ECOS2002 - Intermediate Macroeconomics
Week 1: Review and Introduction of Macroeconomic
Indicators

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Class Outline

- General information about this unit

  - A Tour of the World

  - How do we examine key questions in macroeconomics?

  - Output, Unemployment and Inflation

  - The Short Run, Medium Run and Long Run

  - Readings: Blanchard and Sheen Chapters 1 and 2

About me

- PhD Candidate in Macroeconomics at USyd

- My research area is macroeconomics with a particular focus on monetary policy and low interest rate environments

- Email: **michaela.haderer@sydney.edu.au**

- Consultation Hour: Tuesdays 11am-12pm via Zoom. Link on Canvas page

General information about this unit

- Objective: Develop a more in-depth analysis of two key aspects of macroeconomics: short run analysis and the long-run analysis

- Prerequisite: ECON1002

- Structure: Weekly lecture (2 hours) and tutorial (1 hour)

- Ed (via canvas): For discussions and clarifications

- Recommended Textbook:
  - Blanchard. (2020). Macroeconomics. Pearson Education OR
  - Blanchard, Sheen, J. (2013). Macroeconomics. Pearson Education Australia.

Assessments

- In-semester test (Open book) 30% (Week 7, September 12th)

- Final exam (Open book) 50% (Formal exam period)

- Quiz 15%
  - Quiz 1 due: Aug 21st 6pm Sydney time
  - Quiz 2 due: Sept 4th 6pm Sydney time
  - Quiz 3 due: Nov 2nd 6pm Sydney time

- Tutorial Participation 5%

Let's begin this course with a tour around the world!

Output in 2011: US$15.1 trillion
Population: 311.9 million
Output per person: US$48 400
Share of world GDP: 19 per cent

Australia

Output in 2011: A$1.44 trillion (US$1.48 trillion)

Population: 22.7 million

Output per person: A$63 400

US$65 500 using exchange rate

US$40 200 using PPP

Share of world GDP: 1.2 per cent

The Euro Area

Output in 2011:
US$13.1 trillion

Population: 332.4 million

Output per person (PPP):
US$32,705

Share of world GDP:
16.5 per cent

	Output: (US$ tr)	Population: (millions)	Output per person (PPP)
France	2.8	63.1	35 100
Germany	3.6	81.8	38 100
Italy	2.2	60.6	30 500
Spain	1.5	46.1	30 600

Output in 2011: US$7.3 trillion
Population: 1350 million
Output per person (PPP): US$8386
Share of world GDP: 9.2 per cent

The Crisis

- The global expansion from 2000–07 ended with the financial crisis that began in 2008.

- It was caused by the fall in US house prices from 2007, which had doubled since 2000.

- It exposed serious housing finance weaknesses in the US, creating a crisis for major banks on Wall Street.
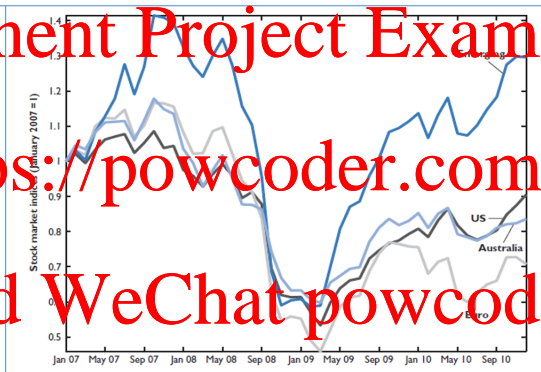
Table 1.1 World output growth since 2000						
	2000–07 (average)	2008	2009	2010	2011	2012*
World	3.2	1.5	−2.3	5.1	3.8	3.3
Advanced economies	2.6	0.1	−3.7	3.0	1.6	1.3
Emerging and developing economies	6.5	6.0	2.8	7.4	6.2	5.3

Output growth: annual rate of growth of GDP. *The numbers for 2012 are forecasts, as of the fall of 2011.

SOURCE: World Economic Outlook database, October 2012. © International Monetary Fund.

Figure 1.1
Stock prices in the United States, the Euro area, Australia and emerging economies, 2007–10

Stock market index (January 2007 = 1)

Jan 07 May 07 Jan 08 May 08 Sep 08 Jan 09 May 09 Sep 09 Jan 10 May 10 Sep 10

US
Australia
Euro

SOURCES: Haver Analytics—USA (S111ACD), Eurogroup (S023ACD), All emerging markets (S200ACD); Yahoo Finance—Australia (ASX S&P200), all monthly averages.

Negative Growth and Rising Unemployment

- In fear of a major recession/depression, consumption and investment fell, reducing output growth, which turned negative in many countries

- Unemployment rose particularly in the US and Europe (though not in Australia)
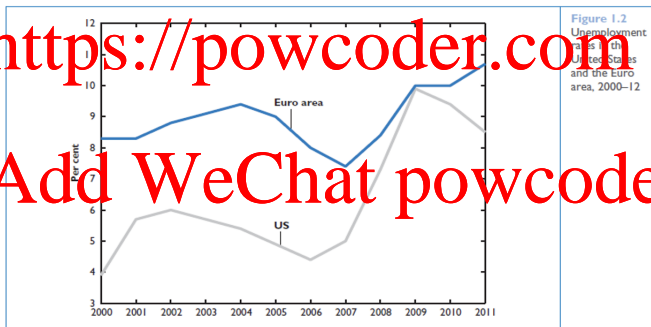
Figure 1.2 Unemployment rates in the United States and the Euro area, 2000–12

# How do we examine key questions in macroeconomics?

- General approach
  - Document the facts
  - Develop a model
  - Use the model to make other predictions that will eventually be tested.
- But what is a model?
  - Models simplify the complicated real world into its most relevant elements
  - A model is useful if it has good predictive power
  - Economic models often involve systems of multiple equations

An Economic Model in a Nutshell

Inputs

Parameters and exogenous variables

Model

Outputs
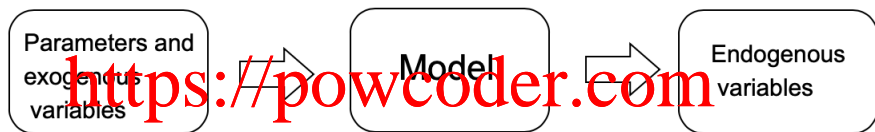
Endogenous variables

- **Endogenous Variables**: Changed or determined by its relationship with other variables within the model

- **Exogenous Variables**: Independent and determined outside the model

- The model outcome and predictions depend on the model design
- No objective measures of economic outcomes
- **Assumptions matter!**

Three key measures of macroeconomic analysis:

- Output (GDP)

- Unemployment rate

- Inflation rate

Aggregate Output

- National income and product accounts are an accounting system used to measure of aggregate economic activity

- The measure of aggregate output in the national income accounts is gross domestic product, or GDP

- Three ways of measuring GDP:
  1. GDP is the value of the final goods and services produced in the economy during a given period
  2. GDP is the sum of value added in the economy during a given period
  3. GDP is the sum of incomes in the economy during a given period

Measuring GDP

Expenditure (Demand)	=	Output (Production)	≡	Income
Production of final goods/ approach Consumption C Investment I Government Spending G Net Exports NX Y = C+I+G+NX(=EX-IM)		**Value added approach** Aggregate output must be equal to the sum of values of outputs across industries less the purchase of goods from other industries i.e. less intermediate purchases		**Income approach** All income (compensation) paid to (or received by) all different factors of production (inputs) utilised in the production process. Sum of wages, rental rates, profits, rents etc

When using the income approach to measure GDP, the largest share of GDP generally consists of

a Labour income

b Capital income

c Interest income

d Indirect taxes

e Firms' profits

Nominal and Real GDP

- **Nominal GDP** is the sum of the quantities of final goods produced times their current price

  - Nominal GDP increases over time because:
    1. The production of most goods increases over time.
    2. The prices of most goods also increase over time.

- **Real GDP** is constructed as the sum of the quantities of final goods times constant (rather than current) prices

Nominal and Real Variables

- **Nominal Variables**: Nominal variables are expressed at current monetary values.

- **Real Variables**: Real variables are adjusted for inflation and show prices/wages at constant prices.

$\Rightarrow$ Nominal amounts might not be as useful for economic analysis since they can increase either when people buy more physical goods and services — more cars, steaks, and haircuts — or when prices rise.

Growth Basics

- The growth rate:

$$g = \frac{y_{t+1} - y_t}{y_t}$$

- Can be rewritten as:

$$y_{t+1} = y_t(1 + g)$$

- Iterating

$$y_t = y_0(1 + g)^t$$

or

$$g = \left(\frac{y_t}{y_0}\right)^{\frac{1}{t}} - 1$$

- Economists focus on the rate of growth of real GDP, on **GDP growth**:

$$\text{Real GDP growth} = \frac{y_{t+1} - y_t}{y_t}$$

- Periods of positive GDP growth are called boom or expansions

- Periods of negative GDP growth are called recession or depression

The Unemployment Rate

- **Employment** (E) is the number of people who have a job

- **Unemployment** (U) is the number of people who do not have a job but are looking for one

- The **labour force** (L) is the sum of employment and unemployment:

$$L = E + U$$

- The **unemployment rate** (u) is the ratio of the number of people who are unemployed to the number of people in the labour force:

$$u = \frac{U}{L} = \frac{U}{E + U}$$

- Economists care about unemployment for two reasons:
  1. Unemployment has important social consequences.
  2. The unemployment rate gives them an indication of whether an economy is operating above or below its normal level of activity
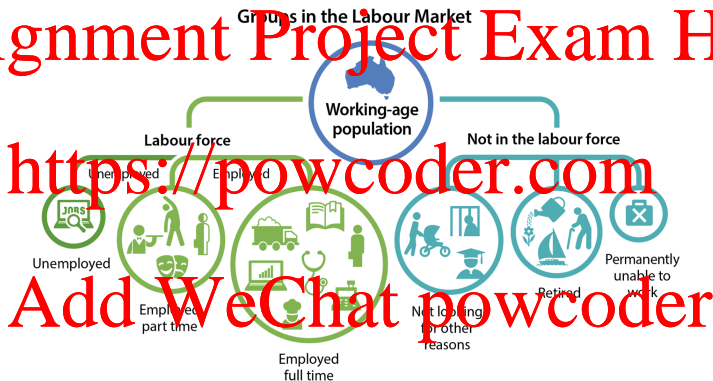
The Unemployment Rate

- Only those looking for work are counted as unemployed

- Those not working and not looking for work are not in the labour force

- People without jobs who give up looking for work are known as discouraged workers

- Participation rate:

$$\text{Participation rate:} \quad \frac{\text{labour force}}{\text{working age population}}$$

The Labour Force

Source: RBA, n.d.

The Unemployment Rate in Australia

Chart 1 - Unemployment rate, Australia, August 1966 to June 2022, Seasonally adjusted

February 1978 to June 2022 estimated monthly, before February 1978 estimated quarterly

Source: ABS, 2022

The Inflation Rate

- **Inflation** is a sustained rise in the general level of prices — the price level

- The inflation rate is the rate at which the price level increases

- **Deflation** is a sustained decline in the price level, or a negative inflation rate

- Economists care about inflation for at least two reasons:
  1. It affects relative prices (e.g. the real wage) and thus income distribution.
  2. It creates other distortions: changes in relative prices create uncertainty and affect decision making

The GDP Deflator

- The **GDP deflator** in year t, P_t, is defined as the ratio of nominal GDP to real GDP in year t:

$$P_t = \frac{\text{nominal GDP}_t}{\text{real GDP}_t} = \frac{\$Y_t}{Y_t}$$

- The GDP deflator is what is called an index number — set equal to 100 in the base year

- The rate of change in the GDP deflator equals the rate of Inflation:

$$\frac{P_t - P_{t-1}}{P_{t-1}}$$

- Nominal GDP is equal to the GDP deflator times real GDP:

$$\$Y_t = P_t Y_t$$

The Consumer Price Index

- The **consumer price index** (CPI) measures household inflation
  - measure of the average change over time in the prices paid by households for a fixed basket of goods and services

- CPI is a very popular measure of inflation but has some limitations:
  1. CPI is not an indicator of the price level
  2. Quality changes not always included
  3. New products not immediately included
  4. Not adjusted for changes in household spending patterns (substitution bias)

The Consumer Price Index

- The GDP deflator measures the average price of output, while the **consumer price index** (CPI) measures the average price of consumption, or equivalently, the *cost of living*

- The two prices need not to be the same — the set of goods produced in the economy is not the same as the set of goods purchased by consumers, for two reasons:

  1. Some of the goods in GDP are sold not to consumers but to firms (machine tools, for example), to the government or to foreigners

  2. Some of the goods bought by consumers are not produced domestically, but are imported from abroad

- However, the CPI and the GDP deflator move together most of the time.

Consumer Price Index and the GDP Deflator in Australia (quarter-on-quarter growth)

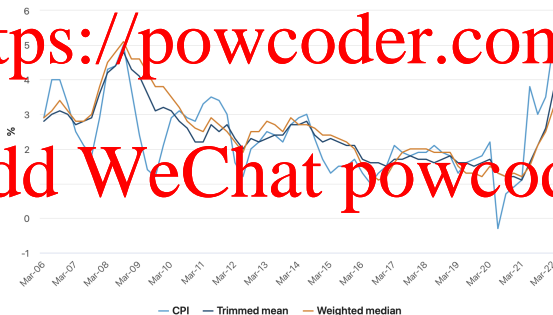Legend: CPI all groups (original) — HFCE implicit price deflator (original)

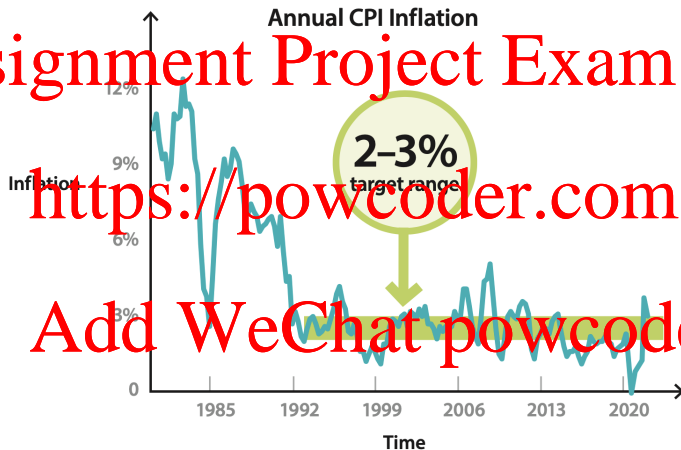Source: ABS, 2022

Inflation targeting in Australia

- Target an inflation rate of 2–3 per cent, on average, over time.
- The inflation target is defined as a medium-term average rather than as a rate (or band of rates) that must be held at all times

CPI, Trimmed mean and Weighted median, Annual movement (%)

Source: ABS, 2022

Inflation targeting in Australia
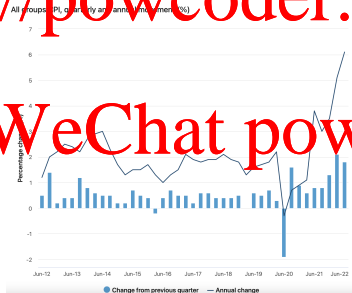

Source: RBA, n.d.

Recent Inflation Shock

- The Consumer Price Index (CPI) rose 1.8% in the 2022-Q2 quarter (quarter-on-quarter growth)
- Over the twelve months to the June 2022 quarter, the CPI rose 6.1%.
- The most significant price rises were New dwelling purchase by owner-occupiers (+5.6%), Automotive fuel (+4.2%), and Furniture (+7.0%).

All groups CPI, quarterly and annual movement (%)
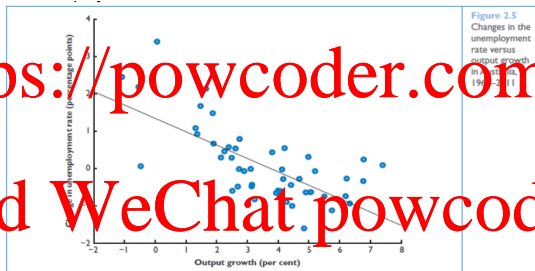
Source: ABS, 2022

Okun's Law

- Intuition suggests that if output growth is high, unemployment will decrease, and this is indeed true

- **Okun's Law**: Output growth is negatively related to the change in the unemployment rate

Figure 2.5
Changes in the unemployment rate versus output growth in Australia, 1991-2011

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.

- Slope: −0.36 ⇒ This implies that, on average, an increase in the growth rate of 1 per cent decreases the unemployment rate by roughly −0.36 per cent

Phillips Curve

- Intuition suggests that, when unemployment becomes very low, the economy is likely to overheat, and that this will lead to upward pressure on inflation

- **Phillips Curve**: The change in the inflation rate is negatively related to the unemployment rate

Figure 2.6
Change in
inflation
versus the
unemployment
rate in Australia,
1960–2011
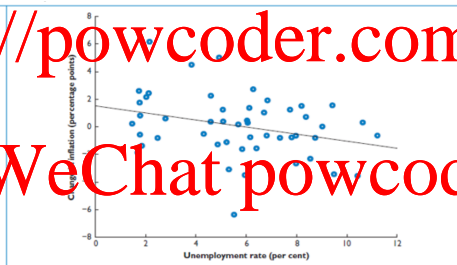
A low unemployment rate leads to an increase in the inflation rate; a high unemployment rate, to a decrease in the inflation rate.

SOURCE: RBA Bulletin, Table G7 and Table G11 (cols L and W); ABS, cat no. 6401, Table I (col. J). © Reserve Bank of Australia, 2001–10. All rights reserved.

- The line is downward sloping (slope: −0.26), although the fit is not as tight as it was for Okun's law

Output is determined by:

- Demand in the **short run**, say, up to a few years

- The level of technology, the capital stock, and the labour force in the **medium run**, say, up to a decade or so

- Factors such as education, research, saving, and the quality of government in the **long run**, say, a half century or more

Outlook

- We will start with the short run

- Next week:
  - Goods Market
  - Money Market

- This will help us to develop a mathematical representation of Keynesian Economics: The IS-LM model