EC566 – Macroeconomics for Business

Week 23 – Lecture 1

Economic Growth

L&C – Ch.26

B&P – Ch. 9

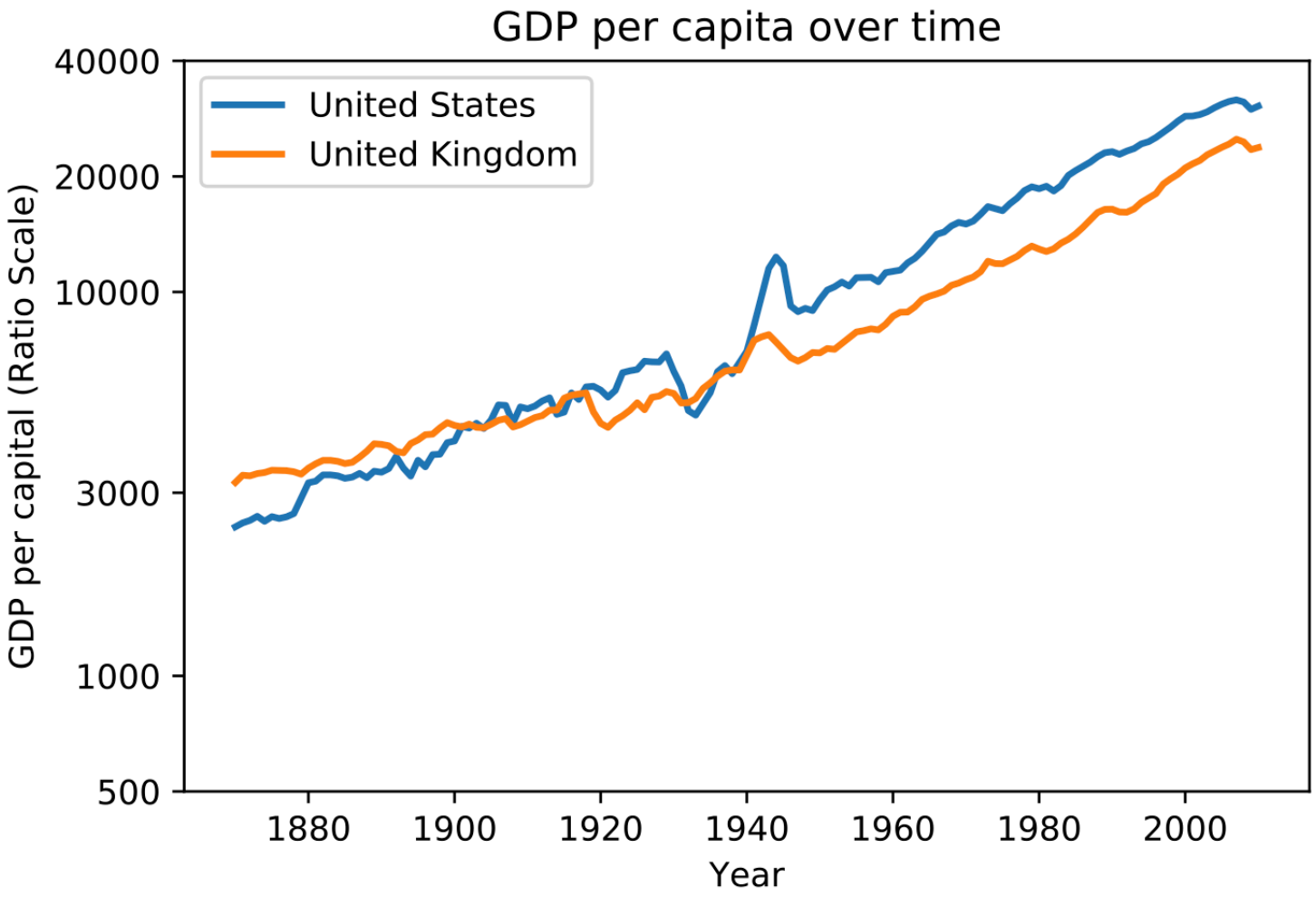
Economic Growth

- Increase in the amount of goods and services that an economy produces over a period of time.

- *Gross Domestic Product* (GDP) measures the value of all *final* goods and services produced over a period of time.

- We particularly care about growth real GDP per person (or per capita):
  - Real means adjusted by inflation
  - Per person adjusts for the size of the population

Real GDP per capita growth in the UK and US



Growth in the UK vs the US

- GDP / capita in 2009 was 12.3 times as large as GDP / capita in 1870 (US)
- 1.8% average growth per year [US]
- 1.5% average growth per year [UK]
- In 1870 the UK was 31% richer than the US, it was 19% poorer in 2009.

What promotes growth?

- Ratio employment/population = more workers
- Physical capital accumulation = more machines and equipment for production
- Technological progress = better machines and equipment
- Human capital accumulation (better and more education) = more productive workers

➢ Hence increase in income per capita comes from:

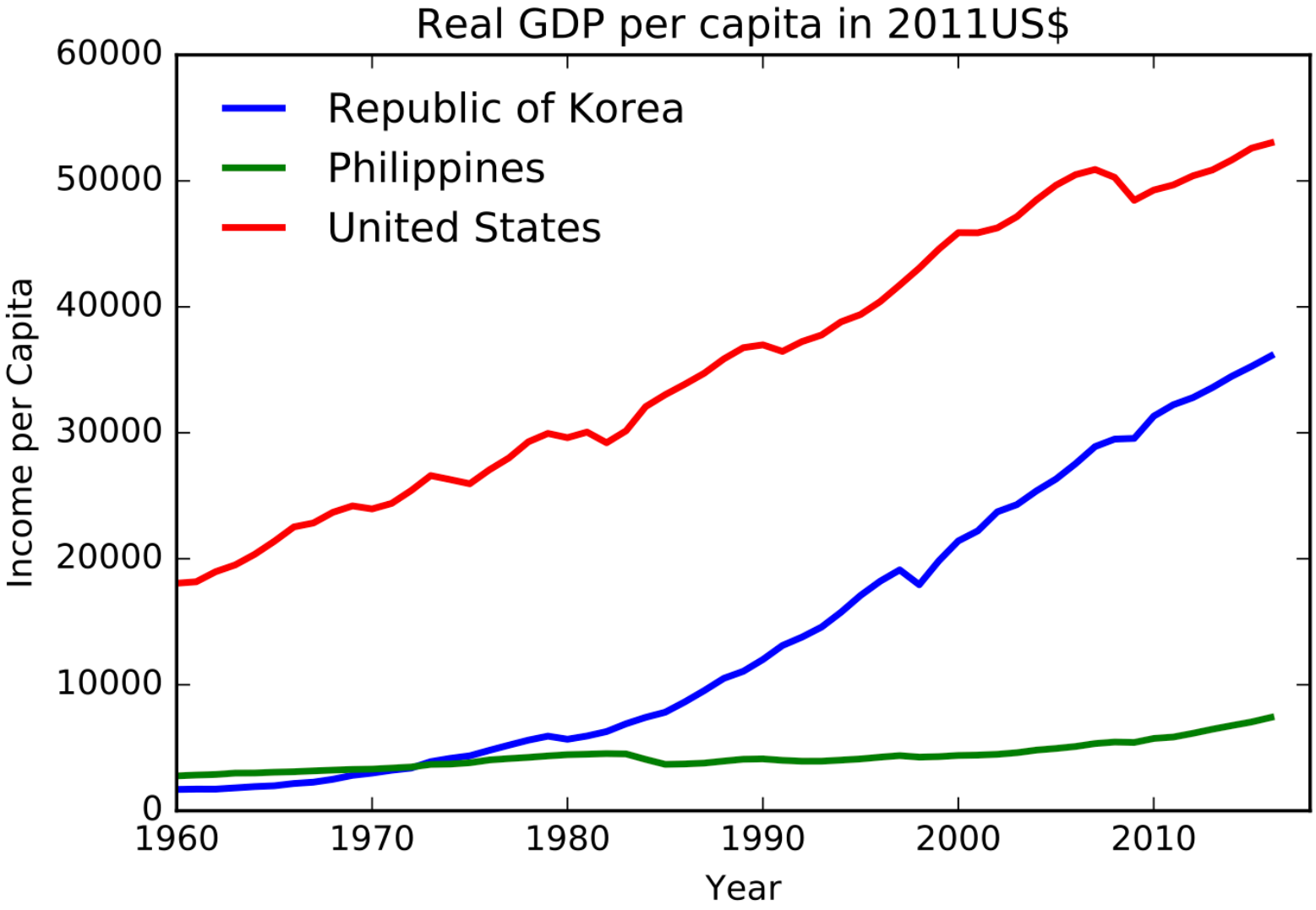
– Quantity of production factors (capital and labor):

- Increase in the number of workers (relative to population)
- Capital accumulation (i.e. increase in capital per worker) how important capital accumulation might be, let's look at the case of S. Korea and Phillipines.

South Korea vs. Philippines

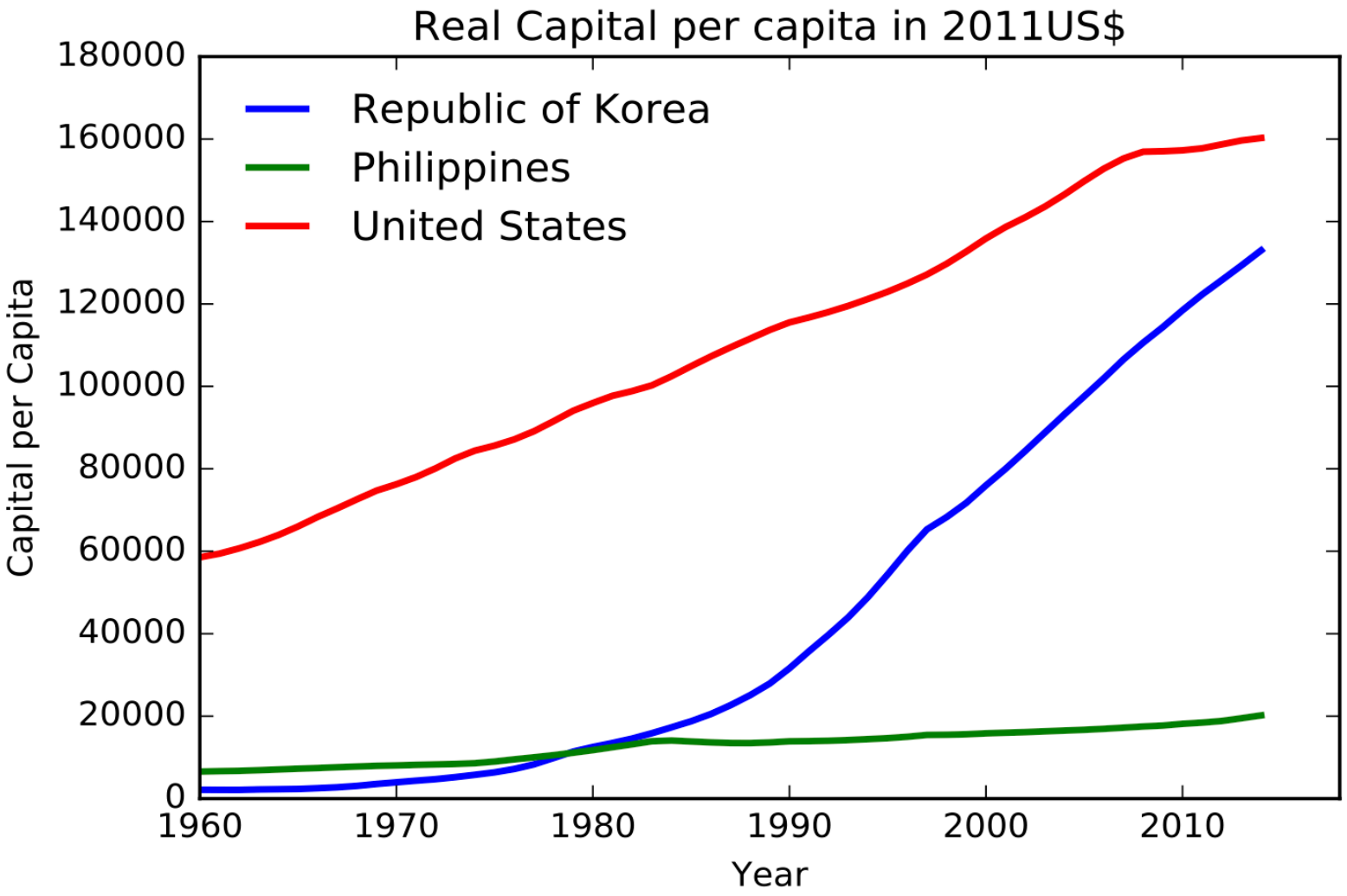
- In 1960, S. Korea and the Philippines were quite similar:
  - Per capita GDP: Both around $1,500 (about 9% of US)
  - Population: Both about 25 million, ½ working age
  - Similar sectoral composition (industry, agriculture)
  - College enrollment: S. Korea 5%, Philippines 13%
- From 1960 to 2016, macroeconomic performance diverged sharply
  - Ave. annual growth: S. Korea 5.7%, Philippines 1.7%
  - Per capita GDP today: S. Korea $36,000 (about 68% of the US), Philippine $7410 (14% of the US)

South Korea vs. Philippines



Maddison (2018)

South Korea vs. Philippines



Penn World Tables 9.0

Economic Growth

- This increase in income per capita comes from:
  - Quantity of production factors (capital and labor):
    - Employment/population ratio
    - Capital deepening
    - Human capital (education, health)
  - *Total Factor Productivity* which measures the state of technology)
    - Technological progress: Improving the efficiency with which an economy uses its inputs!
    - Growth in TFP represents output growth not accounted for by the growth in inputs.

Economic growth in developed countries

- In the post-war period:
  - Increase in Total Factor Productivity accounted for 50-70% of growth in GDP per capita.
  - Capital accumulation (more machines/equip. per worker) accounts for 20-30% (about 1/3 in the US).
  - The rest comes from more increases in the employment/ population ratio.

Growth Accounting

- Sources of the growth in potential output. potential output is determined by the production function
- $Y = A \cdot F(K, L)$
- From the production function it is clear that *Y* grows over time because

➢ Total factor productivity, *A*, grows over time (for reasons that are not entirely clear)

➢ The capital stock, *K*, grows over time (due to investment)

➢ The labor supply, *L*, grows over time (due to population growth, increases in participation rates)

- ***How much does each component contribute to the growth rate in output?***
- Growth Accounting answers this question.

Growth Accounting

- It can be written as:
- $\%\Delta Y = \%\Delta A + \alpha_K \cdot \%\Delta K + \alpha_N \cdot \%\Delta L$

- $\%\Delta Y$ is growth potential output per year,
- $\%\Delta K$ is growth in capital stock per year,
- $\%\Delta L$ is growth in labour supply per year,
- $\%\Delta A$ is the growth rate of technology (or what economists call **Total Factor Productivity**)
- **TFP** measures how <u>efficient</u> is the economy at putting together capital and labour in order to produce goods and services

Growth Accounting

- With constant returns to scale and competitive markets:
- α_K = capital's share of output
- α_N = labor's share of output
- $\alpha_K + \alpha_N = 1$

➢ **Implications**

- 1% growth in A = 1% growth in Y holding K & L fixed
- 1% growth in K = α_K % growth in Y holding A & L fixed
- 1% growth in L = α_L % growth in Y holding A & K fixed

Solow growth theory

- An increase in capital accumulation and labour force will increase the economic growth rate
- but only temporarily because of diminishing returns.
- Economy returns to steady-state growth path
- GDP grows at the same rate as the labour force and an additional factor reflecting improvements in productivity
- Once the steady-state is reached the economic growth rate can only be increased through innovation and improvements in technology.

Endogenous growth theories

- Paul Romer and Rober Lucas – 1980s
- Poor countries cannot simply catch up by adding capital – Govt. must provide investment in human capital and innovation
- Product and process innovation
- Increasing returns to scale from investment in technology
- R&D investment – a key source of technological progress

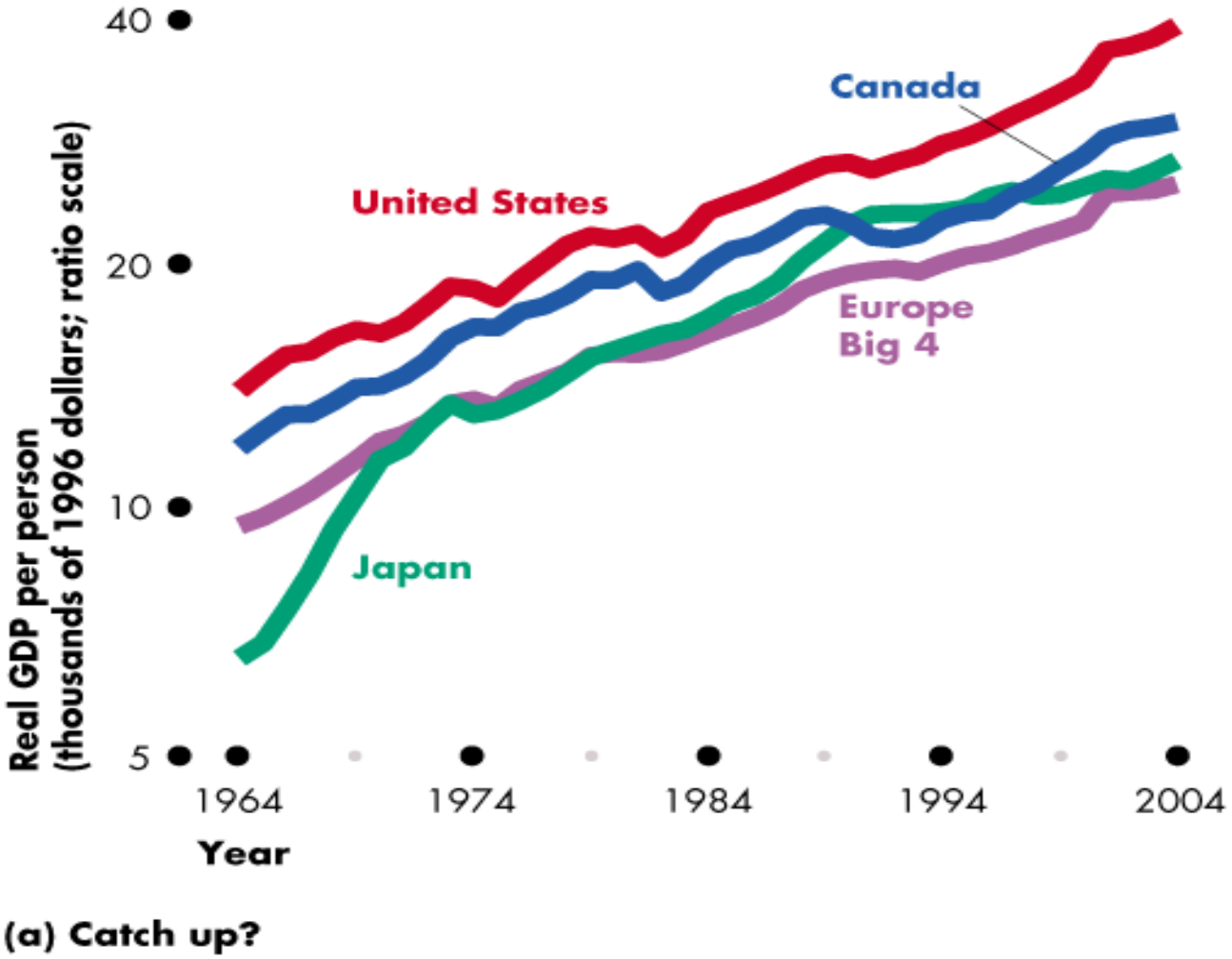
Catch-up or Convergence

- Theory predicts – narrowing of gap between poor and rich countries (poor countries have lower capital to start with and each additional unit of capital will have a higher return than rich countries – China growing at above 9% , UK at mere 2%)

- An important issue in debates about economic growth is whether growth depends on initial conditions

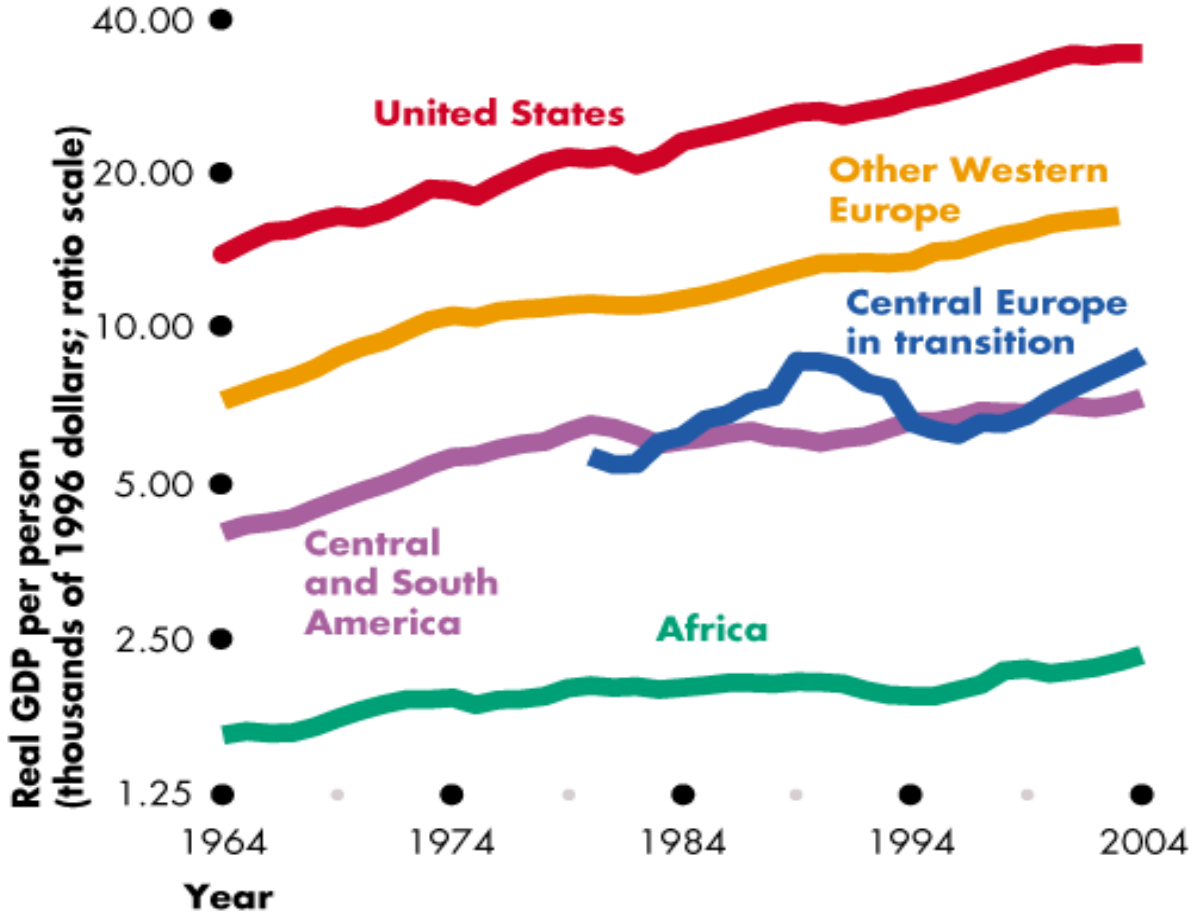
- In other words, will poor countries grow faster than rich countries, and catch them up eventually? Or divergence between rich and poor countries persists?

Economic Growth Around the World: Catch-Up...



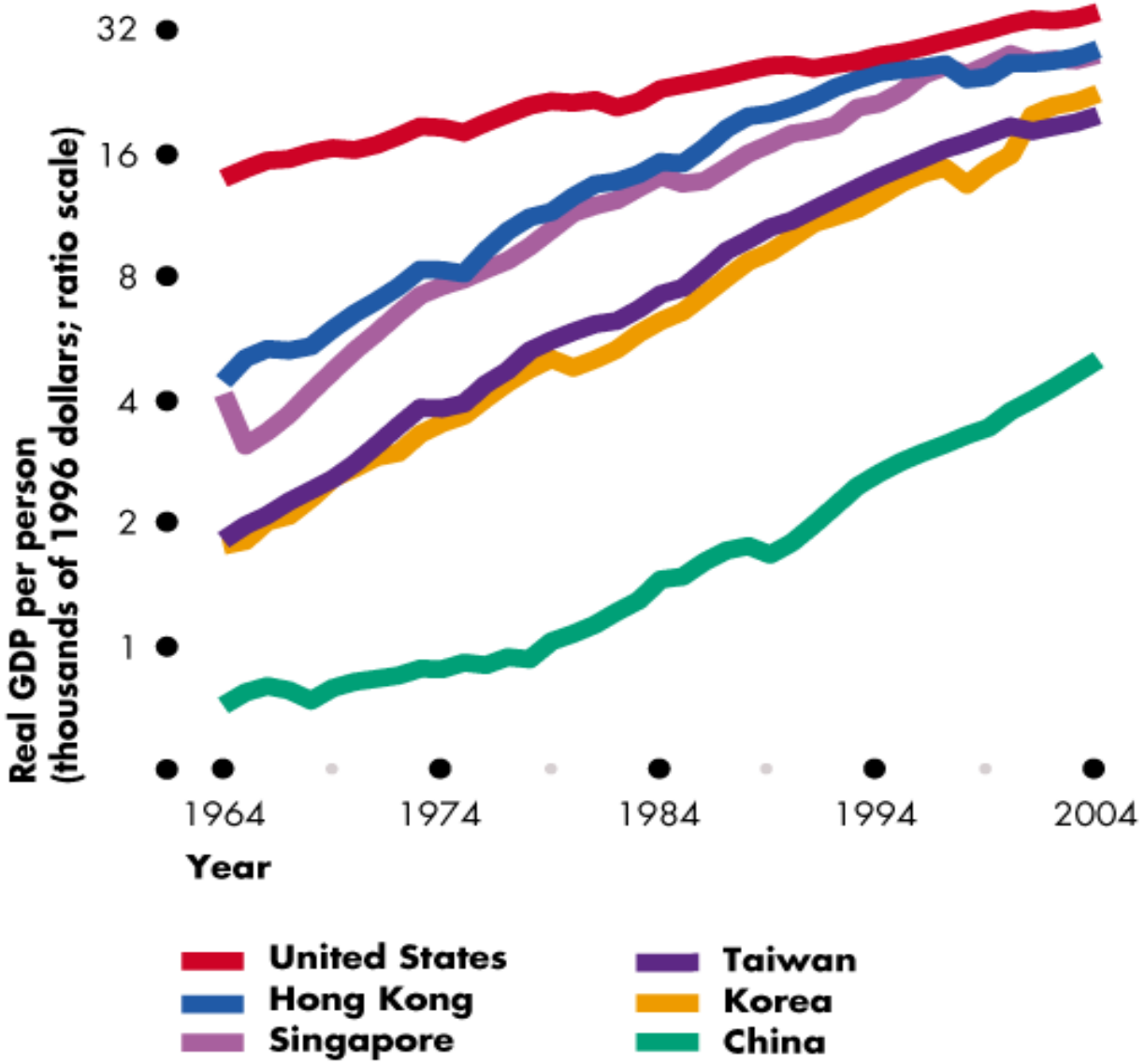
(a) Catch up?

Economic Growth Around the World: Catch-Up or Not?



(b) No catch up?

Catch-Up in Asia



Catch-up or Convergence

- The empirical evidence shows that relatively few poor countries have converged or are catching up
- Why have some countries like South Korea or Japan converged?
  - "Good" *fundamentals* or structural characteristics that affect the production structure of the economy.
  - There can be omitted factors of production (e.g., infrastructure), government policies, and institutions.
  - As a result, they have been able to attract capital, adopt new technologies, innovate, and invest in education.
- Why haven't other countries caught up?
  - "Bad" *fundamentals/institutions*: weak property rights, stringent regulations, bad govt policies, lack of competition, corruption, bad educational system, inefficient financial system, etc.

The role of institutions in economic growth

- Institutions can be understood as the formal and informal "rules of the games" that shape the incentives of economic agents.
- Incentives determine economic agents' choices and behaviour.
  - In particular, incentives influence investment in physical and human capital and innovation, and the organization of production.
- One important institution is the rule of law that leads to well-defined property rights. Without property rights, agents have no incentive to accumulate physical and human capital and adopt more efficient technologies.
  - That's why countries with high levels of corruption, crime and expropriation tend to have lower growth.
- In general, institutions that promote economic freedom tend to foster economic growth. That's why excessive government regulations (e.g. restrictive labour regulations) tend to hurt growth.

Why do we care about economic growth and GDP per capita?

- The level of GDP per capita tells us how prosperous a country is.

- GDP per capita and development have a strong relationship:
  - Life expectancy
  - Infant mortality
  - Poverty
  - Literacy rates
  - Access to clean water
  - Access to health services

The path to development

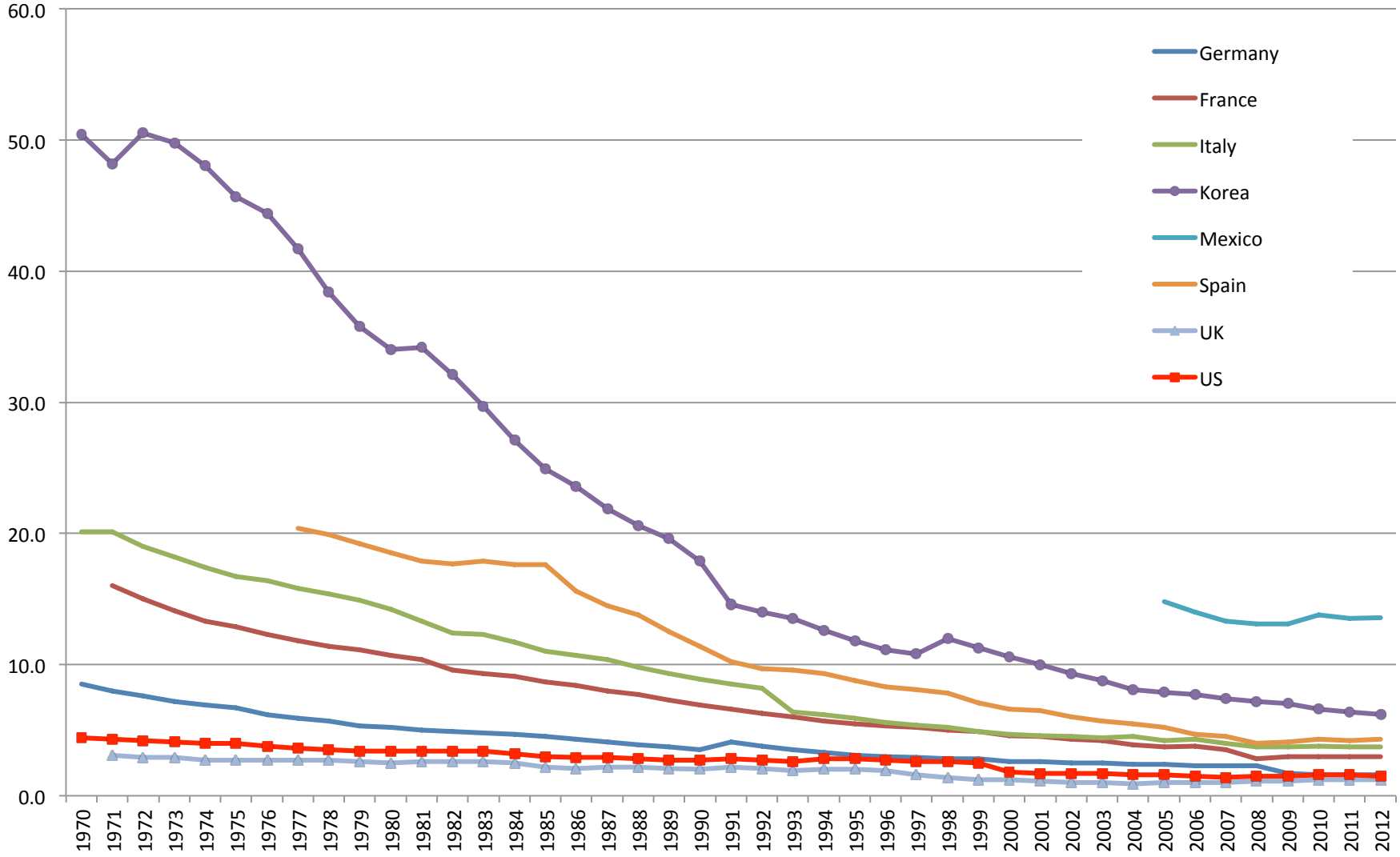
- How can the poorest economies escape under-development?
- Let's first consider the structure of their economies:
  - rural/agricultural economies
  - Most people work in the agricultural sector
  - Low productivity in the agricultural sector

Structural Transformation

- The sectoral composition of developed countries has not always been like this!

- Agriculture used to be quite important:
  - In Germany, 62% of the workforce was employed in agriculture in 1800.
  - In the US, agriculture employed about 70% of the workforce in 1840 (roughly 50% of GDP).
  - Not so long ago, in 1970, S. Korea employed about half of its workforce in agriculture!

Share of employment in Agriculture by countries (1970-2012)



‘Bads’ of Economic Growth

- Negative externalities of Economic Growth:

- Pollution
- Global warming
- Environmental degradation
- Deforestation
- Unequal distribution of resources –poverty

- Per capita GDP or Happiness – Is higher GDP Per capita equivalent to happiness
- Happiness index

Summary

- Sources of growth
- Theories of growth
- Variation in economic growth of economies
- ‘Negatives’ of growth