Lectures on Economic Growth

Topic: An Introduction to Growth

an upper intermediate course offered at the 7th semester at the

Economics Department, University of Piraeus

Literature

- David N. Weil, Economic Growth, 2005.
- Complementary texts by Jones and Barro & Sala-i-Martin.

Topics

Important questions to answer in this course:

- What determines an economy's ability to produce?

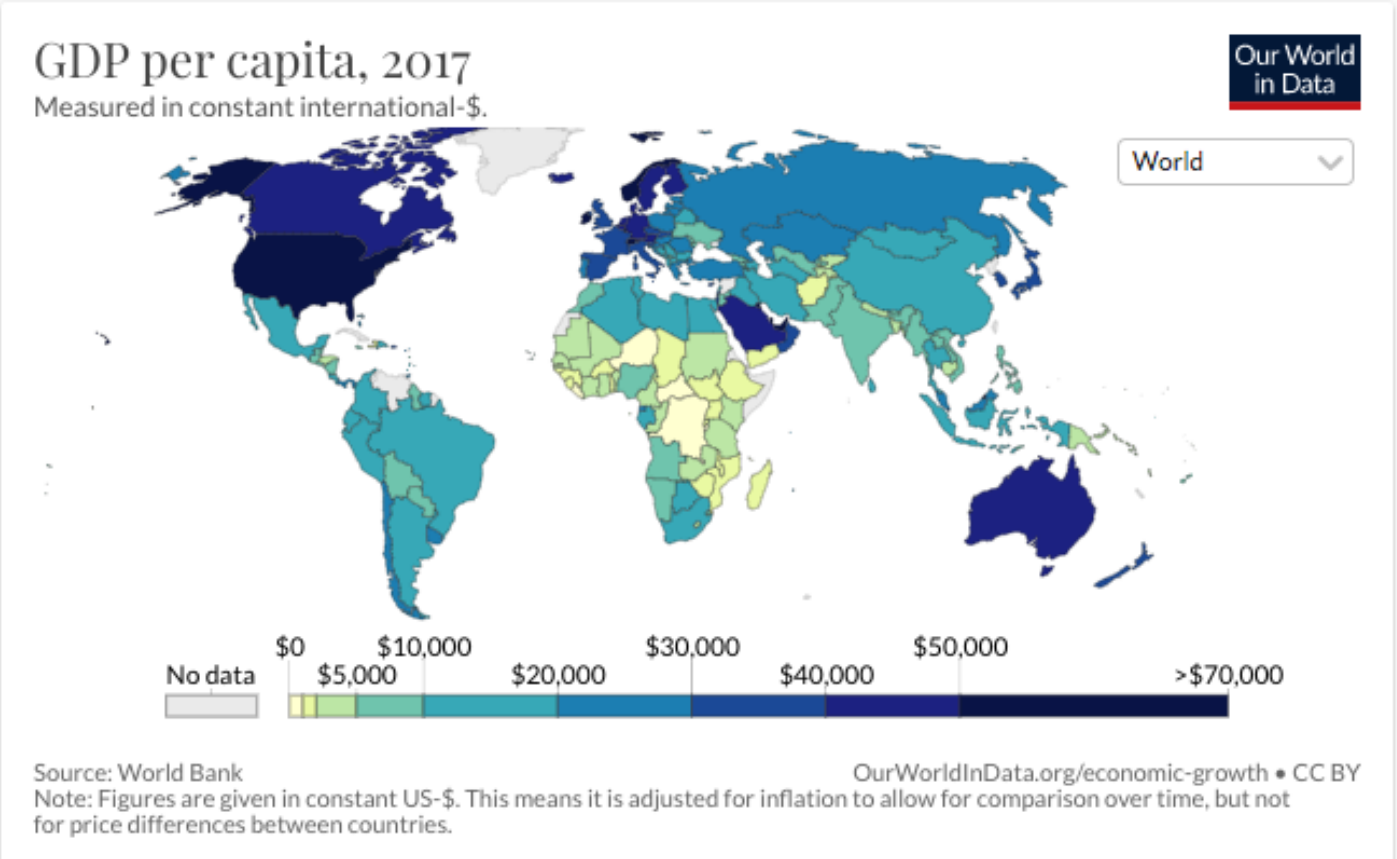
- Why some countries grow faster than others?

- What are the sources of growth?

- History: track record
- Models: explanation
  - Solow's model
  - Endogenous growth models
    - Technology
    - Demographics
    - Government
    - Culture
    - Geography (climate)
    - Resources

Do all countries grow alike?

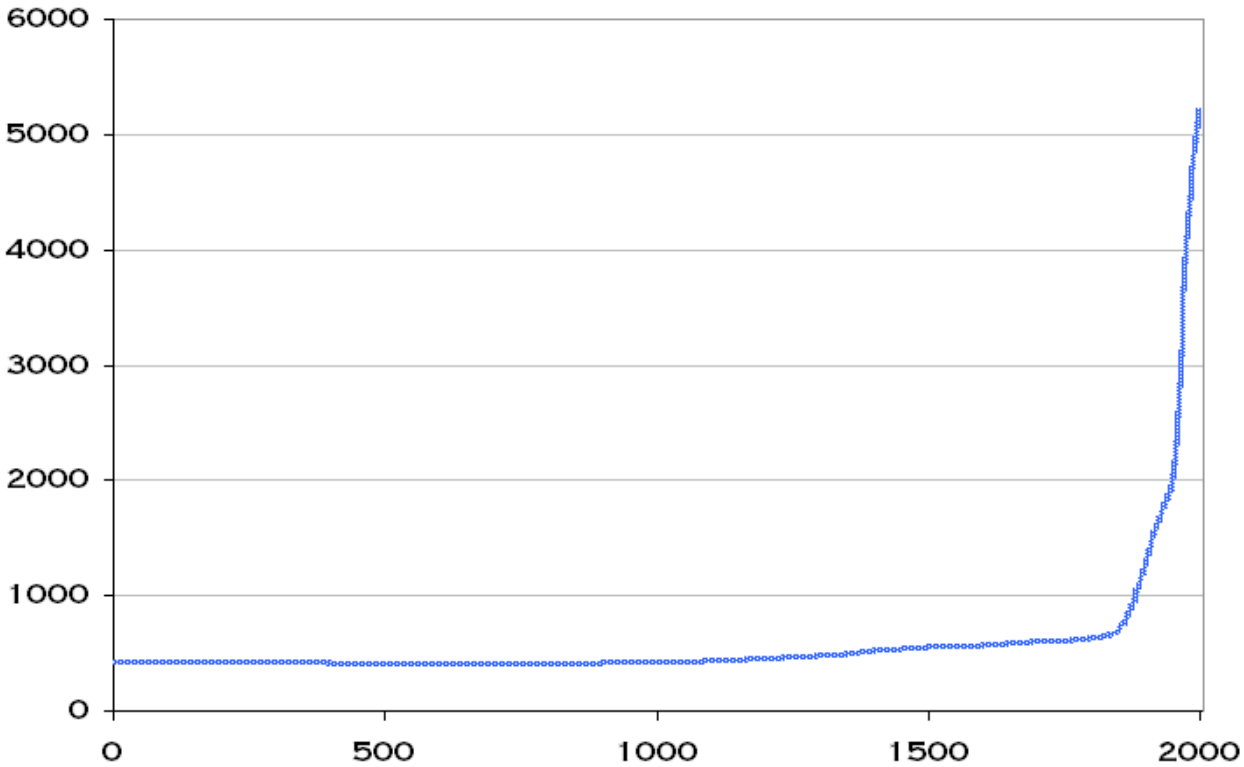
GDP per capita (2017 PPP)



Source: World Bank.

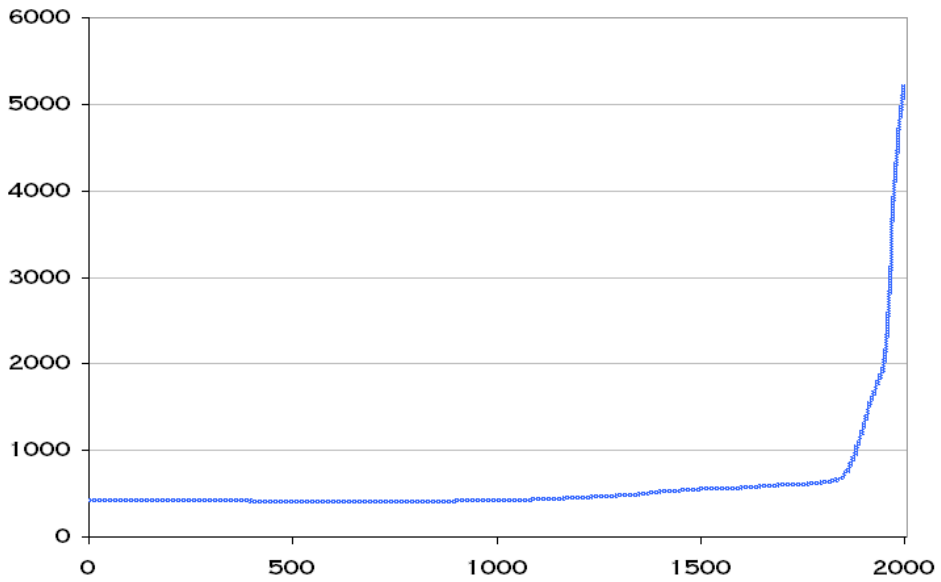
The amazing story of world growth

Real per capita GDP, 0–2000



Source: Bolt, J., and J. L. van Zanden. 2013. "The First Update of the Maddison Project: Re-Estimating Growth Before 1820." Maddison Project Working Paper No. 4.

The amazing story of world growth



- Is this really true?
  - How do you compare income across time?
  - How do you compare income across countries?
- What causes growth?
- Will it run out?

Income across time

Some say that the figure understates the effect of growth as it fails to take into account increases in product variety:

Source:

wikipedia.org

Nathan Mayer Rothschild, the richest man in the world in the first half of the nineteenth century, died of an abscess that could have been cured with less than $10 of antibiotics and fifteen minutes of a nurse's time today (Landes 1998, quoted in DeLong 1998).

Data over time

As in indicator of productivity, we look at GDP per capita. But....

- Regular GDP data includes only formal activities
  - Cannot do too much about this, but the fact should be recognized. Some datasets correct for it.
- Nominal data (in current prices) is subject to inflation.
  - Correct by dividing out the level of prices: real GDP per capita
  - But this poses problems:
    - You can look at the price of a basket of goods,
    - but the basket changes through substitution when prices change, and through innovations
    - and there may be changes in quality or product characteristics.
  - This means that inflation is usually overstated.

Example: shifting baskets

Construct a price index between 2000 and now.

1. Pick a basket of items, give them weights
2. Collect their 2000 and 2020 prices
3. Compute the 2020 index:

$$P = w_1 \cdot \frac{P^1_{2020}}{P^1_{2000}} + w_2 \cdot \frac{P^2_{2020}}{P^2_{2000}} + \dots$$

but what weights?

Between 2000 and 2020, the consumption bundle has changed, due to

- innovations
- price developments

Three methods:

There exist three methods to construct the weights of different components

- Laspeyres: Use historical weights (what do the old products cost now?)
- Paasche: Use current weights (what would today's consumption have cost then?)
- Fisher: Take the geometric average of the above

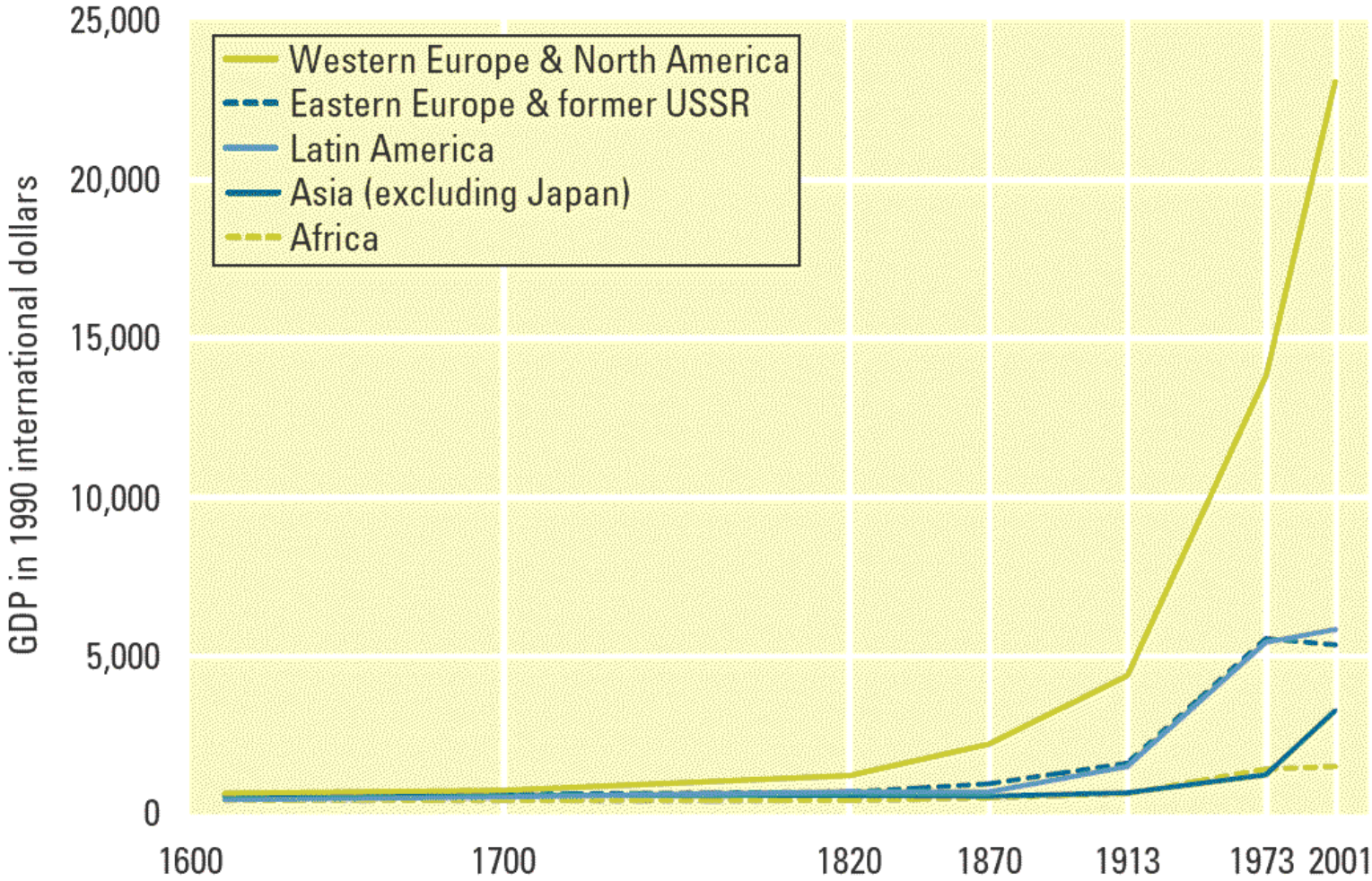
$$P^F = \sqrt{P^L \cdot P^P}$$

In long time series, we usually see chained price indices, which allows for new products:

$$P^F_{3,\text{base } 0} = P^F_3 \cdot P^F_2 \cdot P^F_1$$

Different growth experiences

Growth has been very different across countries:



World Development Report siteresources.worldbank.org/INTWDR2005/Resources/complete_report.pdf

Comparing different countries

Often, (market) exchange rates miss the actual difference in price level due to nontraded goods.

TABLE 1.2
Production and Prices in Richland and Poorland

Country	Production of Televisions per Capita	Production of Haircuts per Capita	Price of Televisions in Local Currency	Price of Haircuts in Local Currency	GDP per Capita in Local Currency
Richland	4	40	10	2	120
Poorland	1	10	10	1	20

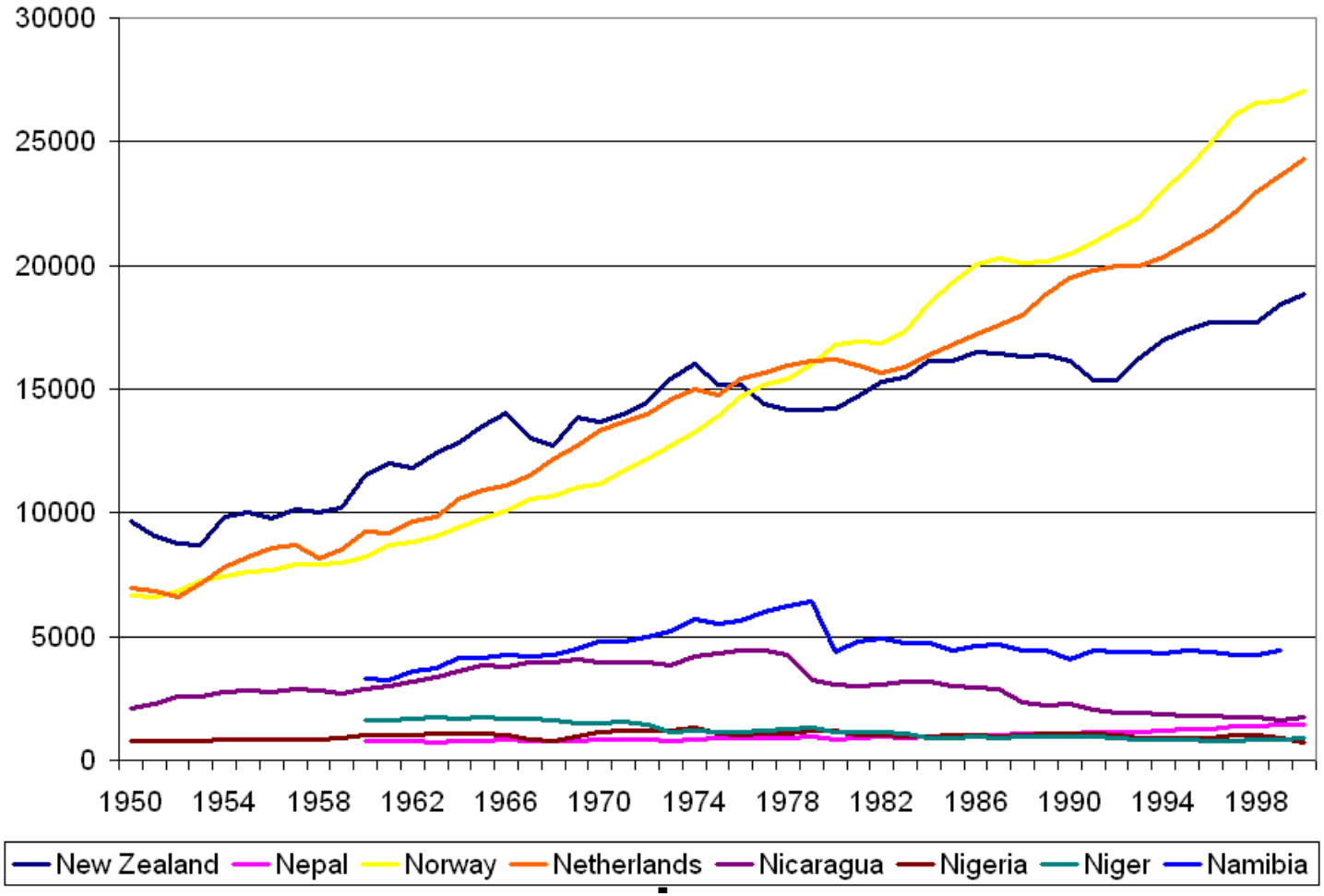
The market exchange rate is 1. Compare a consumption package including nontradeables for the PPP rate, 1.5.

TABLE 1.3
The Effect of Using PPP on Comparisons of GDP

Country	GDP per Capita in 2000 Using Market Exchange Rates (dollars)	GDP per Capita in 2000 Using PPP Exchange Rates (dollars)
United States	35,587	35,587
Japan	37,560	26,375
Germany	22,700	24,430
Argentina	7,675	11,765
Mexico	5,922	9,366
India	450	2,650

Penn World Tables

This gives us the Summers-Heston Penn World tables:



Unfolding the story....

To answer such questions, think of a typical production function:

$$Y = Af(K, N)$$

where,
Y: output;
A: productivity (technology x efficiency);
f: how K and L are combined;
K: physical capital stock;
N: employees (note: N or L may be used interchangeably through out our analysis - both denote employess)

Unfolding the story....

- Technology is shaped by Government's policies (R&D, tax breaks, education, trade) and laws (IPR);
- Efficiency is shaped by Culture and training & education (which is shaped by Government?s policies);
- Capital stock is shaped by Investment, which in turn by Saving, which in turn by Institutions and Culture;
- Labor is shaped by population policies, education: Government?s policies;
- In all above: Geography (climate) and Natural Resources play an important role!

  All above are sources of growth; however, (type of) Government, Culture, Geography and Natural Resources are fundamental sources of growth.

Economic growth vs. economic development

- Economic growth concerns with the performance of real national income (national output).
  - Measures of economic growth will look at GDP (or GDP per capita) growth. This is, $\frac{(Y_t - Y_{t-1})}{Y_{t-1}}$x100%, where Y is either GDP or GDP per capita (i.e., GDP/population).
- Economic development is concerned with how people are actually affected. It looks at their actual living standards and the freedom they have to enjoy a good standard of living.
  - Measures of economic development will look at: Levels of literacy and education standards; Levels of healthcare e.g. number of doctors per 1000 population; Quality and availability of housing; Levels of environmental standards; Life expectancy, among others.
- Ceteris paribus, we would expect economic growth to enable more economic development.
  - Higher real GDP enables more to be spent on health care and education. However, the link is not guaranteed. The proceeds of economic growth could be retained by a small wealthy elite.

A road map of what lies ahead in this course

- Discuss the role of capital and labor (and population , in general) as important sources of growth.
- Unfold the fundamental sources of growth (i.e., what is behind capital and labor), which are government, culture, geography and natural resources.