



Macroeconomics notes

Macroeconomics 1 (Royal Melbourne Institute of Technology)



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Macroeconomics

Part A - Economic objectives

1. What do economists care about?
2. A statistical picture of the Australian and world economy
3. How can we measure economic activity?
4. Human capital, technology and innovation as drivers of economic prosperity
 - Economic indicators
 - Short-run business cycle which fluctuates around long-run trend growth
 - Drivers of the business cycle are changes in $AD = C + I + G + NX$ or changes in SR-AS
 - Long-term growth is expressed in the production function ($Y = Af(M, K, L, H)$, with human capital, technology and innovation being most important for lifting an economy's productive capacity)
 - How economists are ultimately interested in how to optimise human wellbeing
 - Skills to source, present and explain data
 - Goals of economists and policymakers
 - Optimising wellbeing now and in future
 - Business cycle and long-run prosperity
 - How to stabilise short-run functions in economic activity while also fuelling sustainable long-run improvements in the economy's productivity capacity
 - Equality
 - Are the benefits of economic progress equally shared
 - Economic shocks
 - How to recover from economic shocks and make the economy more resilient

Part B - A closer look at the problems to be solved

5. Unemployment and cost of living
 - High unemployment or high inflation indicates current economic conditions are inefficient, unstable or unsustainable
6. Economic inequality
 - 'It's not the size of the pie that matters, it's how it's shared'
7. Economic shocks and environmental sustainability
 - External shocks (E.G. GFC) destabilise the economy; pressure for the economy to adapt to environmentally sustainable practices

Part C - our policy toolkit

8. Fiscal policy
9. Monetary policy
10. Innovation policy financial systems and institutions
11. Financial systems and institutions
12. International cooperation, assessing the impacts of the COVID-19 pandemic and what policies we need next

Week 1 - what do economists care about?

- What are real-world problems and outcomes that economists care about?
- How do economists think about well-being and prosperity?
- What indicators do we use to measure economic growth and prosperity, quality of life, inequality and happiness?
- Who are the key 'players' in the economy? What is the role of individuals, households, businesses, governments, banks and financial institutions, societal institutions, the community and the natural environment? How do these various players interact with each other?

Economics is the study of how people interact with each other and with their natural surroundings in producing their livelihoods, and how this changes over time.

What is macroeconomics?

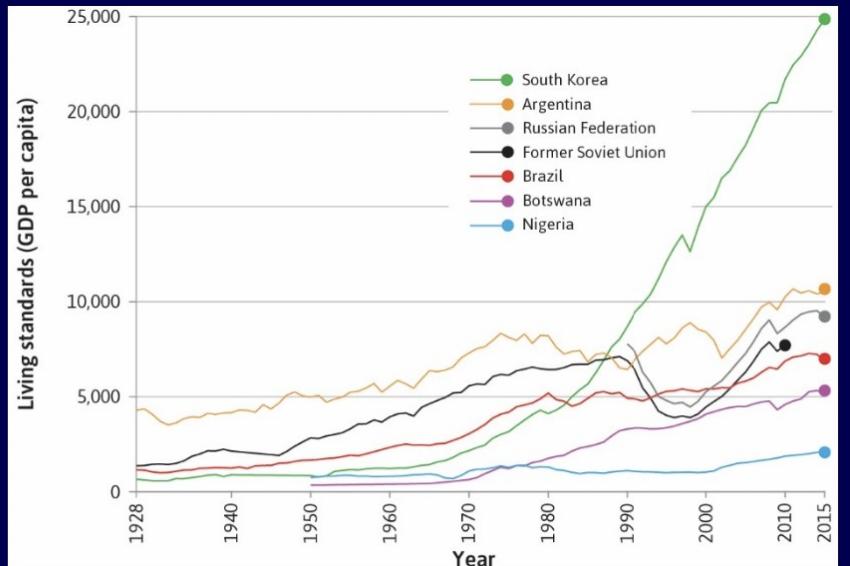
- Economists care about all the factors that matter for well-being and quality of life – not just about money, the stock market or economic growth
- The study of decision making
- Allocation of resources efficiency, maximising input and output.
- Wellbeing – think about it in a holistic way. Rather than being about money economics focuses more on the well-being of people and prosperity as well as economic growth.

GDP – gross domestic product

- GDP is a measure of the overall level of activity in the economy
- GDP measures the production of goods and services that are brought and sold in formal transactions in the paid economy
- It can be expressed as...
 - Total amount (\$ trillions)
 - Average per person (\$ per capita (person))
 - Growth rate over time (%)
- Widely used but not perfect measures of economic activity

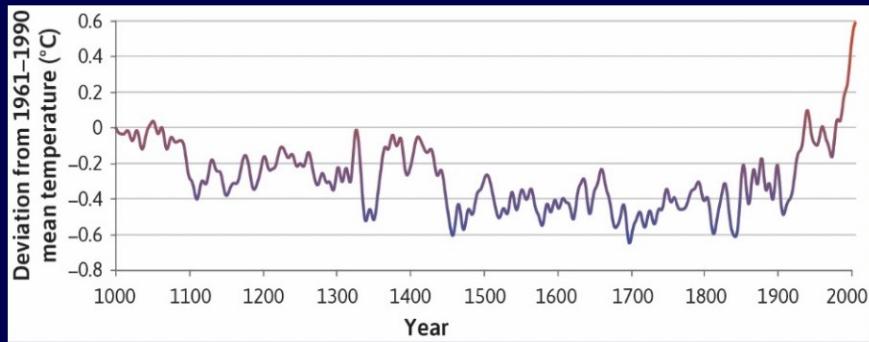
Living standards of most countries have improved over time – but not all

Source: CORE



And improvements in living standards have brought environmental consequences

Source: CORE



Shortcoming of GDP

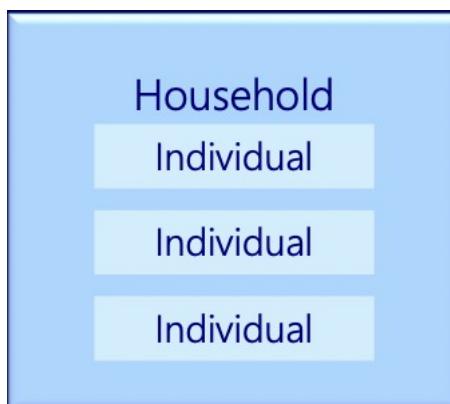
- Many activities are unpaid, or take place outside of the formal economy, and are not counted
- Some forms of paid work are considered under valued
- Some economic activity is counted in GDP does not reflect an improvement in wellbeing
- GDP does not reflect how income is distributed across society or how it is spent

Different components of our economy – and how they interact with each other

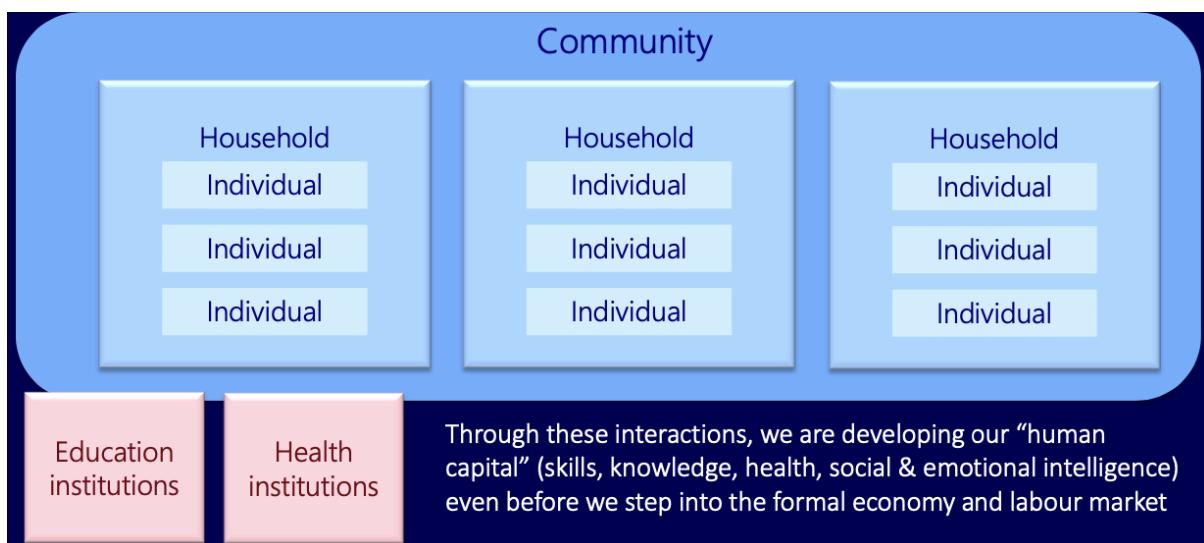
- We can use diagrammatic models to illustrate these concepts
- ‘circular flow of income shows the interactions between households and firms (businesses)
- We will learn how to expand on the traditional diagram of the ‘circular flow of income so that we can encompass other factors that matter for well-being and sustainable prosperity

Interactions within our economy

- Within households, we produce, nurture, look after and begin developing the skills of individuals
- this all contributes to our future productive capacity and our wellbeing



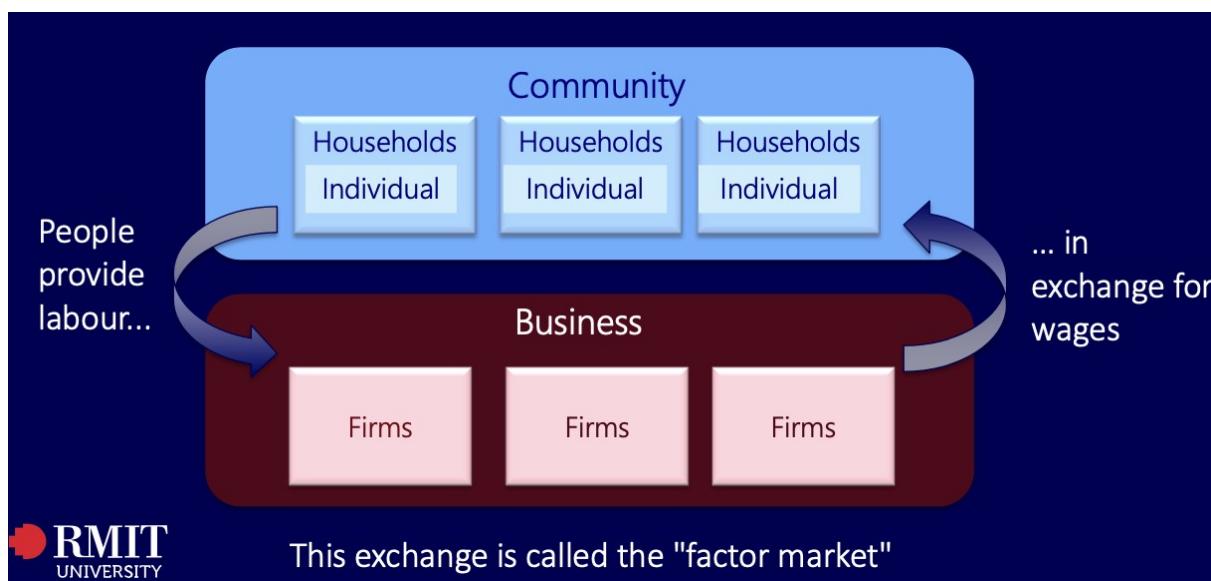
- within our community, we interact with people from other households and groups in ways that matter to our well-being. This is mostly in an unpaid and voluntary way.

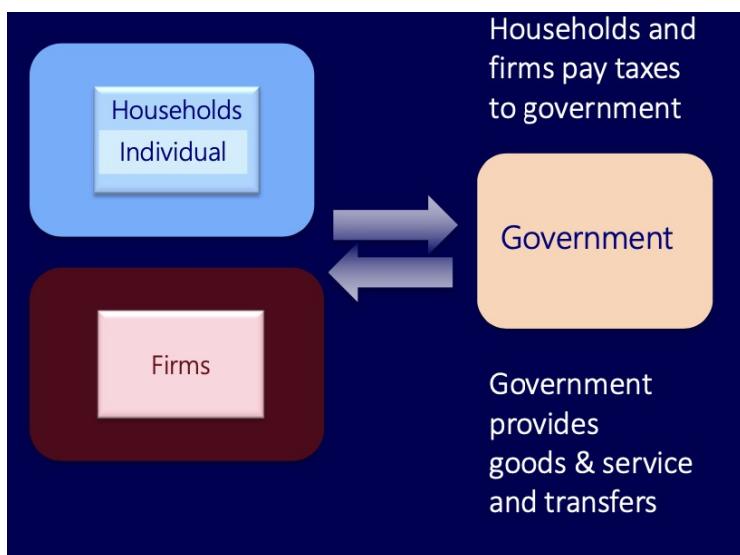
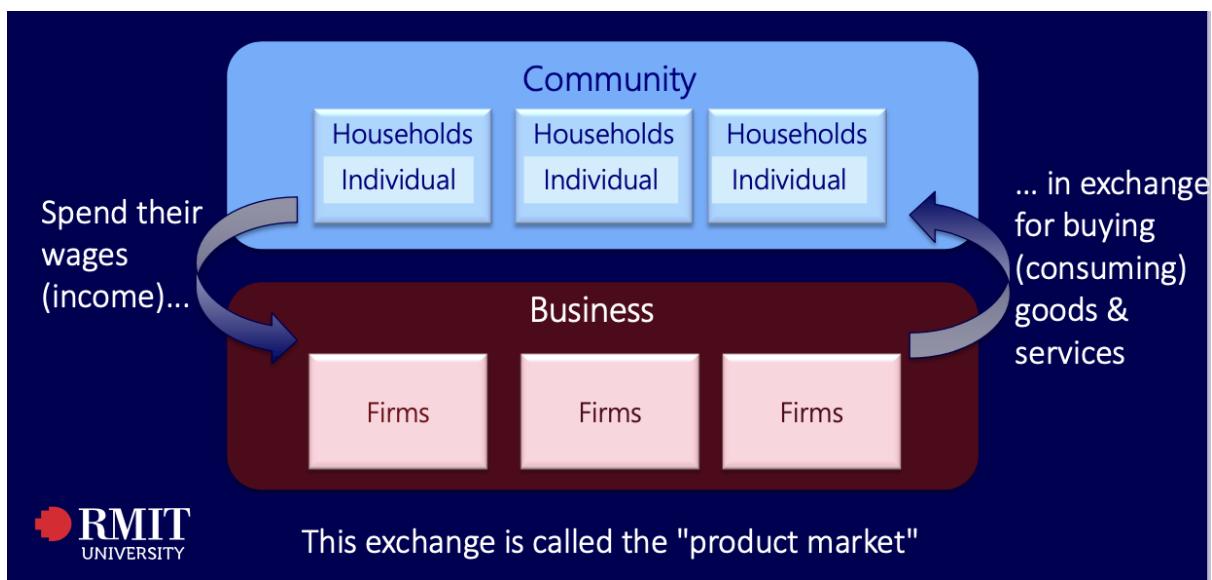
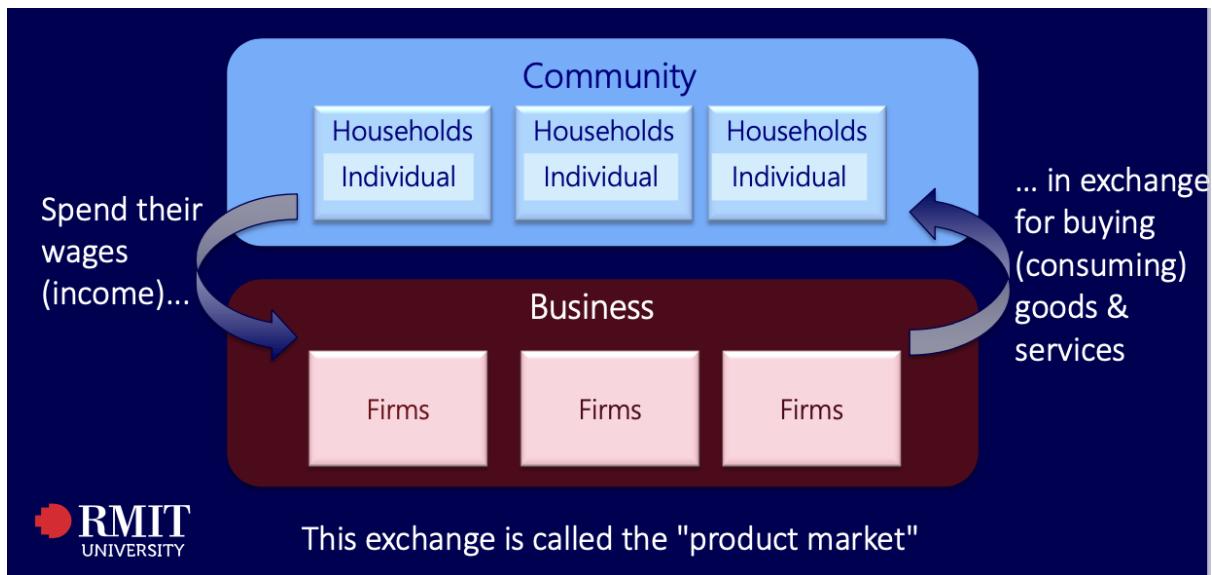


- most voluntary, not-for-profit, unpaid



- 'formal economy', paid transactions





Households and firms save (or invest) income that they do not spend on consumption

Banks & financial institutions

...Or borrow if they need more income than they earn

Households
Individual

Firms

Banks & financial institutions

Households

Government

Firms

Institutions, Technology, Culture

RMIT

Banks & financial institutions

Households

Government

Firms

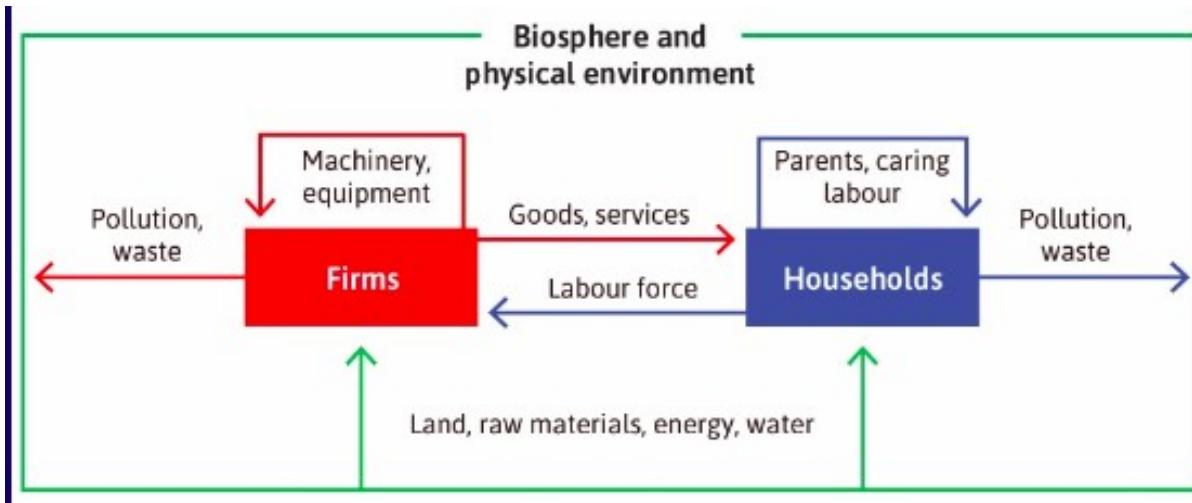
Institutions, Technology, Culture

Natural environment

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Interactions in our economy

- Households (community)
 - Voluntary not profit, unpaid
 - Interactions with other people in the community
- Firms (businesses)
 - Paid transactions
 - Community provides labour for the businesses in exchange for wages.
 - This is called the '*factor market*'
 - The Community spends their wages (income) in exchange for buying (consuming) goods and services
 - This exchange is called the '*product market*'
- Government
 - Government provides goods and services and transfers
 - Flow from government to households and firms such as unemployment benefits
 - Households and firms pay taxes to the government
- Banks and financial institutions
 - Households and firms save or invest income that they do not spend on consumption
 - They also have the opportunity to borrow if they need more income than they earn
- Institutions, technology and cultural norms in wider society also influence all of the interactions we have within our society
- Our natural resources are also very important such as water, natural gas. Input that impact our industrial impact



- Economics explores how people interact with each other and with their natural surroundings in producing their livelihoods
- A diagram of the 'circular flow of income which takes into account:
 - Human interactions with the biosphere and physical/natural environment
 - The resources that households and firms invest in sustain themselves

Key questions in this course

1. What do macroeconomists care about?
2. What do we mean by economic prosperity? What factors matter for wellbeing?
3. What economic models and policy tools can we use to solve economic, social and environmental problems?
4. Have the benefits of economic prosperity been equitably distributed? How can economics be used to create a more equitable society?
5. What is the role of technology, innovation, institution and international cooperation in fuelling economic prosperity?

Week 2 - a statistical picture of Australian society

- What do we mean by 'real' GDP?

Nominal GDP is written like this:

$$\begin{aligned} & (\text{price of a yoga lesson}) \times (\text{number of yoga lessons}) \\ & + (\text{price of a book}) \times (\text{number of books}) + \dots \\ & + (\text{price}) \times (\text{quantity}) \text{ for all other goods and services} \end{aligned}$$

In general, we write that:

$$\text{nominal GDP} = \sum_i p_i q_i$$

Where p_i is the price of good i , q_i is the quantity of good i , and Σ indicates the sum of price times quantity for all the goods and services that we count.

- When comparing production over different years, we need to adjust for the fact that it's not only the number of goods and services that goes up or down – price can too
- To remove the effect of price change and measure only changes in volume, we use the constant prices
- Inflation = prices go up
- Deflation = prices go down

Four phases

Short-run economic fluctuations	Long-run economic growth
Actual GDP	Potential GDP
Business cycle	Trend growth
Influenced by changes in Aggregate Demand (AD) & Short-Run Aggregate Supply (SR-AS)	Determined by improvements in economy's overall productive capacity (Long-Run Aggregate Supply LR-AS)

The Business Cycle

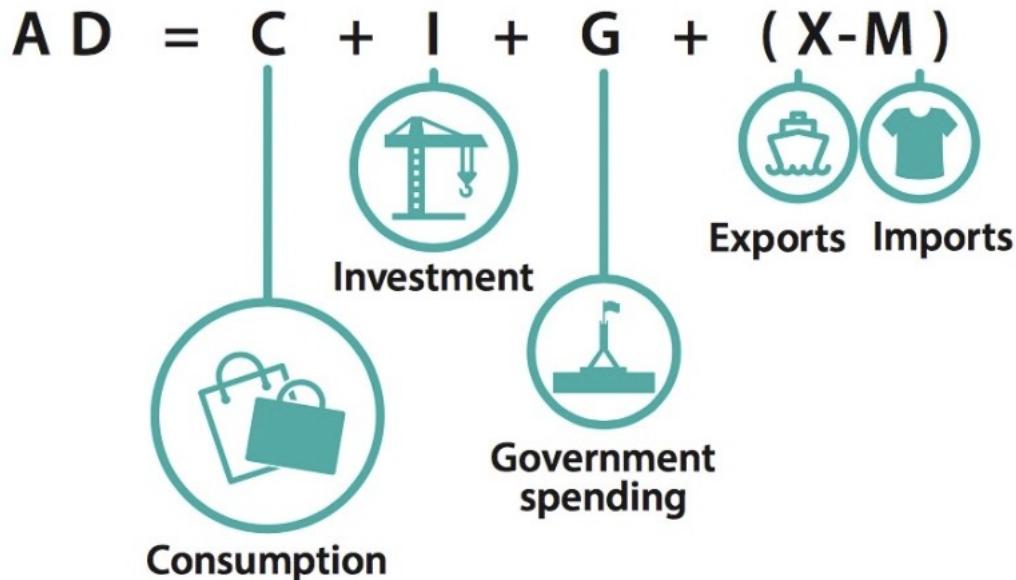
- Expansion
 - Households demand more goods and services, and businesses employ more workers. So unemployment goes down, and wages and prices generally get pushed due to higher demand
- Peak ('boom')
- Contraction
 - Households demand fewer goods and services, and businesses employ fewer workers. So unemployment worsens, and wages and prices slow down in growth as demand eases off
- Trough ('bust')

Recession

- A contraction refers to the phase of a business cycle where economic output declines. This means that growth is real GDP is negative and the company is shrinking in size
- A contraction is defined as a recession if we see 2 consecutive quarters of negative growth in real GDP
- A 'quarter' is a period of 3 months
- A slowdown or fall in the GDP growth rate is generally accompanied by job losses – this means that when we experience a recession, we expect an increase in the unemployment rate
- What is a recession
 - During a recession, several other indicators of economic activity tend to also be weak
 - Lower job adds and vacancies
 - Lower labour forces participation rate if job seekers drop out of the workforce completely
 - Lower levels of household spending and business investment
 - Lower levels of consumer and business confidence

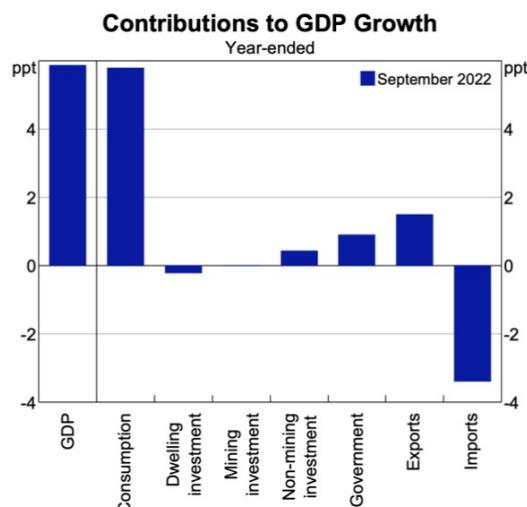
- Increase in the number of households and businesses that are unable to meet loan repayments
- Increase in the number of business closure
- Share market value might also fall or fracture (but not always)
- We must also pay attention to other metrics such as health behaviours, mental health, time spent on unpaid work

What drives economic fluctuations in the business cycle?



Contribution to GDP growth

- Consumption (C) contributed the most to GDP growth
- Export, government spending and non-mining investment made smaller but positive contribution
- Imports are negative because spending on imports flows out of the domestic economy



What is consumption?

- Consumption (C) is spending by people and households and items like rent, food, shopping, phone and internet bills, entertainment, leisure
- Consumption depends on a household's level of income (Y) as well as their expected income and wealth in future
- Income that is not spent on consumption is saved (S)
- Only purchases of new items are counted in GDP. Buying second-hand or used items is just changing ownership, not adding to production.

What is the investment?

- Investment (I) is spending by businesses and households that improves the economy's capacity to produce goods and services now and in future
 - Examples, include building new houses and offices, purchasing machinery and technical equipment, undertaking research and innovations
- Investment depends on interest rates, expected profits, government policies (e.g. subsidies) and technological developments
- Inventories (stock that is purchased by a firm but not used straightway) are also counted as investment

What is government spending?

- Government (G) spending refers to government purchases of goods and services
 - E.g. include public goods and investments such as hospitals and health services, schools, universities, defence, police, roads, transport, legal courts, salaries of public servants, public aged care facilities, essential infrastructure, community services such as homelessness services

What are exports?

- Exports are goods and services made by Australian producers that are bought by businesses, households and governments in other countries
- Demand for Australia's exports is stronger when Australia's trading partners are experiencing strong economic conditions
- Australia's exports are often used as inputs into production in other countries (e.g. Australia exports large volumes of iron ore and coal to China for the production of steel)
- Tourism in Australia and international students' education are also examples of exports

What are imports?

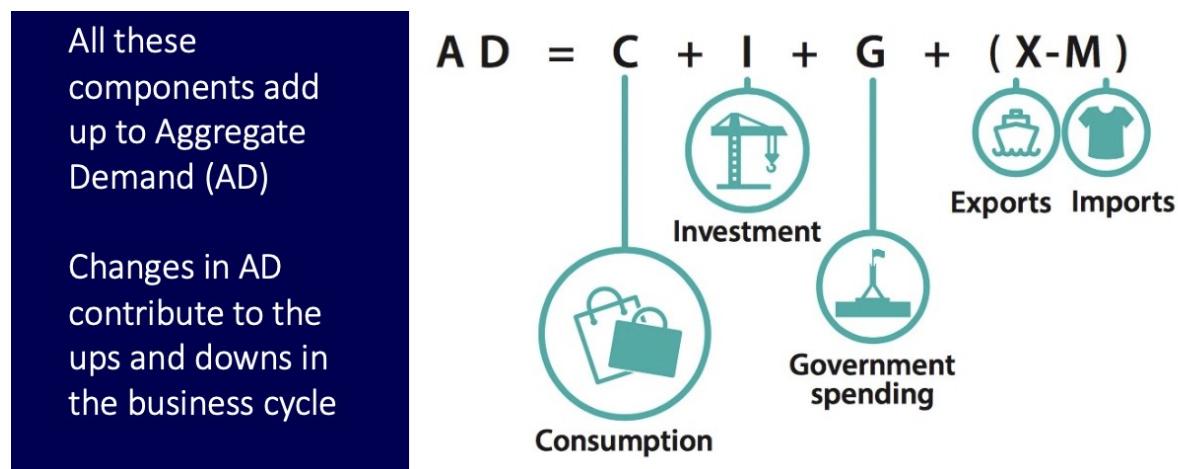
- Imports are goods and services that are purchased by Australian businesses, households and government, but not produced in Australia
- When C, I and G are strong, purchases of imports generally rise too
- Important also depends on the exchange rate. When Australia exchange rate gets stronger from other countries, so imports go up

What are Net Exports?

- We are interested in measuring the number of goods or services produced by a country domestically (GDP)
- When we measure aggregated demand, we count expenditure on our exports because this counts goods and services that were produced domestically
- But we don't count imports, because these are goods and services that were produced by another country
- Net exports are measured as exports minus imports ($NX = X - M$)
- Payments made for exports and imports are recorded in a country's balance of payments

The role of globalisation

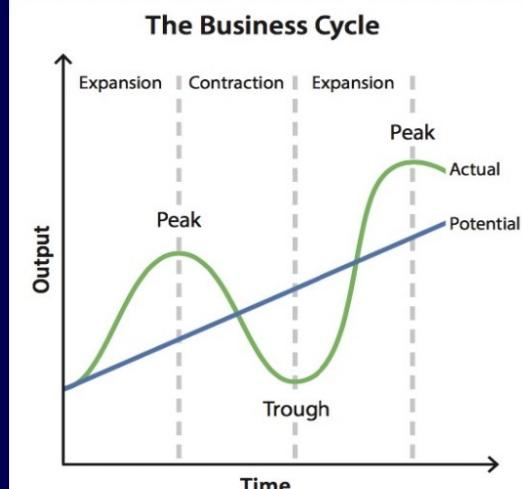
- Economies all around the world have become more interconnected with freer flow of goods and services, investment, finance and workers across international borders
- Opening up international borders had created a more competitive markets, economies of scale, and greater exchange of knowledge and ideas that fuel productivity improvements
- But globalisation has also brought concerns about equality, ethics and human rights. Is it right for multinational companies to take advantage of cheap labour in poor countries? We will explore these issues later in this course



We've look at factors that influence short-run ups and downs in Actual GDP

Now let's look at factors that shape of Potential GDP over the longer-term

Short-run economic fluctuations	Long-run economic growth
Actual GDP	Potential GDP
Business cycle	Trend growth



What drives long-run economic growth?

- Ongoing economic growth comes from an expansion in the economy's productivity capacity
- When we think of 'productivity capacity', we focus on the inputs (ingredients) that matter in production
 - Labour (size of working age population, labour force participation rates)
 - Capital (land, natural resources, infrastructure)
 - Productivity (efficiency and capacity of these inputs – depends on skills, education, technology, innovation, entrepreneurship, research, removing barriers)
- These production side factors determine long-run aggregated supply (LR-AS)⁹

What drives long-run economic growth?

- In economics 'technology' refers to more than devices and gadgets
- Technology refers to the process of converting inputs (resources) into outputs
- Technological progress refers to doing things more efficiently and resourcefully, such as:
 - Producing more with the same amount of input
 - Using fewer inputs to produce the same amount of outputs
 - Improving the quality of the product/service
- The ongoing evolution of our economy is called 'structural change'
- Some jobs become obsolete (job destruction) while new jobs are created requiring new and different types of skills (job creation)
- The economy needs systems to equip workers with the skills that are needed for current technology and ongoing changes in the economy

Short run VS long run

- The distinction between 'short run' and 'long run' is related to more than just periods of time
- It refers to the adjustability/flexibility of our economic inputs and productive environment

- In the short run, technology, institution, regulations, and potential labour supply are somewhat fixed and not easily adjustable
- In the long run, we assume all these factors are fully flexible and changeable
- If we experience short-run fluctuations in the business cycle, what policies can we use to moderate these fluctuations and get back to the potential GDP?
 - Monetary policy (interest rates)
 - Fiscal policy (government budgets)
- What policies can we use to expand potential GDP and fuel long-trend growth?
 - Investment in human capital, technology, innovations, infrastructure
 - Regulatory reform (e.g. reduce inefficiencies, improve mobility of factors of production)

Summary

- The economy typically cycles through short-run fluctuations – expansion, peak, contraction, trough
- Cycles are measured by changes in the economic growth rate (GDP) which generally corresponds with changes in the unemployment rate
- Business cycle fluctuations are mainly driven by the components of AD ($C+I+G+NX$) and short-run AS
- Economy can fuel ongoing growth through improving the economy's productivity capacity, such as by expanding inputs and improving productivity (long run AS) –

Week 3 – “How can we measure economic activity?”

- How do we calculate the economy (GDP) in national accounts? What is the distinction between real and nominal GDP?
- What are leading and lagging indicators? What are some of the challenges of computing economic forecasts?
- How do we measure inflation? What is the link between GDP; employment and inflation? What happens to inflation at different phases of the business cycle?
- Other than GDP, what are some other ways to measure economic production, well-being and prosperity?

3 ways to measure economic activity (GDP)

- 1) Expenditure: total spending by households, businesses, government, and consumers from other countries to buy the economy's products
- 2) Production: total production generated by a country's producers, measured by value added by each stage of the production process
- 3) Income: total incomes received by producers, which included wages, profits, income and self-employed and taxes received by governments

How can we measure economic activity?

- 1) Expenditure method
 - a. Total spending on final goods and services/products that are purchased as inputs for the production of another good/service is not conducted (e.g. If a café buys coffee beans to make cups of coffee, the value of the cup of coffee is counted by the coffee beans are not)
 - b. Counts business inventories (stock that is purchased by businesses but not sold in the same year)
- 2) Production (value added) method
 - a. Identify multiple stages of the production process and sum the value added at each stage
 - i. E.g.
 1. Farmer shears sheep and sells the fleece to a wool maker for a price of \$4
 2. Wool maker spins the fleece into wool, then sells the wool to a clothing manufacturer for a price of \$10
 3. Clothing manufacturer uses the wool to create a jumper, then sells the jumper to a clothing retailer for a price of \$40
 4. Clothing retailer sells the jumper to the final consumer for a price of \$50

How can we measure economic activity?



For example

- i. Farmer shears sheep and sells fleece to wool maker for a price of \$4 **How much value has been added? \$4**
- ii. Wool maker spins fleece into wool and sells to clothing manufacturer for a price of \$10
Value added = Difference between \$4 and \$10 = \$6
- iii. Clothing manufacturer uses wool to create a jumper and sells to clothing retailer for a price of \$40
Value added = Difference between \$10 and \$40 = \$30
- iv. Clothing retailer sells jumper to final consumer for a price of \$50
Value added = Difference between \$40 and \$50 = \$10

- Notice that the sum of all the value add equals the price paid by the final consumer
- We don't count the full price of intermediate inputs because this would lead to "double counting"
- Value added = the amount by which the value of the product is increased at each stage of the production process

3) Income method

- a. Adds up all the income received by factors of production in the process of producing the good or service
 - i. E.g. We count the wages earned by workers and profits earned by business owners

How can we measure economic activity?



Does it matter which of the 3 methods we use? In theory, no. Because they should all add up to the same number!

- When households, businesses, government, consumers spend their money on goods and services, they are purchasing goods and services produced by producers
- This spending then becomes the income of factors of production, who then go out and spend this money, so the cycle continues
- $\text{GDP} = \text{Aggregate expenditure} = \text{Aggregate production} = \text{Aggregate income}$

In practice, however, the 3 different methods might not generate exactly same number, because they rely on different data sources and there are always some measurement errors

How can we measure economic activity?

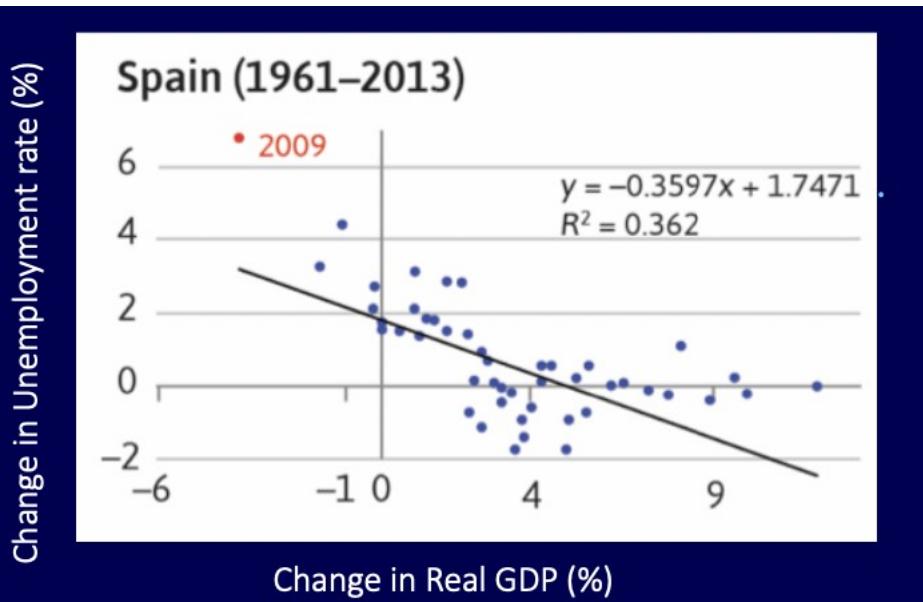


Each method provides different insights

- Expenditure method is useful if you want to understand who is doing the spending and what parts of the economy are driving changes in AD
- Production method is helpful if you want to see the relative contributions of different industries towards the production process
- Income method is informative if you want to see how income is distributed across workers and businesses (eg. what has happened to labour's share of factor income over time?)



Linking together our economic variables



- X coefficient in the equation tells us that a 1% increase in real GDP growth corresponds to a 0.3597% decrease in the unemployment rate
- R² tells us the strength of this correlation (closer to 1 = stronger statistical relationship)
- What other indicators are linked to output and jobs? (imagine aggregated demand for goods and services increases (expansion phase))
 - Higher demand for inputs of production
 - Because one of these inputs is labour, this creates more jobs and lower unemployment
 - Competition among producers for inputs bid up input prices because some inputs are fixed in availability in short term

- Greater competition for labour can also bid up wages
- Producers can cover these higher production costs across the economy by raising the prices of goods and service
 - Therefore, the expansion phase is associated with higher levels of inflation (faster rate of increase in the price level)
- We see the opposite scenario during a contraction
 - Imagine aggregated demand for goods and services weakens
 - Weaker demand for inputs of production
 - Because one of these inputs is labour, this creates fewer opportunities for job leads and increases unemployment
 - Less competition for inputs means there is less pressure on input prices
 - Weaker competition for labour reduced pressure on wage growth
 - Less pressure for producers to raise the price of goods and services
 - Therefore, the contraction [phase is associated with lower levels of inflation (slower increases in overall price levels) or even deflation

This empirical link between unemployment and price inflation has been formalised in a concept called Philip's Curve

Note that the horizontal axis runs highest to lowest values!

This (more modern) representation of the Philip's Curve reverses the horizontal axis

Lower rates of unemployment correspond with higher rates of inflation (and vice versa)

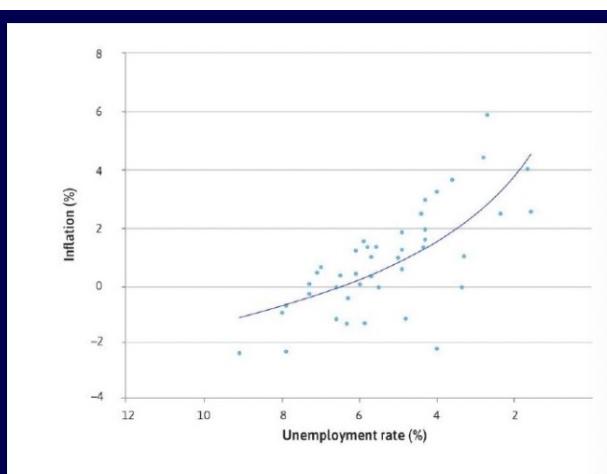
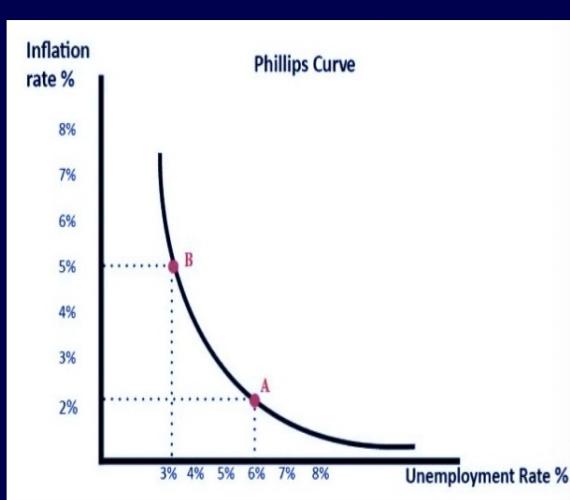


Figure 15.3 Phillips's original curve: Wage inflation and unemployment (1861–1913).



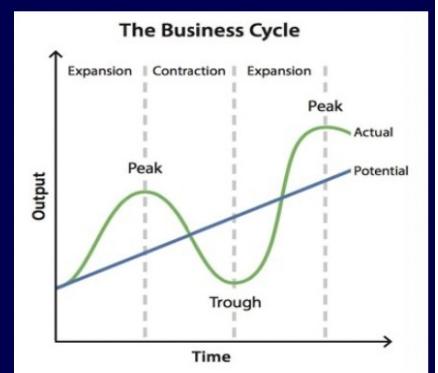
- In a healthy economy, we expect some inflation (moderate price level increases over time). In other words, a lower level of inflation is not entirely bad.
- During an expansion, we expect the price level to rise at a faster pace
- During a contraction, prices do not necessarily fall, the price level can just rise 'less quickly'
- Getting the terminology right
 - Inflation – overall price level is increasing
 - Deflation – overall price level is falling
 - Disinflation – overall price level is increasing, but not as quickly

What happened to inflation during the pandemic?

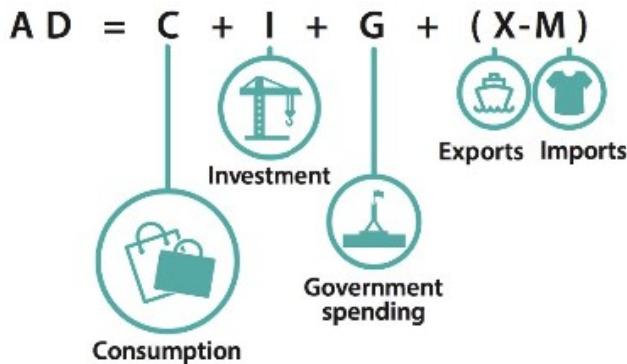
- Most of the time in a well function economy, we experience a small amount of inflation
- But occasionally in history, there are expectation! And you are living through an exception right now
- In July 2020, it was reported: "Australia experience deflation – failing prices – for the year to the end of the June of 0.3%

Recap: Short-run fluctuations vs. long-run growth

- We differentiate between short-run fluctuations and long-term growth
- Short-term fluctuations result from changes in Aggregate Demand (AD) ($C+I+G+NX$) or short-term shocks to Aggregate Supply (AS) (such as economy-wide shock in input price)
- Increase in potential output is driven by a sustained improvement in economy's productive capacity – but what exactly contributes to this?

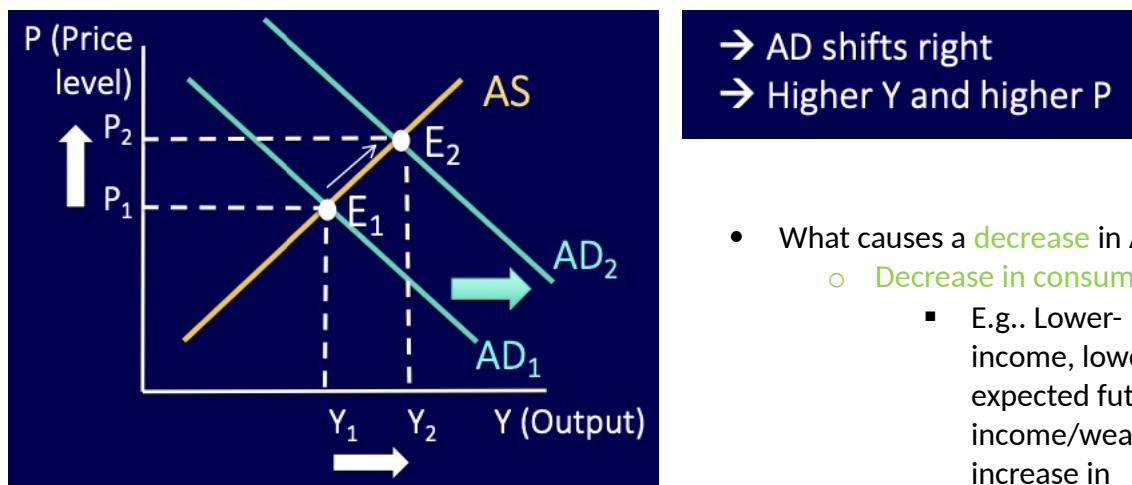


Week 4 – Human capital, technology and innovation as drivers of economic prosperity



What causes AD (aggregated demand) to shift?

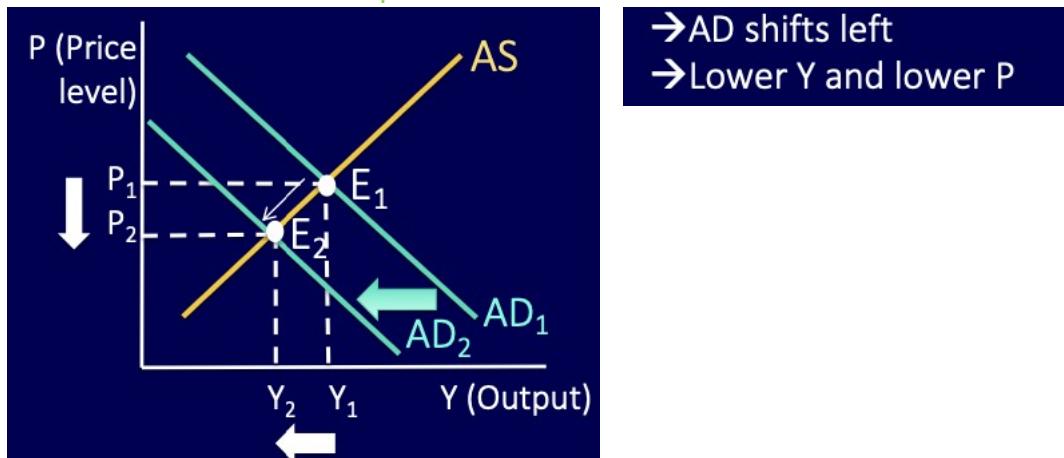
- What causes an **increase** in AD
 - **Increase consumption**
 - E.g. Higher income, higher expected future income/wealth, decrease in personal tax, increase in transfer payments, household stimulus payment, boost in consumer confidence
 - **Increase in investment**
 - E.g. Lower interest rate (cheaper for businesses to borrow), decrease in corporate tax, increase in business subsidy, boost in business confidence
 - **Increase in government spending**
 - E.g. Government spends more money on public goods and services and infrastructure)
 - **Increase in exports**
 - E.g. improvement in other countries' economic conditions, weaker exchange rate which makes exports cheaper for foreign buyers
 - **Decrease in imports**
 - E.g. Weaker exchange rate which makes imports more expensive



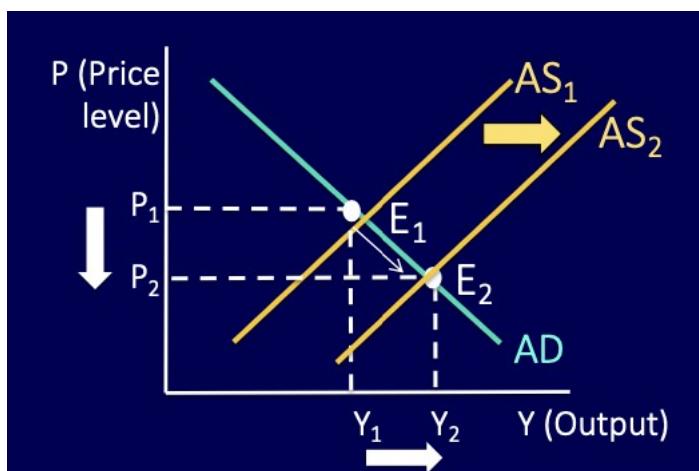
- What causes a **decrease** in AD?
 - **Decrease in consumption**
 - E.g.. Lower-income, lower expected future income/wealth, increase in

personal tax, decrease in transfer payments, withdrawal of household stimulus payment, drop in consumer confidence

- Decrease in investment
 - E.g. higher interest rate (more expensive for businesses to borrow), increase in corporate tax, decrease in business subsidy, drop in business confidence
- Decrease in government spending
- Decrease in exports
- Increase in imports

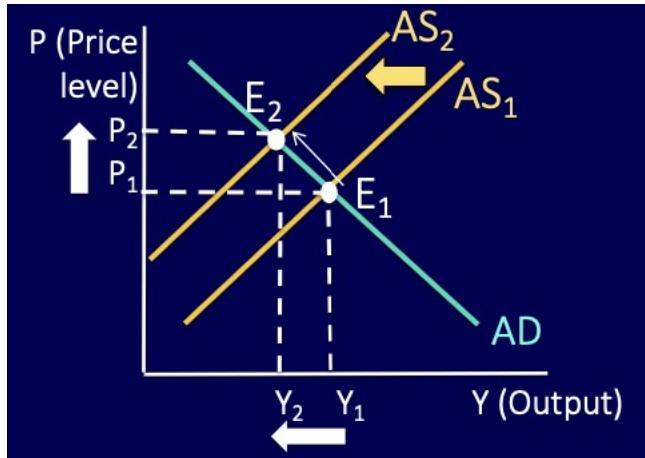


- What causes an **increase** in AS (aggravated supply)?
 - Fall in economy-wide production cost
 - Eg. Surplus of widely used input such as oil/petrol
 - AS shifts right
 - Higher Y and lower P



- What causes a **decrease** in AS?
 - Rise in economy-wide production cost

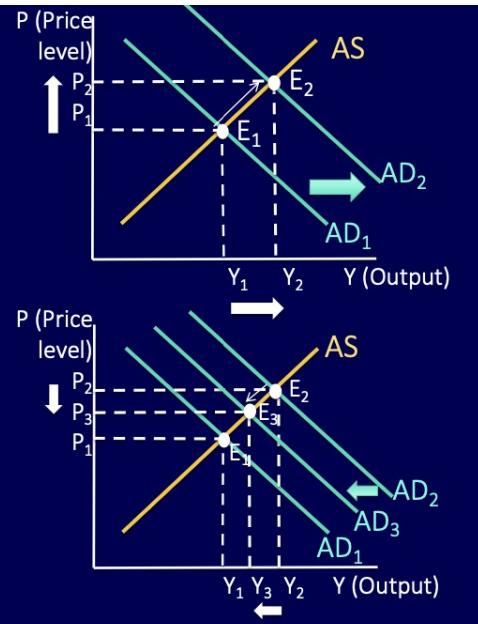
- E.g. Shortage of widely used input such as oil/petrol, natural disaster destroys mass supply of inputs)
 - AS shift left
 - Lower Y and higher P



Multiple shifts in AD and AS

Imagine scientists discover COVID-19 vaccine, causing increase in consumer and business confidence
 → C and I increase
 → AD shifts right
 → Higher Y and higher P

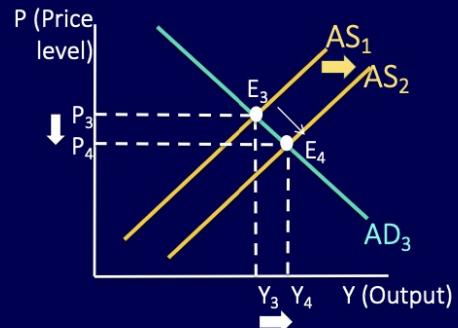
At same time, government winds back financial support for unemployed people
 → Reduction in transfers
 → Reduces disposal income
 → Reduces C
 And government raises personal income and corporate taxes to repay debt
 → Reduces C and I
 → AD shifts left
 Net (overall) effect on Y and P depends on relative magnitudes



Multiple shifts in AD and AS

Once the vaccine is available, regulations are lifted and less need for COVID-safe restrictions
 → Lower production costs
 → AS shifts right
 → Higher Y and Lower P

For each shift in AD or AS, consider what happens to Y and P



Net (overall) effect on Y and P depends on the relative magnitudes of all of these shifts

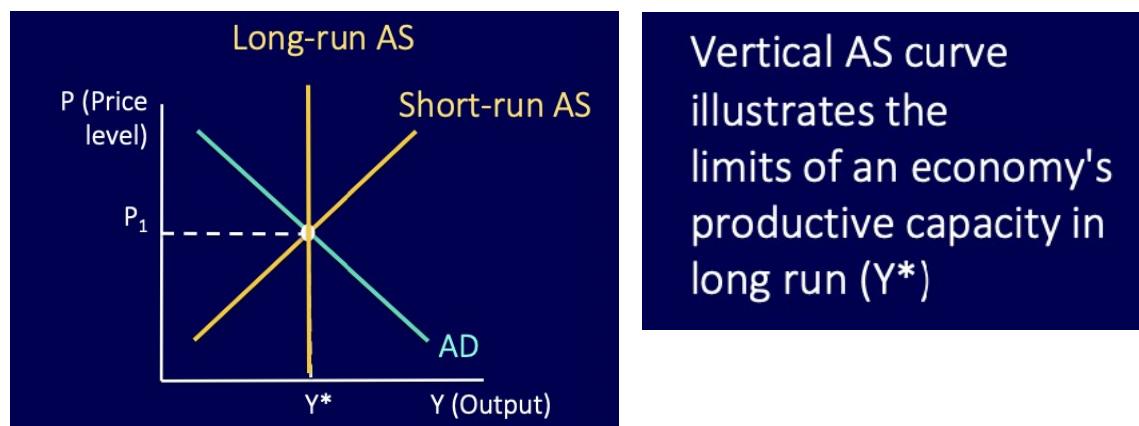


Long-run outcomes

- Whenever AD or AS shifts, we move to a higher or lower level of Y
- But can this higher/lower level of Y be **sustained** in the long run?
- When demand for aggregate output increases, where do we get the extra inputs for production (workers, raw materials, equipment) to deliver this higher output?
- When demand for aggregate output weakens, what happens to the inputs that are no longer needed?

Potential output

- Economy's potential output (Y^*)
- Level of output that corresponds to full employment
- At Y^* , aggregated output matches what can be produced by the economy

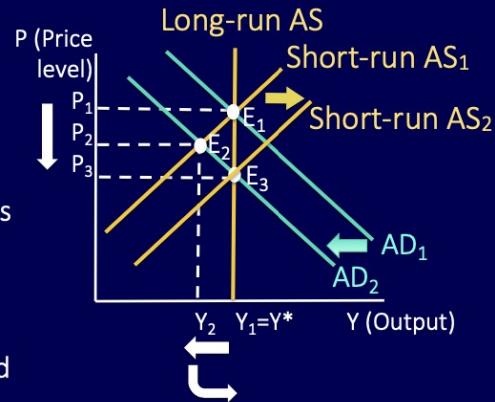


Long-run Aggregate Supply

This mechanism is based on 'Neoclassical model, which assumes economy always finds its way back to long-run equilibrium. Economists have different ideologies about this assumption

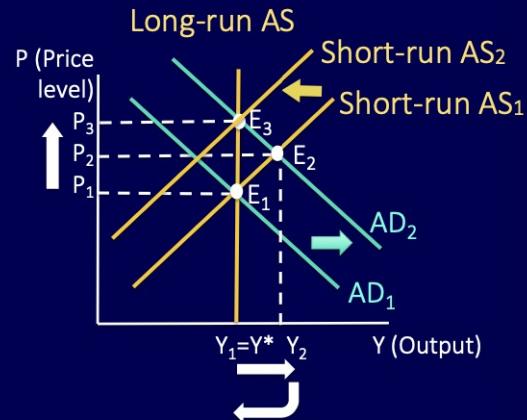


- When AD shifts left, economy moves to lower output level (Y_2)
- But if $Y < Y^*$, lower output results in unutilised inputs
- Surplus inputs reduces costs of inputs (pushes down wage growth)
- Decrease in production costs cause SR-AS to expand (shift right)
- Result is no change in real output, only fall in price level

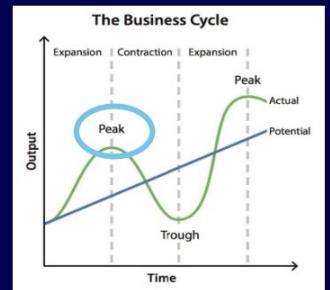
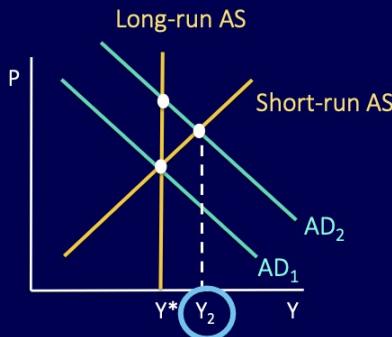


Long-run Aggregate Supply

- When AD shifts right, economy moves to higher output level (Y_2)
- But if $Y > Y^*$, higher output cannot be maintained with current inputs and production processes
- Competition for limited inputs bids up input prices
- This increase in production costs causes decrease in SR-AS (shifts left)
- Final equilibrium results in no change in real output, only increase in price level

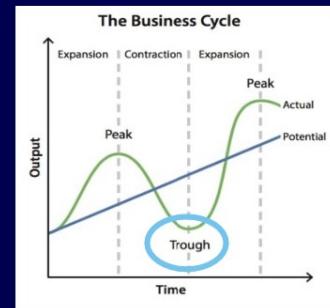
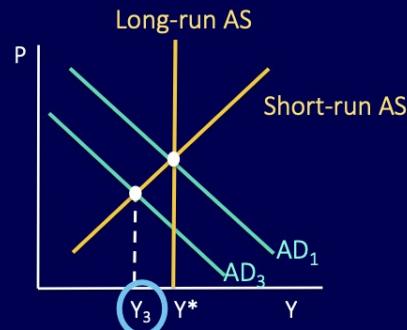


Linking long-run Aggregate Supply to business cycle

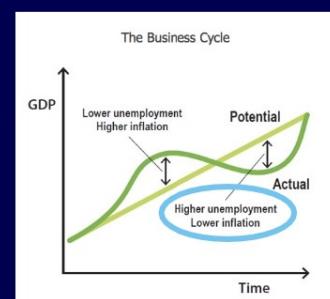


AD-driven increase in output
 → Expansion, leading to peak
 → Actual output rises above Potential Output
 → Lower unemployment but higher price level (inflation)

Linking long-run Aggregate Supply to business cycle



AD-driven decrease in output
 → Contraction and trough
 → Actual output drops below Potential Output
 → Lower price level (lower inflation) but higher unemployment



ingredient for production

- **Natural resources** – land, minerals, water, forests, raw materials sources from nature (which could be either renewable or non-renewable)
 - Natural endowments are generally ‘fixed’ in supply – unless we invest in replenishing the resources we use up
- **Physical capital** – physical equipment, infrastructure, machinery, factories, offices, computers, devices, vehicles
 - Stock of capital expands through investment
- **Labour** – number of people in the workforce
 - Labour force participation
 - Population growth and fertility rate
 - Migration

- **Human capital**
 - Skill, knowledge, health and productive capacity of workers, entrepreneurship
 - Acquired via education, training, apprenticeship, on the job experience, skill development, investment in health
 - Skill migration

We can summarise this information in the production function formula

$$Y = f(N, K, L, H)$$

Y = Output

f means "is a function of" (another way of saying "depends on")

N = Natural Resources

K = Physical Capital

L = Labour

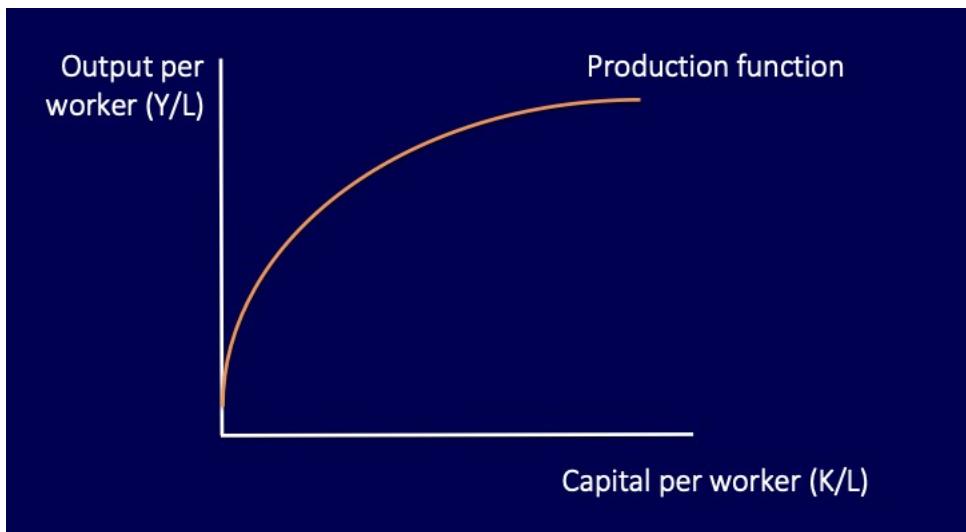
H = Human Capital

(conventional production functions tend to omit natural resources)

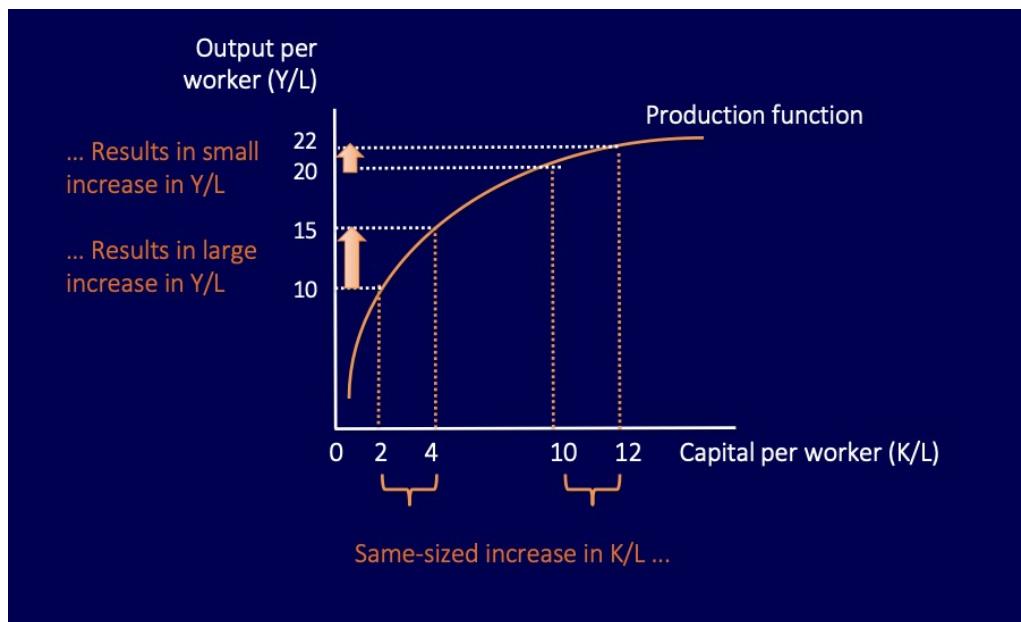
- If we keep expanding out inputs, we can keep increasing output and consequently achieve ongoing output growth
- But we have limitations.....
 - Depletion of **natural resources**
 - We are interested in **output per person**. Increase in labour alone won't improve output per person
 - Even if we increase in capital stock, each additional unit of capital offer less productive value, due to **diminishing marginal return to capital**

Diminishing return to capital

- Higher physical capital generates higher output per worker
- This is illustrated by the upward positive slope
- But as we continue to increase the amount of capital per worker, the resulting increase in output per worker is not as large
- This is illustrated by the flattening slope



- This concept is part of the ‘Solow model’ of economic growth, named after economist Robert Solow

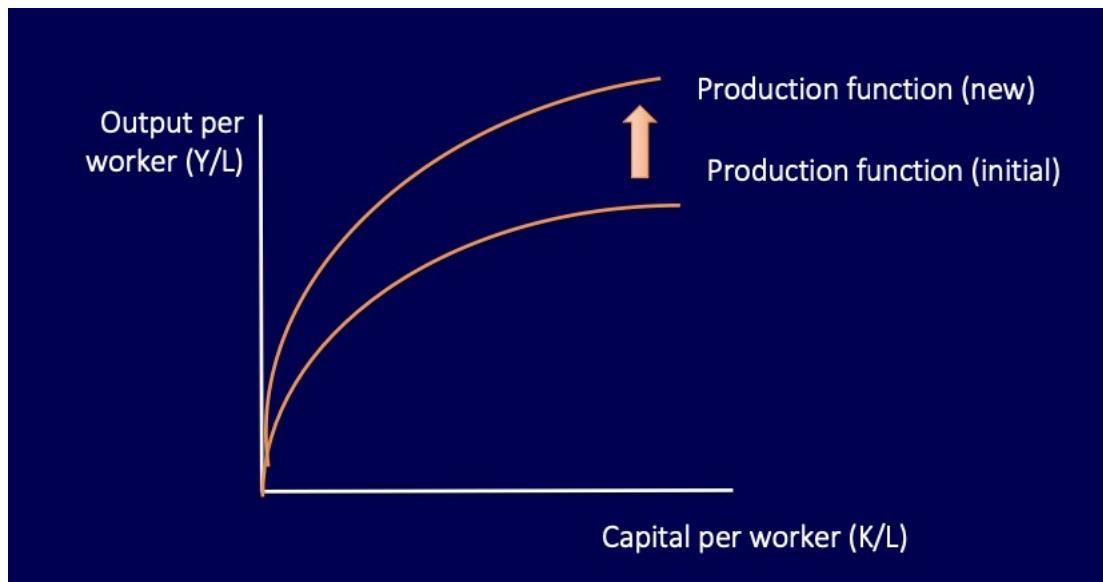


Why do we see diminishing returns to capital?

- Expansion of the stock of physical capital also means more **depreciation** as capital stock wears out over time. Investment goes towards acquiring new stocks of physical capita, but also maintaining and replacing existing stock. Capital stock only grows if the investment rate physically exceeds the depreciation rate.
- Productive returns of each additional unit of capital stock per worker will eventually **plateau**
- Output growth (output per worker = output per person) **slows down** (leading to '**steady state**)
- An ‘upside’ of diminishing return to capital is that it implies that poor countries (with initially low levels of capital) can catch up to rich countries (because growth of rich countries eventually tapers out) – we call this ‘**convergence**’
- Also note investment relies on having sufficient **saving**

How do we overcome the limitations of diminishing returns?

- What could give the production function a boost?
 - What could lift it up (improve the productivity of each unit of capital) or make it steeper (lessen the diminishing effect of marginal returns to capital)



Ingredients for production



Our secret ingredient to add to the production function

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

'A' represents technology which enhances the productivity of all other factors of production



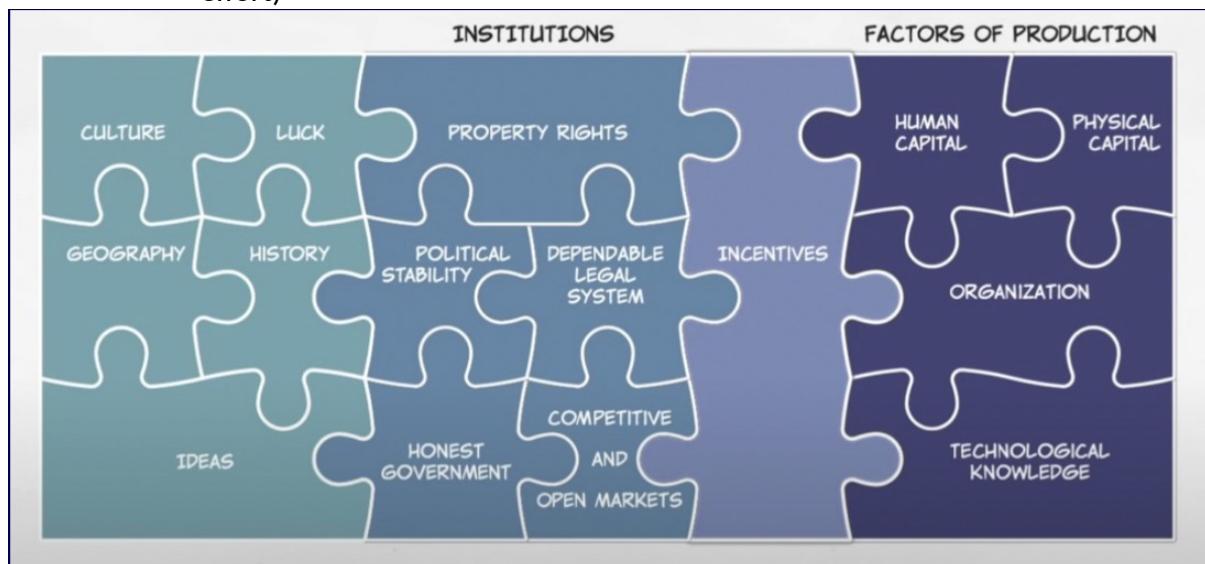
- Technology refers to an understanding of "how" to do things effectively – innovation, ideas, technological advancements, knowledge breakthroughs
- Enables us achieve even more output from existing resources, or to achieve the same output with fewer resources
- Sometimes called "Total Factor Productivity"

Technology unlocks the limitations on growth

- Technology is not constrained by the same limitations of the other inputs to production
 - Existing ideas, innovation and knowledge generate more ideas, innovation and knowledge – we don't have the problem of depletion, depreciation or diminishing returns that limit other resources
 - Ideas, innovations and knowledge can be **freely shared**
 - The supply of technology and knowledge is **endless**

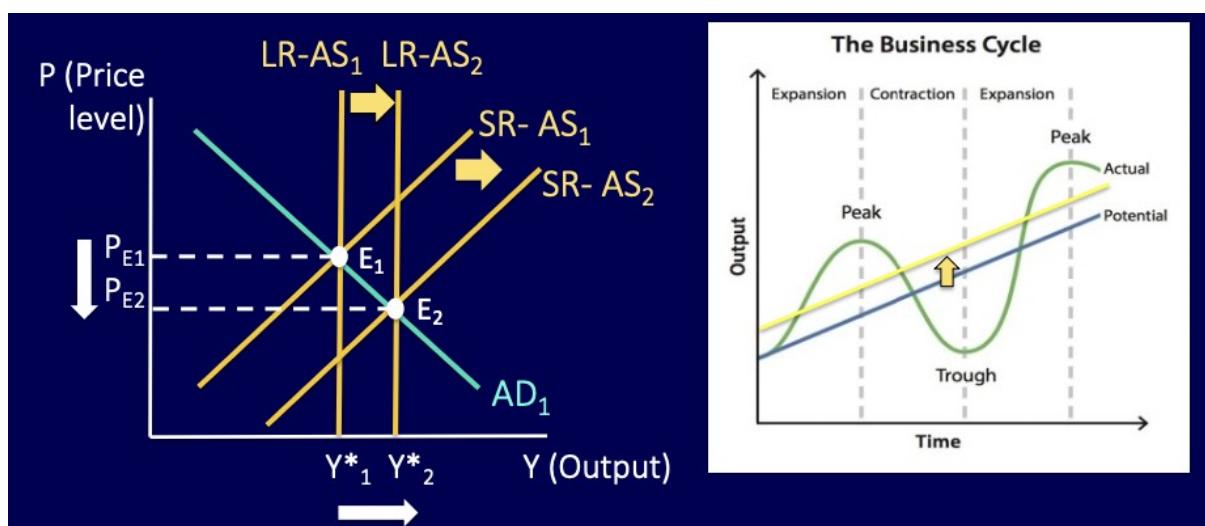
Technology unlocks limitations on growth

- How can we promote technology, ideas and innovations?
 - Research and development (R&D) and institutional policies that support technological development and innovation (e.g. Intellectual property laws) are important
 - In addition to factors of production and technology, a well-functioning economy also requires sound institutional settings – stable government and legal system, open and competitive markets, sound regulations and property rights, rule of law, saving (to fund investment), ethical governance and business practises, and societal values that are conducive to a prosperous society (e.g. Belief in fairness and equality of opportunity; belief in reward for effort)

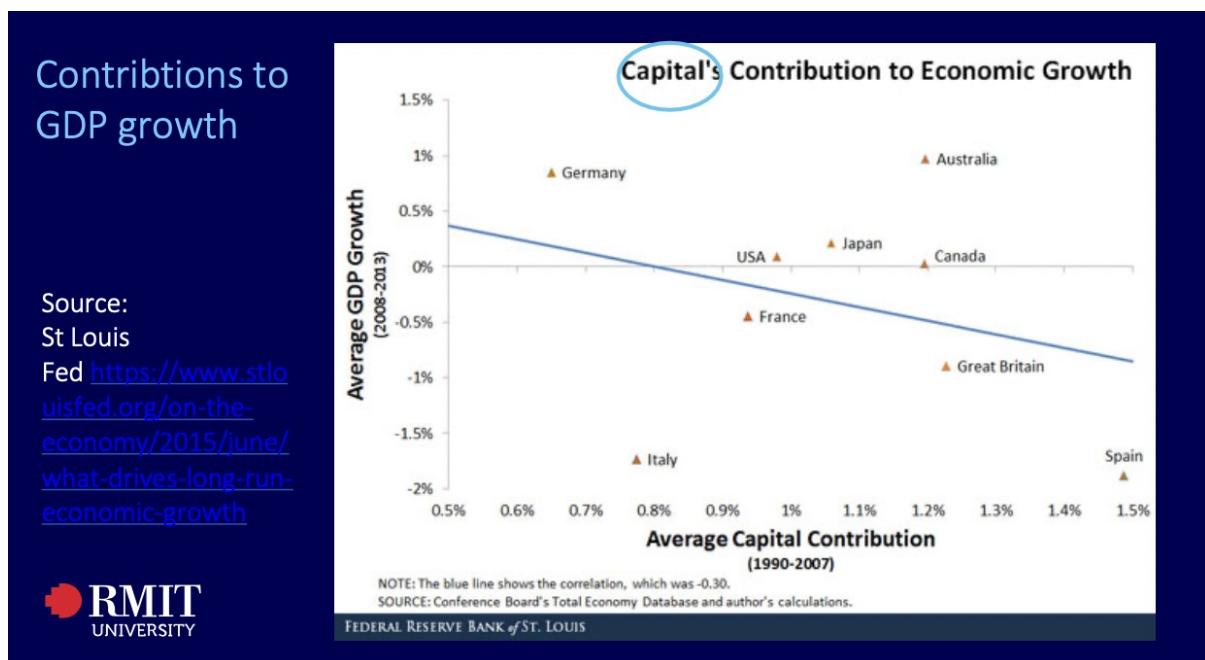
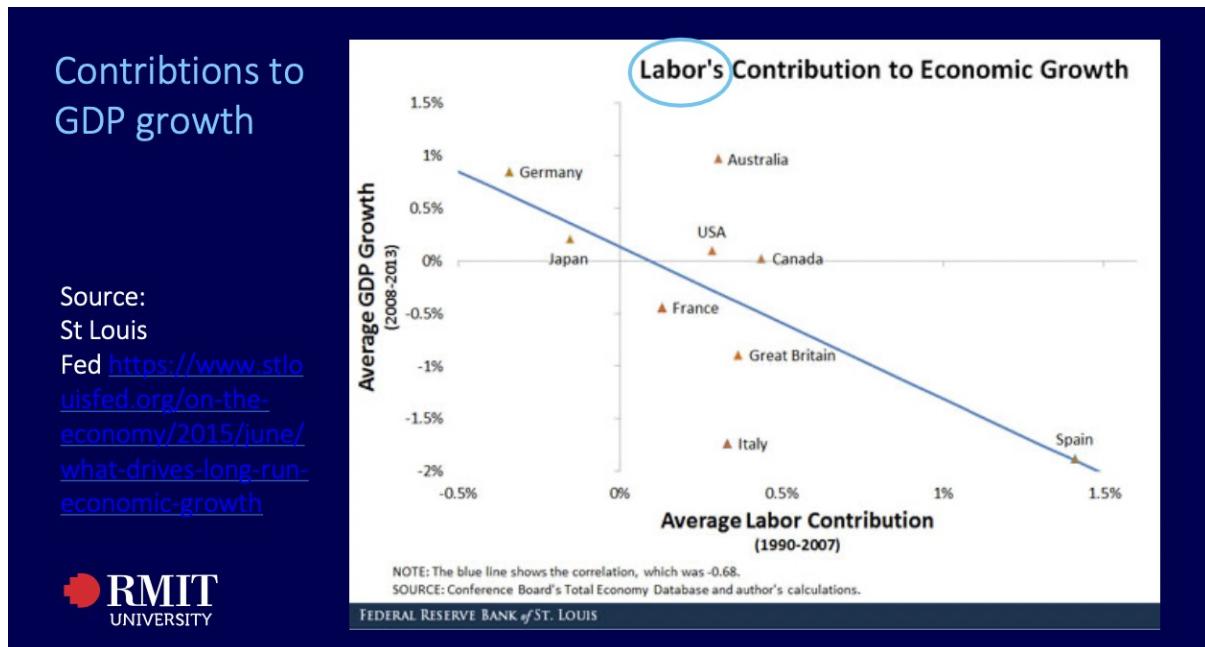


Expanding potential output

- What does an expansion in the economy's productive capacity (potential output) look like on our AD-AS model and business cycle diagram?



- An increase in AD can also boost potential output, depending on how it is spent
 - Household spending on education (human capital)
 - Business investment on research and innovation (technology)
 - Government spending on research and innovation (technology)
 - Government provides subsidies to businesses for innovation (technology)
 - Government spending on health, safety and education (human capital)
 - Government spending public infrastructure (physical capital)

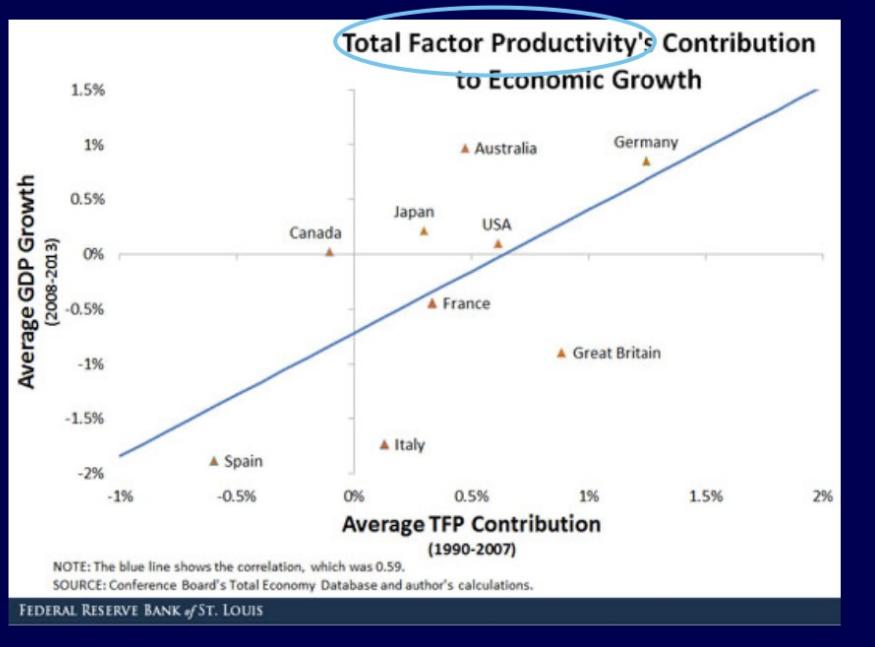


Contributions to GDP growth

Source:

St Louis

Fed <https://www.stlouisfed.org/on-the-economy/2015/june/what-drives-long-run-economic-growth>



Implication of technology progress for jobs

- Interaction between technology and jobs in two-way
 - Advancement in technology can fuel economic growth and therefore create new job opportunities
 - But technological progress can make some jobs obsolete if they are replaced by robots and automation
 - But technology also creates the need for new and different skills
- The full benefits of technological progress, we need workers to be equipped with skills that will be needed in a more technological advanced world

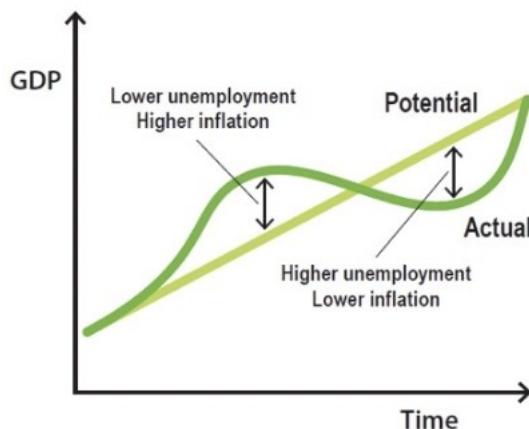
Week 5 - unemployment and costs of living

Learning objectives

- How to do the economic challenges of high unemployment or high inflation (cost of living) correspond with where we are in the business cycle?
- How do economists define and measure unemployment? What causes unemployment and why is unemployment an economic and social problem? What other measures of labour under utilisation also exist?
- How do economists measure inflation? What causes inflation and why is inflation an economic and social problem? What is meant by inflation targeting?
- How can policymakers manage both unemployment and inflation?

Unemployment and inflation

The Business Cycle



- expansions create and reduce unemployment BUT also bring the risks of higher inflation
- Contractions reduce pressure on price level BUT also worsen unemployment sound economic management is therefore about moderating any extremes in economic activity
- Many economists follow the principles of inflation targeting ("healthy" level of inflation (2% - 3% in Australia) while aiming for full employment level of output (a certain level of unemployment is expected as constantly people move between jobs and re-skills, but aim to minimise job losses arising from fall in AD)

Why is unemployment a problem?

- Under utilisation of an economy's productive capacity
- Forgone return on human capital investment
- Mental health and wellbeing – job gives people. A sense of purpose, identity, reward, achievement
- Further cost to government and society – budget outlays on unemployment benefits, forgone tax revenue, higher likelihood of detrimental societal outcomes (crime, health costs, homelessness, poverty, abuse, social unrest, inequality)
- Workforce contribution is an ingredient towards the economy's long-run trend growth and prosperity

Why is inflation a problem?

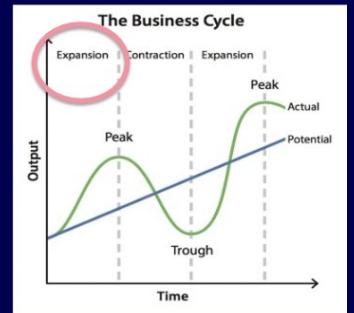
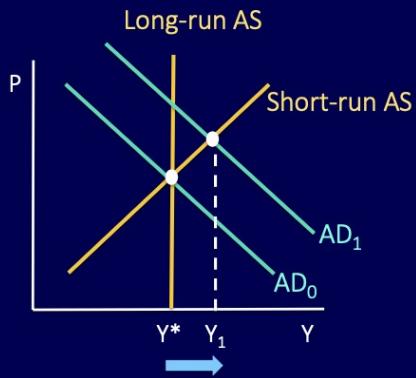
- High inflation (in extreme cases, hyperinflation) erodes consumers' purchasing power
- Keeping up with increases in price level brings extra transaction costs to businesses, employers and consumers (e.g. re-negotiating contracts) ("menu costs" and "shoe leather costs") and necessitates nominal increases in government welfare payments
- If the inflation rate differs from what is expected, this redistributes income in unintentional ways
- Very low inflation or deflation (negative growth in the price level) is not good either – it is a sign of a lethargic economy and can actually deter spending if people anticipate further price falls

Unemployment

Employment
Hours worked
Under-employment
Workforce participation
Job vacancies
Duration of unemployment
Job security (casual, contract, fixed term)



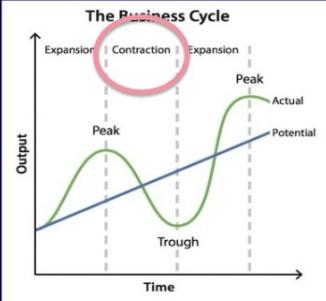
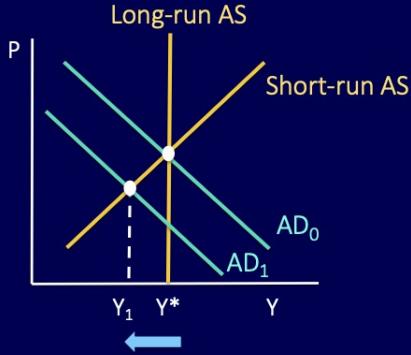
Linking unemployment to the business cycle



- Unemployment gets lower (better) during expansion phase
- When actual output (Y) rises above potential output (Y^*), inputs (including labour) are in higher demand



Linking unemployment to the business cycle



- During contraction phase, unemployment gets higher (worse)
- When actual output (Y) drops below potential output (Y^*), not all inputs are being fully used



*** MORE INFORMATION/EXAMPLES ON SLIDES 17-23***

- COVID recession

- To be counted as unemployed, a person must be:
 - Without a job (and not in self-employment either)
 - Available for work and ready to start work in reference period (e.g. next 4 weeks)
 - Activity seeking a job during the reference period
- If a person gives up activity looking for a job, they are no longer considered unemployed or part of the labour force
- If a person joins the labour force and starts looking for a job but doesn't find a job straight away, they will not be counted as unemployed



Calculating unemployment rate

Source: ABS Labour Force Australia, Cat. 6202.0

Unemployment rate (%)

	Employed (000s)	Unemployed (000s)	Labour Force (000s)
	$= \text{Employed} + \text{Unemployed}$		
June 2020	12,357.2	992.4	13,349.6

	Unemployment rate (%)
	$(\text{Unemployed} / \text{Labour Force}) * 100$
June 2020	$(992.4 / 13,349.6) * 100 = 7.4\%$

RMIT UNIVERSITY

Of all the people looking for a job, 7.4% were unable to find a job
The remaining proportion (92.6%) were successfully able to find a job

MORE EXAMPLES ON SLIDES

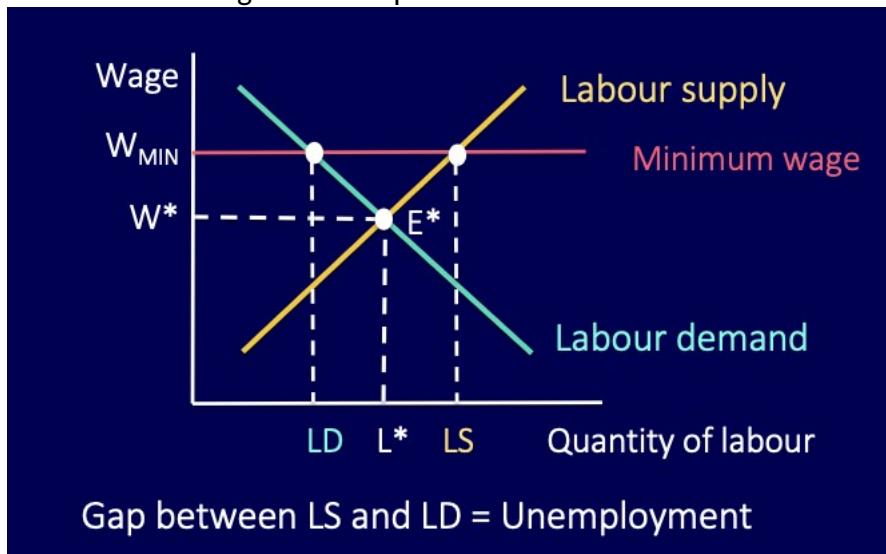
3 types of unemployment

1. Frictional unemployment

- It takes time for workers to be matched to a job that fits their skills
- Labour demand meets labour supply, but the job searching and job matching process takes time
- At Y^* (full employment level of output), we expect some level of frictional unemployment
- Even though frictional unemployment is an expected part of the labour market, it can be reduced by better job searching and job matching processes (e.g. distributing information on job opportunities)

2. Structural unemployment

- Mis-match between the skills workers have and the skills required by employers
- Due to changes in the economy's structure and the nature of work (e.g. technological change makes some jobs obsolete)
- This can be reduced by education, training and re-skilling programs
- Also related to institutional settings that keep wages above market clearing level (e.g. minimum wage laws)
- One reason why structural unemployment can occur is if the minimum wage is set above the equilibrium level, causing $LS > LD$
- But there are other important social and economic reasons for minimum wages to be in place



3. Cyclical unemployment

- Decrease in demand for labour which has been caused by a decrease in AD
- Labour demand < labour supply
- Cyclical unemployment corresponds to contractions in the business cycle
- By comparison, frictional and structural unemployment occur irrespective of which phase of the business cycle we are in
- Cyclical unemployment is the component that drives the 'ups and downs in unemployment that corresponds with the business cycle'

- Original series Actual numbers collected from the survey each month
- Seasonally-adjusted Removes effects of calendar-related patterns and seasonal variation (eg. holidays and agricultural seasons)
- Trend Smooths out seasonally-adjusted series to produce a longer-term trend ("weighted moving average")

Which series should we use?

- For comparisons over time, seasonally-adjusted is recommended
- Trend is useful for extended time periods, but this assumes no irregular events has occurred (ABS is not attempting to calculate trend estimates during the pandemic!)
- Data that is disaggregated into sub-categories (eg. employment according to industry) is often only available as original series

MEASURING UNEMPLOYMENT

Box: Calculating the Unemployment Rate – An Example

To understand how the unemployment rate is calculated we can use an example. In this example 12.6 million people are employed and 0.7 million people are unemployed. The size of the labour force is calculated as the sum of these groups.

$$\begin{array}{rcl} \text{Employed} & + & \text{Unemployed} \\ \text{12.6m} & + & \text{0.7m} \end{array} = \begin{array}{r} \text{Labour force} \\ \hline \text{13.3m} \end{array}$$

With the unemployment rate being the percentage of people in the labour force who are unemployed, using the numbers in our example and the equation below, the unemployment rate is calculated as 5.3 per cent.

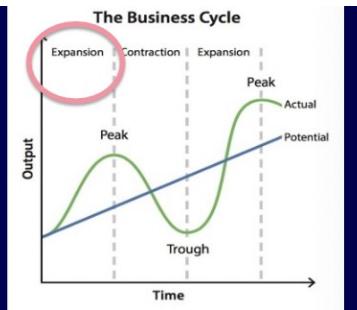
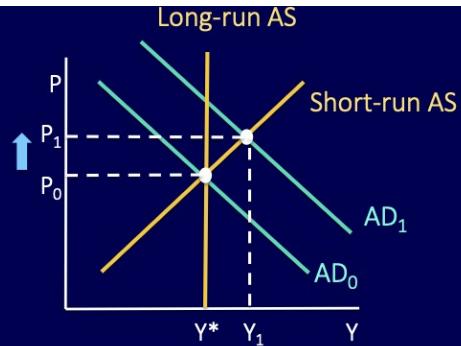
$$\begin{aligned} \text{Unemployment Rate} &= \frac{\text{Unemployed}}{\text{Labour force}} \times 100 \\ &= \frac{0.7m}{13.3m} \times 100 \\ &= 5.3\% \end{aligned}$$

Continued over page.

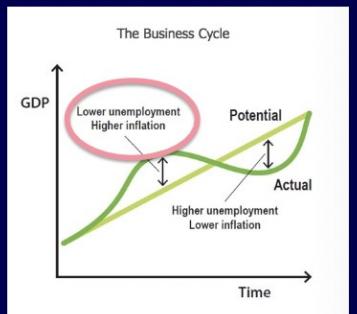
Inflations

- Changes in the overall price level in the economy
 - Zero inflation
 - No change in price level (0%)
 - Inflation
 - price level is rising (e.g. 3%)
 - Disinflation
 - The price level is rising, but less quickly than previously (e.g. 2% instead of 3%)
 - Deflation
 - The price level is falling (e.g. -1%)
- How to measure inflation
 - Consumer price index (CPI) shopping basket of households
 - Production price index (PPI) business costs of producers
 - GDP deflator price index designed for GDP (domestically produced goods and services)

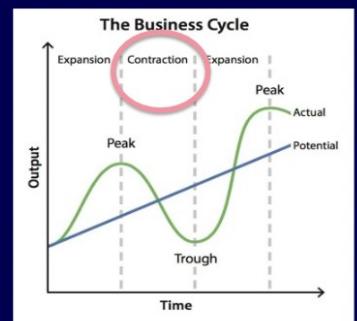
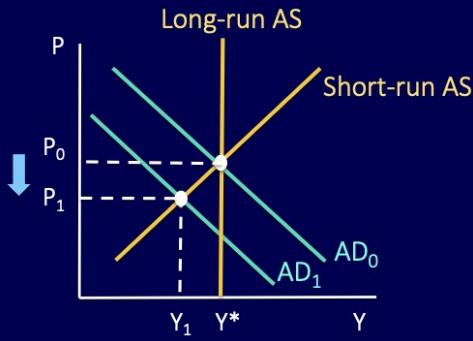
Linking inflation to the business cycle



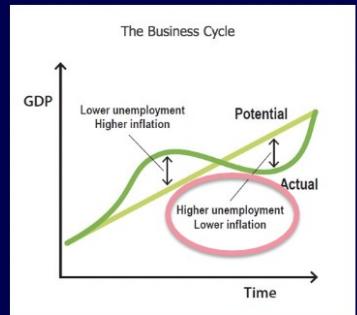
- Inflation gets higher during expansion phase
- When actual output (Y) rises above potential output (Y^*), stronger demand for inputs puts pressure on input prices



Linking inflation to the business cycle



- Inflation gets lower during contraction phase
- When actual output (Y) drops below potential output (Y^*), not all inputs are being fully used, alleviating pressure on input prices



Linking together unemployment and inflation

- The inverse relationship between unemployment and inflation is formed in the Phillips curve

(Note that in this diagram (original published by economist William Phillips in 1958), the unit of measurement on the unemployment axis is in descending order)

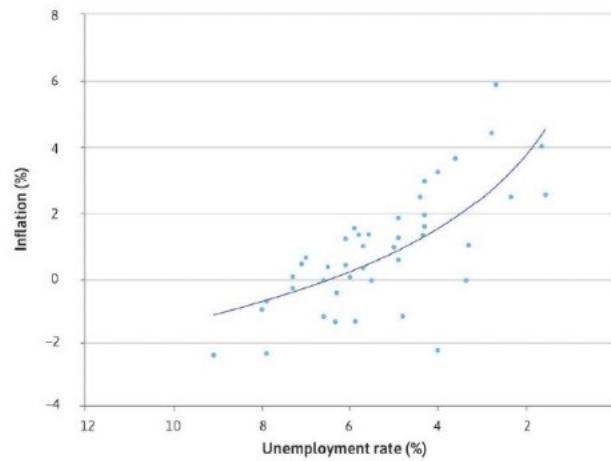
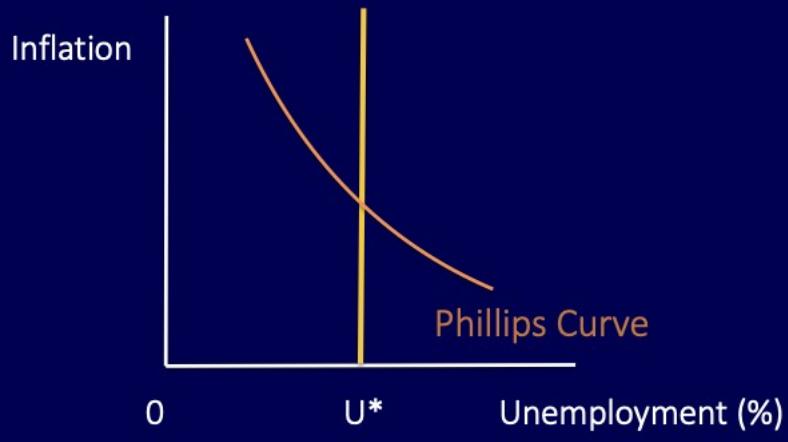


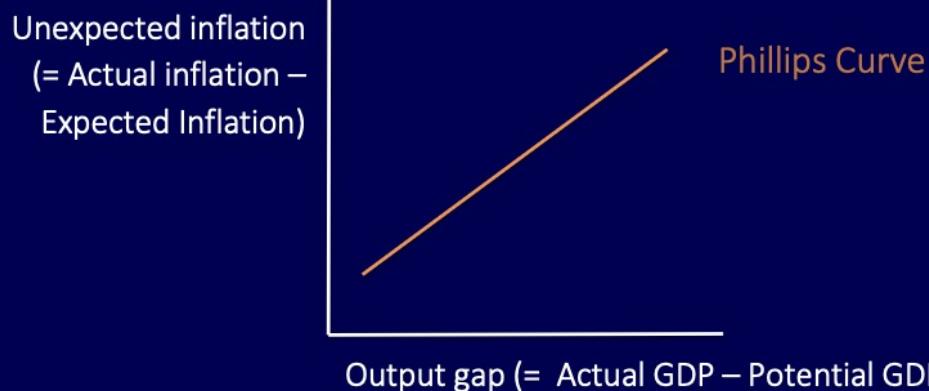
Figure 15.3 Phillips's original curve: Wage inflation and unemployment (1861–1913).

Long-run Phillips Curve



- Phillips Curve can also be illustrated in terms of the relationship between the output gap and inflation expectations

(2) Producers cover these higher production costs by raising prices further above the expected rate of inflation



(1) When output is higher than potential, higher demand puts pressure on input prices

Linking together unemployment and inflation

See CORE Unit 15.3



Linking together unemployment and inflation

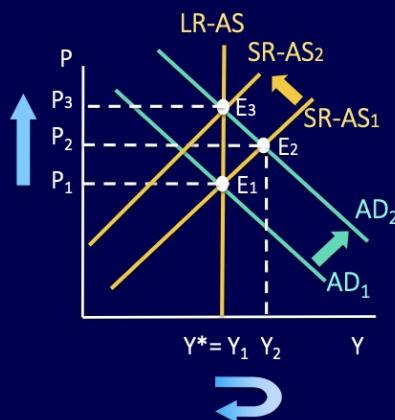
So far we have identified this chain reaction

- Higher aggregate demand (AD)
- Higher output (Y)
- Lower unemployment (U)
- Higher input prices (Wages) (W)
- Higher overall price level (to cover higher input costs)

This chain reaction continues...

- When prices go up, workers face higher costs of living
- Workers bargain for higher wages
- Higher wages further push up production costs, leading to wage-price spiral

In long-run, higher nominal wages (W) can be counterbalanced by higher price level (P), so real wage (W/P) stays the same



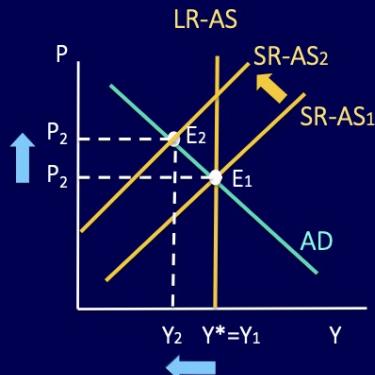
Increase in AD

- Increase in Y
 - $Y > Y^*$
 - Higher demand for inputs
 - Higher price of inputs (nominal wages)
 - Higher costs of production
 - SR-AS shifts left
- In long-run, economy returns to Y^*
- = No change in real variable
 - = Higher nominal wages are offset by higher prices (therefore real wages unchanged)

Inflation expectation

- If wages and price setters are expected, EG, 3% annual inflation, and there are no unexpected changes in AD, the economy remains at Y^* . minimal W and P are scheduled to increase by 3% each year so real wage holds steady
- Now imagine AD increases, increasing output and lowering unemployment, putting higher pressure on prices. Workers would need nominal wages to rise by even more than 3% to preserve real wages
- As workers have experienced a loss in real wages, they have reason to bargain for higher increases in nominal wages next round. Their inflation expectations have risen
- Higher inflation expectations shifts up to Phillip Curve

Inflation can also be caused by supply-side shocks



See CORE Unit 15.6, 15.7

Combination of higher prices level AND lower growth is called "stagflation" (a scenario we want to avoid!)
= Stagnant growth + Inflation

- Higher prices can be caused by higher production costs
- For example, higher price of oil pushes up production costs for businesses ("supply-side shock")
- This causes SR-AS to shift left
- New equilibrium point shows higher P (Price Level) and lower Y (Output)
- Concern because lower Y means higher unemployment
- This corresponds to Phillips Curve shifting upwards
- Need to improve supply-side productivity to shift back to Y^*

Inflation

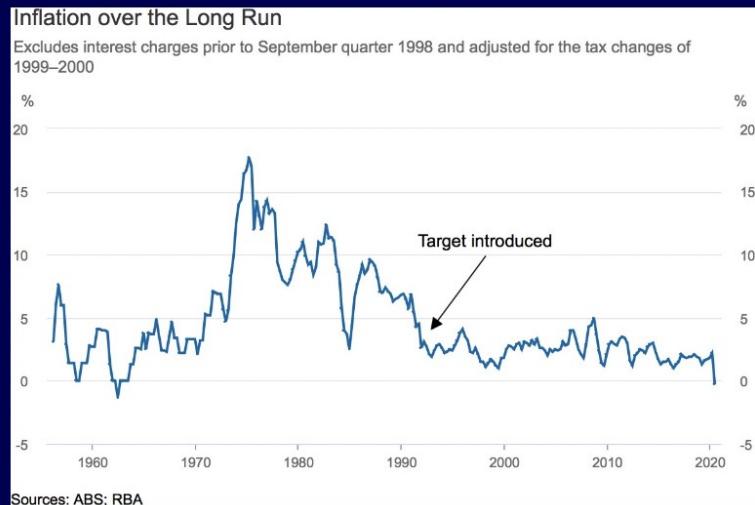
See Core Unit 15 Introduction, 15.1

Also see RBA
Inflation Targeting
<https://www.rba.gov.au/inflation/inflation-target.html>



Inflation targeting

- Central bank aims to keep inflation rate within a target range
- It does this by altering cash rates (monetary policy) to influence AD



Inflation targeting

- If inflation rises above target
 - RBA raises cash rate which raises interest rates
 - Higher interest rates discourage consumption and investment activity
 - Lowers AD and slows down economic activity
 - Reduces pressure on price level
- And vice versa if inflation drops below target

- Inflation amplifies the difference between nominal and real variables
 - Real GDP compares to nominal GDP
 - Real wages compared to Nominal wages
 - Real interest rates compared to nominal interest real
- Focusing on nominal amounts leads to the 'money illusion'
- If normal amounts are not indexed to keep pace with inflation, real value will be different from expected e.g, if inflation is higher than anticipated:
 - Pensioners on fixed nominal pension receive less in real terms (they will be worse off)
 - Lenders who have loaned money in fixed nominal terms receive less in real terms (they will be worse off)
 - Mortgage holders on fixed nominal interest rate loans owe less in real terms (they will be better off)
 - We can use the fisher equation to calculate the effect of inflation on the interest rate, when analysing borrowing and lending decisions
 - **NOMINAL INTEREST RATE – INFLATION = REAL INTEREST RATE**

Suppose Julia borrows \$50 from Marco at a nominal interest rate of 10%. This means Julia will need to repay Marco $\$50 + \$5 = \$55$

Let's say Marco and Julia were expecting an inflation rate of 2% when they agreed on this loan arrangement. This means the **real rate of interest** that Marco is expecting to charge is $10\% - 2\% = 8\%$

Let's suppose inflation is **higher than expected** and turns out to be 6% not 2%

The \$55 that Marco receives from Julia will have less purchasing power than expected

The **real rate of interest** that Julia will pay Marco is $10\% - 6\% = 4\%$

If inflation is higher than expected, Marco, as the lender, is worse off. As the borrower, Julia is better off.

The opposite would occur if inflation were lower than expected

Week 6 - economic inequality

Learning objectives

- How do economists measure economic inequality?
- What explains the gap between poor and rich countries? Can poor countries catch up to achieve the living standard of rich countries?
- What explains the gap between poor and rich people within a country? How do differences in economic outcome depend on a person's geographic, socioeconomic and demographic characteristics?
- What policies are important for addressing inequalities of economic outcomes and for removing barriers to equality of opportunity?
- Is there a trade-off between economic growth and economic equality? Or does improvement in equality contribute to stronger economic growth?
- What has been the impact of the COVID-19 pandemic on economic inequality?

Economic inequality

- Inequality between countries – the gap between the richest and poorest countries
- Inequality within a country – the gap between the richest and poorest people within a country

Global economic inequality

See: Global Economic Inequality, Our World in Data, by economist Max Roser
<https://ourworldindata.org/global-economic-inequality>



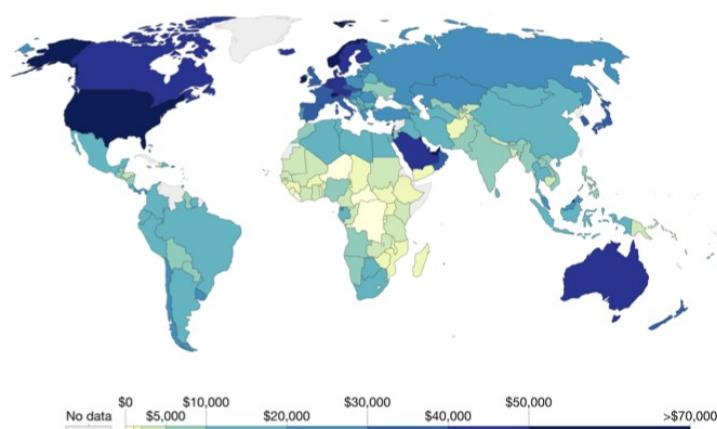
"Living conditions are vastly unequal between different places in our world today. And they have also changed over time. In some places living conditions changed dramatically, in others more slowly.

Our individual stories play out amidst these major global changes and inequalities. And it is these circumstances that largely determine how healthy, wealthy, and educated each of us will be in our own lives.

Yes, our own hard work and life choices matter. But as we will see in the data, these matter much less than the one big thing over which we have no control: where and when we are born."

GDP per capita, 2017
GDP per capita adjusted for price changes over time (inflation) and price differences between countries – it is measured in international-\$ in 2011 prices.

Our World in Data



Source: World Bank

OurWorldInData.org/economic-growth • CC BY

Inequality between countries

- Global differences in health
- Global differences in education
- Global differences in income

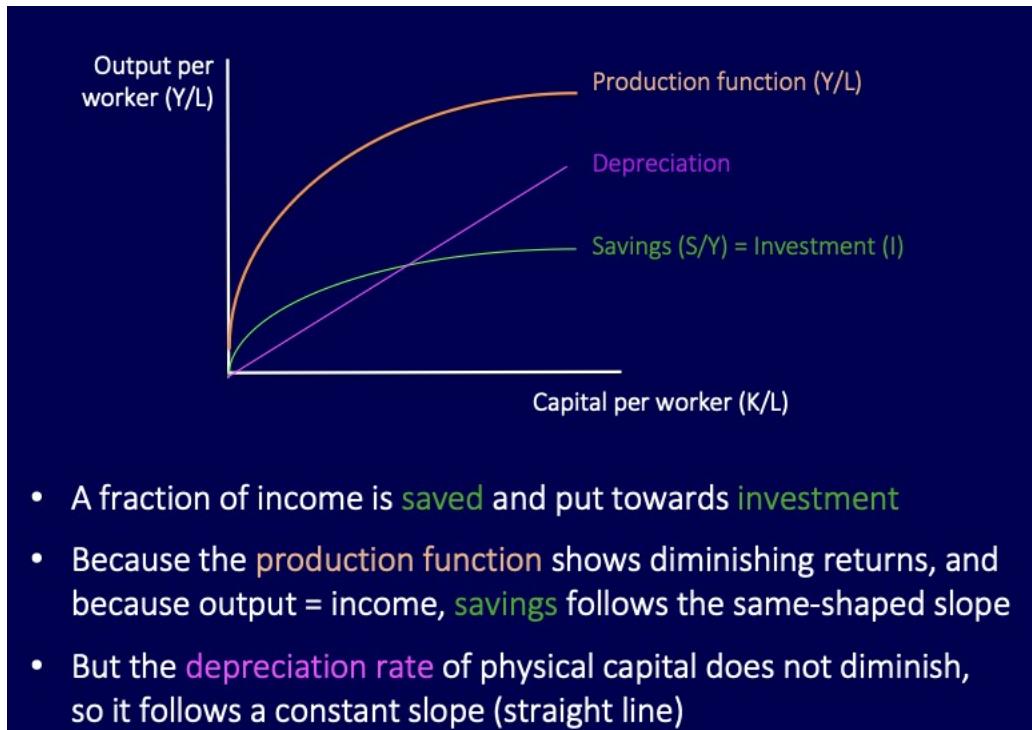
Can poor countries catch up?

- **Production function** (natural resources, physical capital, labour, human capital)
- Importance of human capital (skills, education, health of workforce) so workers' skills will match job requirements
- Technology (new ideas and innovation) provides the driver for economic growth without limitations of resource depletion, depreciation and diminishing returns which constrains all other factors)
- Where does the funding come from to drive this investment? Importance on saving
- Rely on **national savings**
- Saving is any income that is not put towards the consumption of goods and services
- Who are the people who spend income on purchasing goods and services?
Households (consumption) and government (gov spending)
- Any income (Y) that is not spent on household consumption (C) or on government spending (G) therefore goes towards savings (S)
 - $Y - C - G = S$
 - We can rearrange this expression: $Y = C + G + S$
 - For simplicity, we omit NX or assume zero

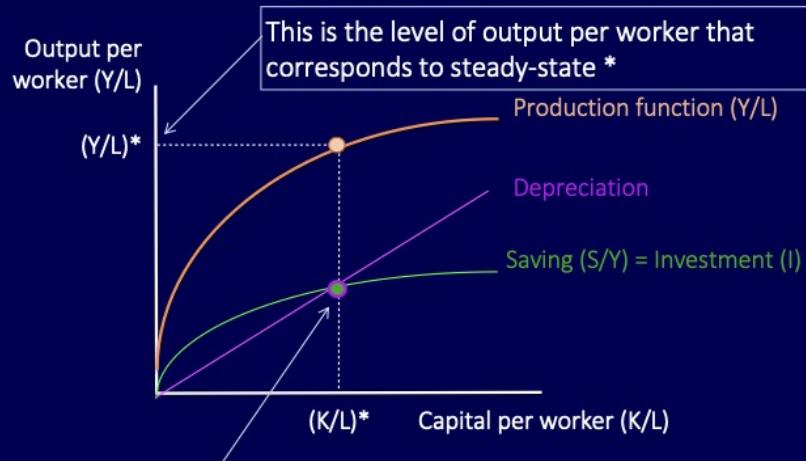
- Now think back to $AD = C + I + G + NX$
- Remember $C + I + G + NX = Y$ in Macro Equilibrium
(and we are omitting NX for simplicity)
 $Y = C + I + G$
- Remember our expression for Saving from the previous slide: $Y = C + G + S$
- Because both of these expressions equal Y , we can equate them together: $C + I + G = C + G + S$
- C and G cancel each other out, so we are left with:
 $I = S$

- Saving = investment
- The investment enables a country to maintain its capital stock per worker
- If a country experiences a one-off increase in savings rate, this can be directed towards investment which lifts up output per person

- The country will experience a burst of faster growth – but it can only grow up to the point where it can still maintain its capital stock if it expands the capital stock too much, it won't be able to keep up with depreciation (i.e. replacing capital that gets worn out)



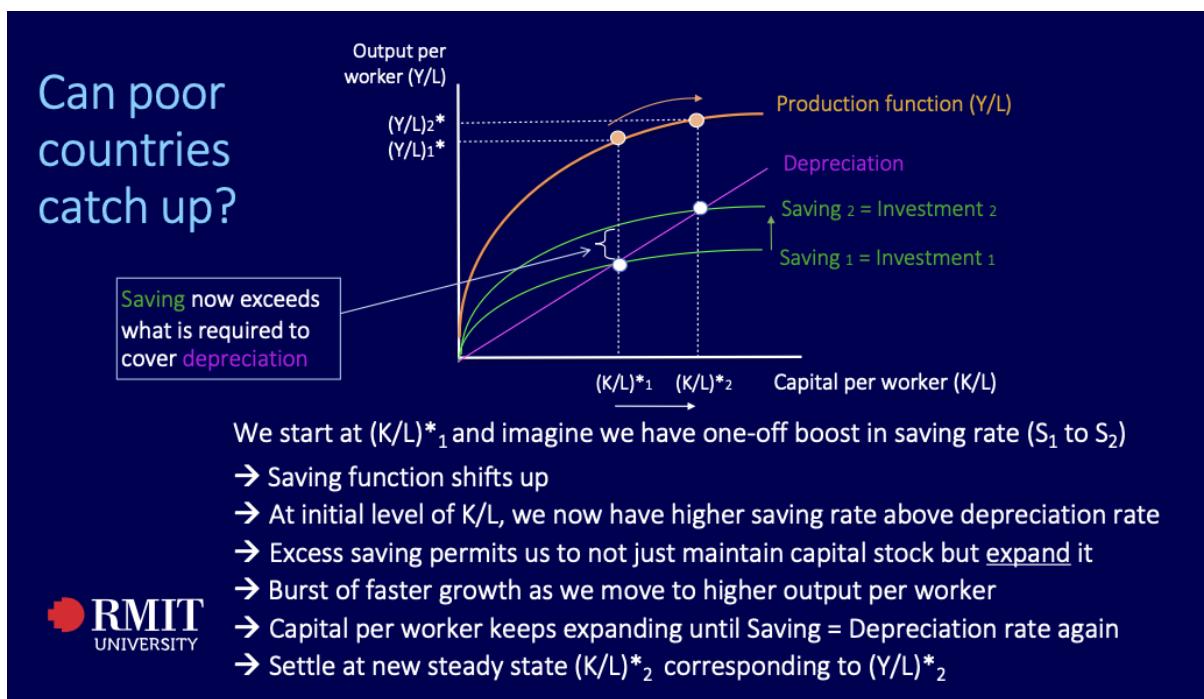
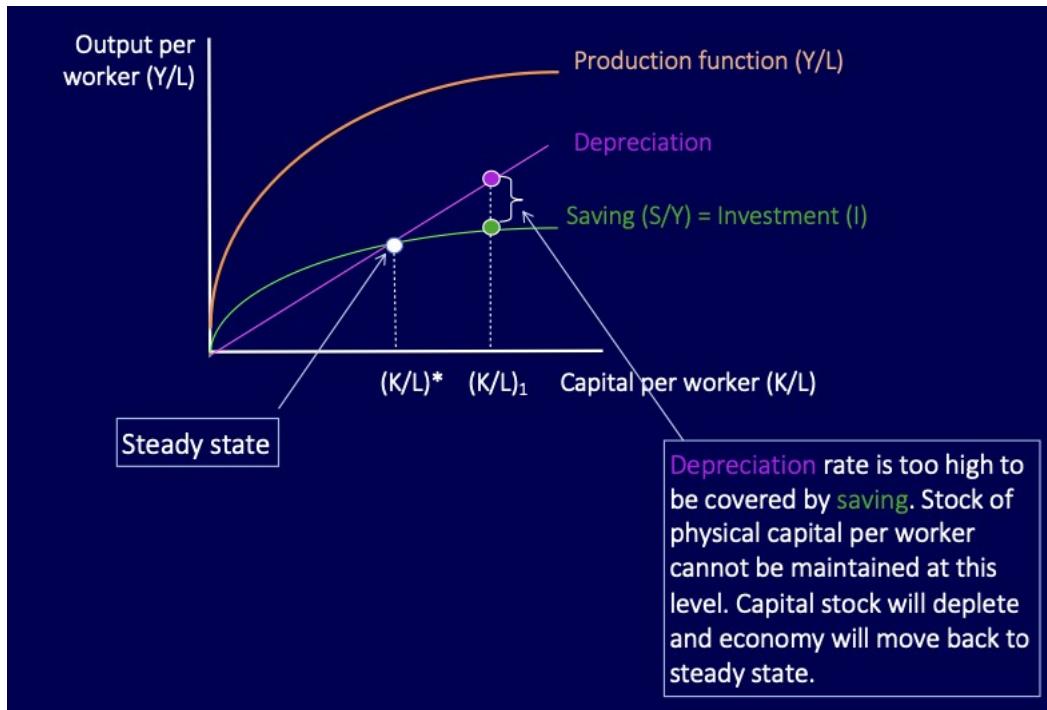
Can poor countries catch up?



At this point, saving is sufficient to cover depreciation of physical capital

This means that the stock of physical capital per worker can be maintained through investment

We call this 'steady state' (*)



- Yes – a boost in the saving rate can propel a country to a higher level of output per person
- But this cannot fuel continually faster growth (unless the saving rate keeps going up again)
- Could we keep increasing our saving rate? Saving is traded off with current consumption. Allocating more income towards savings means less income is available for current consumption

- Therefore the Solow Model predicts that poor countries can catch up to rich countries, but eventually converge
- This is why we still need technology (new ideas, innovation, discoveries, knowledge) as the fuel to keep driving ongoing growth in output per worker
- Economic model predicts
 - Solow Model predicts poor countries can grow faster than rich countries, enabling them to catch up to rich countries
 - But this also depends on countries having a stable institutional environment that supports economic growth – we call this process conditional convergence
 - But, contrary to convergence theory, we still see the richest countries continue to grow. This is possible due to technology, ideas and innovation

Inequality within a country

- Income disparities among people are due to the resources they own (e.g. land) and productive capability (e.g. skills) which enable them to receive income
- It also depends on their personal characteristics (e.g. race, gender, socioeconomic background) because these factors can influence the opportunities and resources available to them in society
- Discrimination means that people can experience different incomes and economic opportunities through no fault of their own
- These factors can also affect a person's educational opportunities, job opportunities, access to finance and healthcare, and ultimately influence their economic outcomes and quality of life
- Economic research looks at the effect of: socioeconomic status (SES), indigenous status, sexual orientation, migrant background, English speaking proficiency, geographic remoteness, disability, gender, ethnic and cultural background, parents' educational, family background, single parents

How to measure inequality within a country

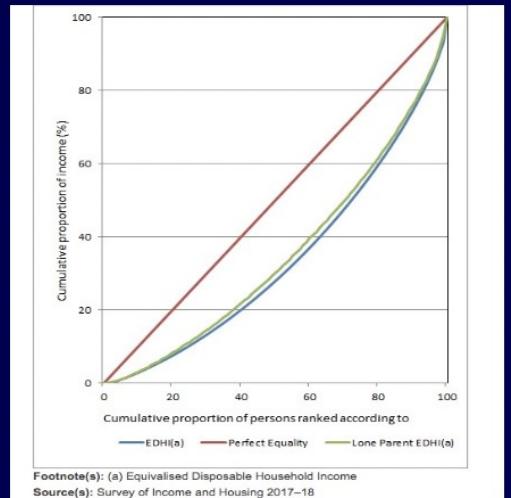
See [ABS Survey of Income and Housing, User Guide, Australia](#)



- Compare mean or median income of different cohorts (eg. gender pay gap; metro vs. rural; Indigenous compared to population average; family composition)
- Compare income of people at different points of the income distribution eg. people at the lowest, middle and top of income distribution ("distributional analysis")
- Compare share of total income held by richest 1% (or 10%) to poorest 1% (or 10%)
- Lorenz Curve and Gini Coefficient/Index

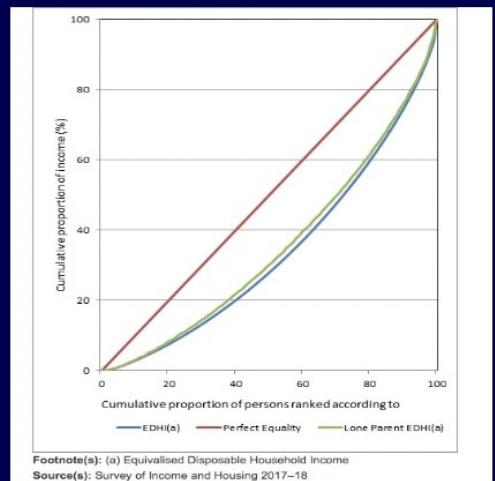
Lorenz Curve

- Graph showing degree of income inequality in a population
- Horizontal axis shows cumulative proportion of people in the total population, ranked according to their income
- Vertical axis shows their corresponding proportion of income
- Perfect equality (red line) denotes every person has same income
- Curved lines denote some degree of inequality



Gini Index / Gini Coefficient

- We can summarise the information illustrated by the Lorenz Curve into a single number
- Gini Index measures the area between Perfect Equality line and Actual Inequality line, as a fraction of total area under the Perfect Equality line
- Larger the area = higher Gini index = worse inequality
- Named after Italian economist Corrado Gini
- See CORE 19.1



Redistributive policies to reduce inequalities

- The progressive policy is a policy (expenditure, tax or transfer) that increases the incomes of poorer people and households by relatively more than it increases the incomes of wealthier households
- The regressive policy is a policy (expenditure, tax or transfer) that increases the incomes of wealthier people and households by relatively more than it increases the incomes of poorer household

The link between inequality and economic efficiency

- The traditional (and narrow) view was that equality and growth/efficiency were seen to be a 'trade-off'
 - The argument that redistributing income to improve equality creates costs (e.g. administration) and inefficiency
 - Also argument that redistribution policies discourage people from working hard, and take entrepreneurial risks and erodes the principle of meritocracy and rewards for effort
 - Greater awareness that barriers to equality of opportunity are determinantal to economic growth - if we impede a person from fully reaching their individual potential, we are limiting an economy's productive capacity
 - Distinguish between equality of outcome and equality of opportunity

Week 7 - economic shocks and environmental sustainability

Learning objectives

- In what ways can unexpected shocks destabilise the economy? How can we understand these economic shocks using the concepts and frameworks that we have learned so far in this course?
- What is the role of banks and financial institutions in the economy? As an example of a major economic shock originating in the financial sector, what factors contributed to the Global Financial Crisis (GFC)?
- Another example of a major economic shock is the impact of environmental shocks – such as natural disasters – on the economy and well-being.
- Although economists have devised policy solutions to promote more environmentally sustainable production practices, what are the challenges of implementing these policy solutions?

Economic shocks

- Macroeconomics has 2 sides – AD and AS – that together generate our macroeconomic equilibrium point
- The economy can be hit by ‘shocks’ – unexpected events that bump the economy away from the current equilibrium
- These shocks can be demand-side or supply-side
 - Shocks to AD – unexpectedly hits C, I, G, NX
 - Shocks to AS – unexpectedly hit supply-side factors affecting the availability of resources and pushing up production costs e.g. oil prices, natural disasters, war, conflict and political unrest)
 - If its supply side, consider whether it’s a short-term shock that can be resolved (only affecting SR-AS) or permanent shocks (that will also affect LR-AS)

Example of supply-side production shock

- Supply side of the economy has been disrupted in a widespread way
- Large-scale delays in the transportation and delivery of many products, including oil, has ripple effects throughout the economy
- This could push up the price of key inputs such as petrol

If we start at E_1 , the disruption to supply causes SR-AS to shift left

As a result, what happens to Output (Y) and Price Level (P) ?

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Example of supply-side production shock

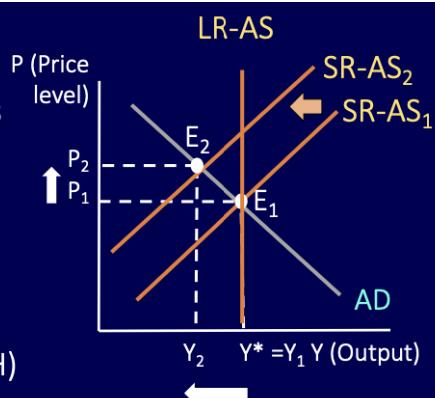


What happens to LR-AS?

- We have to ask ourselves: has this supply chain disruption caused long-term damage to the economy's productive capacity (potential output)?
- No, the ingredients for aggregate production (N, K, L, H) and technology (A) are not affected – this is just a short-run shock

If we start at E_1 SR-AS shifts left and LR-AS is unchanged

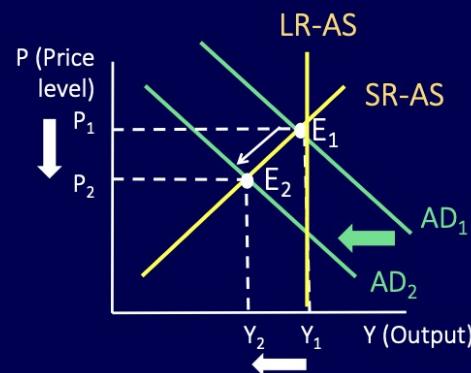
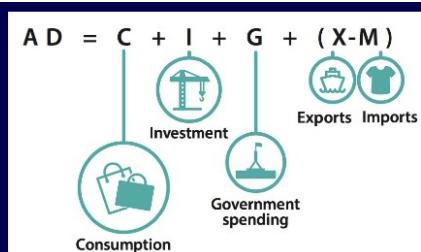
$Y < Y^*$ meaning economy is operating below potential capacity



Example of demand side shock



What does an unexpected collapse in consumer confidence look like on our AD-AS model?



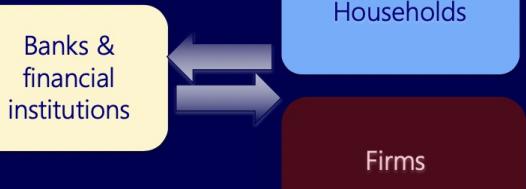
What does our AD-AS model predict will happen to Y and P ?

- Economics shock can also take the form of climate change disasters (e.g. bushfires, floods, droughts, tsunamis) – We will also consider these climate change disasters and the implications of environmental sustainability

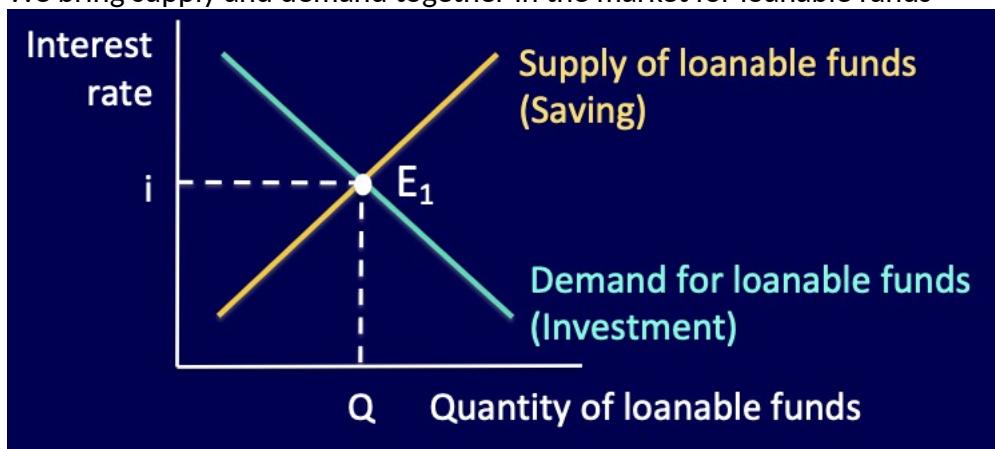
Role of banks and financial institutions



Saving and borrowing

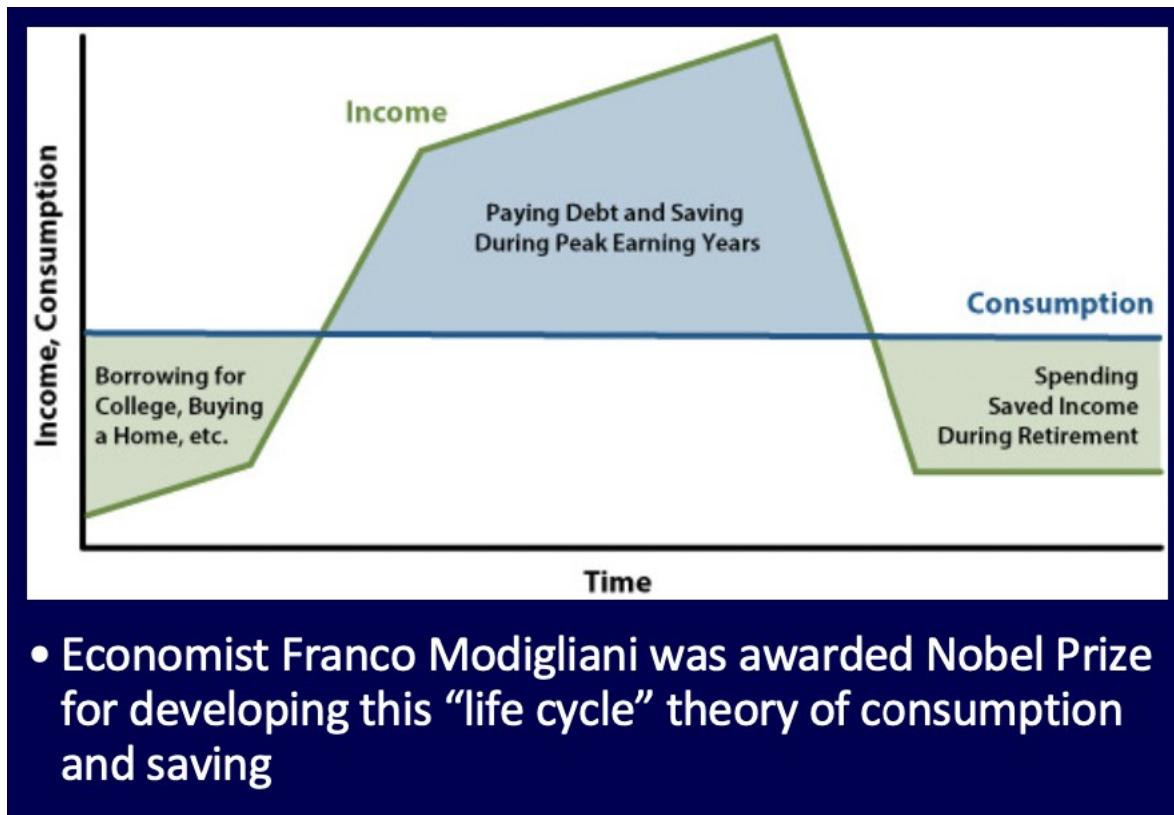


- Households can allocate unspent income to saving (earning interest)
- Households and firms borrow money, to fund consumption or investment (paying interest)
- For households who want to save, a higher interest rate = higher incentive to save
- But for households and firms who want to borrow higher interest rates = lower incentive to borrow
- Saving and investment come together in the loanable funds market
- Savers provide the supply of loanable funds, while borrowers generate demand for loanable funds
- We bring supply and demand together in the market for loanable funds



Saving and borrowing

- Business and entrepreneurs need to borrow to fund their investment and put their innovations and ideas into action
- Individuals and households usually have a personal reason to save and borrow. These are generally based on the idea of aiming to smooth out consumption over our lifetimes – we call this consumption smoothing



Financial decision making

- Putting aside some of your income today in the form of saving means sacrificing some of your consumption today to increase your consumption in the future
- You give up your enjoyment of consumption today, but you earn compound interest which increases your income in the future
- Economic decision-making involves trade-offs e.g. well-being today VS well-being in the future
- And it involves identifying opportunity costs if you chose one option, what other options are you giving up?
- Superannuation decision
 - If you allocate more of your income towards superannuation to improve your well-being in retirement, what would you be ‘giving up’ today?
 - Alternatively, if you withdraw your savings early today, what would you be ‘giving up’ in your retirement?
 - An economist would recommend: that you choose the option that involves the lowest opportunity cost e.g. you are giving up the least

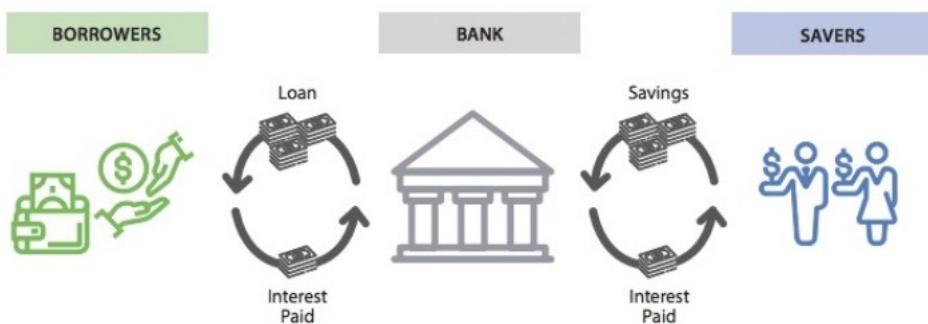
- Economists understand that each person's decision will depend on their own 'discount rate'
- Now we'll look at some of the ways that the financial sector help the economy operate
- We'll learn about the role of 'money'
- 3 key components – banks, stock market and bond market

What is money?

- Economic think of money as a medium of exchange that is universally accepted as a form of payment (coin, bank notes, bank deposits and any other medium)
- Money needs to serve as a unit of account – it can be used to measure the value of goods and services, record debts, and make calculations)
- Money needs to serve as a store of value – it can be reliably stored, retrieved and exchanged at a later date
- Money is one of the most liquid forms of assets

What are banks?

- Banks provide a source of loans for borrowers (for business investment or household consumption) and a place for savers to despite their unspent income
- Banks rewards savings by offering interest payments. Banks use these savings as a source of funding for borrowers, charging interest for these loans
- We think of banks and other financial institutions as financial intermediaries



- Banks serve to
 - Pool together saving from many savers
 - Diversify (spread out) the risks of lending money because they have so many borrowers
 - Solve information problems (e.g. undertake credit checks on borrowers)
 - Banks provide convenience when making financial transactions
- Banks help to make the overall economy function more efficiently. They provide services that would be difficult for borrowers and lenders to carry out on their own

What's the difference between banks and financial institutions?

- Banks hold most financial system assets in Australia. As well as retail deposit-taking and lending activities, banks are involved in almost all other facets of financial intermediation, including business banking, trading in financial markets, stockbroking, insurance and funds management
- Financial institutions that are authorised to take deposits are credit unions and building societies
- Financial institutions that serve as intermediaries between lenders and borrowers, but are not authorised to take deposits, are financial companies and money market corporations (merchants banks)
- Banks and financial institutions are regulated by different authorities (APRA and ASIC)

What is the bond market?

- Instead of a bank loan, companies can raise funding for their investment via bonds or stocks
- A bond is an 'IOU' – it details the arrangement of who owes what and when this specified payment will be made
- The bond market serves to:
 - Channel funds from savers to borrowers
 - Fund government debt
 - Diversity risk
 - Create liquidity (quickly convert investments into cash)

What is the stock market?

- A stock is a partial ownership (a 'share') in a firm
 - Owning a stock entity gives you to a share of a company's assets and future profits (paid in the form of dividends)
- The stock market serves to:
 - Channel funds from savers to borrowers
 - Diversity risk
 - Reallocate control (e.g. shareholders' voting rights)

	Bonds	Stocks
What is the predictability of future payments	Future payments are known	Future dividends depend on company's performance
What happens if company goes bust	First to get paid	Last to get paid
Do you have a say in how company is run	No rights to control company	Shareholder have voters right

What caused the GFC?

- The global financial crisis (GFC) was a global economic downturn that occurred between 2007 and 2009
- Originated by a collapse in the lending market for US housing, which destabilised global financial markets and banking systems
- Although most of the world refers to this as the 'GFC', US refers to this as the 'great recession'
- Factors that contributed to the collapse of the financial market in 2008
 - Excessive risk-taking in lenders' market
 - Increased borrowing by banks and investors
 - Weak regulations and oversight
- Excessive risk-taking in the lender market
 - Strong macroeconomic conditions created expectations that the housing market would continue to grow strongly
 - Excessive risk-taking and more 'dodgy' loans – many mortgage loans were for amounts close to or higher than the purchase price of the house
 - More 'subprime' borrowers: higher risk of default due to lower income and wealth, and poor credit score
- Also an outcome of the regulatory environment for mortgage lending

Environmental shocks and sustainability

- Disasters, destruction and depletion of our environment and natural resources can be considered another type of shock to the economy
- Natural resources are. One of our ingredients for production while the ecosystem provides our habitat needed for sustainability
- The destabilisation of our climate and natural environment creates largely unpredicted shocks to the economy
- With biological origin, pandemics/epidemics can also be considered an environmental shock and threat to sustainability
- Building on the knowledge of environmental scientists, economists are making progress in identifying the costs of environmental depletion and designing policies to shape a more environmental responsible economy
 - E.g. Carbon emissions trading scheme, incentives for switching to renewable energy such as solar power
 - Carbon emissions trading scheme ('cap and trade' policy)
 - 1 government sets total levels of permissible emissions
 - 2. The government creates permits, each one allowing a certain level of emissions, which sum up to the total level of emissions that are allowed in the economy
 - 3. Government allocate permit to firms
 - 4. Firms are allowed to trade (buy or sell) their permits with other firms
 - If it is easy and cheap for a firm to reduce their emissions, these firms can sell their 'permit to pollute' to other firms
 - If it would be expensive and difficult for a firm to reduce their emissions, they can buy more 'permits to pollute' from the low-cost firms

- Ecological economics is a field of study concerned with sustainability and development, more than efficiency and growth
- Ecological economists are concerned with issues such as carbon emissions, deforestation, and overfishing and specify extinction
- Focuses on production practises that keep within the limits of earth's regenerative capability (not just 'productive capacity')
- What makes it difficult to make progress on implementing environmental policy?
 - The trade-off between current and future industries, geographical locations, and generations over time
 - Measurement – Currently GDP doesn't even acknowledge environmental damage
 - Reliance on 'free market mechanisms' vs. government intervention when dealing with public externalities
 - Large upfront investments, discount rates, myopia
 - Political ideologies
- Exemplifying what we know about economic progress and development, we see that technology and innovation is being used to manage, mitigate and prevent environmental shocks

Manage economic stocks

- We see from history that economic shocks, environmental shocks and many other types of unexpected events are a part of life
- We also see that people find a way to get through these shocks through resilience, innovation and listening to the science and research
- We can keep learning from the past to shock ourselves for the future

Week 8 - Fiscal policy

Learning objectives

1. What are the components of fiscal policy? Who has responsibility for fiscal policy and how is fiscal policy implemented?
2. In what way can the three levers of fiscal policy (government spending on goods and services, taxes, and transfers) be used to address the economic problems we identified earlier in the course?
3. How does Australia's fiscal policy work in a Federal system?
4. What factors does the government need to consider when choosing to use fiscal policy?
5. Should high public debt be a concern for the government?
6. In what way has fiscal policy been used to manage the effects of the COVID-19 pandemic?