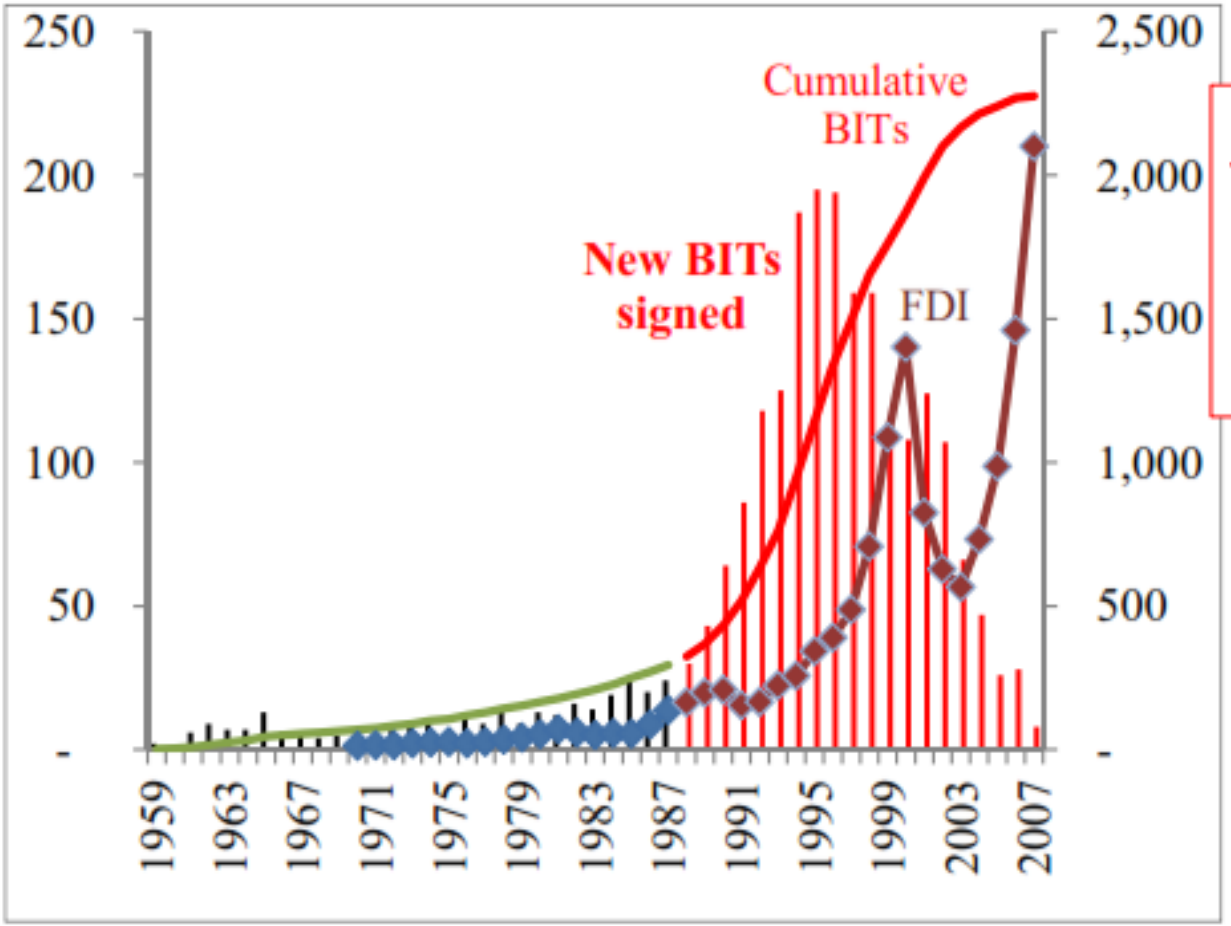
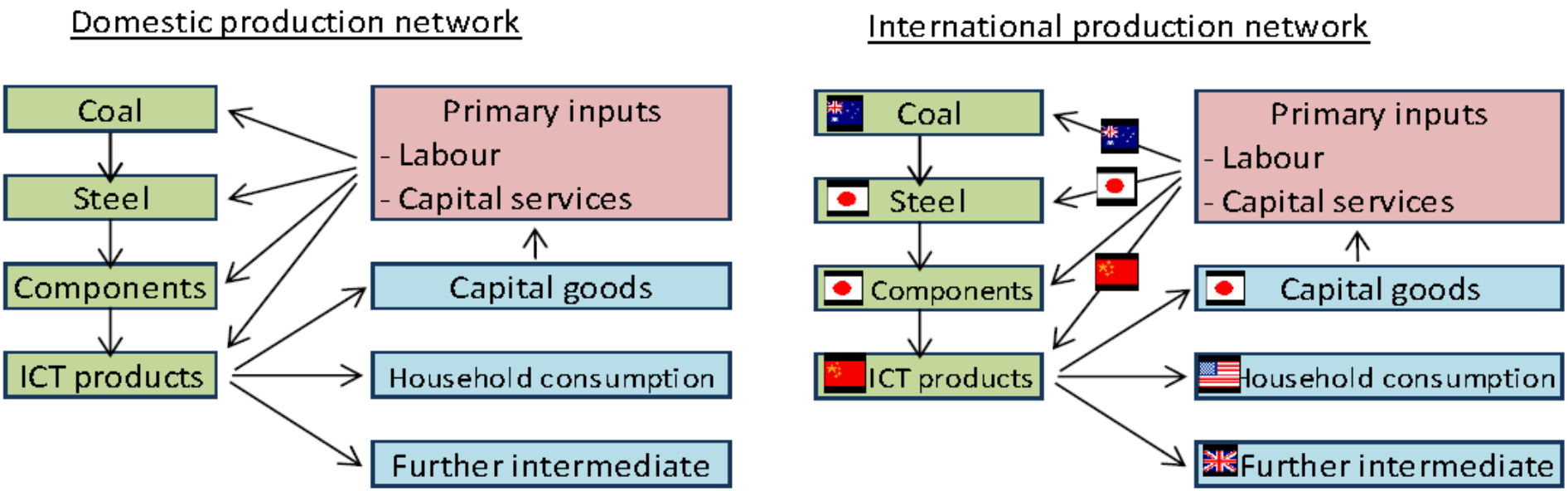


1987 – 2007:

- **Number of BITs signed booms;**
- **FDI booms**

Source: Baldwin (2011)

Global Value Chain (GVC)

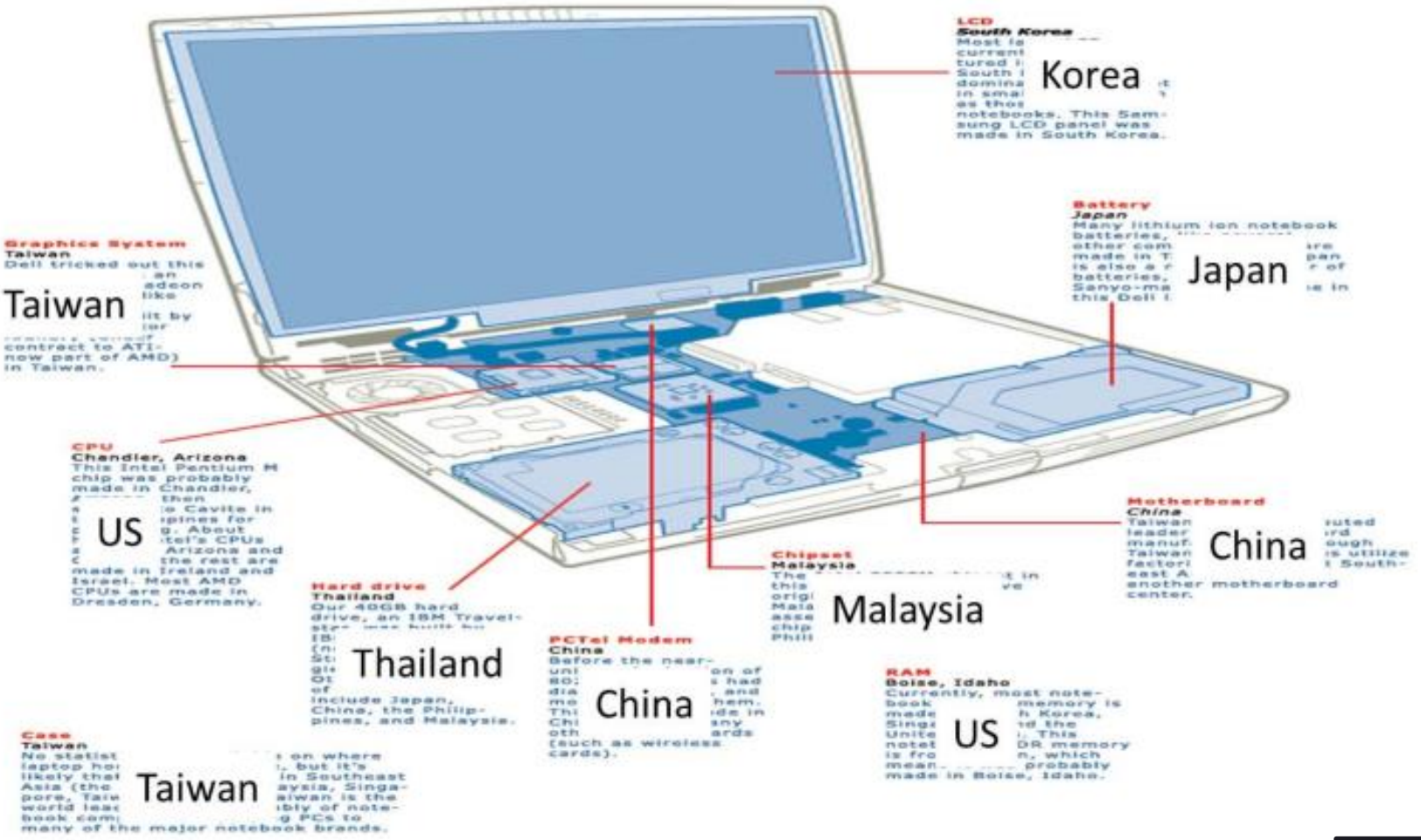


Source: Meng and Yamano (2011)

Apple IIc made in Dallas area,1980s

Apple's know-how + Chinese labour

Fractionalisation of manufacturing



Global Value Chain (GVC)

- Linden (2009), Xing and Detert (2010) , Dedrick (2010), Linden (2011) have analyzed the value chain of producing iPod and iPhone :

Country	Components	Manufacturers	Costs
Chinese Taipei	Touch screen, camera	Largan Precision, Wintek	$ 20.75
Germany	Baseband, power management, transceiver	Dialog, Infineon	$ 16.08
Korea	Applications processor, display, DRAM memory	LG, Samsung	$ 80.05
United States	Audio codec, connectivity, GPS, memory, touchscreen controller	Broadcom, Cirrus Logic, Intel, Skyworks, Texas Instruments, TriQuint	$ 22.88
Other	Other	Misc.	$ 47.75
		Total	**$ 187.51**

Source: Xing and Detert (2010)

Global Value Chain (GVC)

Betting on Displays

Apple supplier Foxconn is in talks to make smartphone screens, the most expensive parts in iPhones.

Apple iPhone 6

COST OF SELECTED PARTS	
Display	$45
Memory	15
Communications	37.50
Cameras	11
Processor	20
Mechanical	30
Other	37.60
TOTAL PARTS	**$196.10**
Labor	4
TOTAL	**$200.10**
U.S. RETAIL PRICE	**$649**

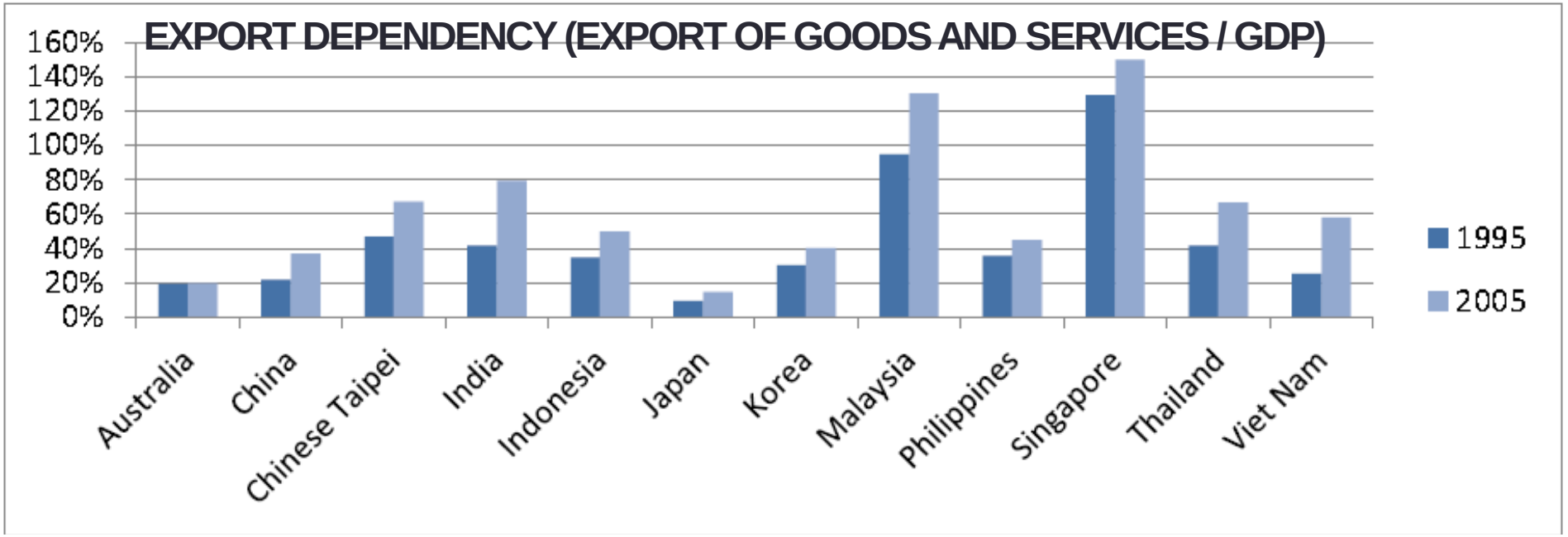
Sources: IHS iSuppli (price), Apple (photo)

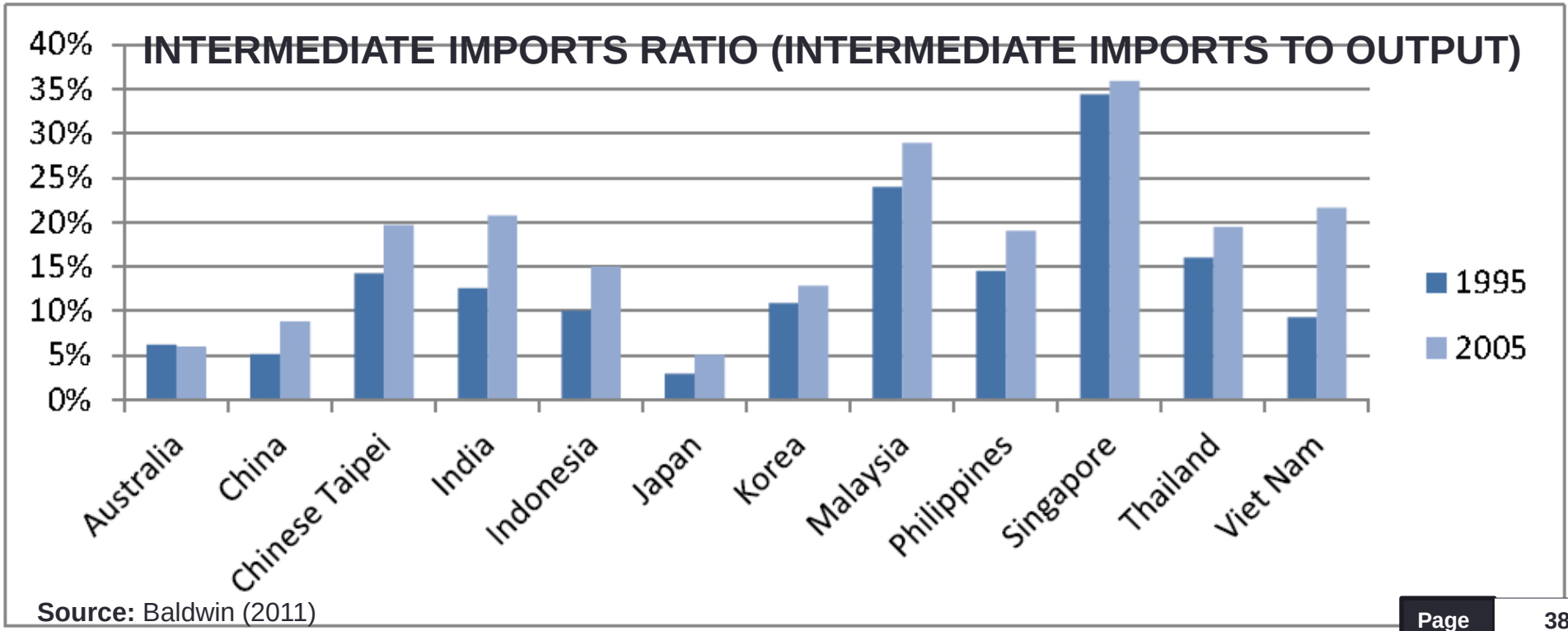
The Wall Street Journal

Apple iPhone 6 Plus

COST OF SELECTED PARTS	
Display	$52.50
Memory	15
Communications	37.50
Cameras	12.50
Processor	20
Mechanical	35
Other	38.60
TOTAL PARTS	**$211.10**
Labor	4.50
TOTAL	**$215.60**
U.S. RETAIL PRICE	**$749**

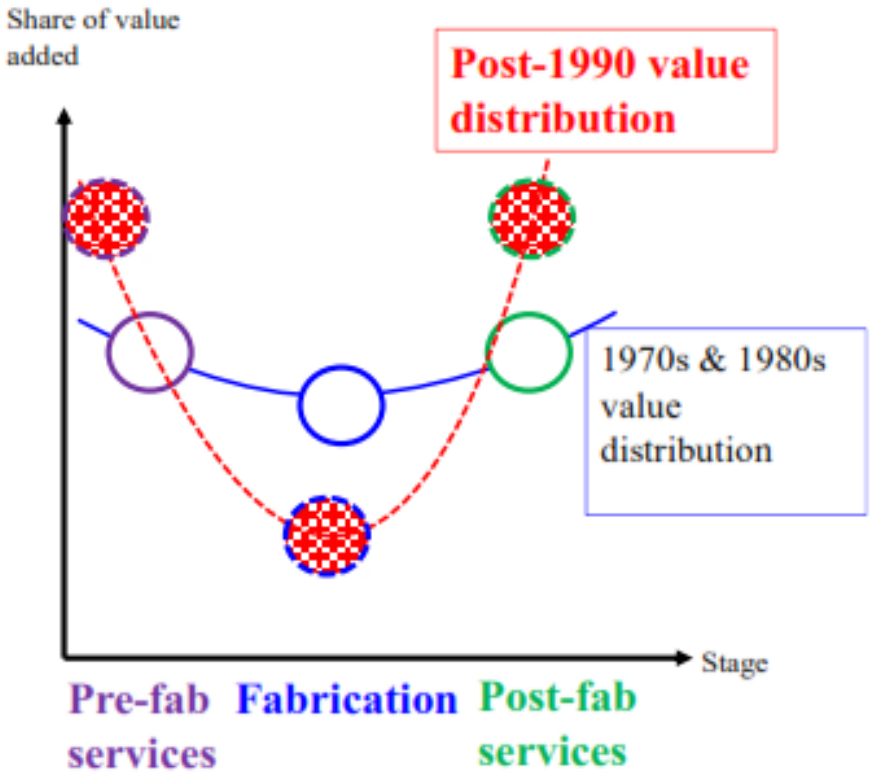
Note: Both price breakdowns are based on the 16 GB Sprint model without contract

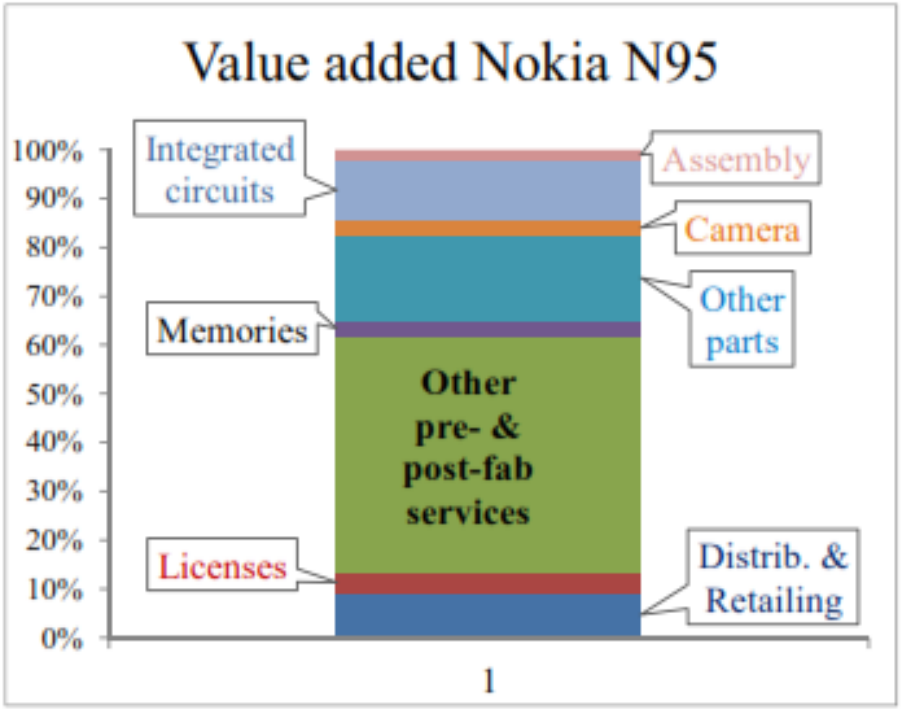




Source: Baldwin (2011)

Smiling Curve and Value Added

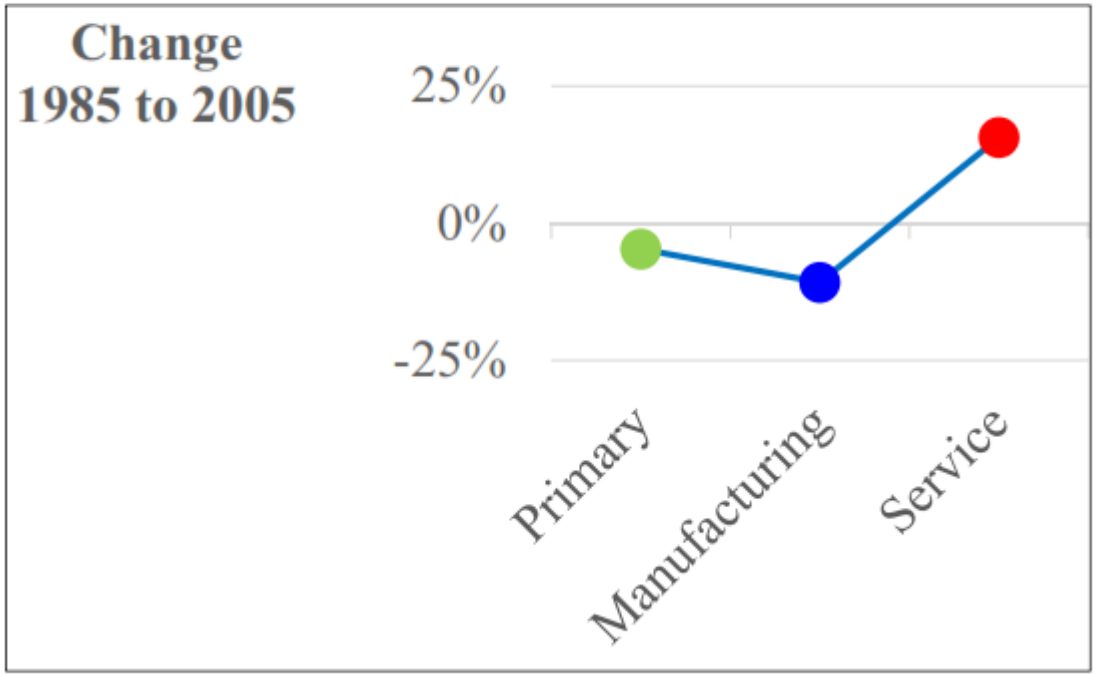




Source: Baldwin (2011)

Smiling Curve and Value Added

Smile curve: Look at the change in source sector value added



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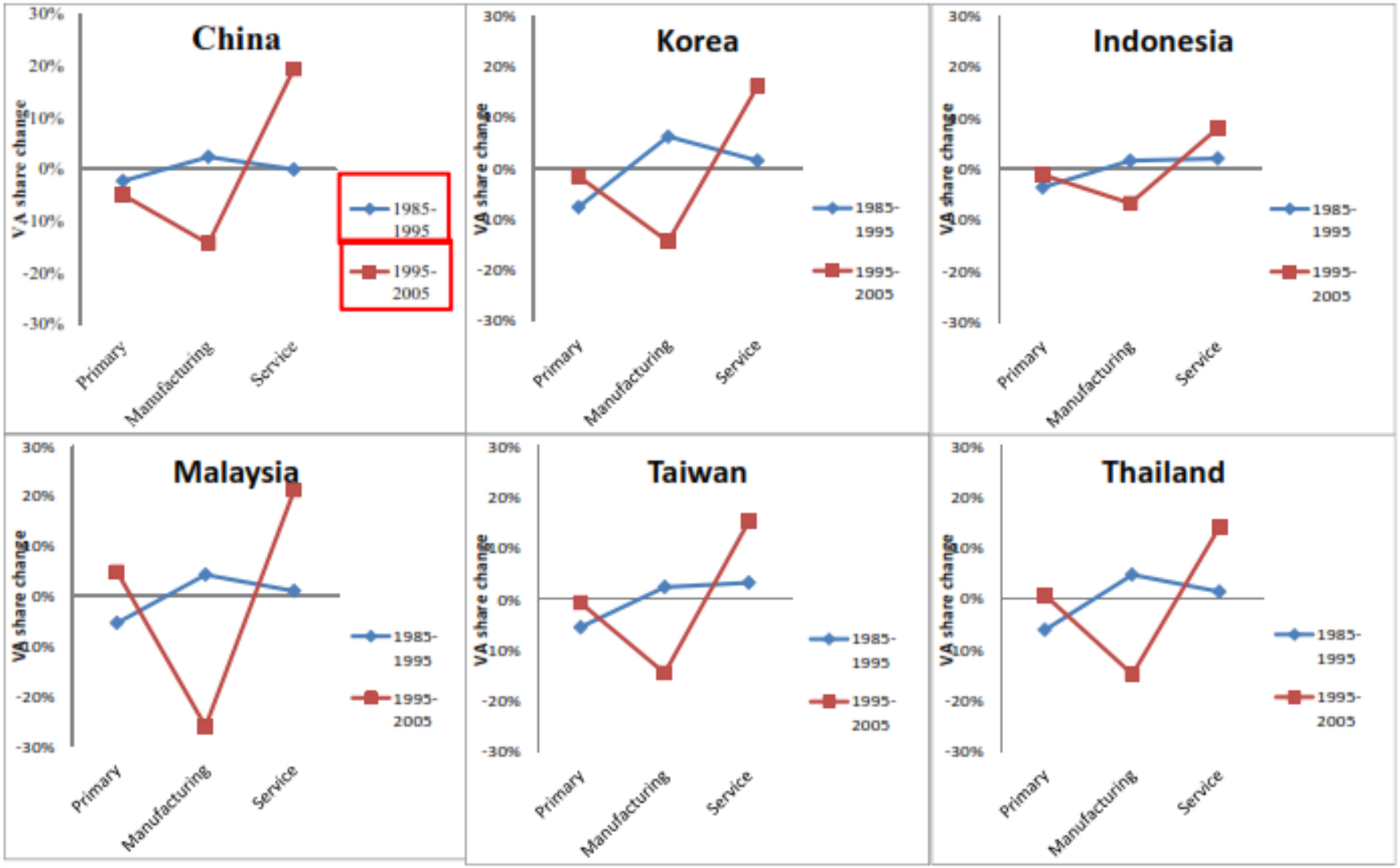


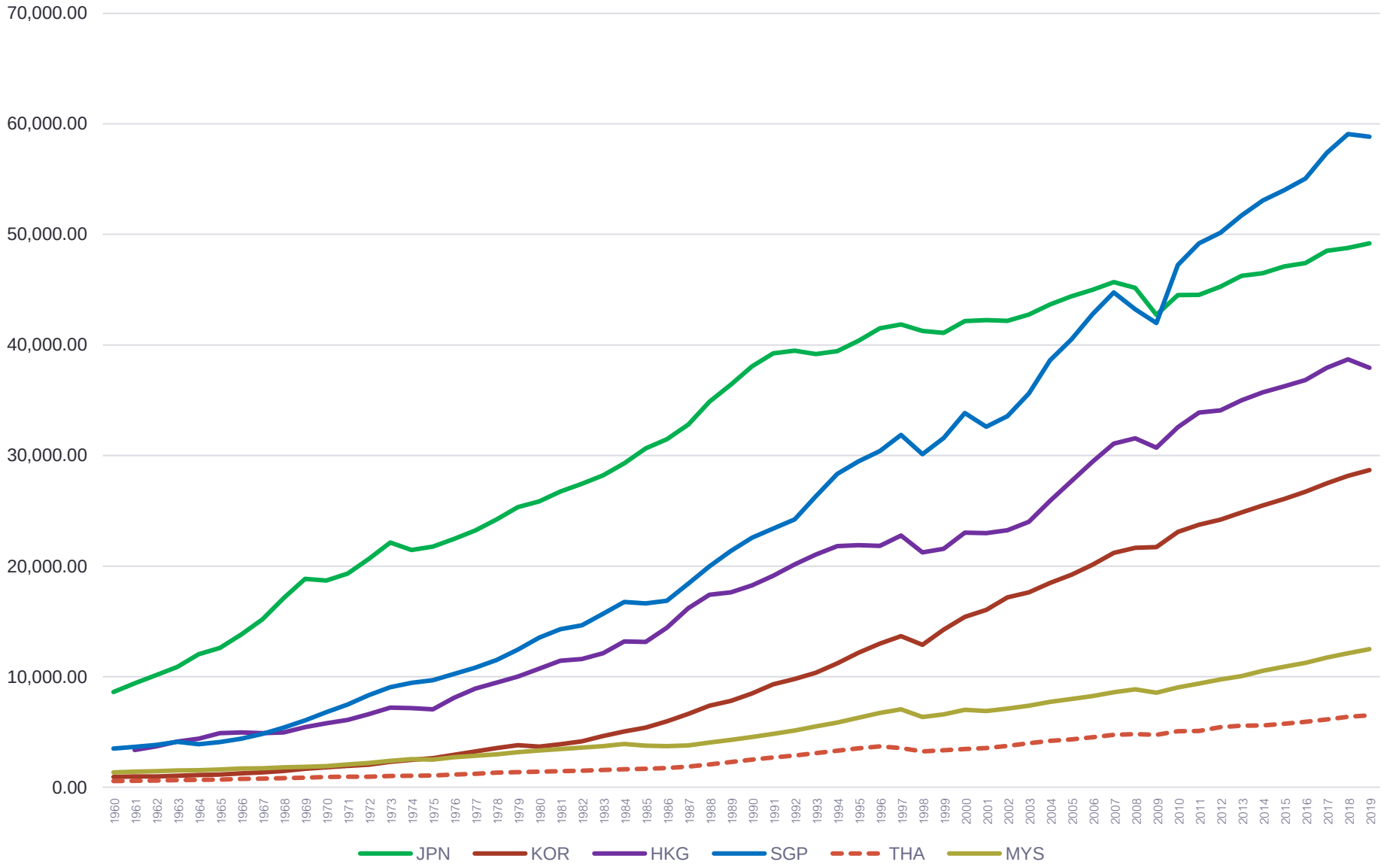
Source: Baldwin (2011)

WE2-1 Years of Asian Economies Shifting to High-Income or Upper Middle-Income Countries

Item / Country	Grouping	Per Capita Nominal GNI (2012)	Per Capita Nominal GNI (1995)	The year of entering into a group		
				High-Income	Upper Middle-Income	Lower Middle-Income
Japan	High-Income	47,870	41,350	1967	Before 1962	・・・
Singapore	High-Income	47,210	22,420	1981	Before 1962	・・・
Hong Kong	High-Income	36,560	22,619	1978	Before 1962	・・・
Taiwan	High-Income	20,083	12,648	1988	1973	Before 1962
Korea, Republic	High-Income	22,670	10,770	1993	1978	Before 1962
Malaysia	Upper Middle	9,820	4,010	—	1979-86、1991	Before 1962、1987-90
China	Upper Middle	5,720	530	—	2010	1998
Thailand	**Upper Middle**	**5,210**	**2,720**	**—**	**2010**	**1966**
Indonesia	Lower Middle	3,420	980	—	—	1979
Philippines	Lower Middle	2,500	1,030	—	—	Before 1962
India	Lower Middle	1,550	370	—	—	2007
Vietnam	Lower Middle	1,550	288	—	—	2008
Laos	Lower Middle	1,270	360	—	—	2010

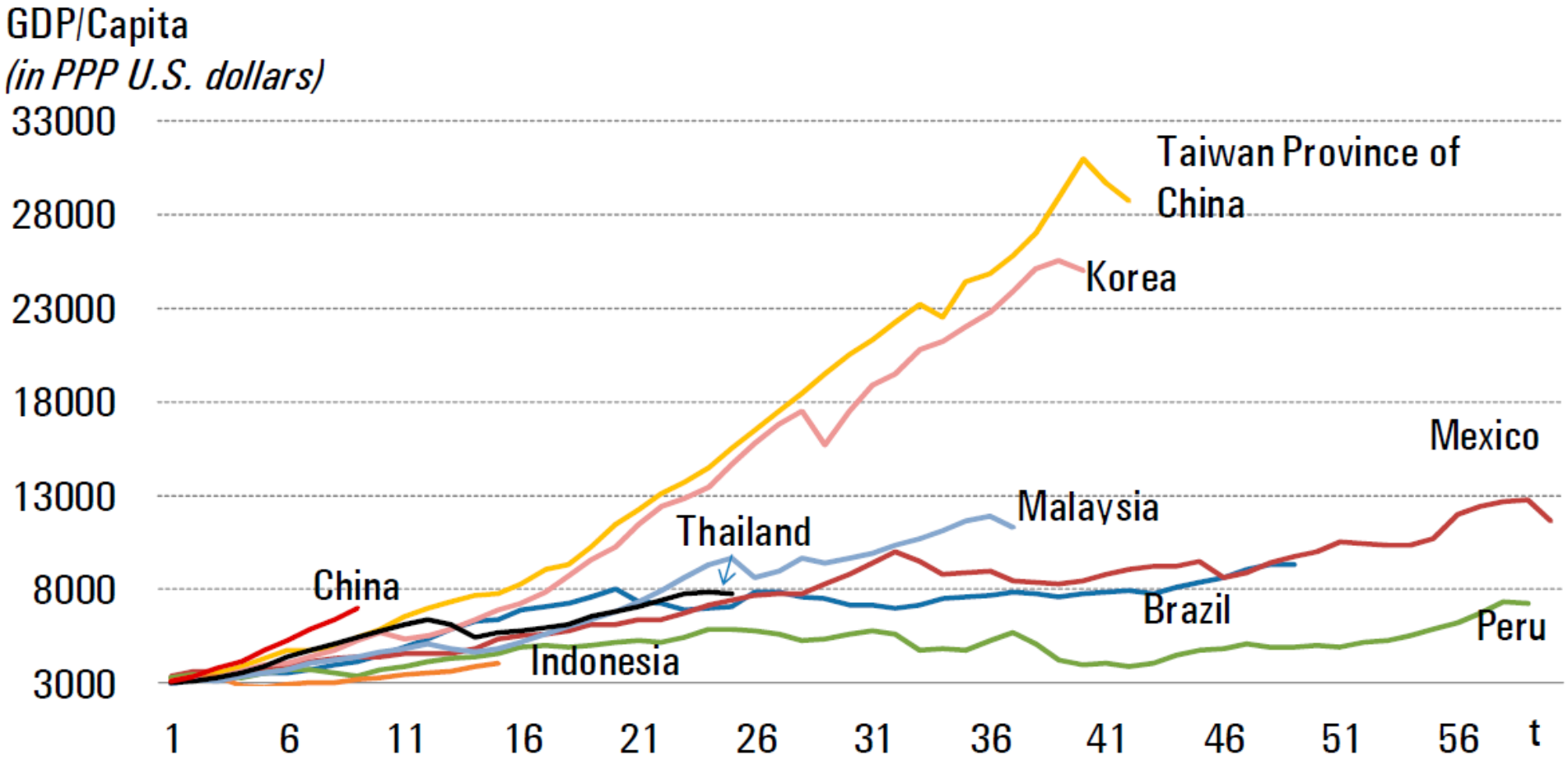
Source: Suehiro (2014), Studies on Emerging Asian Economies: Beyond the Catch-up Industrialization, Iwanami Publisher, p.128 (in Japanese). Up-dating the figure of per capita GNI in 2012.

GDP per capita (constant 2010 US$)



Source: World Development Indicator, World Bank

Cross-Country Comparison



Source: IMF staff calculations.

* t=0 is defined as the year when the GDP per capita for a particular country reached 3000 U.S. dollars in PPP terms.

Part 3: Quantifying the Impact of Technological Progress

PRODUCTIVITY GROWTH IN THE INDUSTRIAL REVOLUTION:

A NEW GROWTH ACCOUNTING PERSPECTIVE

Nicholas Crafts

(London School of Economics)

January 2002

Abstract

The issue of why productivity growth during the British industrial revolution was slow despite the arrival of famous inventions is revisited using a growth accounting methodology based on an endogenous innovation model and the perspective of recent literature on general purpose technologies. The results show that steam had a relatively small and long-delayed impact on productivity growth when benchmarked against later technologies such as electricity or ICT. Even so, technological change including embodiment effects accounted entirely for the acceleration in labor productivity growth that allowed the economy to withstand rapid population growth without a decline in living standards.

Table 1. Accounting for Growth During the British Industrial Revolution (% per year)

		Contributions from		
	Output Growth	Capital Stock Growth	Labor Force Growth	TFP
Crafts				
1760-80	0.6	0.25	0.35	0.0
1780-1831	1.7	0.60	0.80	0.3
1831-73	2.4	0.90	0.75	0.75
Feinstein				
1761-1800	1.1	0.5	0.4	0.2
1801-30	2.7	0.7	0.7	1.3
1831-60	2.5	1.0	0.7	0.8

		Contributions from		
	Output Growth	Capital Stock Growth	Human Capital Stock Growth	TFP
Greasley & Oxley				
1760-80	0.6	0.3	0.2	0.1
1780-1831	1.7	0.6	1.1	0.0
1831-73	2.4	0.9	1.7	-0.2

		Contributions from		
	Capital Income	Labor Income	Land Income	TFP
Antras & Voth				
1770-1801	-0.1	0.2	0.0	0.1
1801-31	0.3	0.2	0.0	0.5
1831-60	0.3	0.3	0.0	0.6

Table 2. Contributions to Labor Productivity Growth in US Non-Farm Business Sector, 1974-99 (% per year)

	1974-90	1991-5	1996-9
Capital Deepening	0.81	0.62	1.10
ICT Capital	0.44	0.51	0.96
Other	0.37	0.11	0.14
Total Factor Productivity	0.33	0.48	1.16
ICT Sector	0.17	0.23	0.49
Other	0.16	0.25	0.67
Labor Quality	0.22	0.44	0.31
Labor Productivity Growth	1.37	1.53	2.57
Memorandum Items			
ICT Capital Income Share (%)	3.3	5.3	6.3
ICT Sector Output Share (%)	1.4	1.9	2.5

Source: derived from Oliner and Sichel, "Resurgence", p. 10, 13, and 17

Table 3. Steam's Contribution to British Labor Productivity Growth, 1760-1860 (% per year)

	1760-1800	1800-30	1830-60
Steam Engine Capital Stock Growth	4.3	3.9	4.9
Income Share (%)	0.1	0.2	0.7
Steam Power Capital Deepening	***0.004***	***0.008***	***0.03***
Steam Engine TFP Growth	6.7	0.0	3.4
Output Share (%)	0.04	0.1	0.3
Steam Power TFP	***0.003***	***0.00***	***0.01***
Railway Capital Stock Growth			16.2
Income Share (%)			0.9
Railway Capital Deepening			***0.15***
Railway TFP Growth			3.5
Output Share (%)			1.4
Railway TFP			***0.05***
Total Steam	***0.004***	***0.008***	***0.24***

Table 4. Contributions to Labor Productivity Growth in US Private Non-Farm Domestic Economy, 1899-1929 (% per year)

Capital Deepening	0.34
Electrical Capital	0.24
Other	0.10
Total Factor Productivity	1.65
Electrical Sector	0.06
Electrical Capital Spillovers	0.24
Other	1.35
Labor Quality	0.16
Labor Productivity Growth	2.15
Memorandum Items	
Electrical Capital Income Share (%)	3.0
Electrical Sector Output Share (%)	1.7

Table 5. Modernized Sector Capital Stock, 1780 and 1860. (£mn, 1851-60 prices)

	1780	1860
Cotton Textiles	1.9	46
Woolen Textiles	7.4	13
Iron	1.1	44
Canals	12	37
Ships	14	65
Railways	0	253
Total	36.4	458

Table 6. Contributions to British Labor Productivity Growth, 1780-1860 (% per year)

Capital Deepening	0.22
Modernized Sectors	0.12
Other	0.10
Total Factor Productivity	0.56
Modernized Sectors	0.34
Other	0.22
Labor Productivity Growth	0.78
Memorandum Items	
Labor Force Growth	1.22
Capital Income Share (%)	40
Modernized	5.9