

# An Introduction to Macroeconomics

Samuel Obeng

University of Warwick

Warwick Pre-University Summer School

# Intended Learning Outcomes

The Intended Learning Outcomes (ILOs) of this course are:

- ① learning some definitions and basic economic concepts
- ② discovering some empirical facts about economies
- ③ getting a basic understanding of macroeconomics
- ④ representing an economy by a model

# Introduction

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- Why are there fluctuations in aggregate economic activity?
- What causes inflation?
- Why is there unemployment?
- What is the impact of Brexit on the British pound sterling (GBP)?

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So can we define *macroeconomics*

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### Economic Agent

A person or legal entity (e.g. institution or group of institutions) that take constrained decisions

# Introduction

## What is Macroeconomics?

In other words, **macroeconomics** focuses on:

- the **aggregate** behaviour of consumers and firms,
- the behaviour of governments,
- the overall level of **economic activity** in individual countries,
- the economic interactions among nations,
- and the effects of **fiscal and monetary policies**.

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- the economic interactions among nations,
- and the effects of **fiscal and monetary policies**.

Macroeconomics is distinct from **microeconomics** in that it deals with the overall effects on economies of the choices that all economic agents make, rather than on the choices of individual consumers or firms.

# Measuring the Economy

## A bit of Accounting

To begin our study of macroeconomic phenomena, we must first understand what facts we are trying to explain.

The most basic set of facts in macroeconomics has to do with the behaviour of **aggregate economic activity** over time.

### Aggregate

A sum, mass, or assemblage of particulars; a total or gross amount. In macroeconomics, it is synthetic measure representative of the economic variable (e.g. GDP, investment, ...)

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One main measure of aggregate economic activity is the **gross domestic product** (GDP), also called aggregate output.



# Measuring the Economy

## A bit of Accounting: Example 1 - measuring GDP

To understand how GDP is constructed, it is best to work with a simple example:

- An economy is composed of two firms and many consumers
- Firm 1 produces steel by employing workers. It sells the steel for \$100 to Firm 2, which produces cars. Firm 1 pays its workers \$80, leaving \$20 in profit
- Firm 2 buys the steel and uses it to produce cars by employs workers. Revenues from car sales are \$200. \$100 goes to pay for steel and \$70 goes to workers, leaving \$30 in profit

# Measuring the Economy

## A bit of Accounting: Example 1 - measuring GDP

We can summarize this information in a table:

<b>Steel Company (Firm 1)</b>		<b>Car Company (Firm 2)</b>	
Revenues from sales	\$100	Revenues from sales	\$200
Expenses	\$80	Expenses	\$170
Wages	\$80	Wages	\$70
		Steel purchases	\$100
Profit	\$20	Profit	\$30

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How would you define aggregate output in this economy?

# Measuring the Economy

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- 1 As the sum of the values of all goods produced in the economy?  
⇒ \$100 of steel and \$200 of cars, so \$300?
- 2 Just the value of cars?  
⇒ which is equal to \$200?

# Measuring the Economy

## A bit of Accounting: Example 1 - measuring GDP

**The right answer is \$200.**

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## A bit of Accounting: Example 1 - measuring GDP

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Why? Because steel is an **intermediate good**: It is used in the production of cars.

Once we count the production of cars, we do not want to count the production of the goods that went into the production of these cars.

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### Gross Domestic Product

The quantity of **final** goods and services produced within a country during some specified period of time.

# Measuring the Economy

## A bit of Accounting: Example 2 - measuring GDP

Using the previous example, suppose now the two firms merged, so that the sale of steel took place inside the new firm and was no longer recorded.

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Write down the accounts of the new firm (e.g. revenues, expenses and profit). What would be the new GDP?



# Measuring the Economy

## A bit of Accounting: Example 2 - measuring GDP

The accounts of the new firm would be given by the following table:

<b>Steel and Car Company</b>	
Revenues from sales	\$200
Expenses (wages)	\$150
Profit	\$50

# Measuring the Economy

## A bit of Accounting: Example 2 - measuring GDP

The accounts of the new firm would be given by the following table:

<b>Steel and Car Company</b>	
Revenues from sales	\$200
Expenses (wages)	\$150
Profit	\$50

We can see that the new firm would be selling cars for \$200.

**So the GDP would still be \$200, as it should!**

⇒ We do not want our measure of aggregate output to depend on whether firms decide to merge or not

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## Key Economic Indicators

Now that we understand how to measure an aggregate indicator such as GDP, what other indicators would be of interest?

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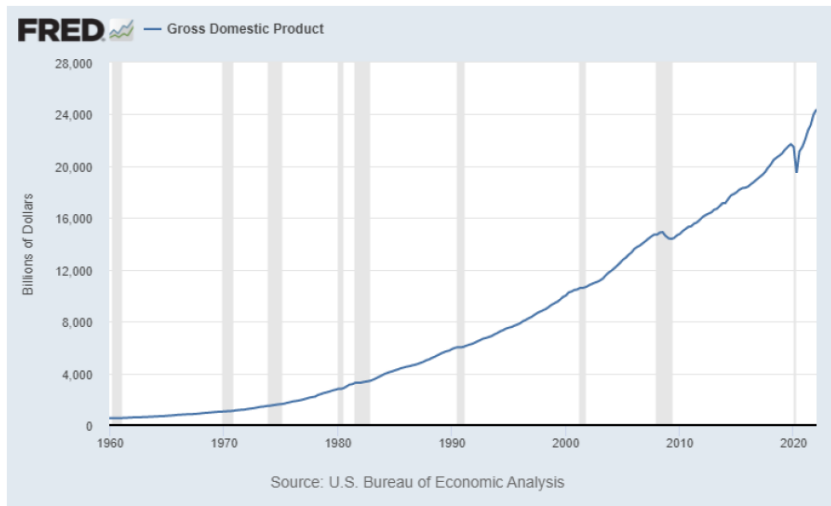
## Key Economic Indicators

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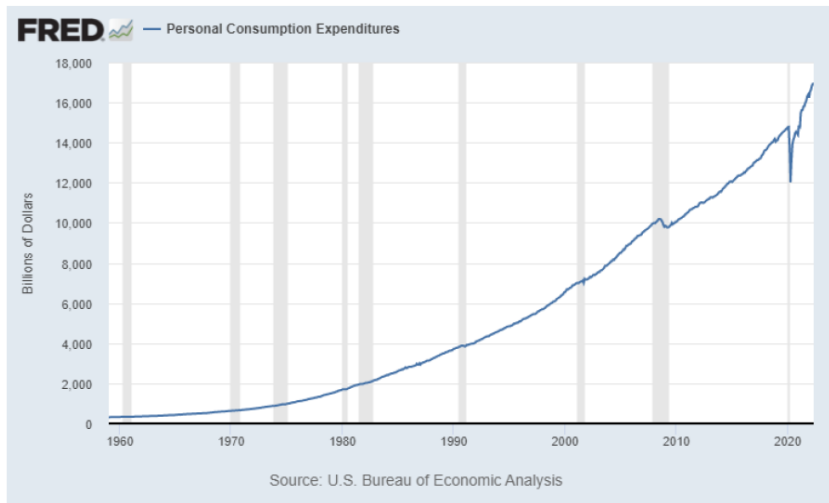
# Measuring the Economy

## Key Economic Indicators: US Gross Domestic Product



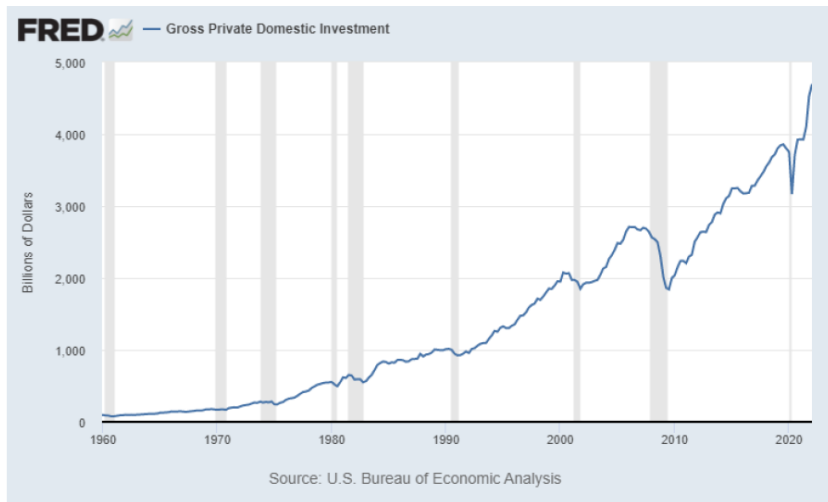
# Measuring the Economy

## Key Economic Indicators: US Total Consumption



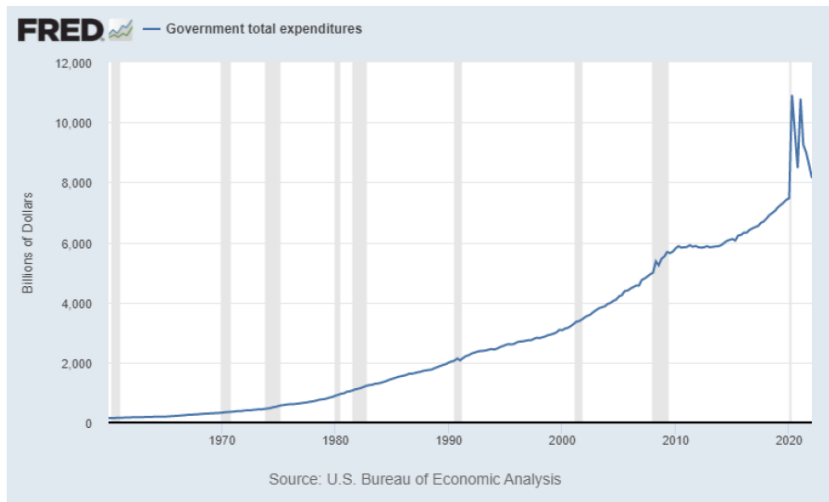
# Measuring the Economy

## Key Economic Indicators: US Total Investment



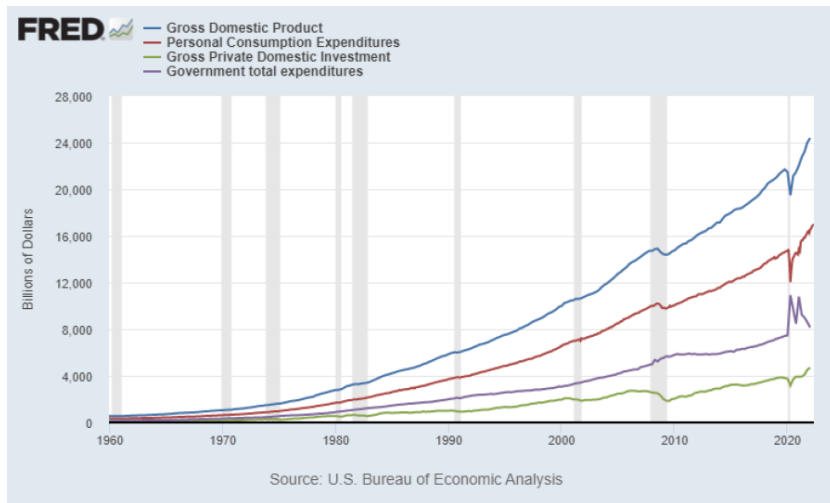
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## Key Economic Indicators: US Total Government Expenditures



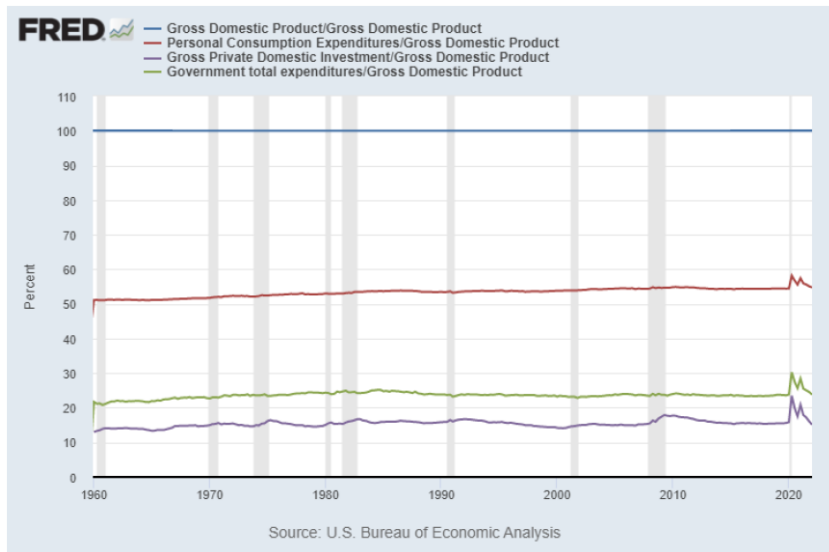
# Measuring the Economy

## Key Economic Indicators: US GDP and main Aggregates



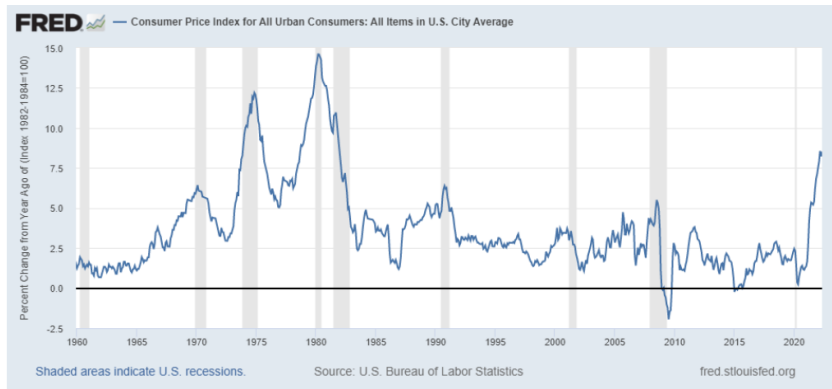
# Measuring the Economy

## Key Economic Indicators: Stylised Facts in Shares of GDP



# Measuring the Economy

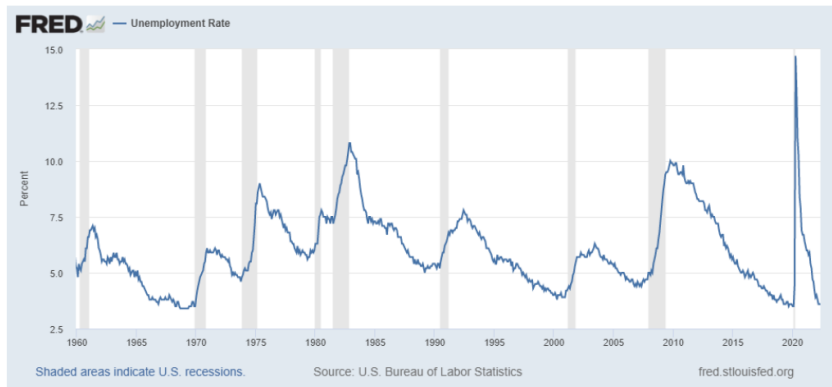
## Key Economic Indicators: US Inflation





# Measuring the Economy

## Key Economic Indicators: US Unemployment



# Measuring the Economy

## Key Economic Indicators: Welfare

We just had a look at the aggregate key indicators of an economy.

**Now the question is:** what would be good indicators to examine welfare?

Would GDP be a good indicator for welfare?

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⇒ The answer is mostly **no**. Why? Because GDP is an indicator of the overall economy and not of individuals' economic welfare.

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What indicators could be useful to evaluate welfare?

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## Key Economic Indicators: Welfare

Some imperfect indicators:

- unemployment rate
- unemployment benefit
- government transfer
- inflation rate
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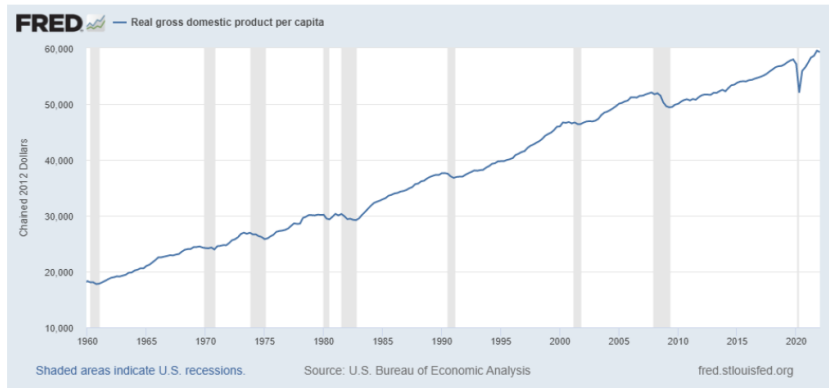
One often used indicator is the real GDP per capita.

### Per capita Real GDP

It is a measure of the average level of income for a resident of a country

# Measuring the Economy

Key Economic Indicators: Welfare - real GDP per capita

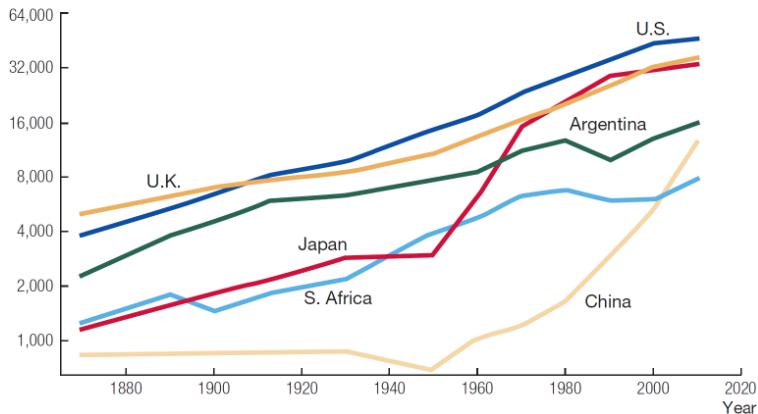


# Measuring the Economy

## A Quick Tour of the World: Real GDP per capita

### Per Capita GDP in Seven Countries

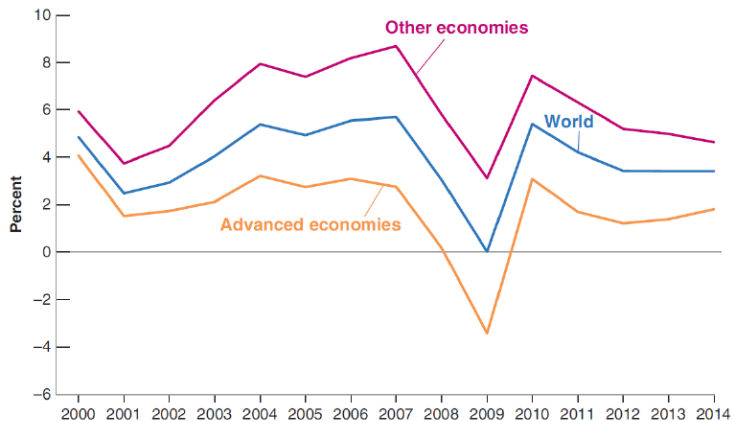
Per capita GDP  
(ratio scale, 2009 dollars)





# Measuring the Economy

## A Quick Tour of the World: Growth Rates of GDP

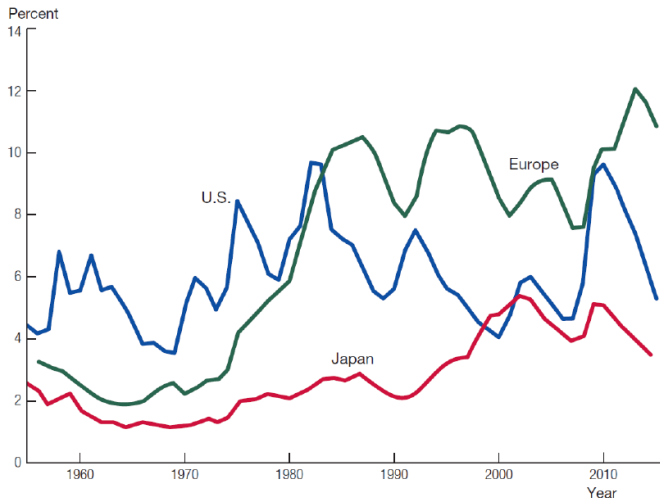


Source: World Economic Outlook Database, July 2015

# Measuring the Economy

## A Quick Tour of the World: Unemployment rates

### The Unemployment Rate in the United States, Europe, Japan



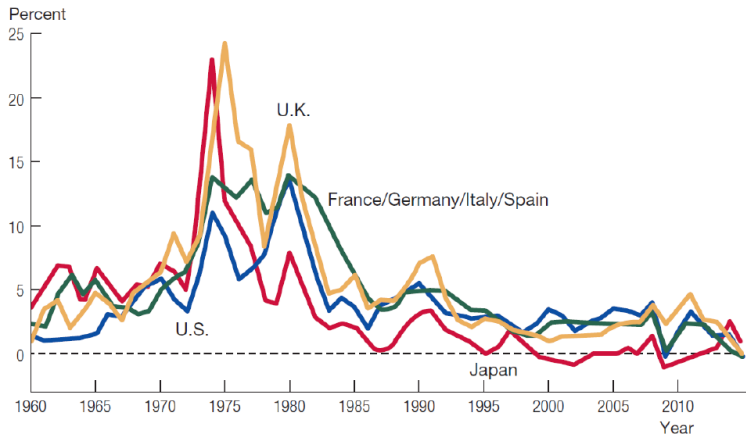
Sources: OECD Main Economic Indicators and the U.S. Bureau of Labor Statistics.



# Measuring the Economy

## A Quick Tour of the World: Inflation rates

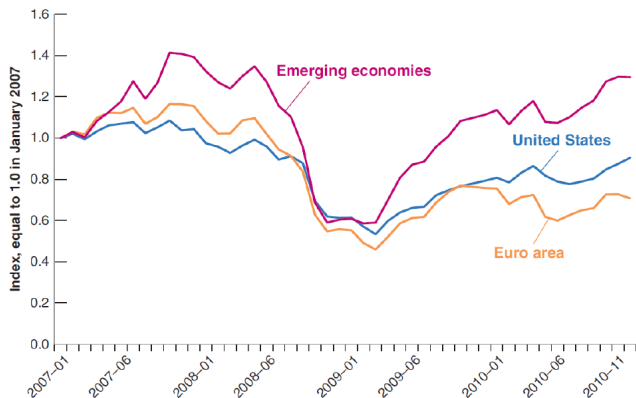
### Inflation Rates in Certain Rich Countries



Source: The OECD.Stat database at [stats.oecd.org](http://stats.oecd.org). The inflation rate measures the percentage change in the overall price level.

# Measuring the Economy

A Quick Tour of the World: Stock market indexes around the 2008 financial crises



Source: Haver Analytics USA (S111ACD), Eurogroup (S023ACD), all emerging markets (S200ACD), all monthly averages.

# Macroeconomic Concepts and Relations

Now that we had a look at the data, can we observe some **relations** or develop some **concepts** to better understand the economy?

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⇒ Output growth, the unemployment rate, and the inflation rate clearly do not seem independent

⇒ Output, consumption, investment and unemployment rate fluctuate, but not “randomly” evolve

We will introduce two important relations, *Okun's Law* and the *Phillips Curve*, and concept of *Business Cycles*.

# Macroeconomic Concepts and Relations

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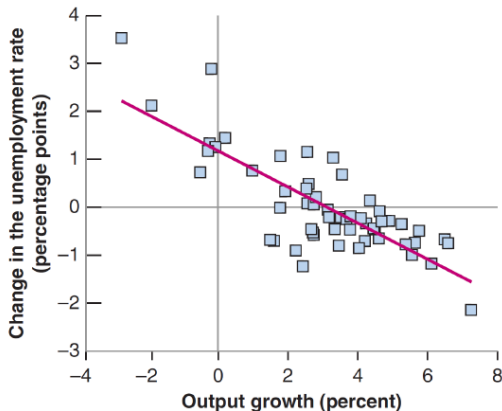
- output growth that is higher than usual is associated with a reduction in the unemployment rate
- output growth that is lower than usual is associated with an increase in the unemployment rate

This relation was first examined by U.S. economist Arthur Okun and for this reason has become known as Okun's law.

# Macroeconomic Concepts and Relations

## Okun's Law

Changes in the Unemployment Rate versus Growth in the United States between 1960–2014



Source: Series GPDCA, GDPA - Federal Reserve Economic Data (FRED) <http://research.stlouisfed.org/fred2/>.

# Macroeconomic Concepts and Relations

## The Phillips Curve

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## The Phillips Curve

Okun's law implies that, with strong enough growth, one can decrease the unemployment rate to very low levels.

But intuition suggests that, when **unemployment becomes very low**, the economy is likely to **overheat**, and that this will lead to **upward pressure on inflation**. To a large extent, this is **true**:

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## The Phillips Curve

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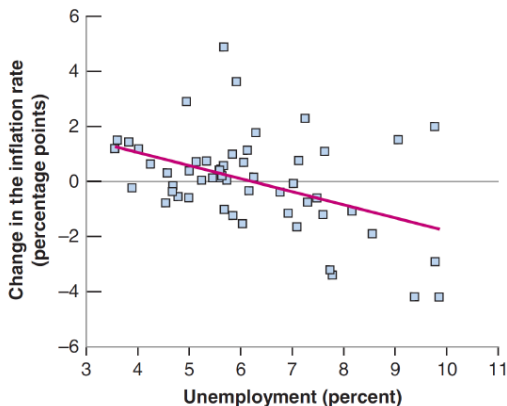
- A low unemployment rate leads to an increase in the inflation rate
- a high unemployment rate to a decrease in the inflation rate

This relation was first explored in 1958 by a New Zealand economist, A. W. Phillips, and has become known as the Phillips curve.

# Macroeconomic Concepts and Relations

## The Phillips Curve

Changes in the Inflation Rate versus the Unemployment Rate  
in the United States between 1960–2014



Source: Series GPCCA,GPDA - Federal Reserve Economic Data (FRED) <http://research.stlouisfed.org/fred2/>.

# Macroeconomic Concepts and Relations

Short Run, Long Run and Business Cycles

**Business cycles** are **fluctuations** of the aggregate economic activity around its **trend**.



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## Short Run, Long Run and Business Cycles

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⇒ A **cycle** that consists of **expansions** occurring at about the same time in many economic activities, followed by similarly general **contractions** (or recessions). This sequence of changes is **recurrent** but not periodic.

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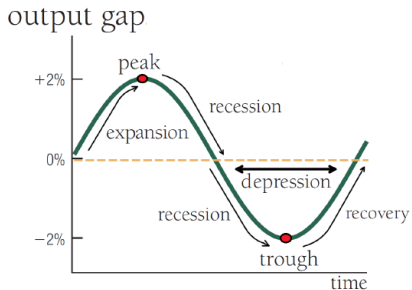
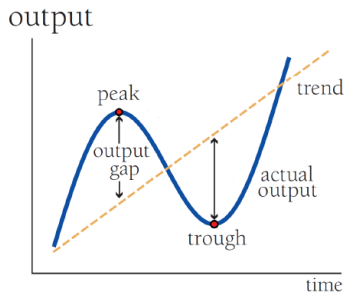
You can think of the economy as being constantly hit by **shocks**. These shocks may be shifts in consumption coming from changes in consumer confidence, shifts in investment, changes in policies and so on.

Each shock has dynamic effects on output and its components. These dynamic effects are called the propagation mechanism of the shock, which is different for different shocks.

# Macroeconomic Concepts and Relations

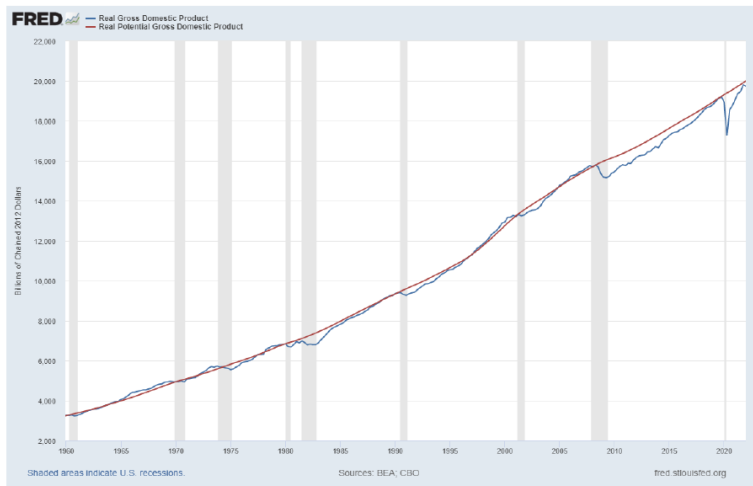
## Short Run, Long Run and Business Cycles

Sketch of the Fluctuation of Output around its Trend and Output Gap



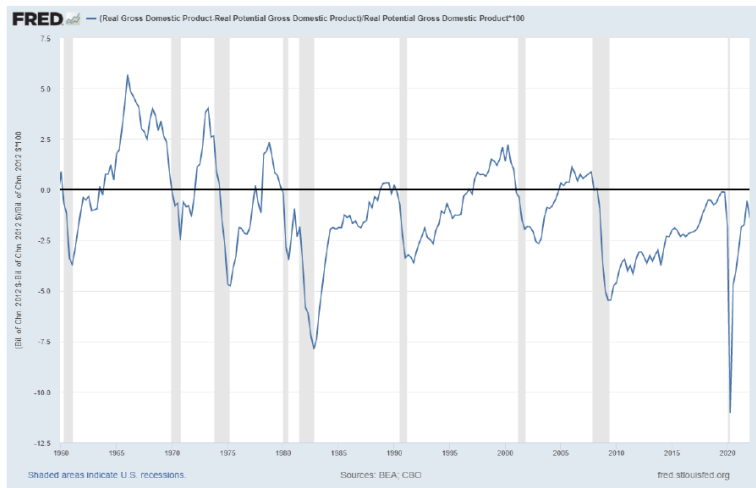
# Macroeconomic Concepts and Relations

## Short Run, Long Run and Business Cycles: Fluctuations of US GDP around its Trend



# Macroeconomic Concepts and Relations

Short Run, Long Run and Business Cycles: Percentage deviation of US GDP around its Trend



## How Macroeconomics Studies Key Questions?

In general, the **macroeconomic approach** consists of four steps:

- 1 Document the facts
- 2 Develop a model
- 3 Compare the predictions of the model with the original facts
- 4 Use the model to make other predictions that may eventually be tested

We are going to model a circuit with 2 agents:

- Households
- Firms

In this first circuit, there is no investment.

There are only two markets:

- Good and services market
- Labour and capital market



We assume:

- Firms (F) produce only one type of goods (Y) for consumption. They use labour (L) and capital (K)
- There is no inflation, price of one good is fixed to 1
- There are two types of households (HH):
  - ▶ Capitalists: HH who own the machine, they receive a profit (P)
  - ▶ Workers: HH only receive a wage who spend their entire revenue on consumption good
- Output (Y) is equal to 1728 and is entirely sold. Wages (W) equal 1500. Profit (P) is the remainder after paying the workers

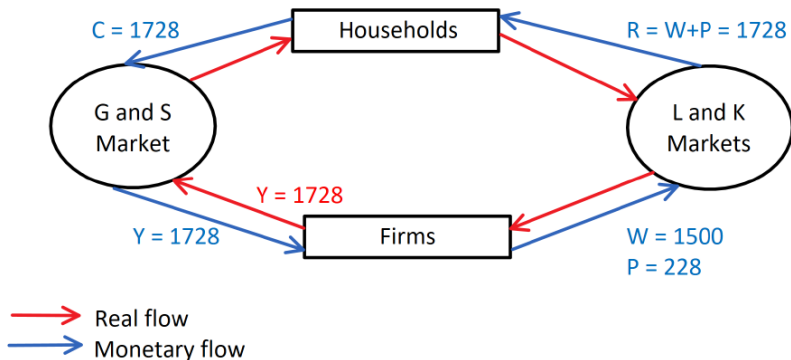
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Find the revenue and the consumption of household, and illustrate this circuit (i.e. draws real and monetary flows between the agents and markets)

# Macroeconomic Theory

## Macroeconomic Circuits



The profit of firms is given by:

$$P = Y - W = 1728 - 1500 = 228$$

The revenue of the household is:

$$R = W + P = 1500 + 228 = 1728$$

Then the consumption is:

$$C = R = W + P = 1728$$

which is also equal to aggregate output.

# What is next?

Now that we have a model that is able to describe the real and monetary flows between the different agents, we want to understand:

- how an economy would react after being hit by a shock
- what economic policy should we implement to reduce the impact of shock
- what are the different characteristics of economies

This is a part of what you will learn studying macroeconomics, together with studying multiple and more advanced models.

Blanchard, O. J. (2017). *Macroeconomics*. Pearson Education Limited, Harlow, Essex, 7th edition.

Jones, C. I. (2017). *Macroeconomics*. W.W. Norton and Company, 4th edition.

Williamson, S. D. (2018). *Macroeconomics*. Pearson, 6th edition.

# *Appendix*

# Unemployment and Happiness

How painful is unemployment? To answer the question, one needs information about particular individuals, and how their happiness varies as they become unemployed. This information is available from the German Socio-Economic Panel survey. The survey has followed about 11,000 households each year since 1984, asking each member of the household a number of questions about their employment status, their income, and their happiness. The specific question in the survey about happiness is the following: “How satisfied are you at present with your life as a whole?”, with the answer rated from 0 (“completely dissatisfied”) to 10 (“completely satisfied”).

The effect of unemployment on happiness defined in this way is shown in Figure 1. The figure plots the average life satisfaction for those individuals who were unemployed during one year, and employed in the four years before and in the four years after. Year 0 is the year of unemployment. Years -1 to -4 are the years before unemployment, years 1 to 4 the years after.

The figure suggests three conclusions. The first and main one is indeed that becoming unemployed leads to a large decrease in happiness. To give you a sense of scale, other studies suggest that this decrease in happiness is close to the decrease triggered by a divorce or a separation. The second

is that happiness declines before the actual unemployment spell. This suggests that either workers know they are more likely to become unemployed, or that they like their job less and less. The third is that happiness does not fully recover even four years after the unemployment spell. This suggests that unemployment may do some permanent damage, either because of the experience of unemployment itself, or because the new job is not as satisfying as the old one.

In thinking about how to deal with unemployment, it is essential to understand the channels through which unemployment decreases happiness. One important finding in this respect is that the decrease in happiness does not depend very much on the generosity of unemployment benefits. In other words, unemployment affects happiness not so much through financial channels than through psychological channels. To cite George Akerlof, a Nobel Prize winner, “A person without a job loses not just his income but often the sense that he is fulfilling the duties expected of him as a human being.”

◀ The material in this box, and in particular the figure, comes in part from “Unemployment and happiness,” by Rainer Winkelmann, *IZA world of labor*, 2014: 94, pp 1–9.

Source: Blanchard (2017), page 50