

Chapter 1

The Facts to Be Explained



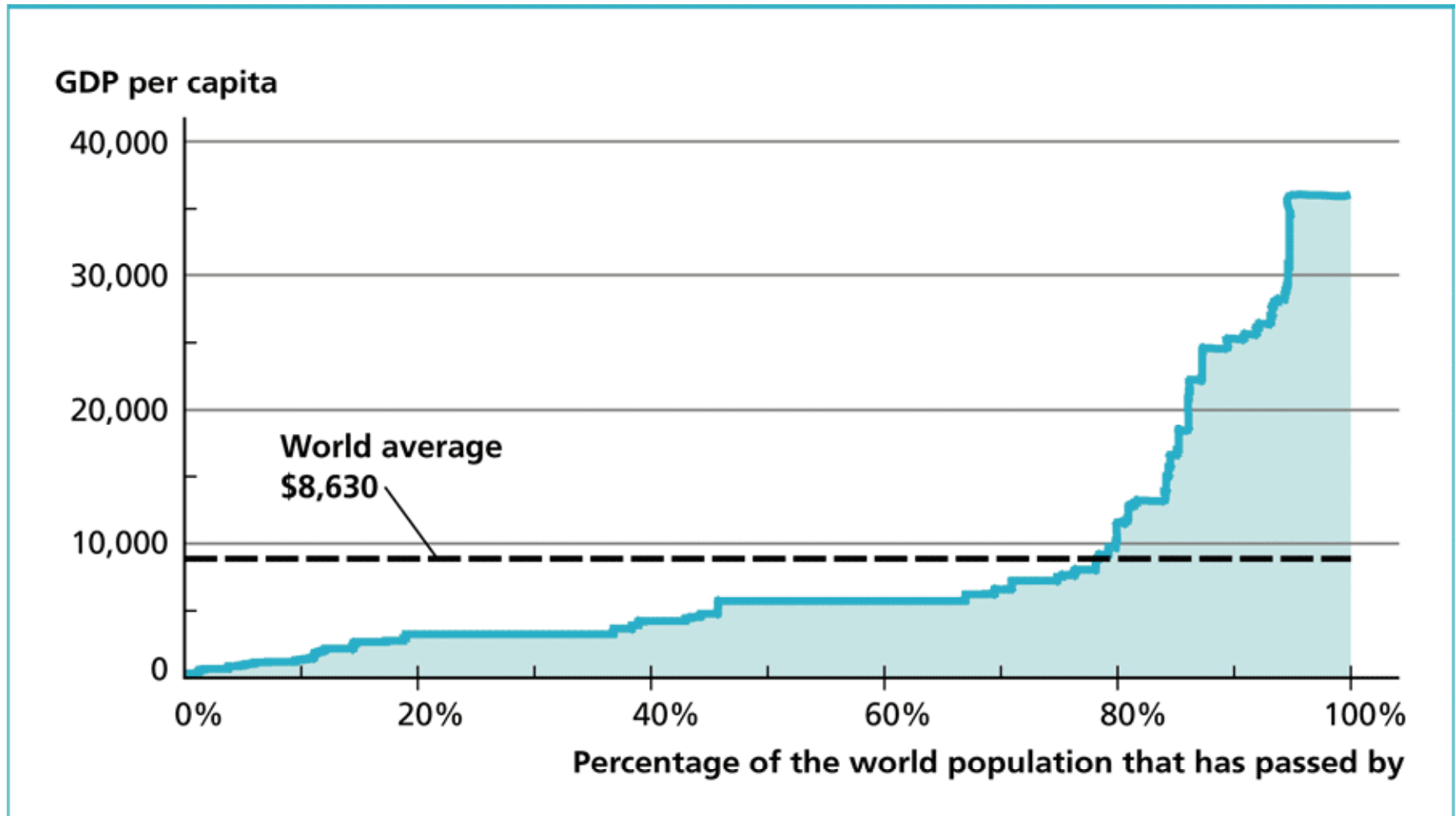
Economic Growth

DAVID N. WEIL



1. Differences in the Level of Income Among Countries.

Parade of World Income



Sources: Heston, Summers, and Aten (2006) World Bank (2007a).

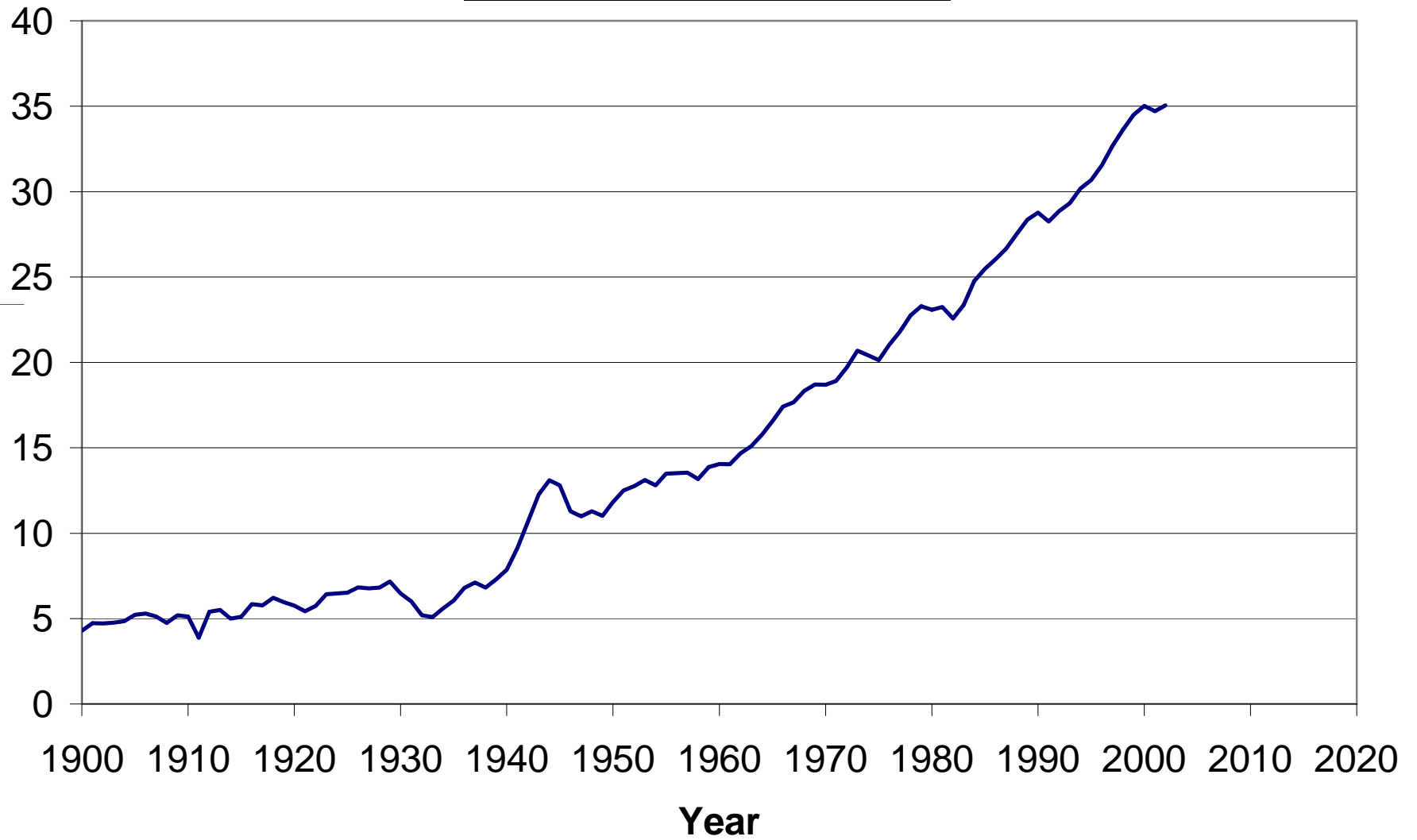
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Country	GDP per Capita (PPP \$)	Year
Zimbabwe	\$200	2008
Congo	300	2009
Burundi	300	2009
Liberia	500	2009
U.S.A.	46,400	2009
Singapore	50,300	2009
Norway	59,300	2009
Luxemburg	77,600	2009

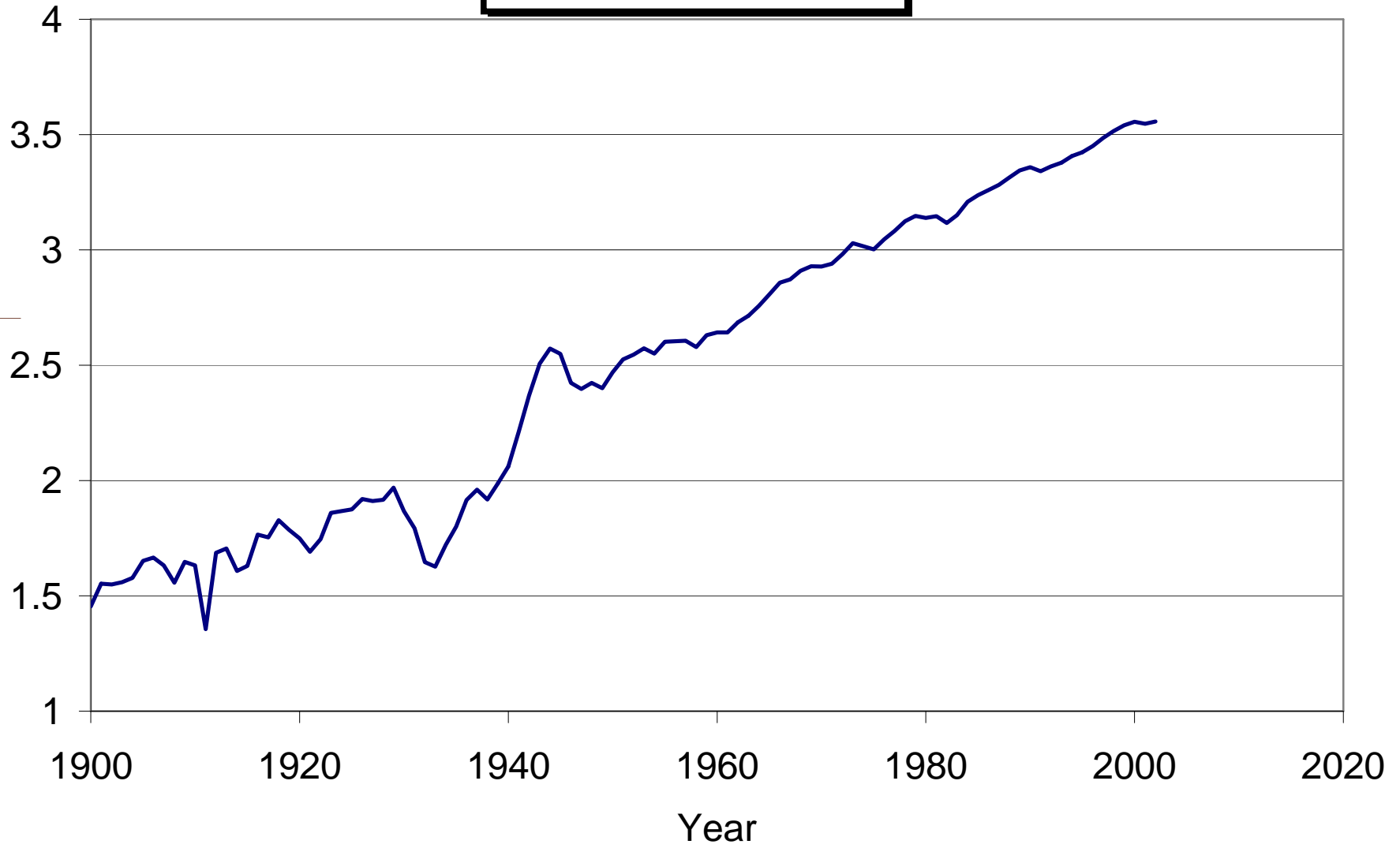
Big differences between rich and poor countries.

2. Differences in the Rate of Income Growth Among Countries.

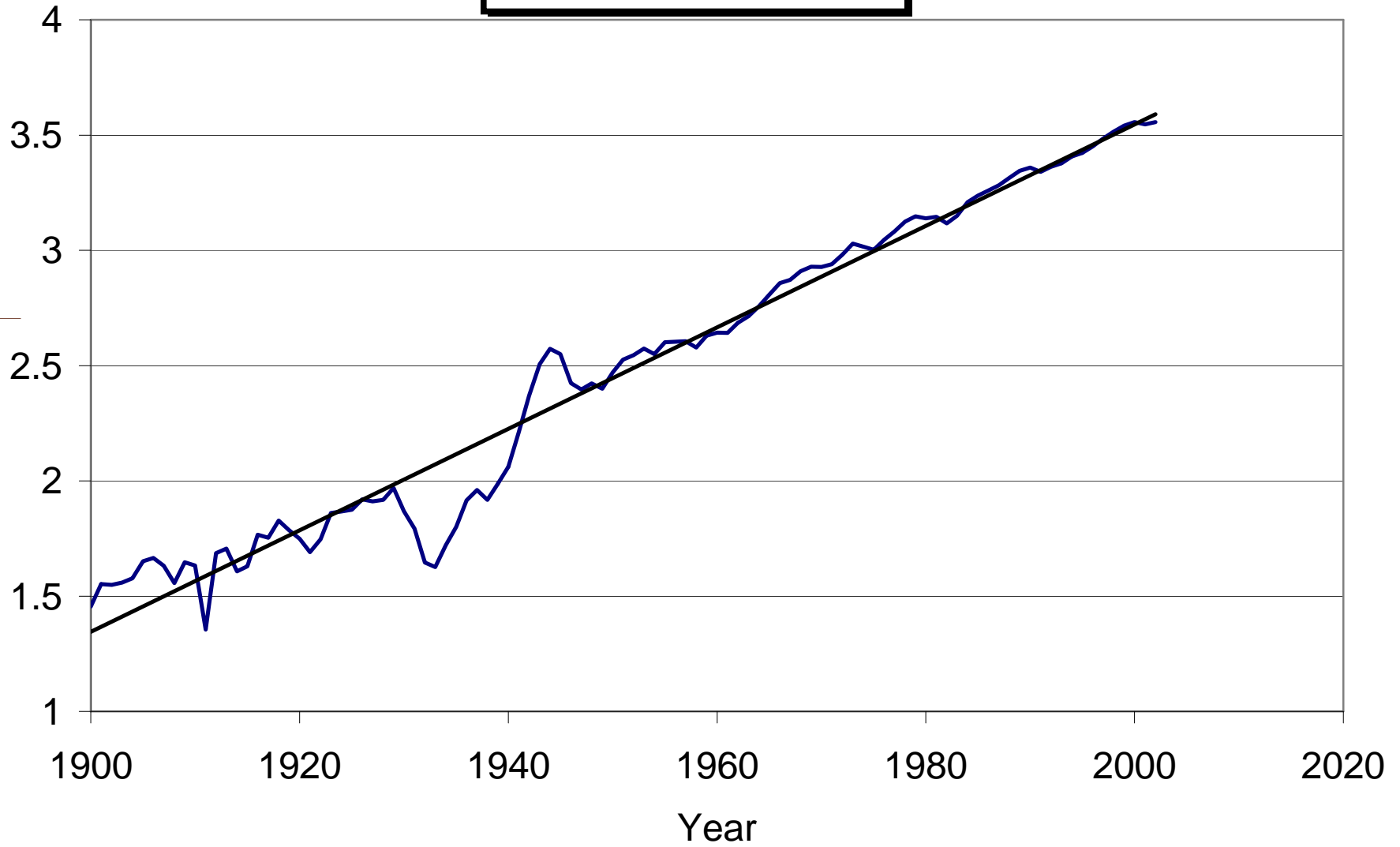
Real GNP per capita (USA)



In(Real GNP per capita)



In(Real GNP per capita)



Is the growth rate in the U.S. real GNP per capita constant since 1900?

- From the above figure, which plots the $\ln(\text{real GNP per capita})$ against time, we see that the growth rate in the U.S. is more or less constant (because the $\ln(\text{real GNP per capita})$ is a linear function of time).
- Also, we can see that the average growth rate is about 2% per year (the slope of the $\ln(\text{real GNP per capita})$ is approximately 2%).

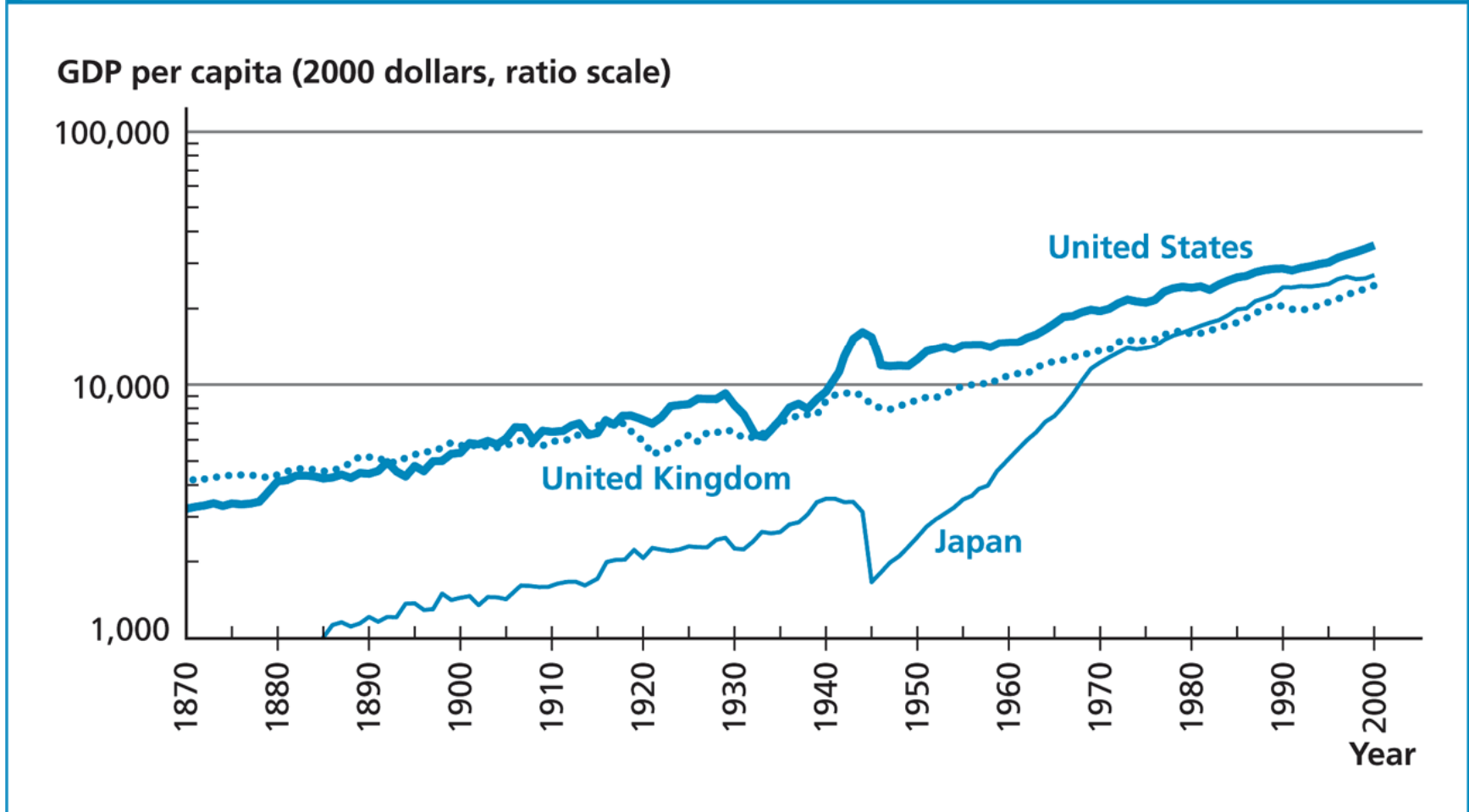
Small differences in growth rates make big differences in income

Annual growth	Doubling time
1%	70 years
2%	35 years
3%	23 years

Other countries?

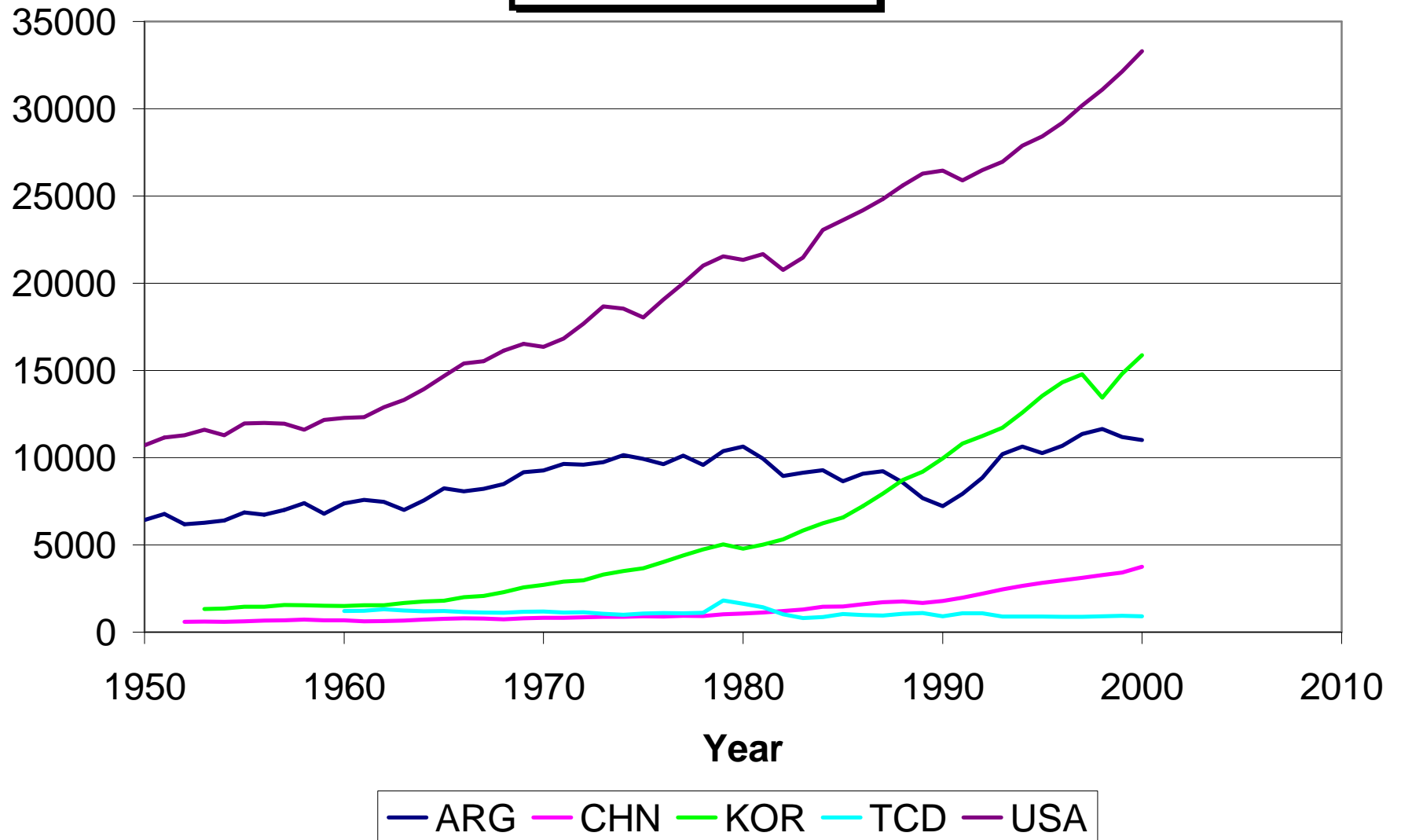
FIGURE 1.5

GDP per Capita in the United States, the United Kingdom, and Japan, 1870–2000

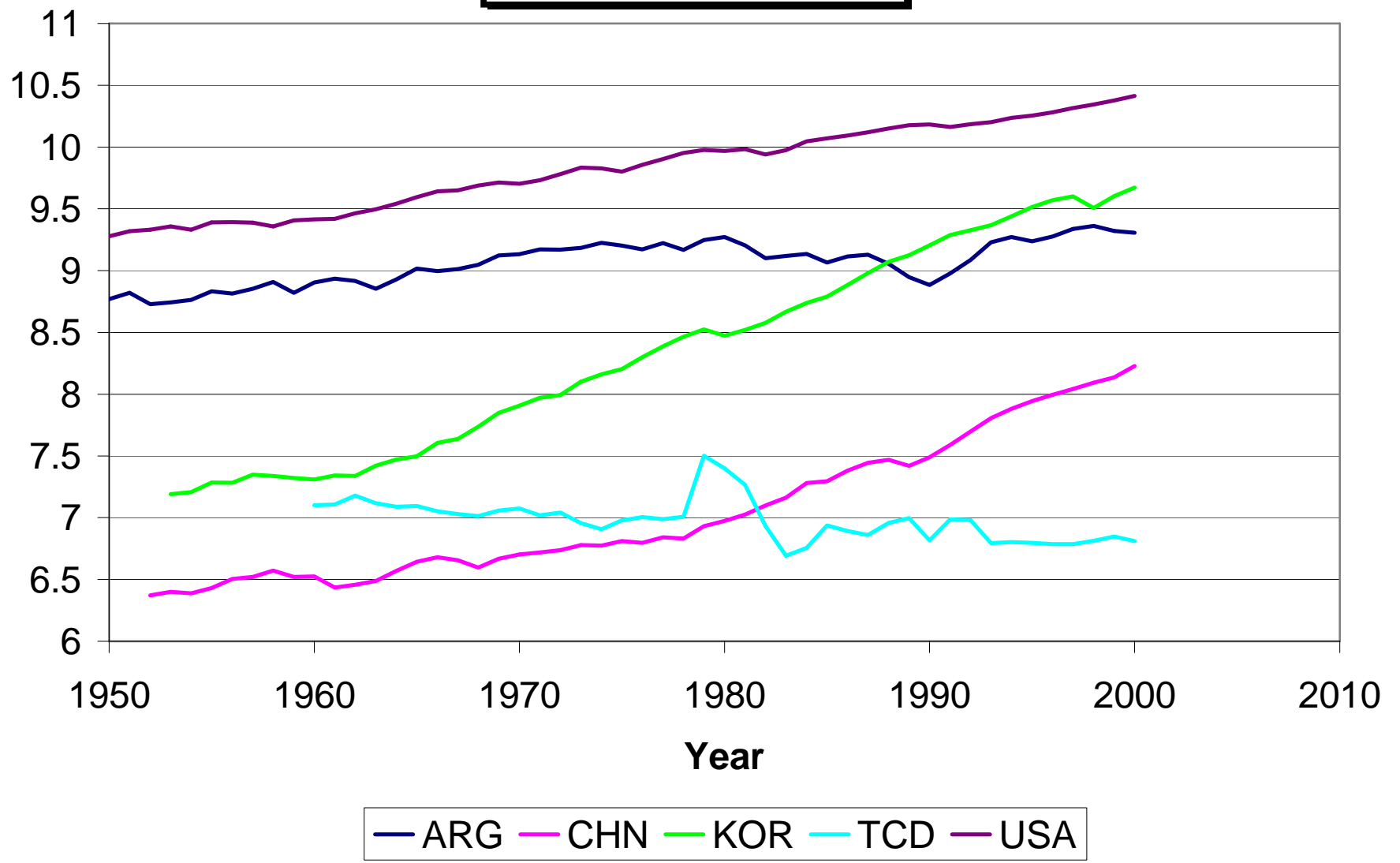


Source: Maddison (1995).

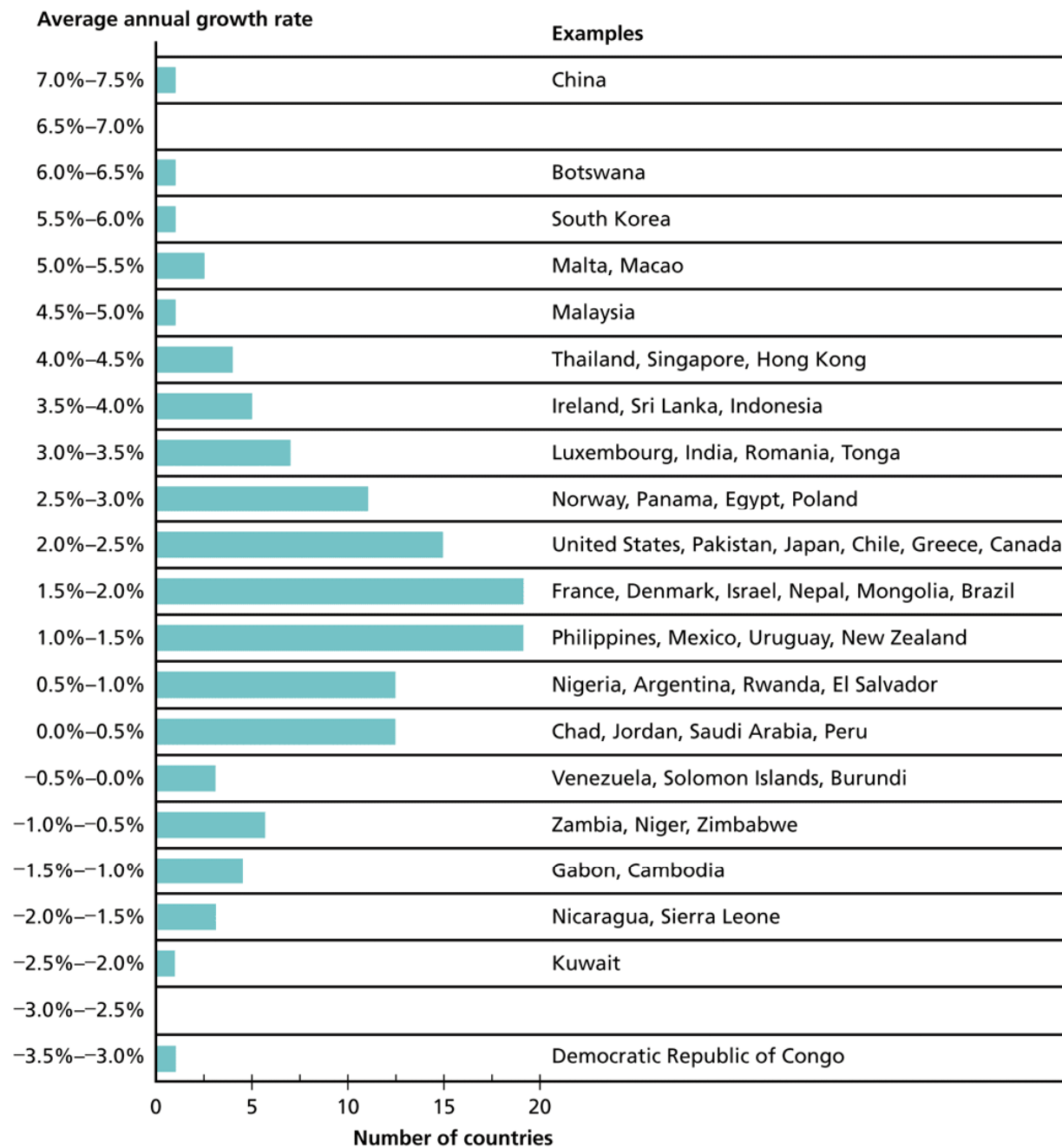
Real GDP per capita



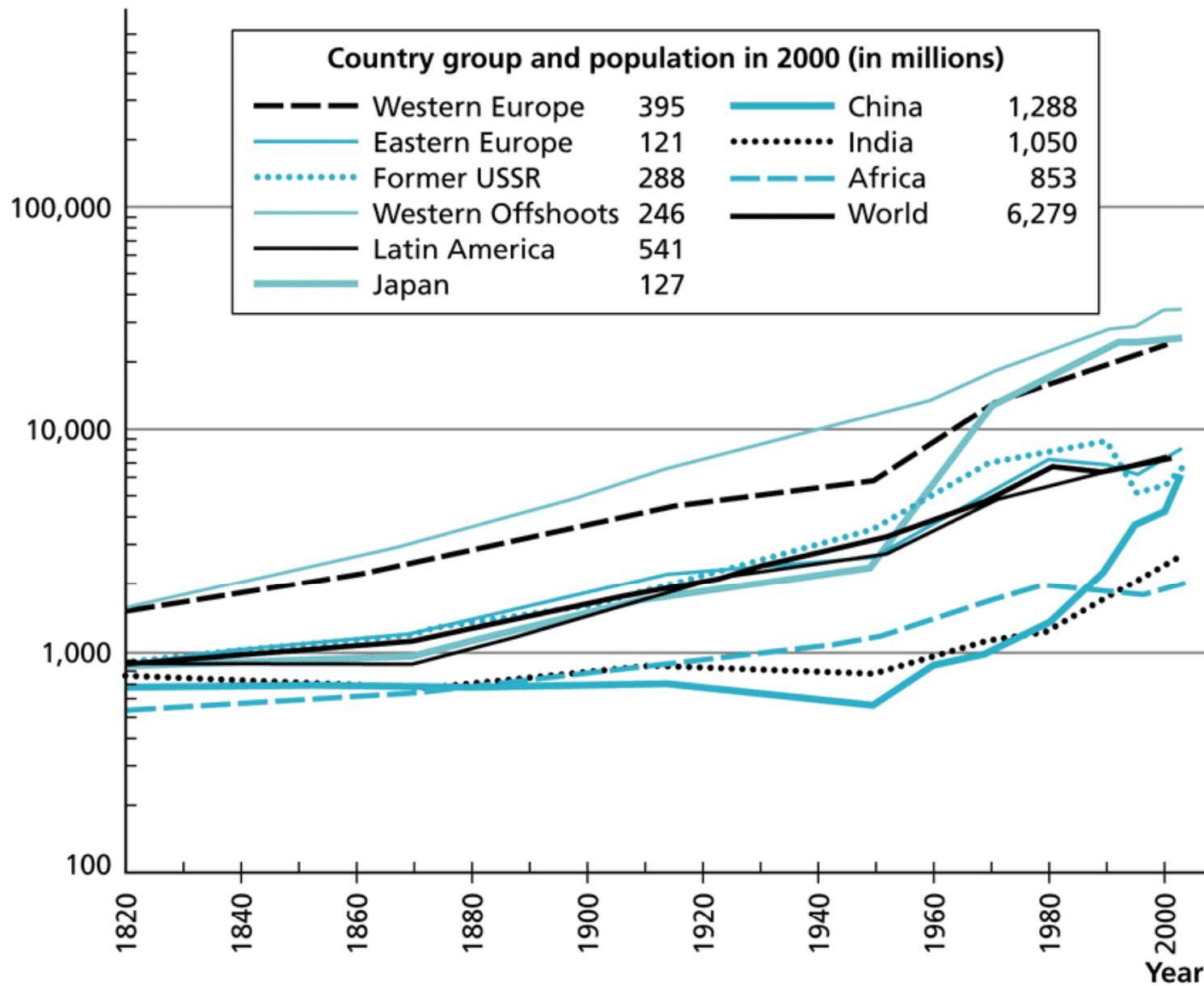
In(Real GDP per capita)



Average over 1970-2005



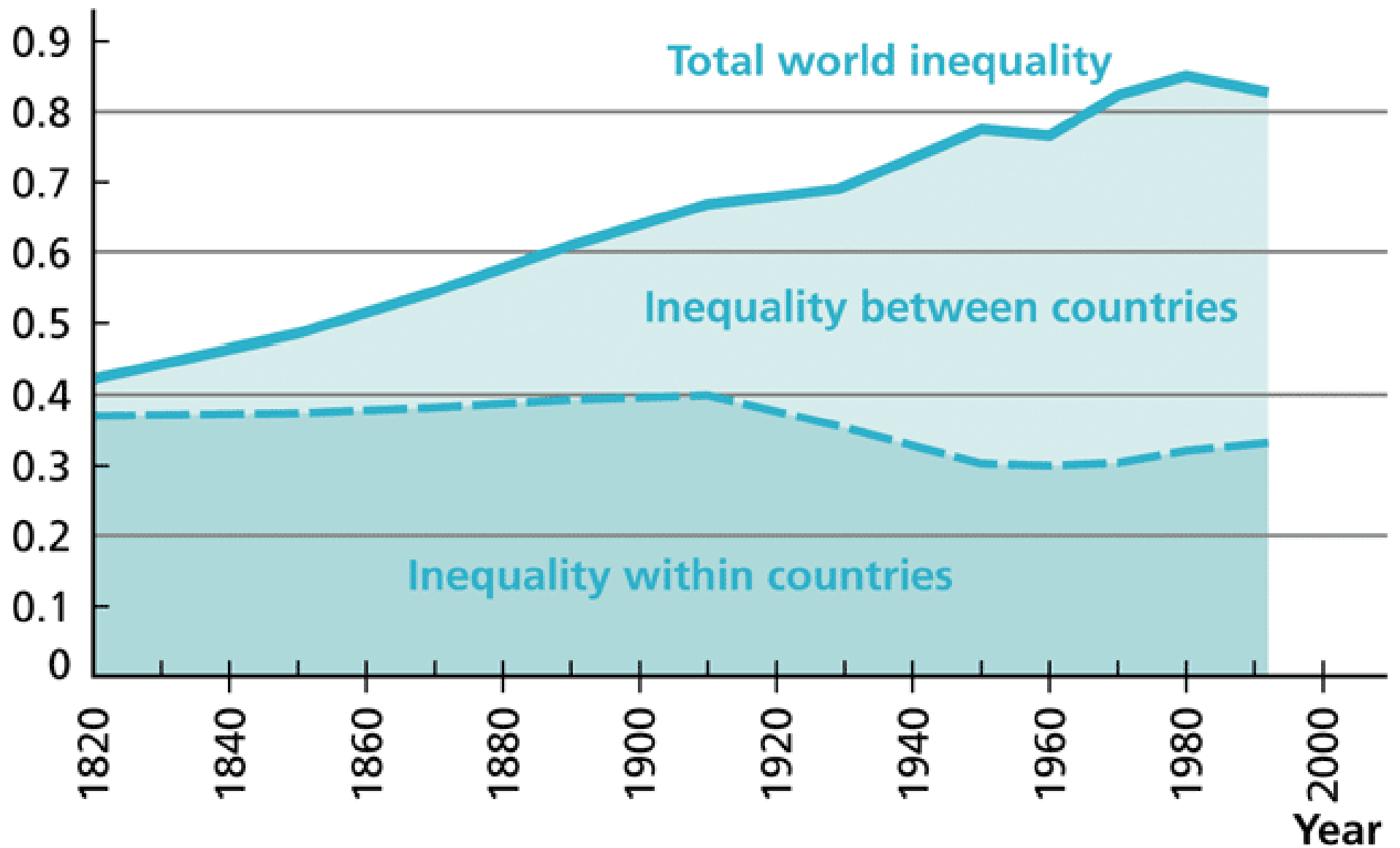
GDP per capita (2000 dollars)



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Source: Maddison (2001), Heston, Summers, and Aten (2006).

Inequality



Source: Bourguignon and Morrison (2002).

From the above graph, we see that

- All regions grow
- The gap between the regions is widening (because of different growth rates).

Growth before 1820

Years	Growth in income per capita in the world
1700-1820	0.07%
1500-1700	0.04%
0-1500	~0%

Relatively small differences between the richest and the poorest, before 1820 (factor of 2).

The case of China

- 8th – 12th centuries China is economic and technological leader in the world.
- Important inventions: gunpowder, printing, water-powered spinning wheel, use of coal in smelting iron, digging of canals and waterways, world exploration.

Zheng He Voyages

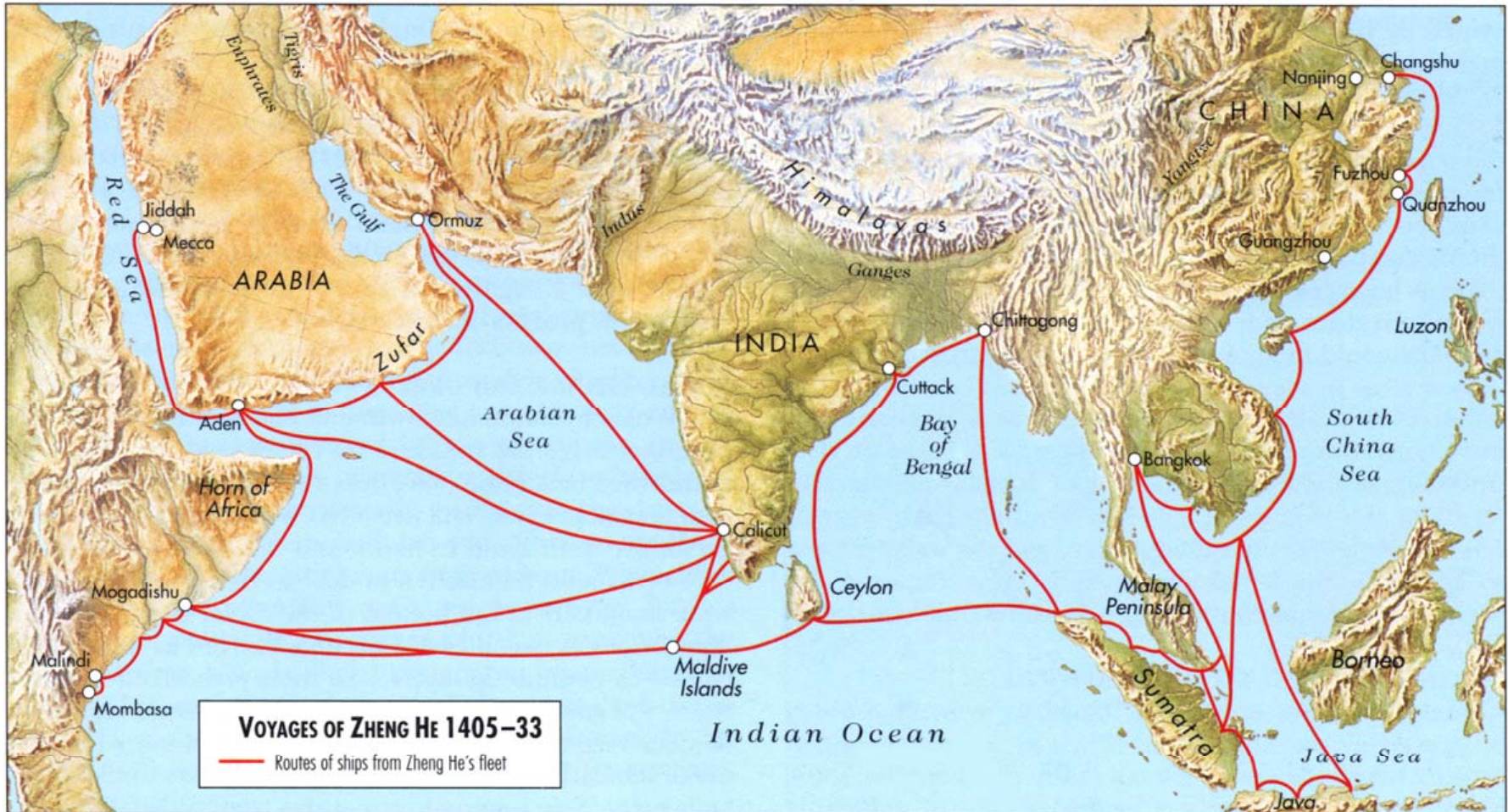
ZHENG HE

As the "Admiral of the Western Sea" Zheng He led China's most ambitious voyages of discovery. He was ordered by the Ming Emperor to sail to "the countries beyond the horizon, ... all the way to the end of the earth...to display the might of Chinese power and collect tribute ... from beyond the seas." Between 1405 and 1433 Zheng He made seven voyages that took him as far as the eastern coast of Africa – or perhaps even beyond. For his first voyage Zheng He amassed more than 300 vessels with some 30 000 men! Many of these vessels were more than 130 meters long and 60 meters wide.

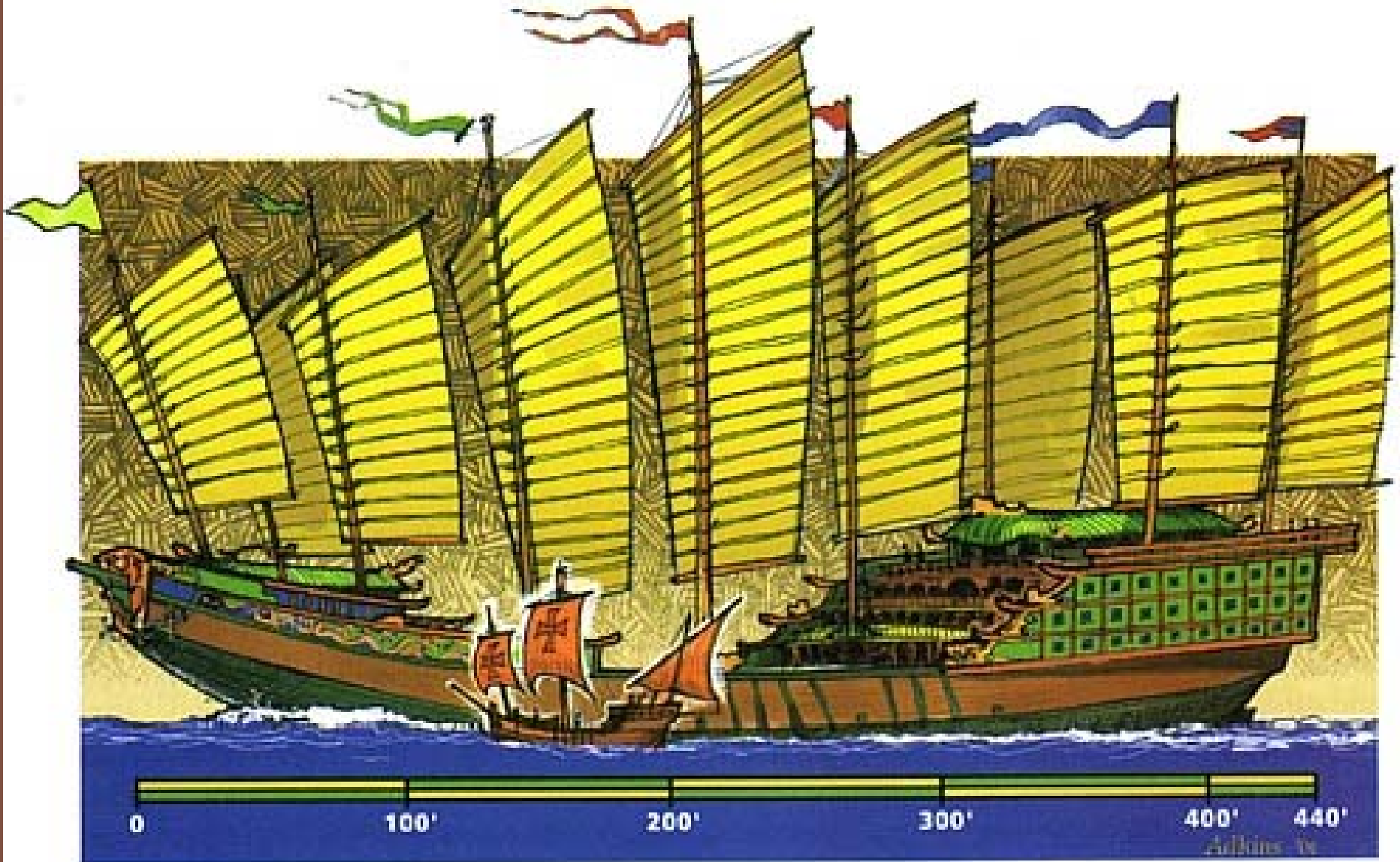
The extraordinary size of these ships is illustrated by the superimposition of Columbus' ships against Zheng He's treasure ship. Throughout his seven voyages Zheng He visited more than 30 countries before collecting marvellous treasures and tribute for the Ming Emperor.



Zheng He Voyages



Zheng He ship vs. Santa Maria



Summary of main facts

- Before 1820 very little growth and no big differences between countries.
- After 1820 unprecedented growth in the world as a whole.
- Very unequal distribution of income among countries.
- Uneven distribution of growth among countries, widening the gap between the rich and the poor.

Questions

- What factors determine which countries prospered?
- Can we point to specific economic policies?
- Are there specific country characteristics that determine economic fate?
- Is prosperity just a result of luck?

Our Methodology

Step 1: Decomposing the cross-country difference in output per worker into differences in inputs and productivity

- We will use something similar to the next formula.

$$\frac{y_A}{y_B} = \left(\frac{E_A}{E_B} \right) \cdot \left(\frac{T_A}{T_B} \right) \cdot \left(\frac{k_A}{k_B} \right)$$

Step 1: Decomposing the cross-country difference in output per worker

- y – output per capita (or per worker)
- k – capital per worker
- T – technology level (knowledge how to combine inputs to produce output).
- E – efficiency (includes effort, institutional bureaucracy, customs, other factors that affect productivity that are not captured by technology).

Step 2: Why are there differences in capital?

- Constructing theory that relates investment and future capital. Main idea: higher saving rate leads to higher investment rate and higher capital per worker.
- Learn how to measure “human” capital.

Step 3: Digging deeper – why are there differences in investment rate, technology, efficiency?

- Looking at fundamental (exogenous) cross-country differences such as geography, climate, natural resources, political regimes.