DEVELOPMENT ECONOMICS

INTRODUCTION

What is Development Economics?

- Common theme: understanding the causes and consequences of poverty.

- This leads to two main questions (the two parts of this course):
  - Why are some countries so much poorer than others?
  - What explains poverty differences *within* countries and what types of policies can be done to remediate this?

Course Logistics

- We meet Wed, 9:30-12:20 at MH 201
- Check for updates on course material (slides, papers) on Moodle.
- Instructors:
  - Matteo Bobba (matteo.bobba@tse-fr.eu)
  - Pepita Miquel Florensa (pepita.miquel@tse-fr.eu)
- Office hours: by appointment (drop us an email to coordinate)
  - Preferred mode of interaction: before/after class.
  - Also available to answer questions via e-mail.

Prerequisites

- First semester M1 courses in macro, micro, and econometrics

- Taking (M1 second semester):
  - Program Evaluation
  - Applied Econometrics
    - Or equivalents.

- This course will use:
  - Basic concepts from microeconomics.
  - Some calculus (simple derivatives).
  - Understanding the tables and main results of an empirical paper (linear regressions).

Evaluation

- Final exam: 80%
  - Exact date and time to be announced
  - Open questions (both analytical exercises and argumentative answers), see last years' exams on moodle
  - 90 minutes (approx. 45 minutes for each part of the course).

- Class participation: 20%
  - Participation in class, read empirical papers ahead of class, etc…

Readings

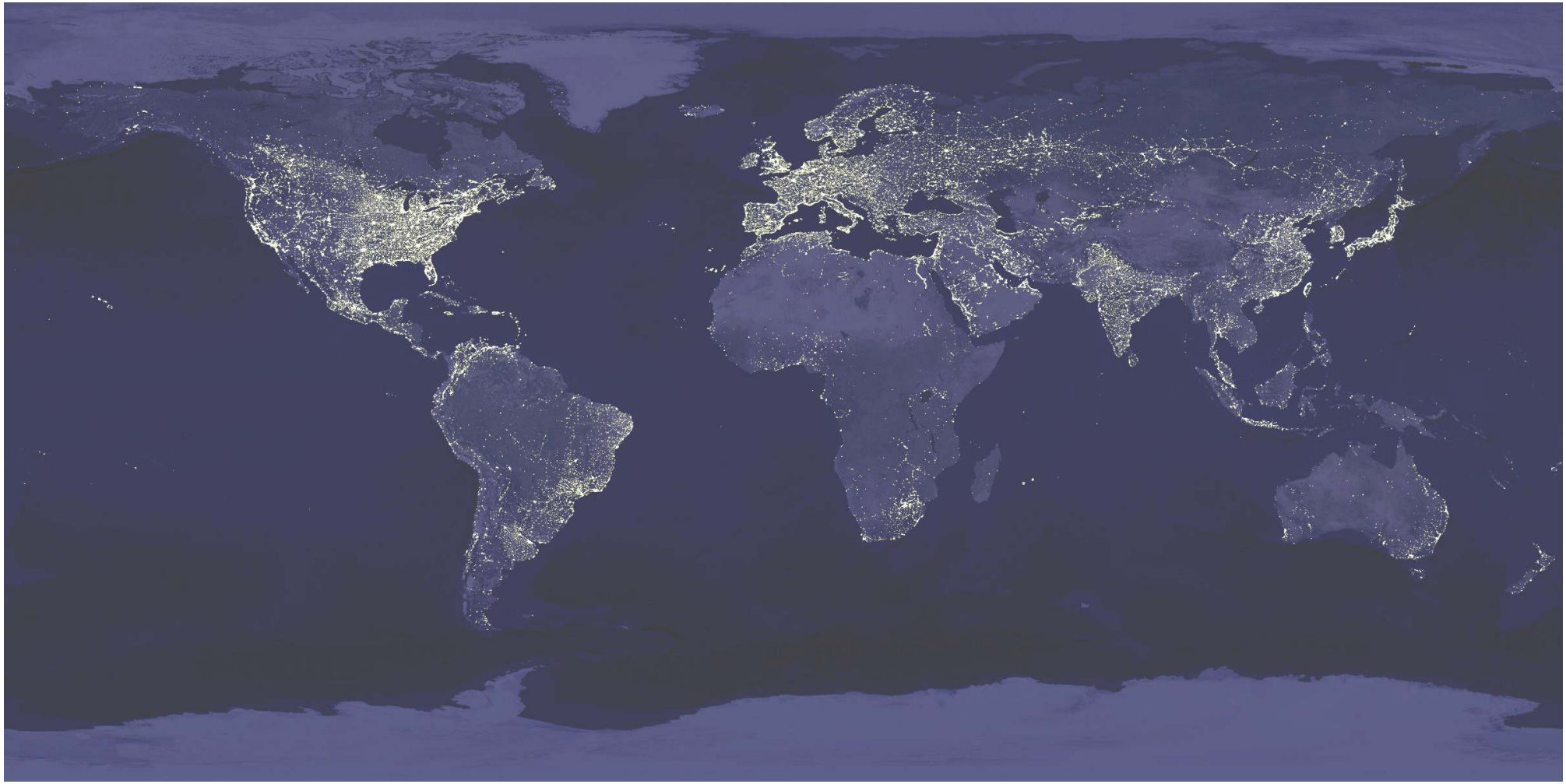
- There are two books we will use:
  - Weil, David N. Economic Growth – 3rd Edition. Prentice Hall, 2013
  - Banerjee, Abhijit V. & Duflo, Esther. Poor Economics – Public Affairs, 2011
    - Cheaper at Amazon's Kindle Store

- Other readings are journal articles from academic literature
  - Available on Moodle
  - Reading for next class: paper by Mankiw-Romer-Weil (QJE 1992)
    - Focus on intro + empirical results (regression tables)

This Lecture

- We will (briefly) talk about the structure of the course
- We will discuss some facts about the distribution of income and economic growth around the World.
- We will go over the basic version of the **Solow Model**.
  - I will present and solve the model in its simplest version (see also notes in pdf in moodle)
- And use it to test how much of worldwide income differences can be explained by differences in **physical capital**.
- Readings:
  - Chapters 1, 3 (sections 3.1, 3.2 and 3.3) and 4 (section 4.2) of Weil's textbook
  - Chapter's 8 Appendix

Why are some countries poorer than others?



South and North Korea at night

Recall what GDP means…

- *Gross Domestic Product:* the value of all of the final goods and services produced in a country in a year.
  - A flow, not a stock, variable.
- Also referred to as *output* or *national income*.
  - GDP also equals all the wages/rents/interests/profits paid in a country.
- There are several difficulties in measuring GDP
  - Non-market production/consumption is not fully part of GDP.
  - Informal economy.
- Or using GDP as a measure of wellbeing
  - We care about health, leisure, and many other things.
  - **But it is still the most common measure of development.**

Life evaluation vs. GDP per capita

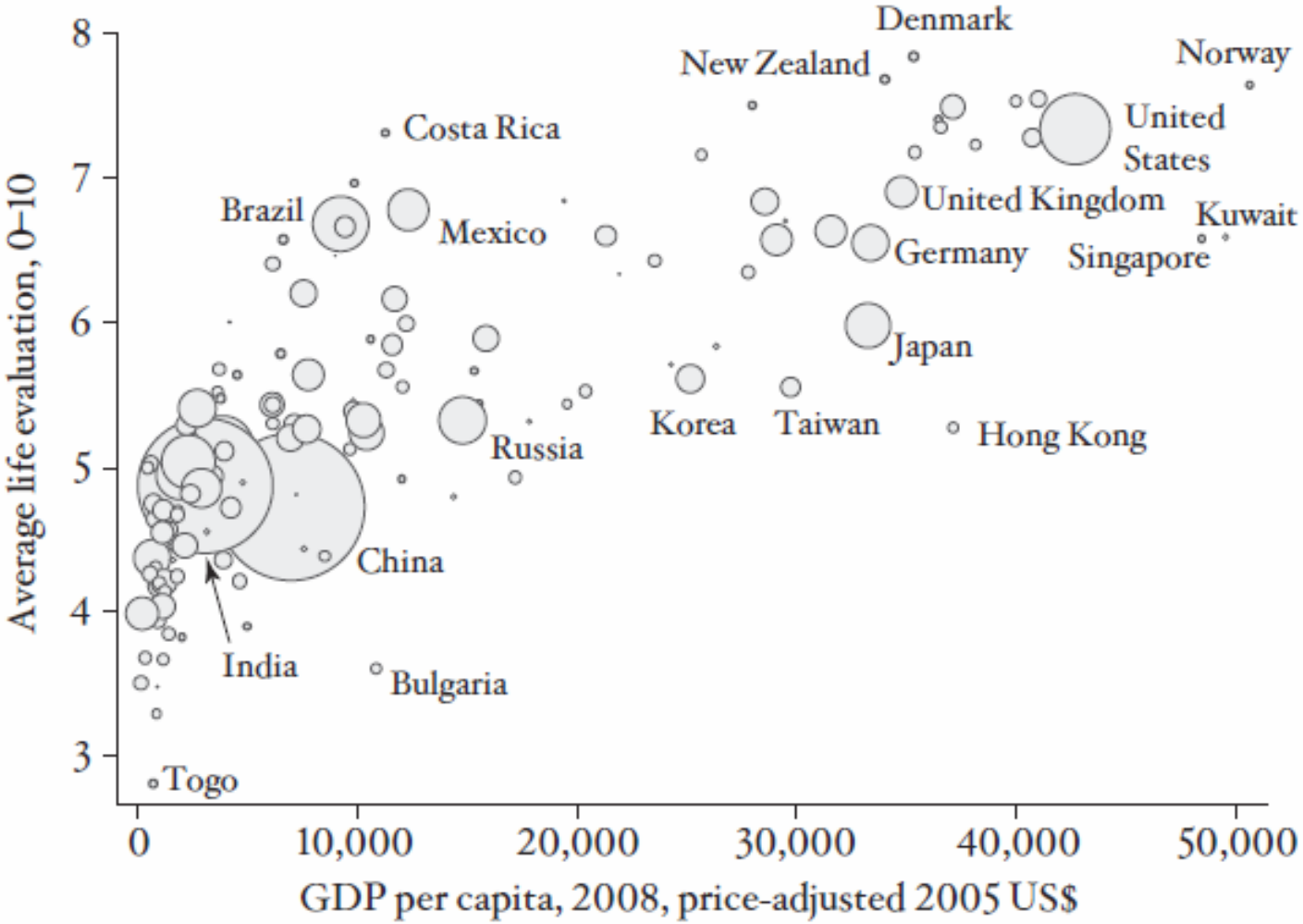


FIGURE 1 Life evaluation and GDP per capita.

Per Capita GDP in 2009 (constant 2005 prices)

- United States: US$ 41,000
- France: US$ 30,800 (US GDP is 1.3 times higher)
- Brazil: US$ 9,300 (US GDP is 4.4 times higher)
- China: US$ 7,000 (US GDP is 5.9 times higher)
- India: US$ 3,200 (US GDP is 12.8 times higher)
- Uganda: US$ 1,200 (US GDP is 34.2 times higher)
- Somalia: US$ 460 (US GDP is 89.1 time higher)

These differences in context

- Some rough estimates:
  - Recent "Great Recession" lowered US GDP by 5%.
  - The 1930's Great Depression lowered US GDP by 25%.

- If the US GDP per capita became like India's, that would be a 92% reduction!

- The differences in income across countries are gigantic compared to business cycle variations.

The Puzzle

- If you think of GDP as ***income***, the consequences are staggering.
  - Robert Lucas: "*I do not see how one can look at figures like these without seeing them as representing possibilities [...] The consequences for human welfare involved in questions like these are simply staggering: once one starts to think about them, it is hard to think about anything else.*"

- If you think of GDP as ***output***, the causes are puzzling.
  - Why can an American produce 4 times more than a Brazilian? Or 12 times more than an Indian?
  - Why can an American produce in less than a month what takes an Indian a year to produce?

So why are Americans/European much more productive?

- We have more (and better) machines, computers, tools.
  - Physical capital.
- We are healthier and more educated.
  - Human capital.
- We use the same inputs (human and physical capital) to produce things more efficiently.
  - Efficiency or factor productivity.
- We call these the **proximate causes** of income differences.

The Fundamental Causes of Income

- OK, we have more capital (of both kinds) and use it more efficiently.
  - But why did we accumulate more in capital and are able to use it more efficiently?

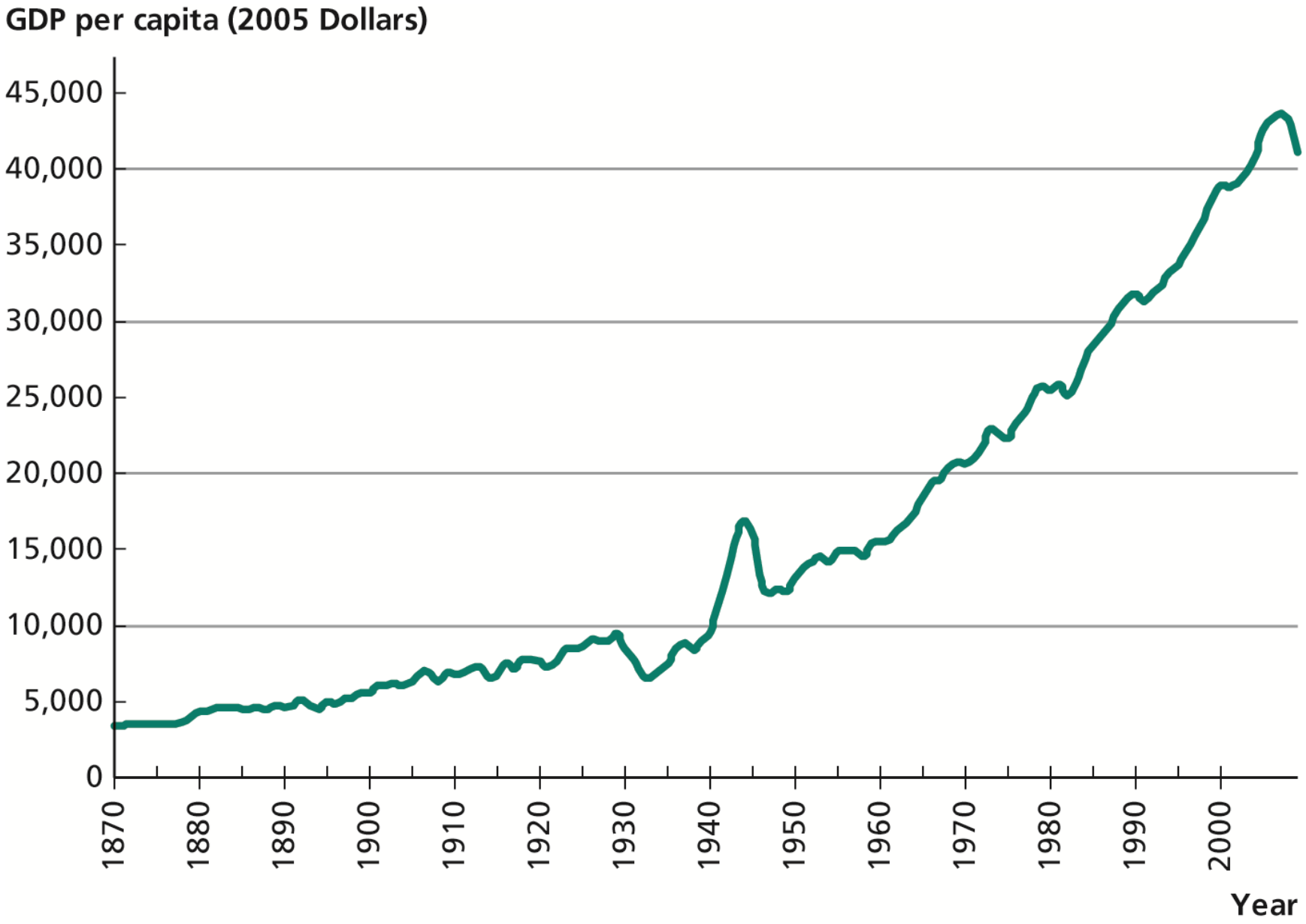
- Possible answers: the *fundamental causes of income differences*.
  - Geography and institutions.
  - Culture and social capital.

- We will use influential academic articles (see moodle) to dig out each of these explanations
  - I will tell you which parts of each paper you will have to read (better if before the corresponding class)

From differences in growth rates to differences in income levels…

- Relatively small changes in growth rates compound over time, having large effects on income levels.
  - A country growing 2% per year doubles its income every 36 years.
  - A country growing 3% per year doubles its income every 24 years.

Figure 1.2 GDP per Capita in the United States, 1870–2009



Taking averages of growth rates

- Growth in income (y) between year t and t+T:

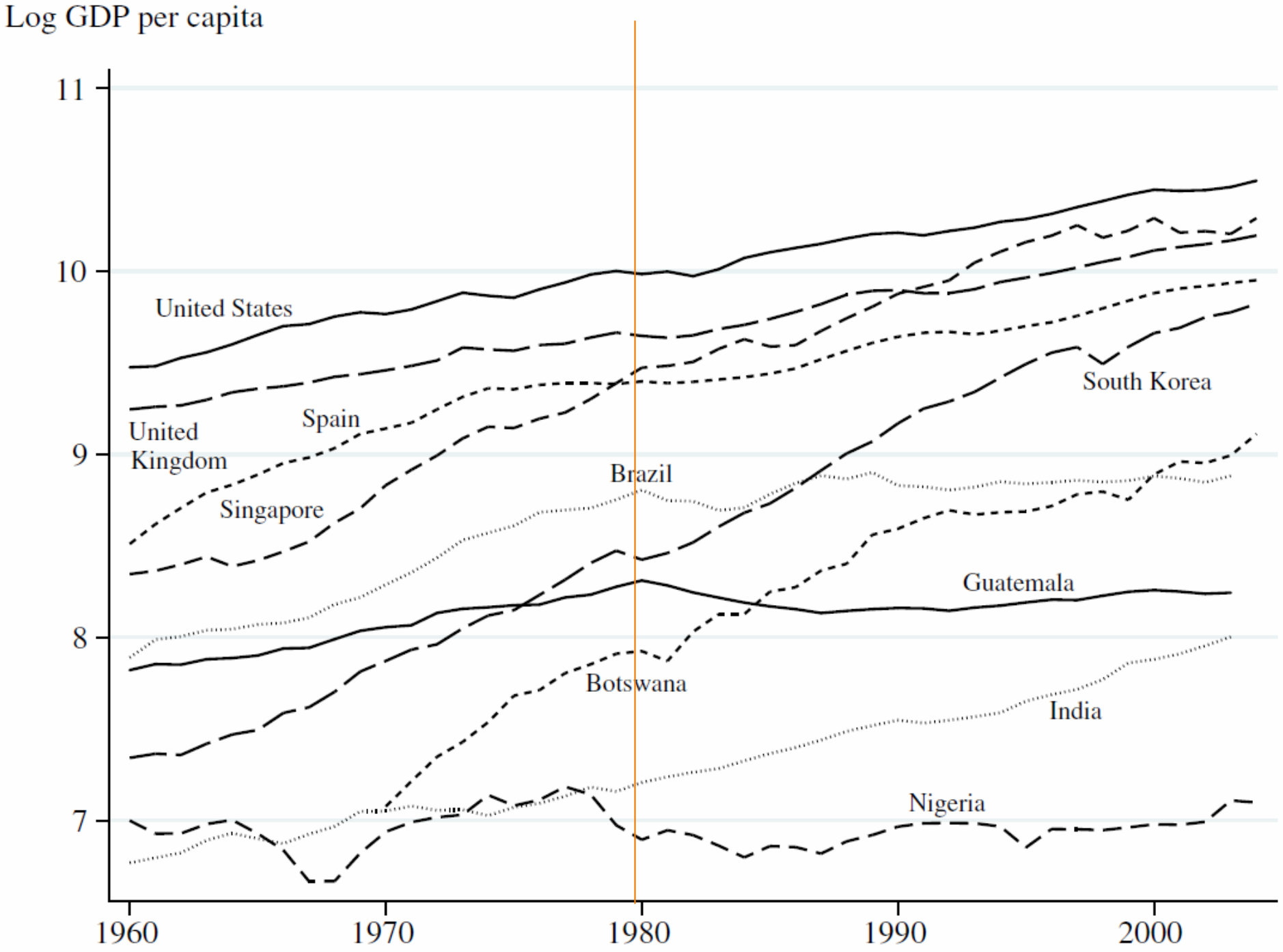
$$g_{t,t+T} = (y_{t+T}/y_t)^{1/T} - 1$$

- Or, equivalently using (natural) logs:

$$g_{t,t+T} \approx \ln(y_{t+T}) - \ln(y_t)/T$$

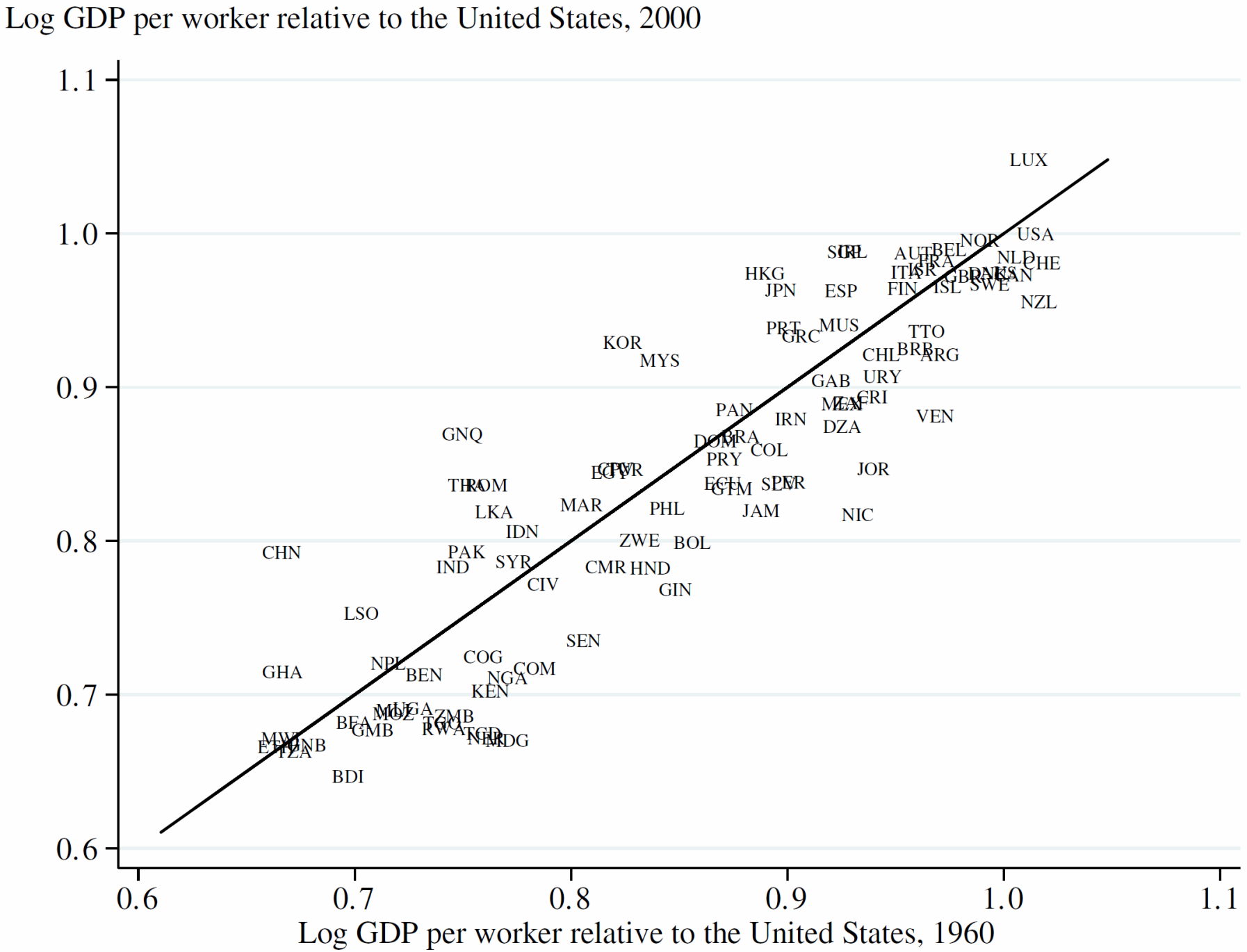
- US per capita GDP (constant 2005 dollars):
  - 1959: 15,000
  - 2009: 41,100

- Growth in 50 years: $(41{,}100/15{,}000)^{1/50} - 1 = 0.0204 = 2.04\%$
  - Using logs: $(\ln(41{,}100) - \ln(15{,}000))/50 = 0.0202 = 2.02\%$


Log GDP per capita
11
10
9
8
7
1960
1970
1980
1990
2000
United States
United Kingdom
Spain
Singapore
Brazil
South Korea
Guatemala
Botswana
India
Nigeria

Is the World Distribution of Income changing?

- We saw that some countries are growing much faster than others.
- But what is the big picture? How is the WDI changing?
  - In the last 40-50 years, not that much.
- Although some specific countries are moving up (e.g., Korea), in general the relative positions are still the same.
  - We can check this in one picture: does a country's GDP in 1960 (relative to the US) predict its GDP in 2000?


Log GDP per worker relative to the United States, 2000
1.1
1.0
0.9
0.8
0.7
0.6
LUX
USA
NOR
NLD
CHE
NZL
HKG
JPN
ESP
FIN
ISL
SWE
PRT
GRC
MUS
TTO
KOR
MYS
CHL
ARG
URY
GAB
CRI
PAN
IRN
DZA
VEN
GNQ
COL
PRY
JOR
MAR
PHL
JAM
NIC
LKA
IDN
ZWE
BOL
CHN
PAK
IND
SYR
CMR
HND
CIV
GIN
LSO
SEN
COG
NPL
BEN
COM
NGA
GHA
KEN
ZMB
GMB
BDI
0.6
0.7
0.8
0.9
1.0
1.1
Log GDP per worker relative to the United States, 1960

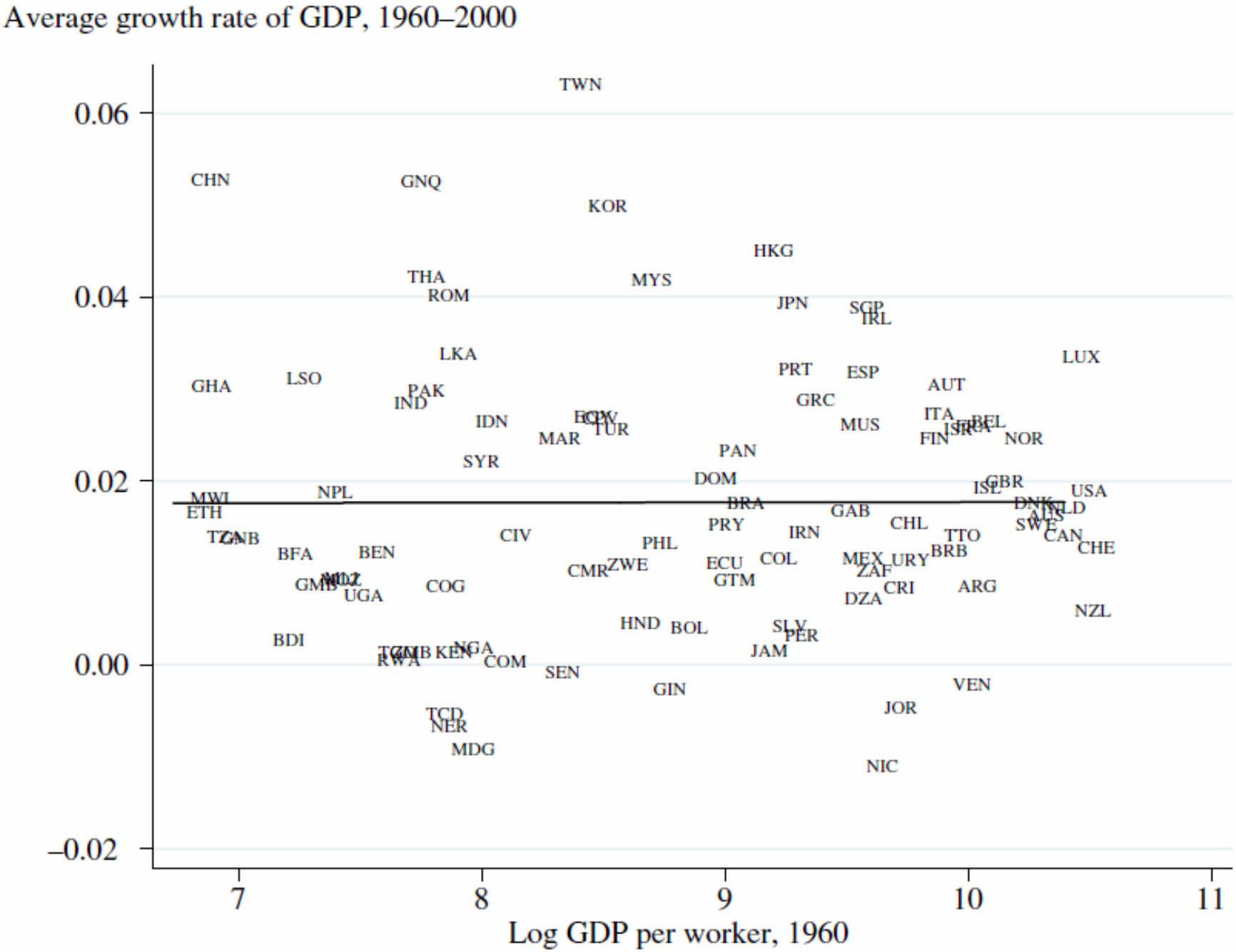


FIGURE 1.13 Annual growth rate of GDP per worker between 1960 and 2000 versus log GDP per worker in 1960 for the entire world.

So where does the WDI come from?

- We just saw that the WDI is not changing in the last decades…
- But when did it take the shape it has today?
- For that, we need to use historical data.
  - More sparse and sketchy, but still useful.
  - A lot comes from the work of economist Angus Maddison.
    - There are some disagreements on this, but the general picture is a consensus.

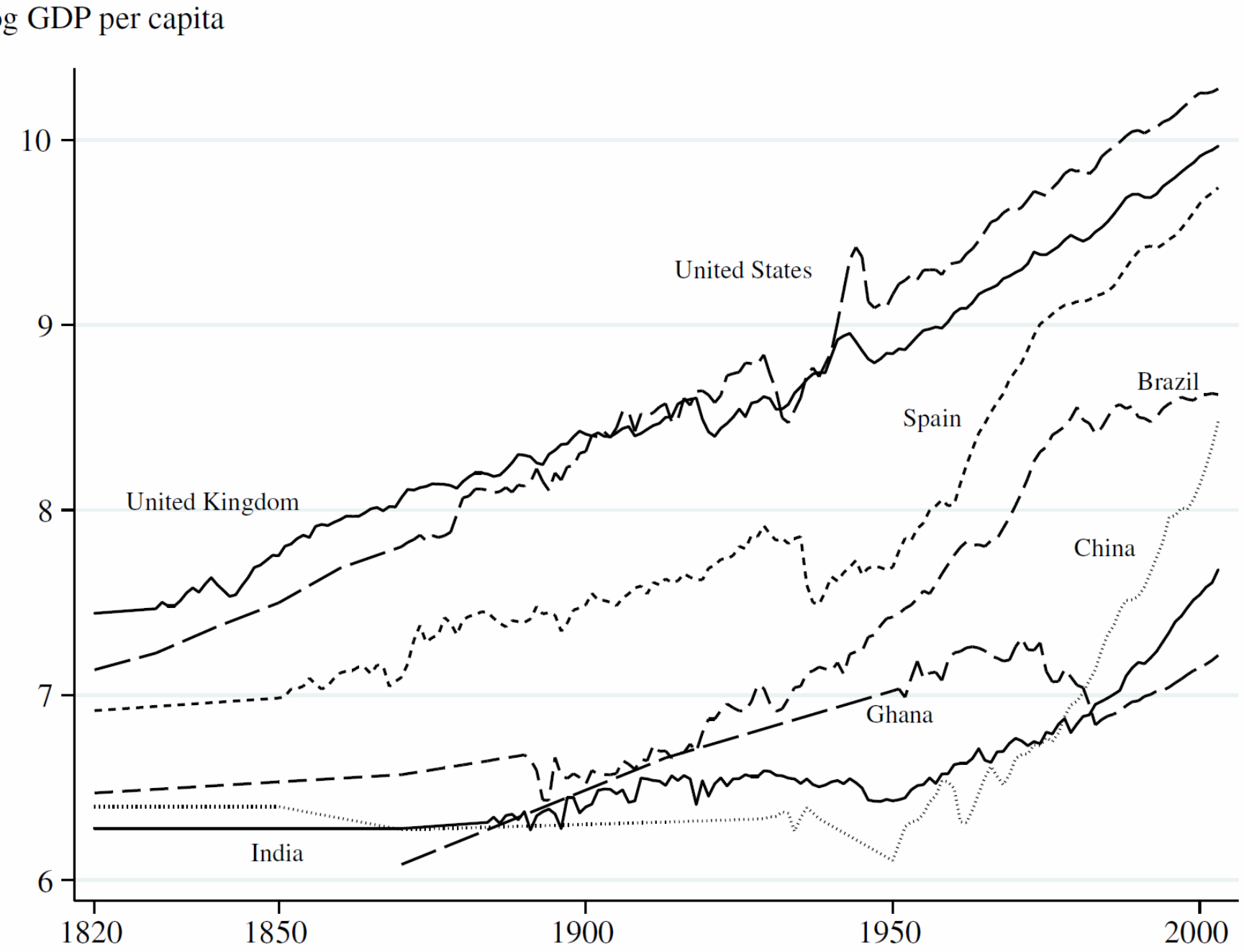


FIGURE 1.12 The evolution of income per capita in the United States, the United Kindgom, Spain, Brazil, China, India, and Ghana, 1820–2000.

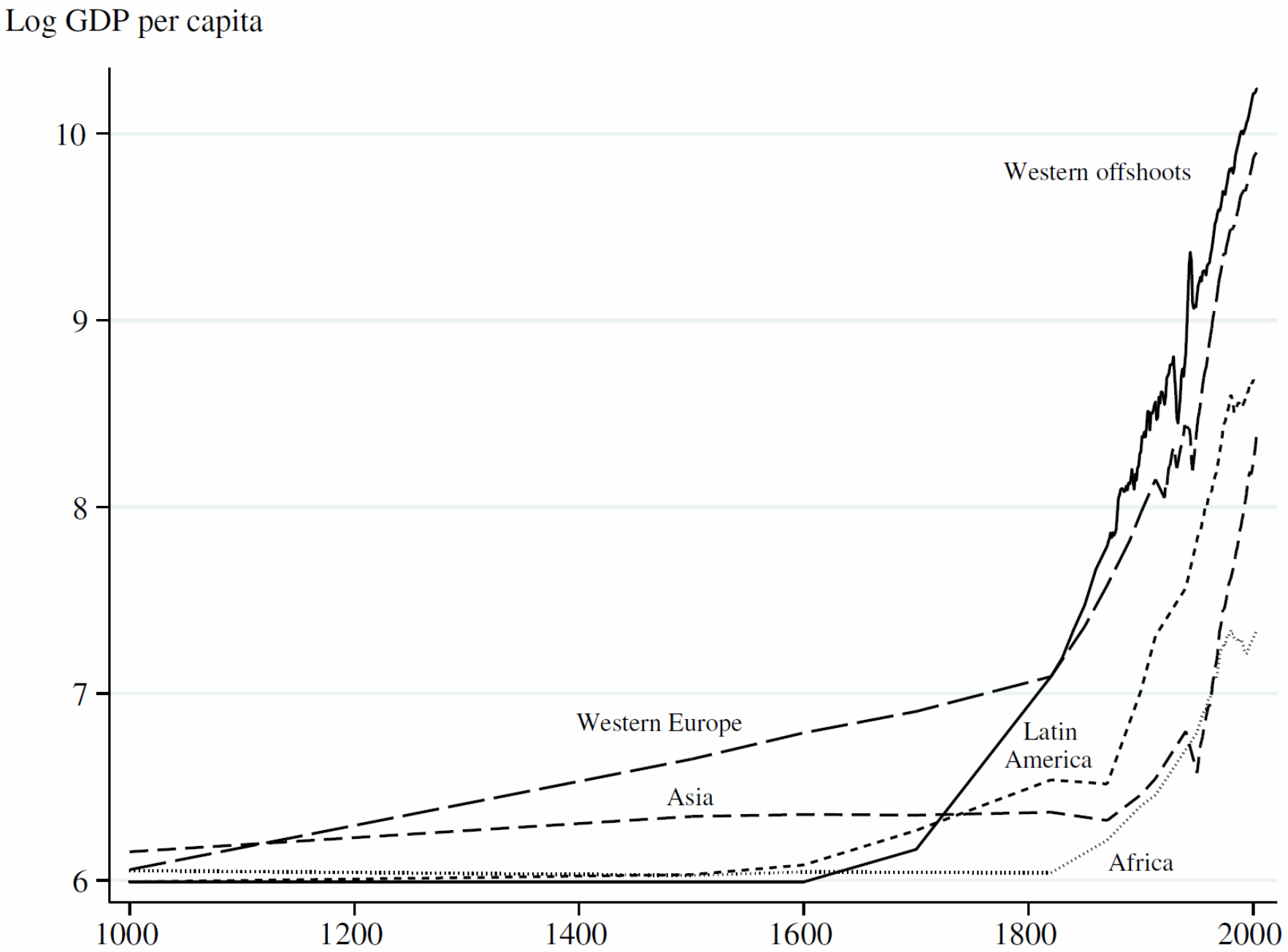


FIGURE 1.11 The evolution of average GDP per capita in Western offshoots, Western Europe, Latin America, Asia, and Africa, 1000–2000.

Summary: main facts about the WDI

- Substantial variation in today's per capita incomes.
- These differences mainly come from a divergence of growth rates in the last 200 years.
- Large variation in growth rates across countries,
  - And within countries across time: periods of high growth and stagnation.
- In the last decades the WDI is stable.
  - Poor are not converging to the income level of the rich.

What is physical capital?

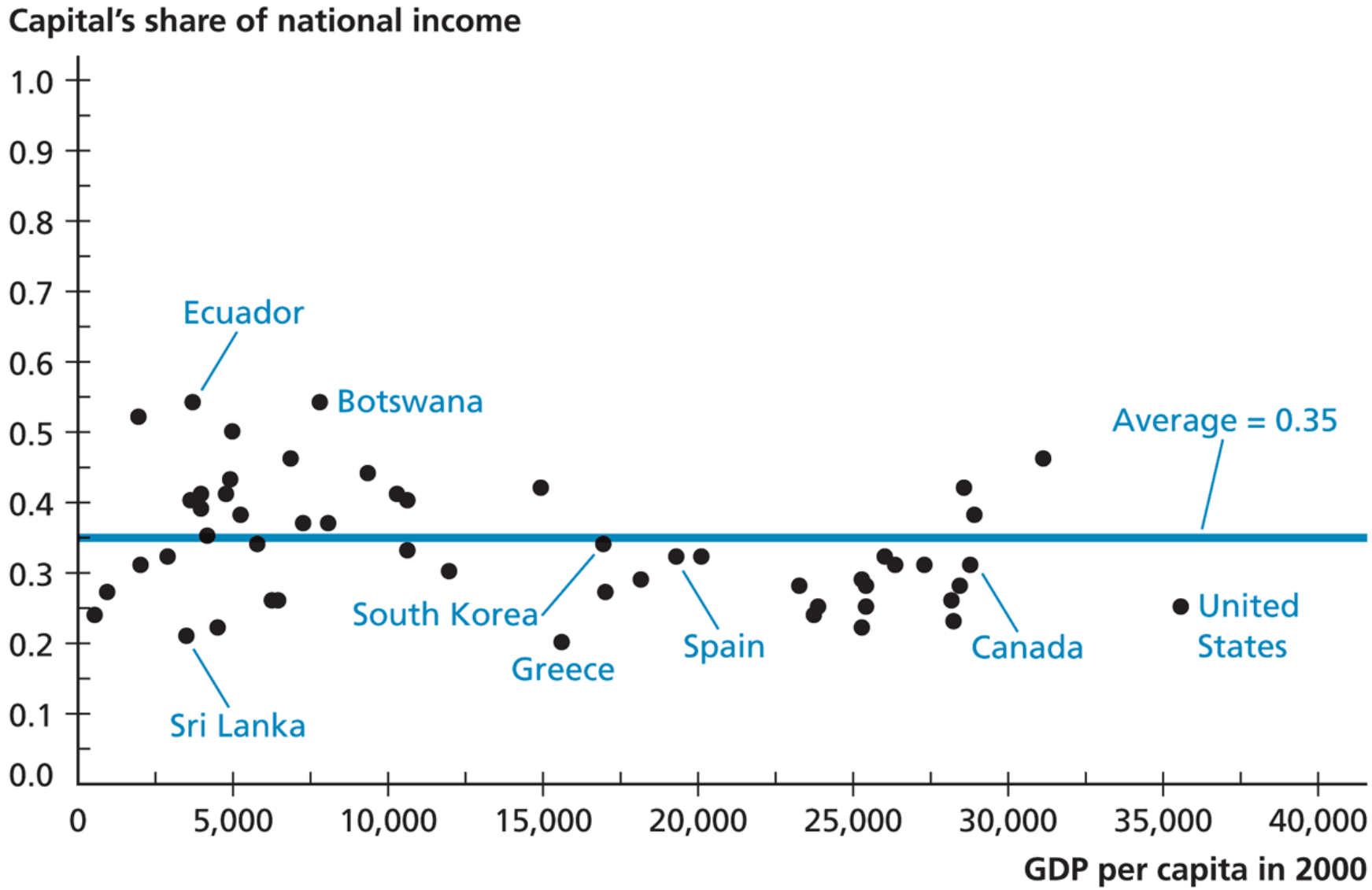
- The tools/objects that extend our ability to do work.
  - Factory machines, computers, trucks, tractors, buildings, roads, etc.

- Key characteristics of capital:
  - It is productive.
    - It is an input in the production of output.
  - It can be produced.
    - We can use capital and labor to make more capital.
  - Its use is limited (or rival).
    - Ideas and knowledge are not capital.
  - It can earn a return.
    - You have to buy or rent capital.
  - It wears out.
    - Depreciation.

The Solow Model

- The first big assumption: there is one good, Y, which we call output.
  - Empirically, think of GDP.
- This one good Y is produced using 2 factors of production:
  - Labor: the hours of work humans put in.
  - (Physical) capital.
- There is a production function that expresses the relationship between inputs (the factors of production) and output.

FIGURE 3.3
Capital's Share of Income in a Cross-Section of Countries



Source: Bernanke and Gürkaynak (2002), table 10 and note 18.

FIGURE 3.2
A Production Function with Diminishing Marginal Product of Capital

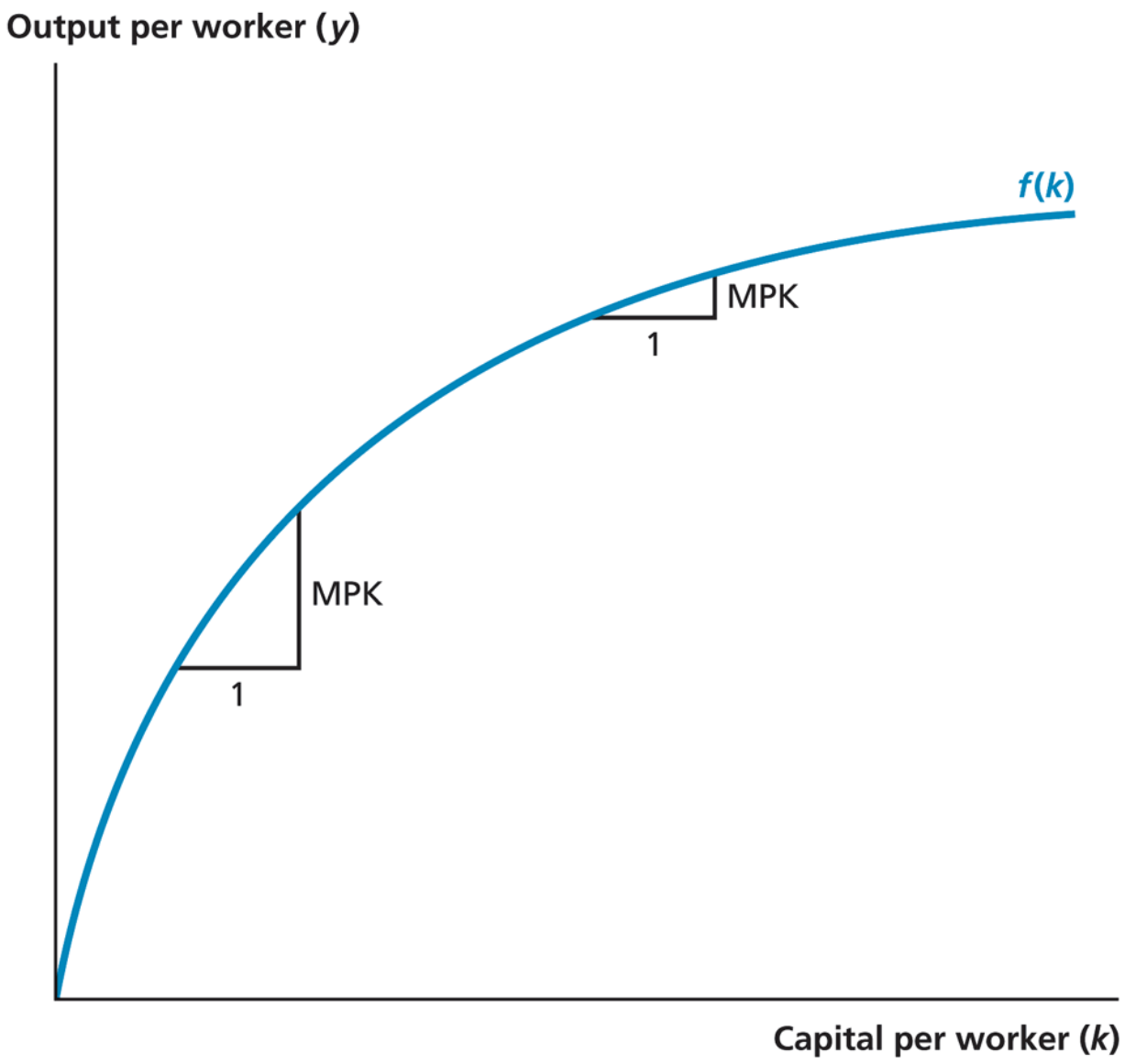
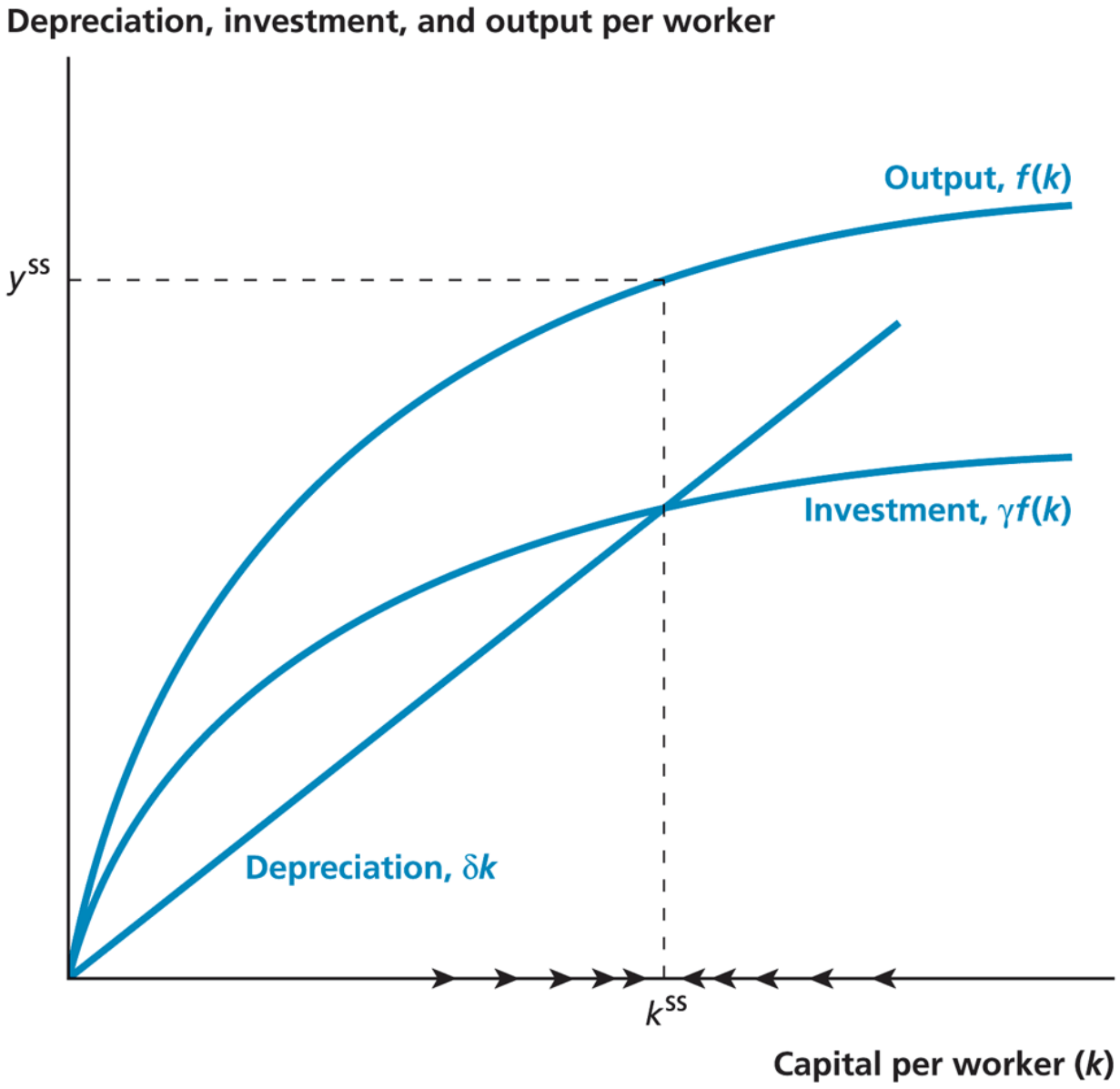
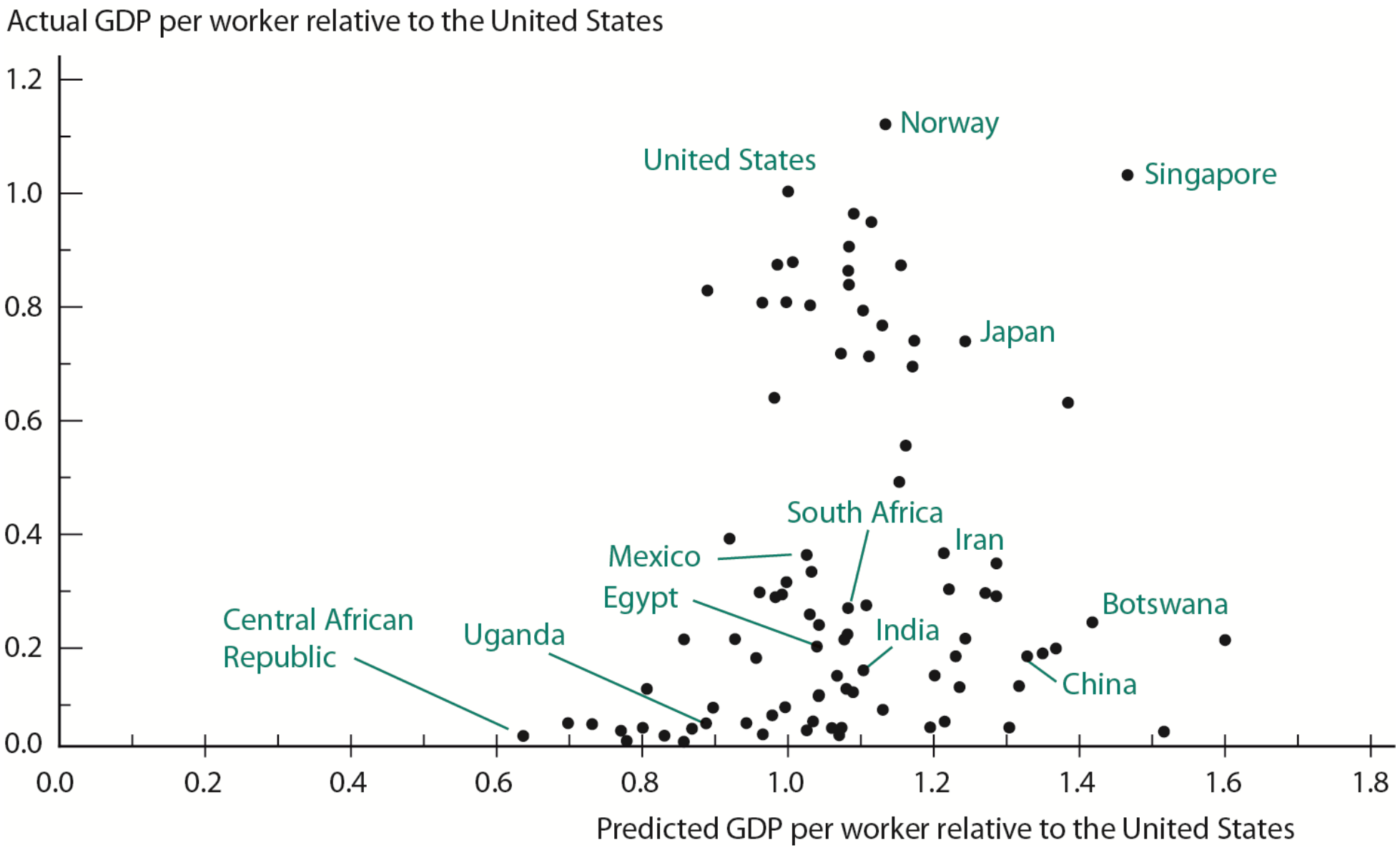
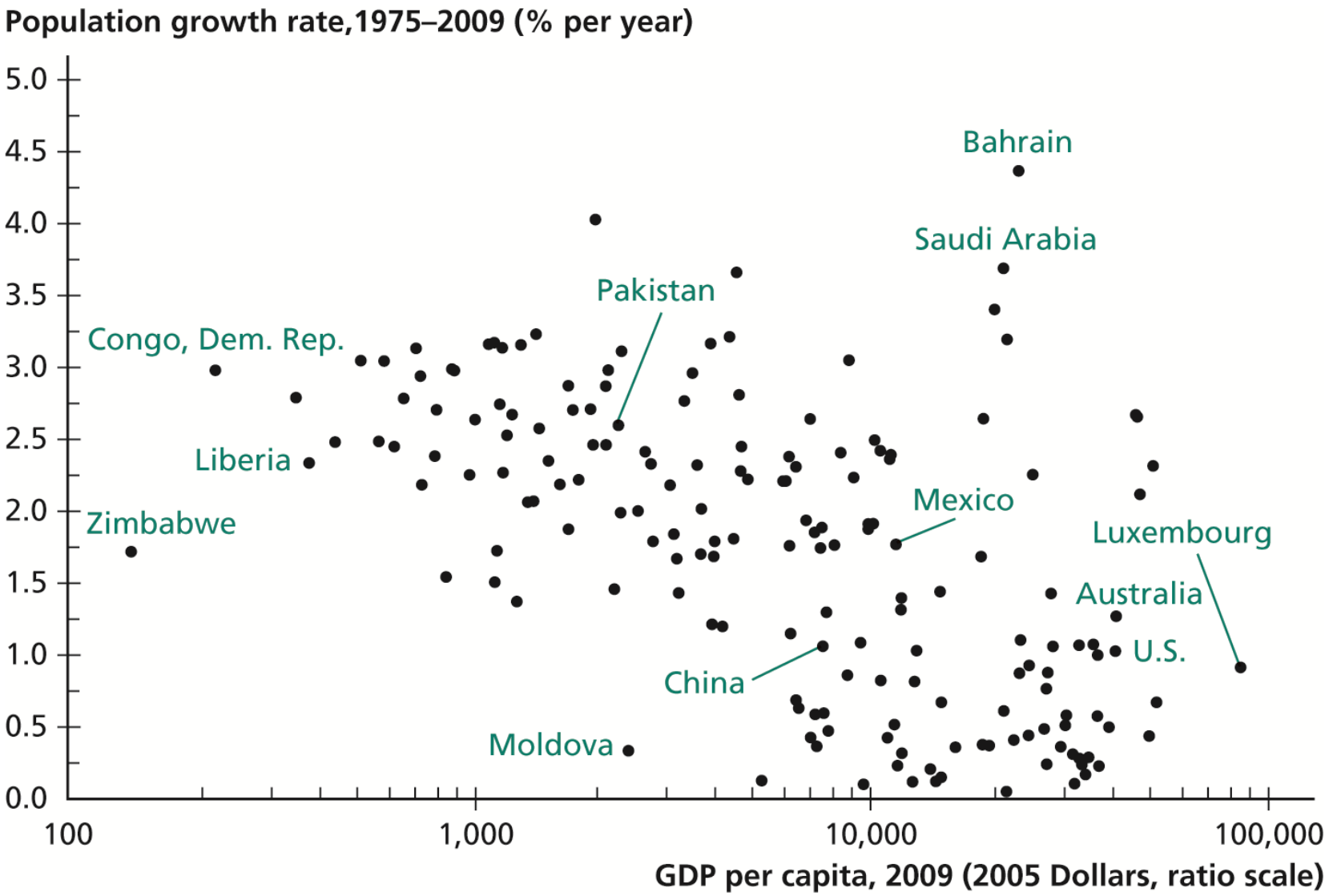


FIGURE 3.4
The Steady State of the Solow Model




Actual GDP per worker relative to the United States
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
Predicted GDP per worker relative to the United States
Norway
United States
Singapore
Japan
South Africa
Iran
Mexico
Egypt
Botswana
Central African Republic
Uganda
India
China


Population growth rate,1975–2009 (% per year)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Bahrain
Saudi Arabia
Pakistan
Congo, Dem. Rep.
Liberia
Zimbabwe
Mexico
Luxembourg
Australia
U.S.
China
Moldova
100
1,000
10,000
100,000
GDP per capita, 2009 (2005 Dollars, ratio scale)

Solow Model with Population Growth