Economic Growth

EC 103–002

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Motivation

Housekeeping

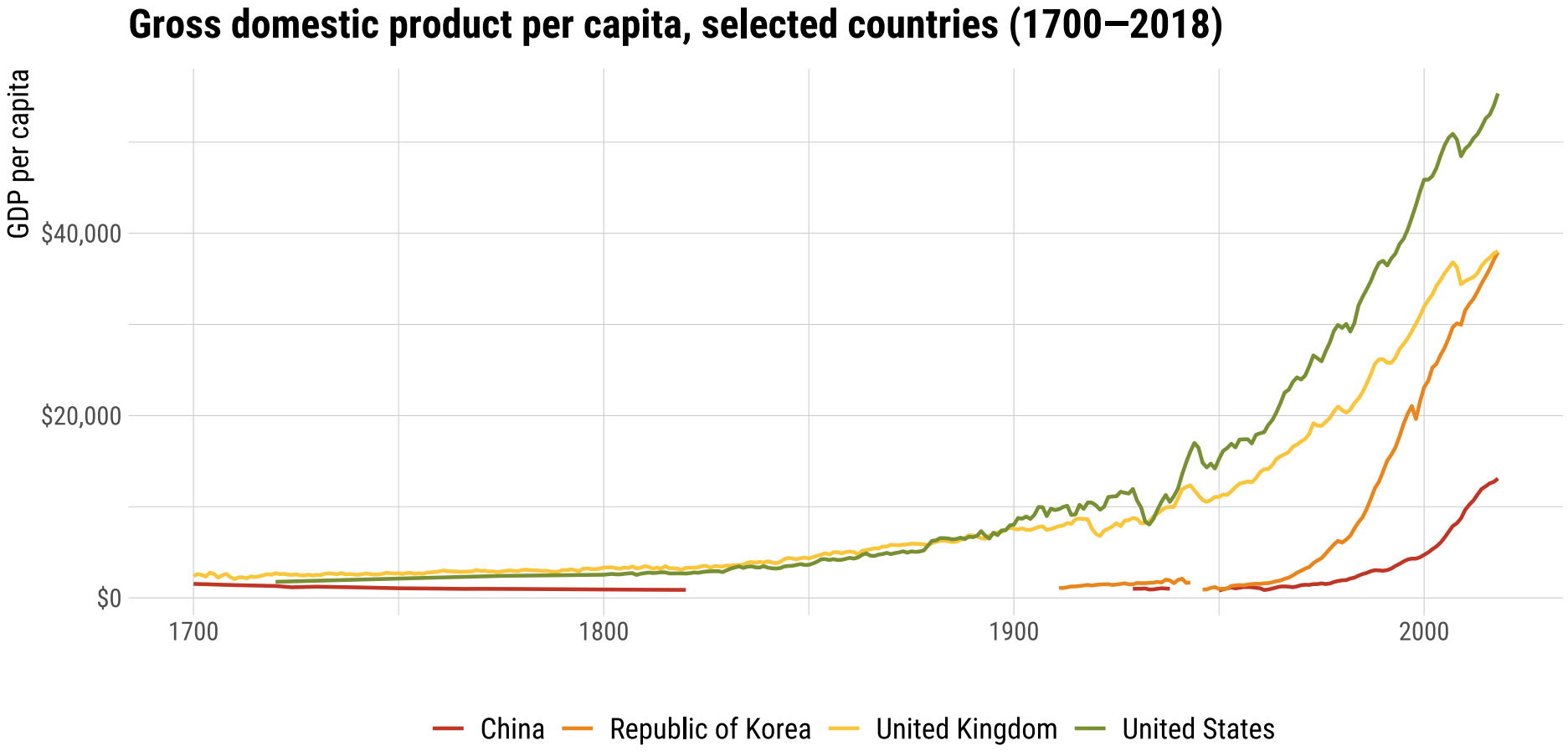
- **Required reading**:
  - `OpenStax, ch. 7`.

Growth: A recent phenomenon

In human history, economic growth is a relatively **recent** phenomenon.

Now that we have studied what is the main measure of economic performance, we can come back to the "*hockey stick*" chart from previous lectures.

Growth: A recent phenomenon



Growth: A recent phenomenon

Measuring **GDP *per capita*** (i.e., *GDP/total population*) is a valid (but rough) measure of a nation's overall standard of living, as it measures much output each individual would receive in case total output were evenly divided across society.

If, instead, we turn our attention to economic growth, the concept of **output per worker** seems more appealing.

- Think about for **how long** your parents/grandparents had to work in order to afford basic goods, such as food and clothing.
- It is very likely that you will have to work relatively **less time** to afford the same things—and probably with a higher *quality*!

The **main reason** why this happens is because **output per worker** has been increasing over time.

Growth: A recent phenomenon

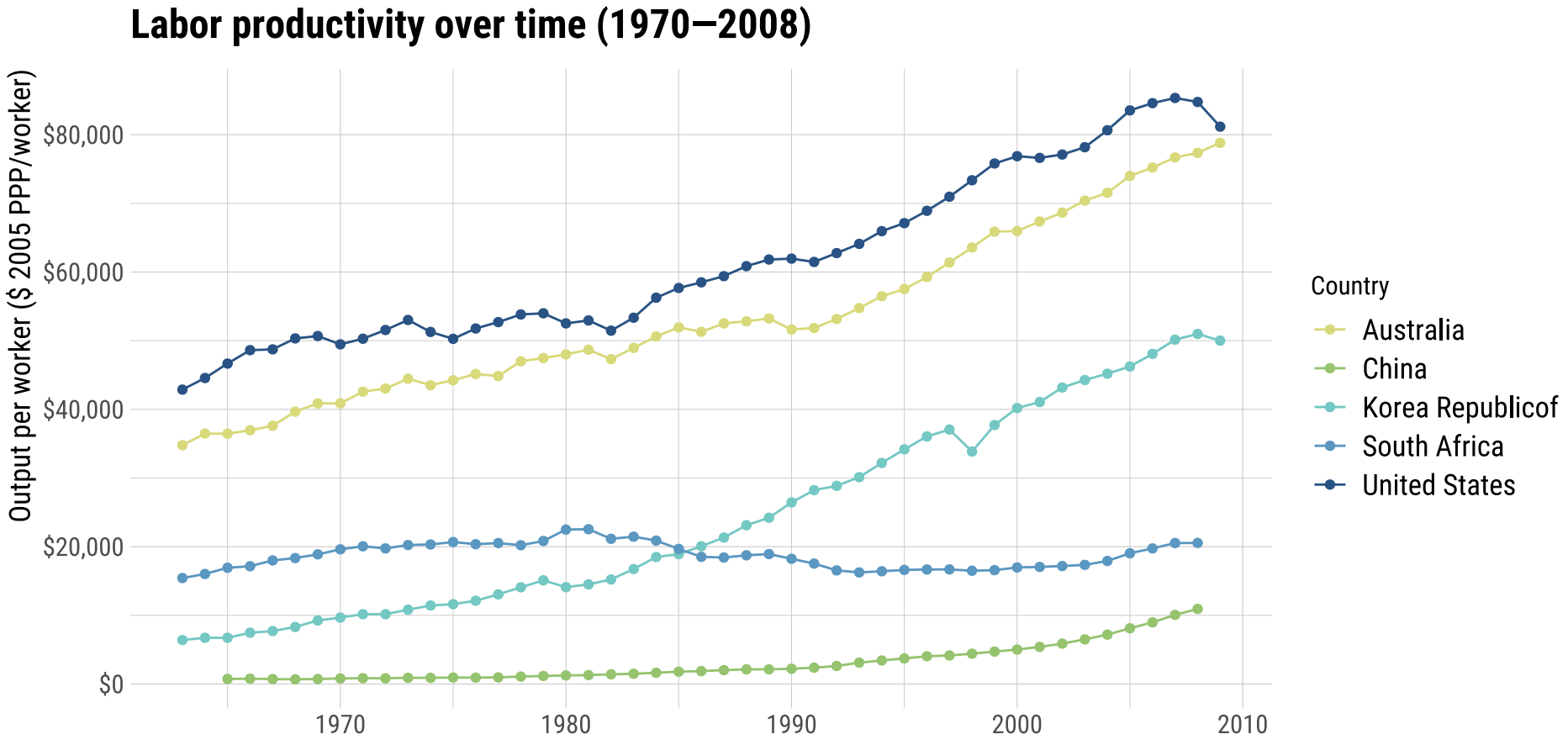
Output per worker measures how much output each worker, on average, is producing.

- It is **not** the same as output per worker, since not everyone in the population *formally* works.
- Also, output *per capita* may *fall* while output per worker is *increasing*!

Given its definition, another way to call output per worker is **labor productivity**.

- But **why** has labor productivity increased?
- And what **factors** allow for a *sustained* growth in output per worker?

Growth: A recent phenomenon



Components of economic growth

Components of economic growth

We all understand that a *steady* increase in GDP over time implies an economic growth path.

But what makes the economy ***actually*** grow?

Among others, we may highlight a few important **components** of economic growth:

1. Physical capital (infrastructure);
2. Human capital;
3. Technology.

Components of economic growth

Physical capital includes the overall infrastructure firms and government use to create and distribute their production.

- This infrastructure ranges from firm plants, physical equipment (e.g., machinery), roads, ports, etc.

Not only can a larger and better infrastructure increase the *quantity* of output generated, but also its *quality*.

Examples?

Components of economic growth

Human capital embraces the *skills* and knowledge that allow workers to increase their dexterity and, consequently, their productivity.

If the amount of physical capital is held *fixed*, a more **skilled** worker can produce *more* output using the same structures relative to a *less* skilled one.

`Our World in Data: Literacy`

Components of economic growth

Technological improvement is way more than inventing newer machinery, or creating better smartphones.

New forms of organizing production are **also** technological improvements.

When the **quality** of machinery and other production equipment increase, we call it **embodied technical change**.

- Faster computer chips, fuel-efficient cars,...

Even if the quality and quantity of physical capital remain the same, labor productivity may still increase due to **changes** in the production process.

- This is known as **disembodied technical change**.

Components of economic growth

Technical change generally takes place in **two** stages:

- Invention;
- Innovation.

An **invention** involves knowledge advancements.

When this new knowledge is put into production—to develop new products or to make existing processes more efficient—we have an **innovation**.

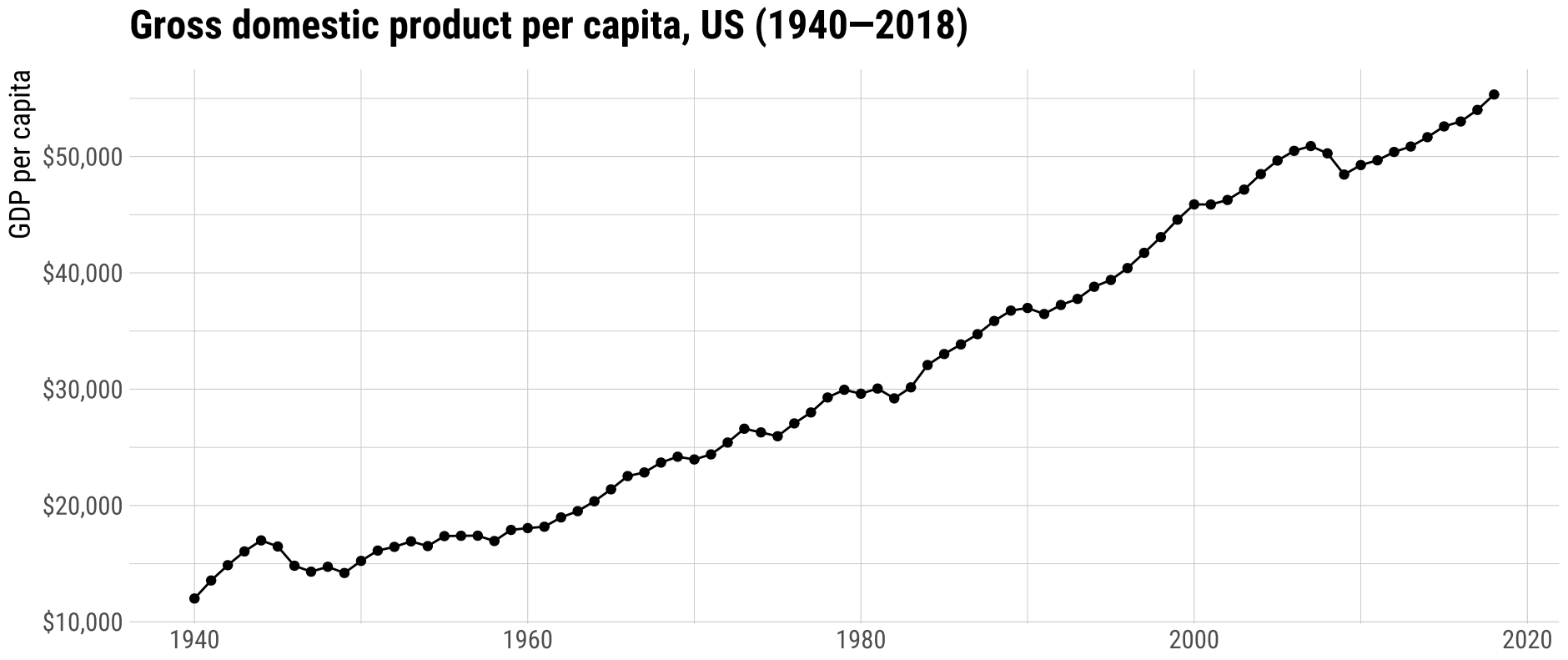
A great way of looking at how a country values investing is research is to verify the **share** of GDP spent on Research & Development.

- `Data from OECD`

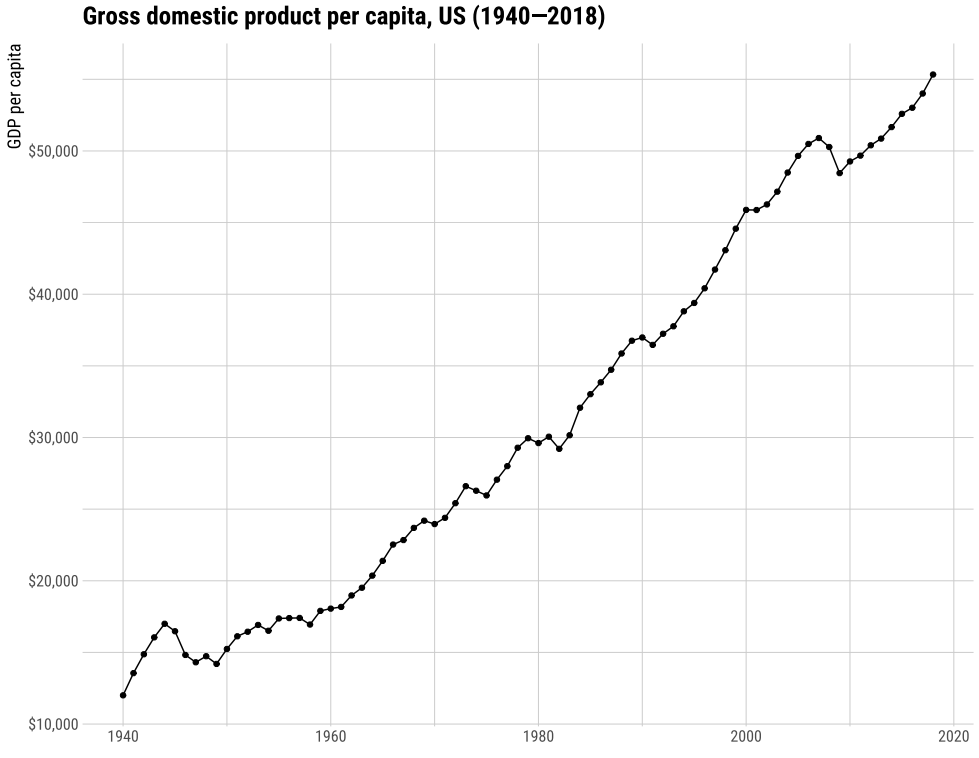
Calculating economic growth

Calculating economic growth

Starting from:



Calculating economic growth



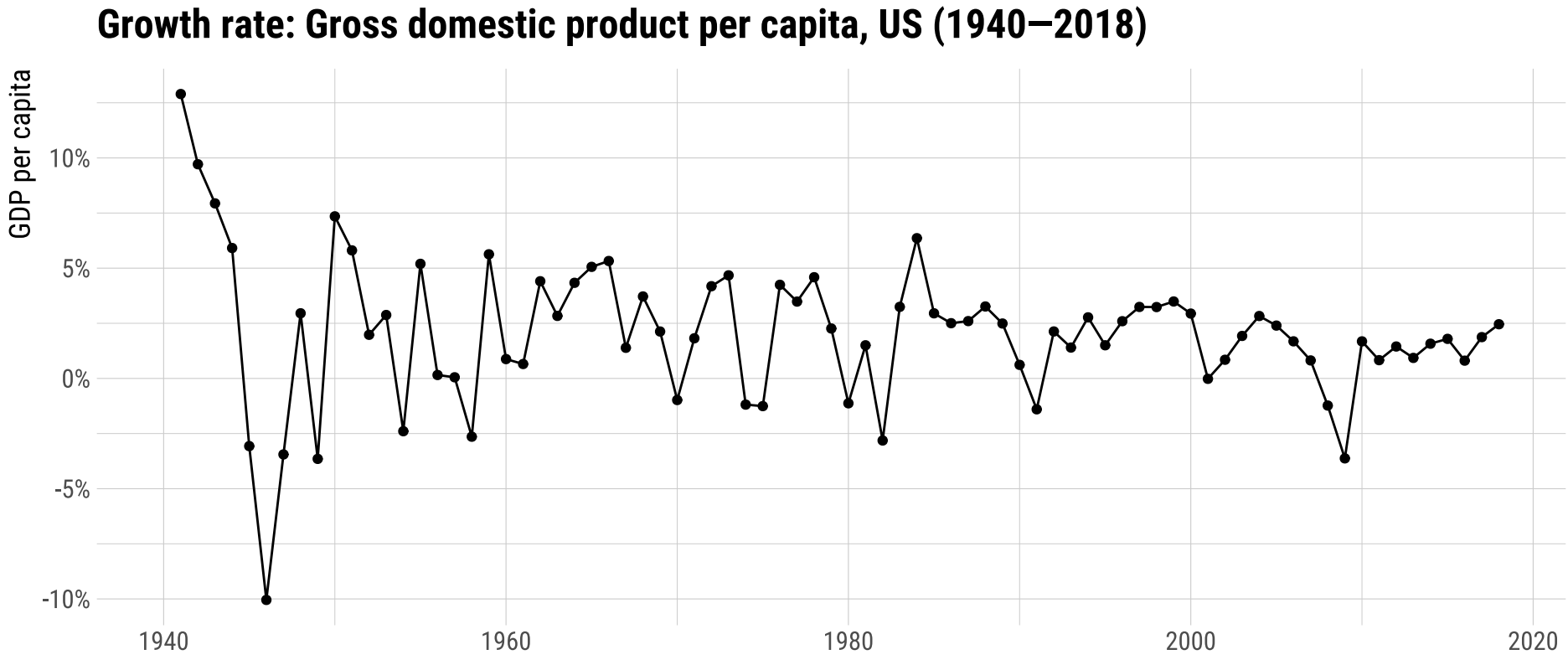
Looking at this measure in **levels** shows the overall long-run process of economic growth.

But if we would like to know what was the **growth rate** over time, we need to compute these rates from the data in levels.

$$\text{Growth rate (\%)} = \frac{\text{Final Period - Initial Period}}{\text{Initial Period}} \times 100$$

Calculating economic growth

Then, from the first chart, we can calculate the year-to-year growth rate in GDP per capita:



Calculating economic growth

From our previous lecture,

Quarter	Nominal GDP	GDP deflator
2008q1	14373.9	1.08
2008q2	14497.8	1.08
2008q3	14546.7	1.09
2008q4	14347.3	1.09
2009q1	14178.0	1.10
2009q2	14151.2	1.10
2009q3	14242.1	1.10
2009q4	14453.8	1.10

Calculate the **growth rate** of nominal GDP between the first and the last periods.

Next time: Growth discussions