



THE UNIVERSITY OF
SYDNEY

ECON1002: INTRODUCTORY MACROECONOMICS

LECTURE 3: LABOUR, UNEMPLOYMENT AND BUSINESS CYCLES

20, 22 March 2017

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Based on slides by Melatos, Wills and Bernanke, Olekalns and Frank

Chapter 3

Unemployment and the Labour Market

Learning Objectives

- 3.1 How can the perfectly competitive model be used to understand trends in the labour market?
- 3.2 What have been the five major trends in the labour market in the post-war era?
- 3.3 What factors influence firms' demand for labour?
- 3.4 What factors influence workers' supply of labour?
- 3.5 What are the three different types of unemployment?
- 3.6 For what reasons do some countries find it difficult to achieve full employment?

Australia's Labour Force

Key trends in the Australian labour market

Five key trends in the Australian labour market

1. Steady growth in the real wage rate since the late-1960s.
2. Slow growth in the real wage from the mid-1970s until the early-2000s.
3. A widening real wage gap between skilled and unskilled workers.
4. A rising participation rate in the labour market.
5. A relatively low unemployment rate in the 2000s compared to some EU countries.

Key trends in the Australian labour market

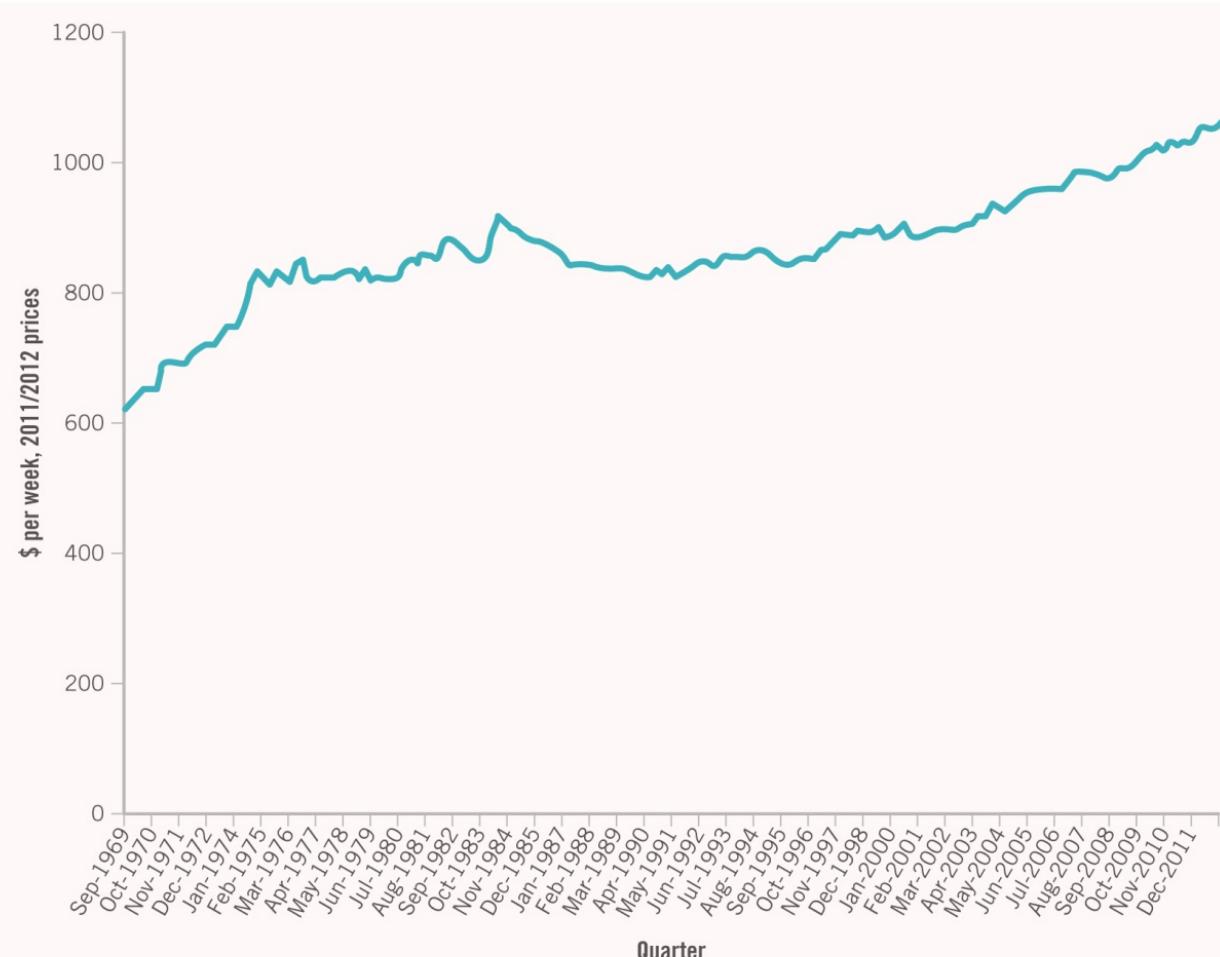


Figure 3.1 Real average weekly earnings The growth in real average weekly earnings was strongest in the first half of the 1970s. In the 1980s and 1990s growth in real earnings slowed significantly. The 2000s have seen a return to relatively strong real earnings growth.

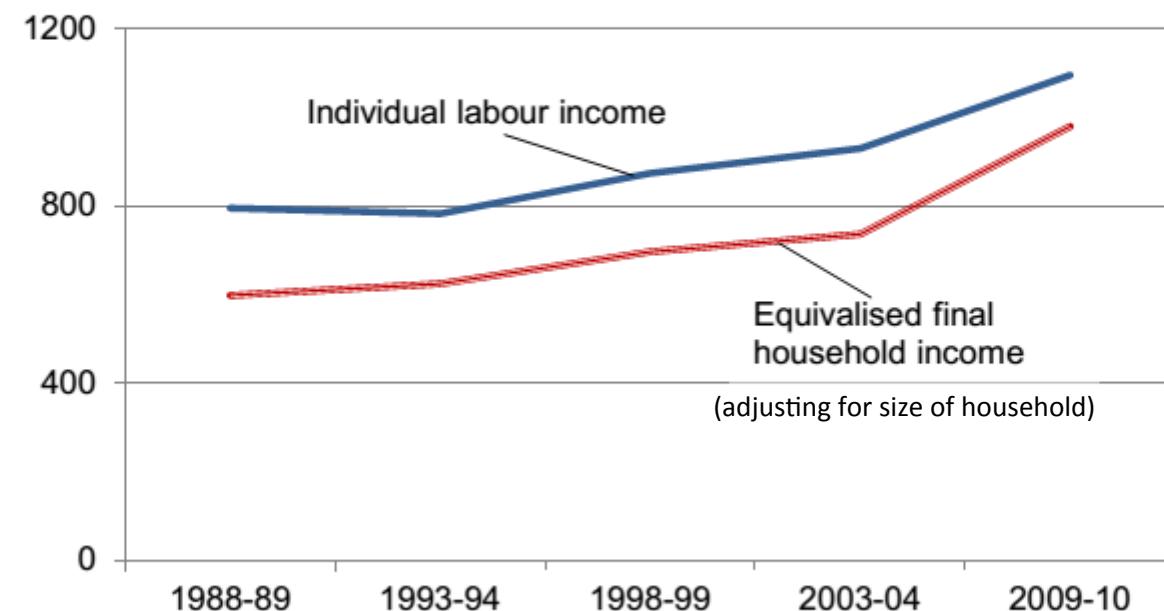
Source: Average Weekly Earnings—Reserve Bank of Australia, Labour Costs (www.rba.gov.au/statistics/tables/index.html#output_labour) deflated by the CPI. All groups: Weighted average eight capital cities (Australian Bureau of Statistics, Cat. No. 6401.0, *Consumer Price Index, Australia*)

Real wages in Australia have risen consistently over the past 30 years

Figure 2

Individual and equivalised final household incomes, 1988-89 to 2009-10

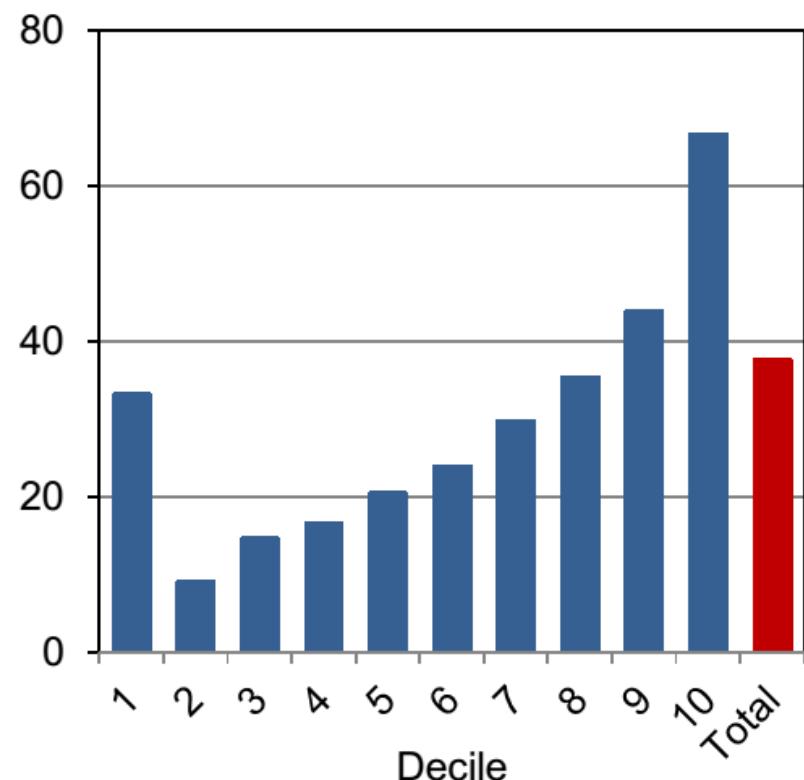
Inflation adjusted 2011-12 dollars



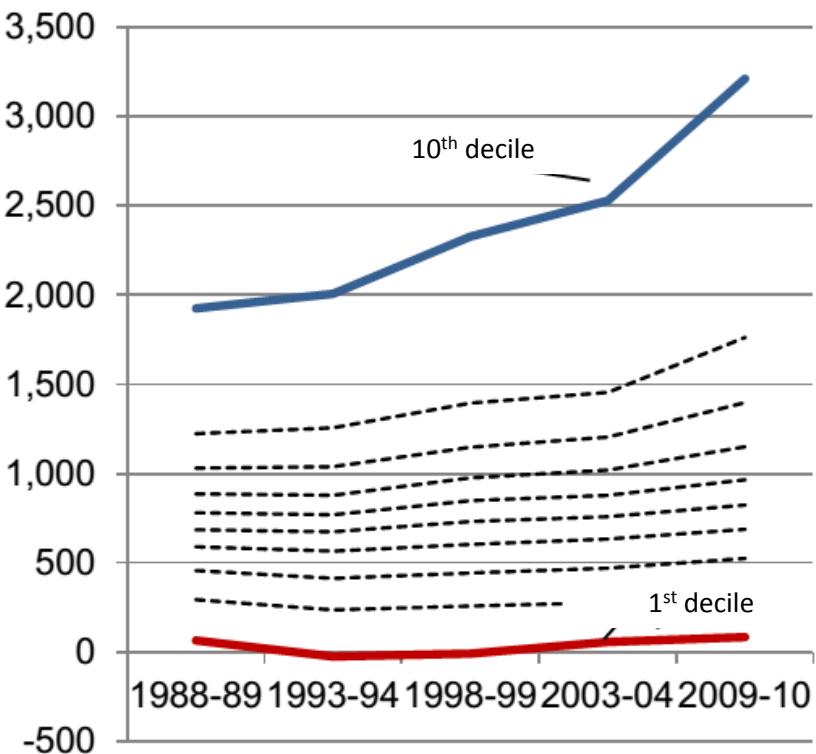
Source: <http://www.pc.gov.au/research/supporting/income-distribution-trends/income-distribution-trends.pdf>

However, the gains have not been evenly shared with the richest benefitting the most

Per cent change in labour income by decile^a

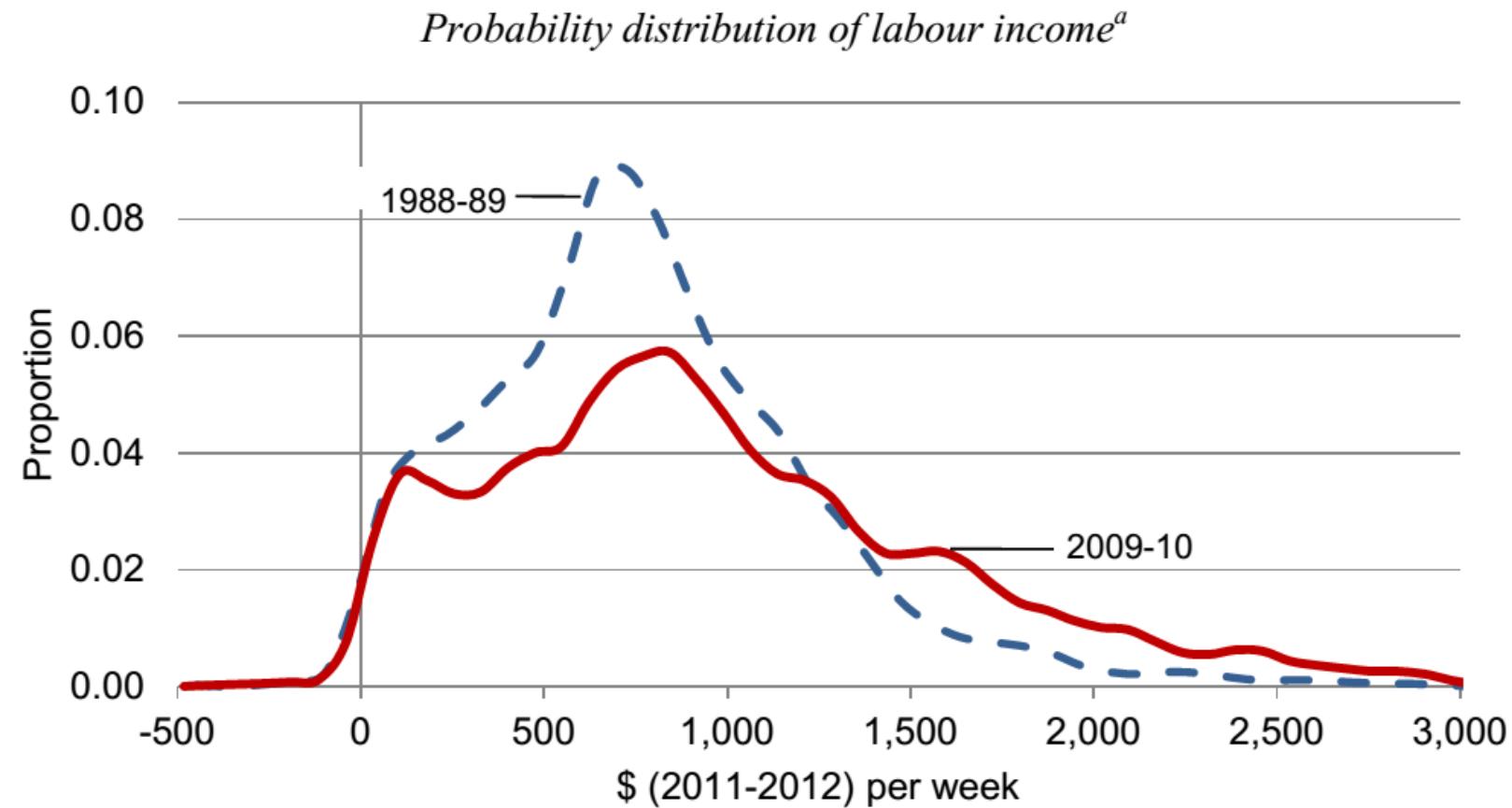


Dollars per week, 1988-89 to 2009-10



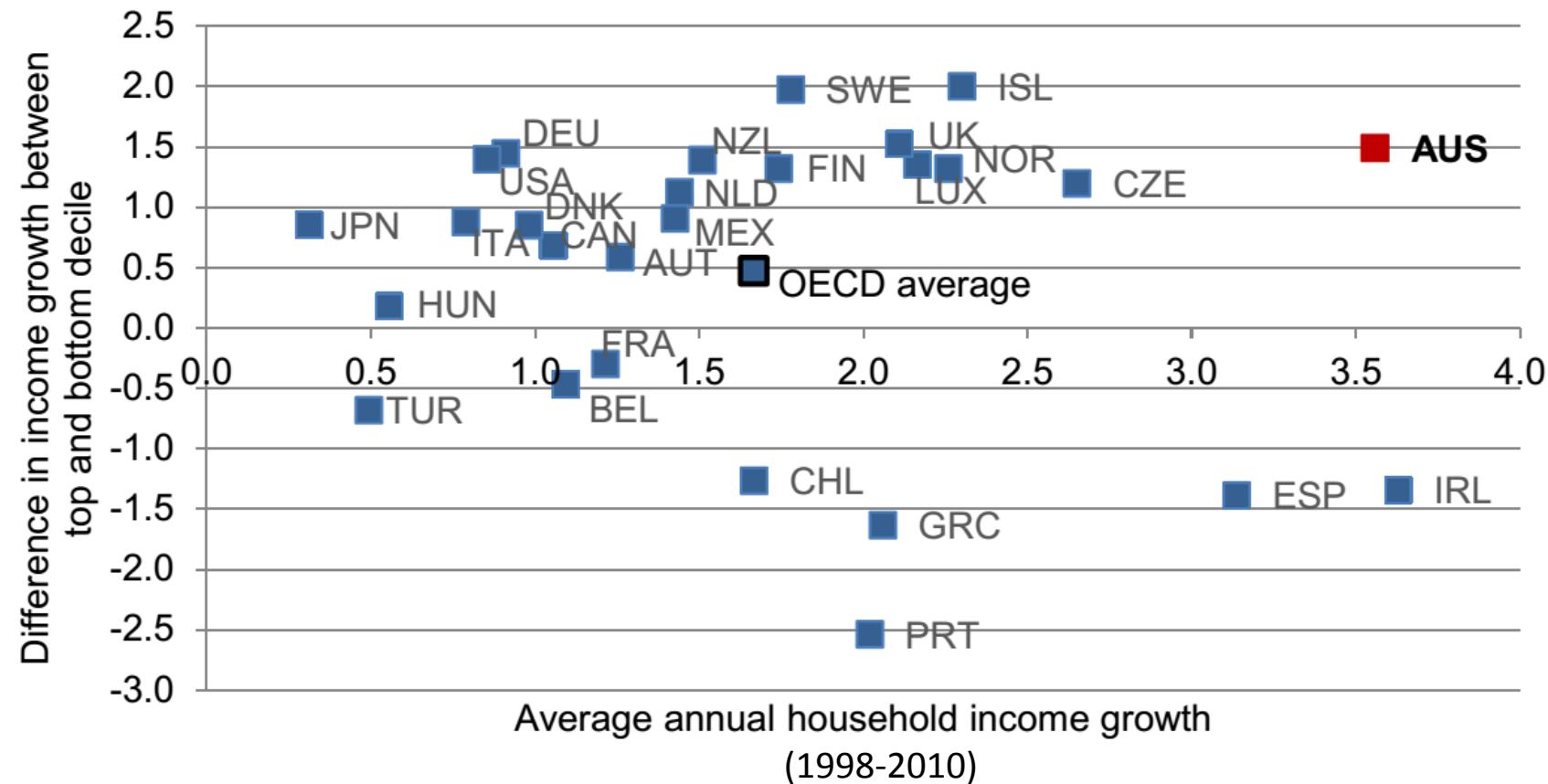
Source: <http://www.pc.gov.au/research/supporting/income-distribution-trends/income-distribution-trends.pdf>

This has caused income in Australia to become more dispersed



Source: <http://www.pc.gov.au/research/supporting/income-distribution-trends/income-distribution-trends.pdf>

Income in Australia grew faster than all other OECD countries except Ireland (1988-2010, pre crisis), and inequality grew faster than OECD avg



Source: <http://www.pc.gov.au/research/supporting/income-distribution-trends/income-distribution-trends.pdf>

Over the last 5 years Australia's nominal wage growth has slowed to the lowest levels on record (partly due to low inflation)



Source: ABS

The Labour Market

The perfectly competitive model of labour market

- Supply and demand analysis can be used to analyse the market for labour.
- Demand for labour comes from employers for use in the production of goods and services.
- Supply of labour comes from people who work for pay.
- The price of labour is determined by the wage rate per unit of time.

Wages and the demand for labour

- Each firm will decide how much labour to hire to maximise profits.
- A worker is hired if the benefit of hiring an additional worker \geq cost of hiring that worker.
- The marginal cost of hiring (MC) is the wage that has to be paid to that worker.
- The marginal benefit (MB) is the value of that worker's marginal product (VMP).

Example: Banana Computer Company

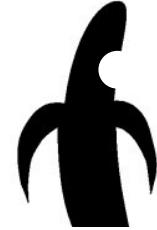


TABLE 3.1 Production and marginal product for Banana Computer Company

(1) NUMBER OF WORKERS	(2) COMPUTERS PRODUCED PER YEAR	(3) MARGINAL PRODUCT	(4) VALUE OF MARGINAL PRODUCT (AT \$3000/ COMPUTER)
0	0		
1	25	25	\$75 000
2	48	23	69 000
3	69	21	63 000
4	88	19	57 000
5	105	17	51 000
6	120	15	45 000
7	133	13	39 000
8	144	11	33 000

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How many workers should BCC hire if the wage rate was \$60 000 per year? How about \$50 000 per year?

The demand curve for labour

- Diminishing returns to labour
 - If the amount of capital and other inputs in use is held constant, then the greater the quantity of labour already employed, the less each additional worker adds to production.
- The demand curve for labour is downward sloping. The higher the wage, the fewer workers employers will hire.
- **Shifts in the demand** curve for labour occur for anything that changes the VMP. For example:
 - A rise or fall in the relative price of the good
 - A rise or fall in labour productivity—the marginal product of labour (MPL)—for any level of employment.

The demand curve for labour

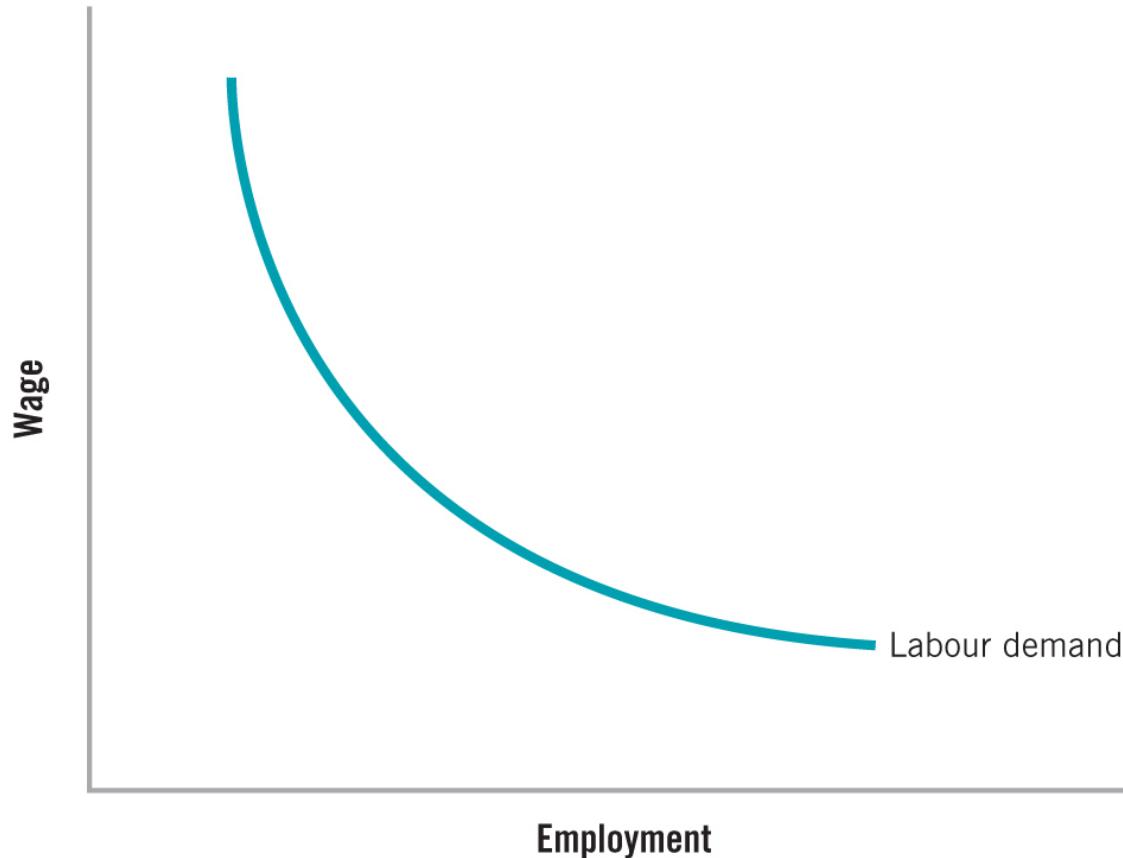
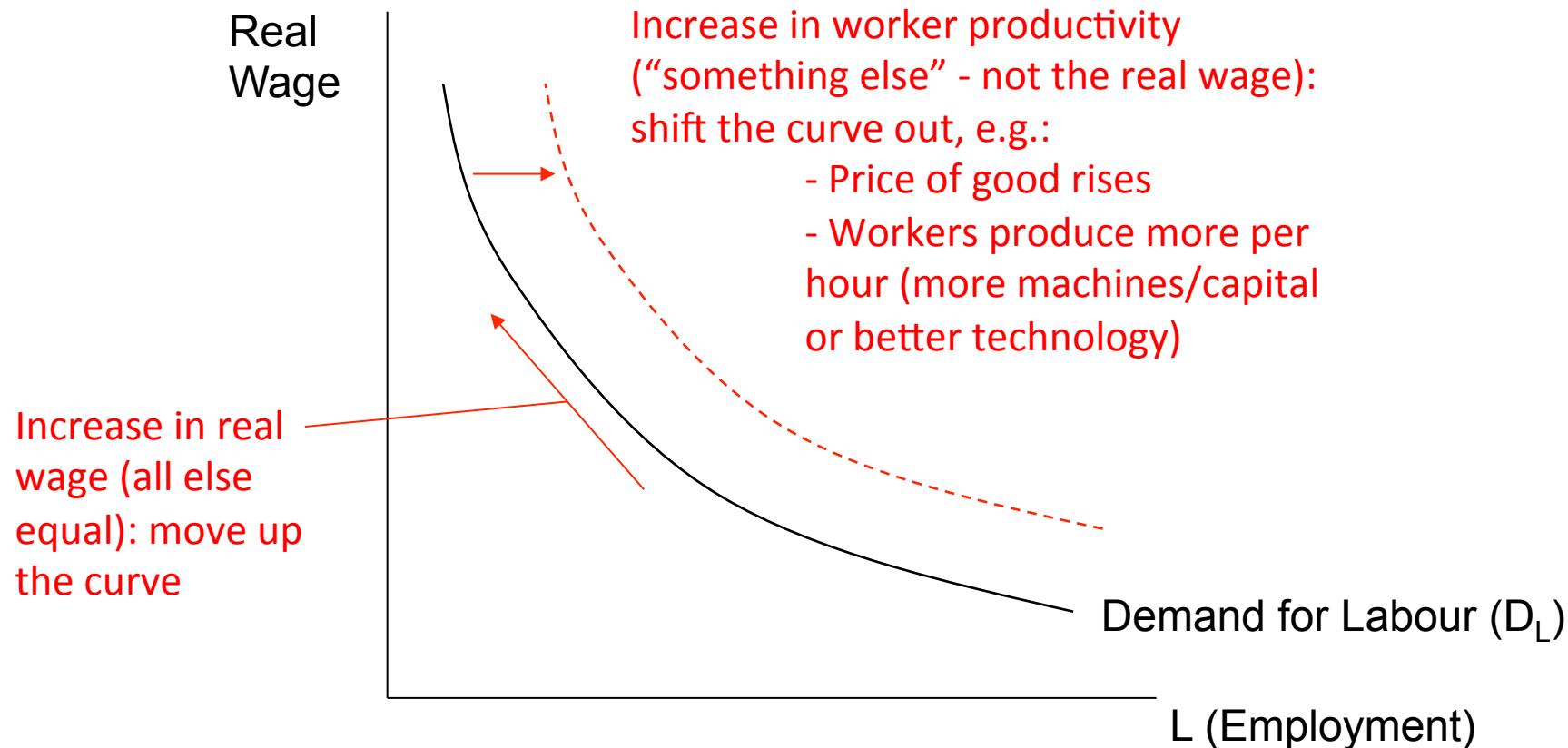


Figure 3.2 The demand curve for labour The demand curve for labour is downward sloping. The higher the wage, the fewer workers employers will hire.

The demand for labour is based on whether the marginal benefit of a worker ("marginal product") exceeds their marginal cost (real wage)



Example: A rise in relative prices

TABLE 3.2 Production and marginal product for BCC after an increase in computer prices

(1) NUMBER OF WORKERS	(2) COMPUTERS PRODUCED PER YEAR	(3) MARGINAL PRODUCT	(4) VALUE OF MARGINAL PRODUCT (AT \$5000/ COMPUTER)
0	0		
1	25	25	\$125 000
2	48	23	115 000
3	69	21	105 000
4	88	19	95 000
5	105	17	85 000
6	120	15	75 000
7	133	13	65 000
8	144	11	55 000

How many workers should BCC hire if the wage rate was \$60 000 per year?

Example: A rise in productivity

TABLE 3.3 Production and marginal product for BCC after an increase in worker productivity

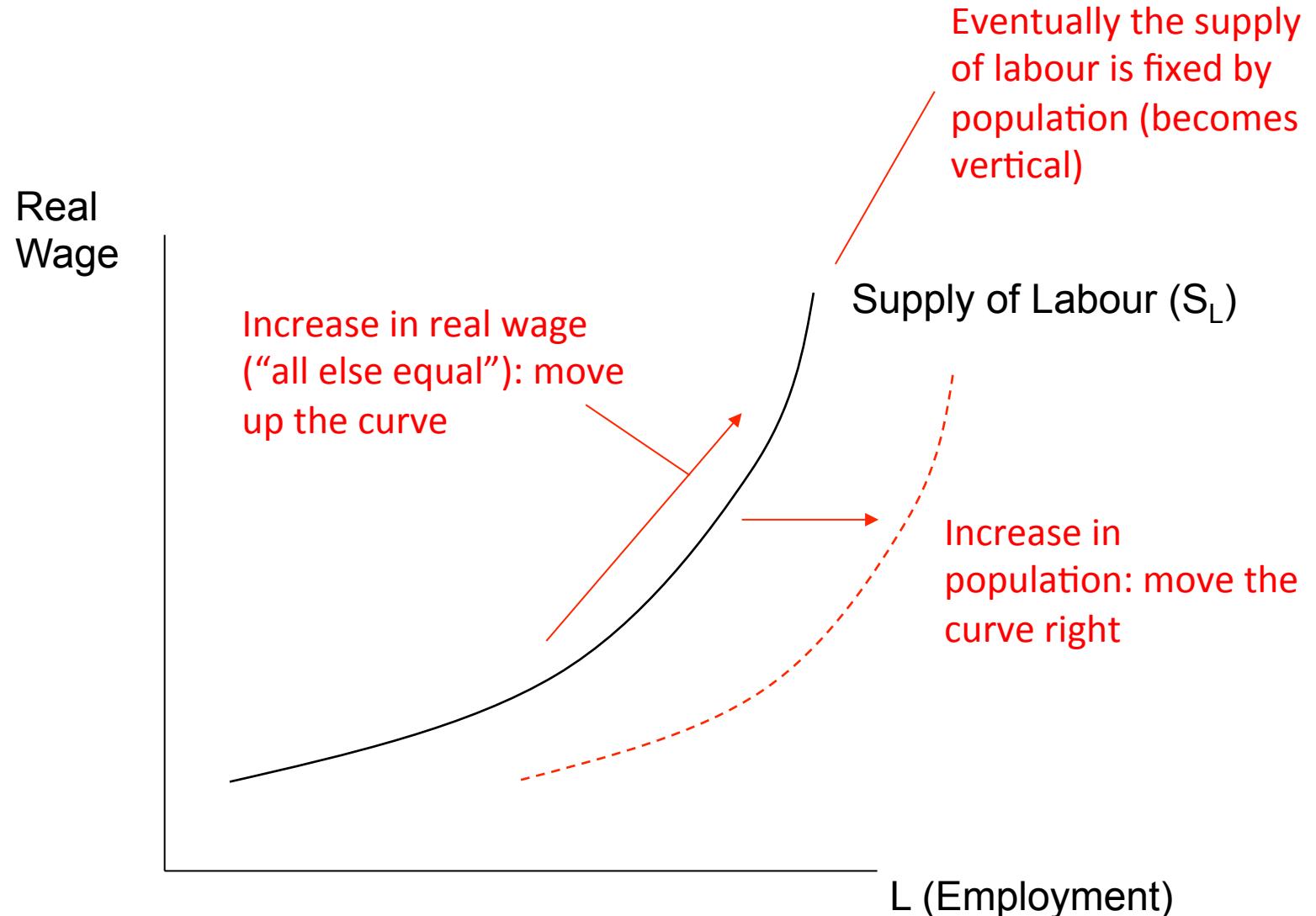
(1) NUMBER	(2) COMPUTERS PRODUCED	(3) MARGINAL PRODUCT	(4) VALUE OF MARGINAL PRODUCT (AT \$3000/ COMPUTER)
0	0		
1	37.5	37.5	\$112 500
2	72	34.5	103 500
3	103.5	31.5	94 500
4	132	28.5	85 500
5	157.5	25.5	76 500
6	180	22.5	67 500
7	199.5	19.5	58 500
8	216	16.5	49 500

How many workers should BCC hire if the wage rate was \$60 000 per year?

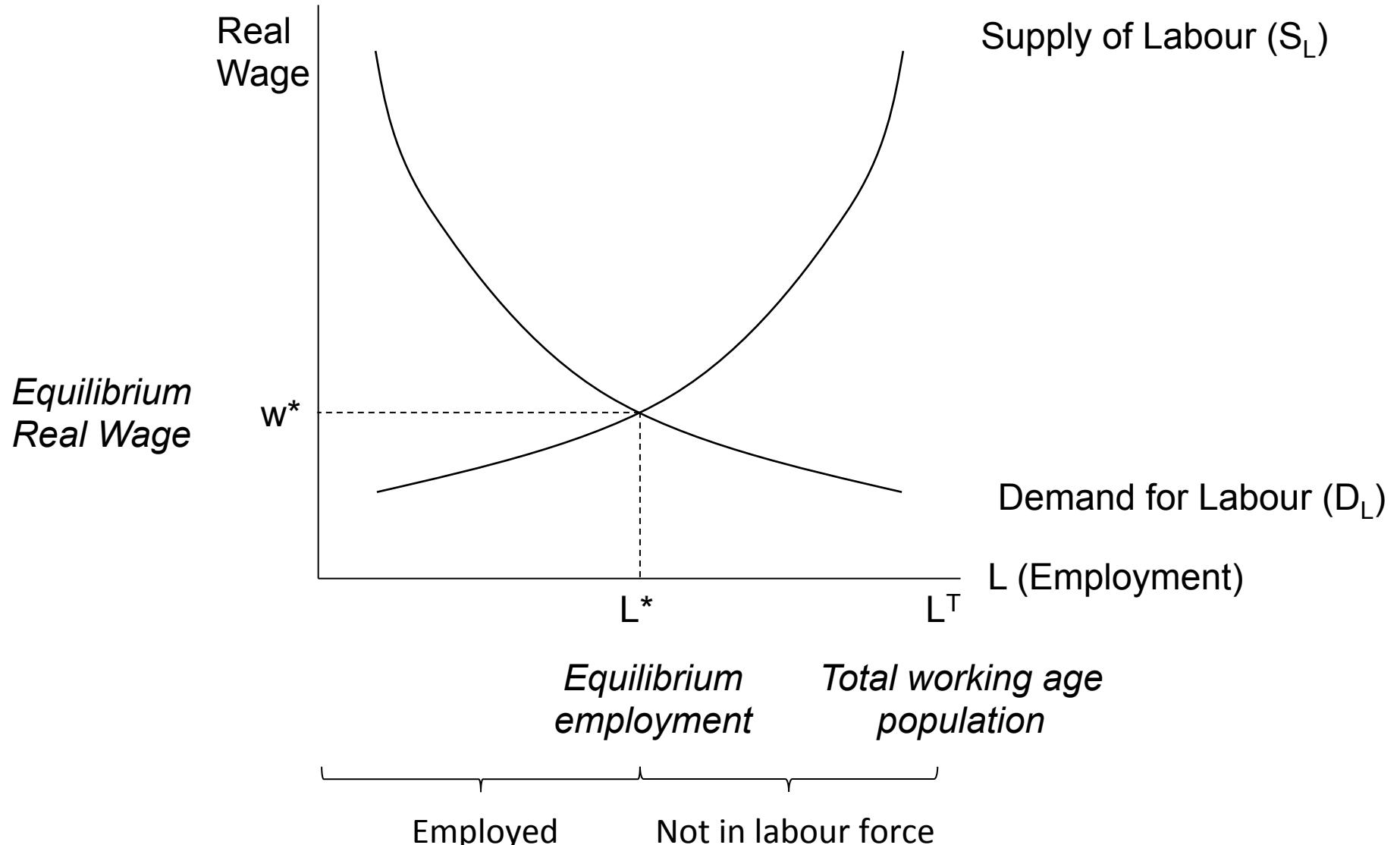
The supply of labour

- Your reservation price of working is the minimum payment that you would accept to work rather than your next best alternative.
- Although a little work might be fun, income is the main point of working, and the higher the wage, the greater the willingness to sacrifice other pursuits to work.
- So a higher wage must be paid to induce a greater supply of labour, thus the labour supply curve slopes up.
- Any factor that affects the quantity of labour offered at a given real wage will shift the supply curve. Most important are:
 - demographic factors
 - factors which lead to changes in the share of the working-age population who want to work or who are acceptable to employers.

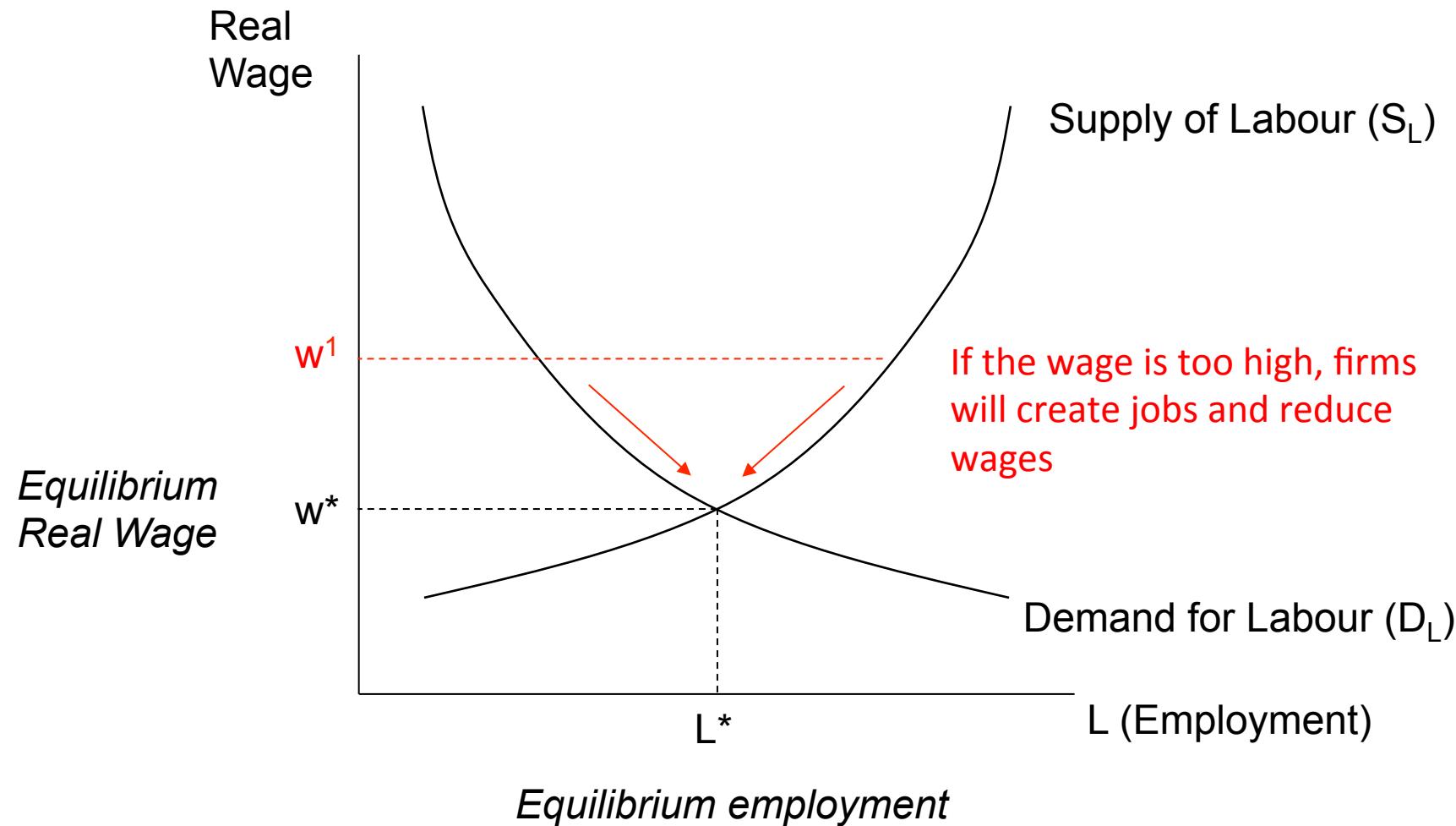
The supply for labour is based on people moving in and out of the labour force (based on their reservation wage)



The labour market consists of the supply of labour (willing workers) and the demand for labour (available jobs)



Market forces bring the labour market into equilibrium



Trends in real wages

- Some stylised facts on real wages in industrialised countries:
 - Throughout the 20th century all industrial countries enjoyed substantial growth in real wages.
 - Since the early 1980s, however, the rate of real wage growth has slowed.
 - Recent decades have brought a pronounced increase in wage inequality between high-skilled and low-skilled workers.
- Why have real wages increased by so much in the industrialised countries?

For example, in countries with low real wages petrol stations employ attendants to fill your car, but not in Australia

Low real wages



In countries with low real wages, petrol stations employ attendants to fill cars

Petrol station attendant, India

High real wages



In countries with high real wages, the marginal cost (wages) exceeds the marginal benefit (more sales) so people fill their own cars

Petrol station, Australia

Very high real wages



If real wages become very high (people's time is very valuable), cars may fill themselves

Tesla automated recharging station

Question 1: If female labour force participation has increased so much, why hasn't the real wage fallen since the 1980s?

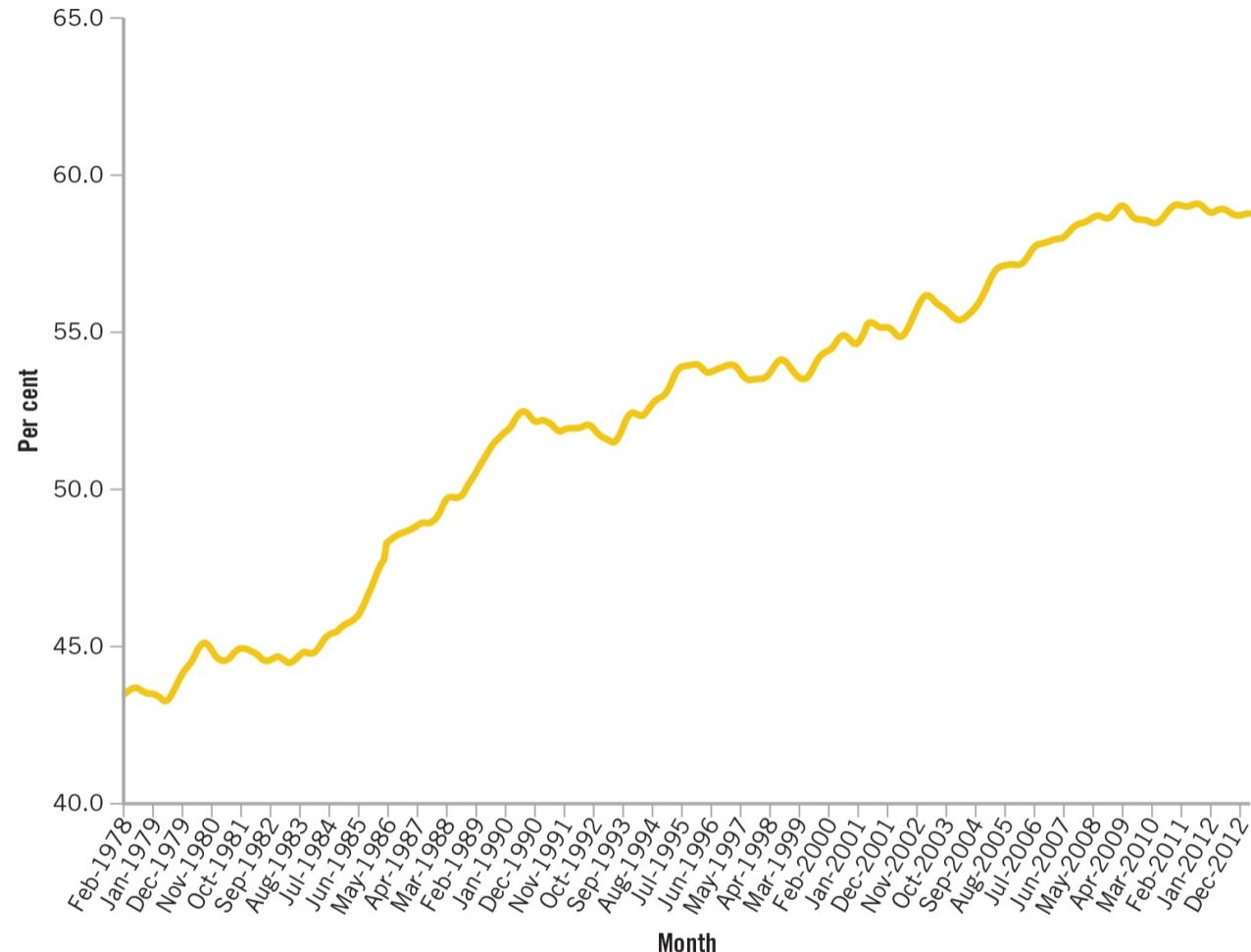
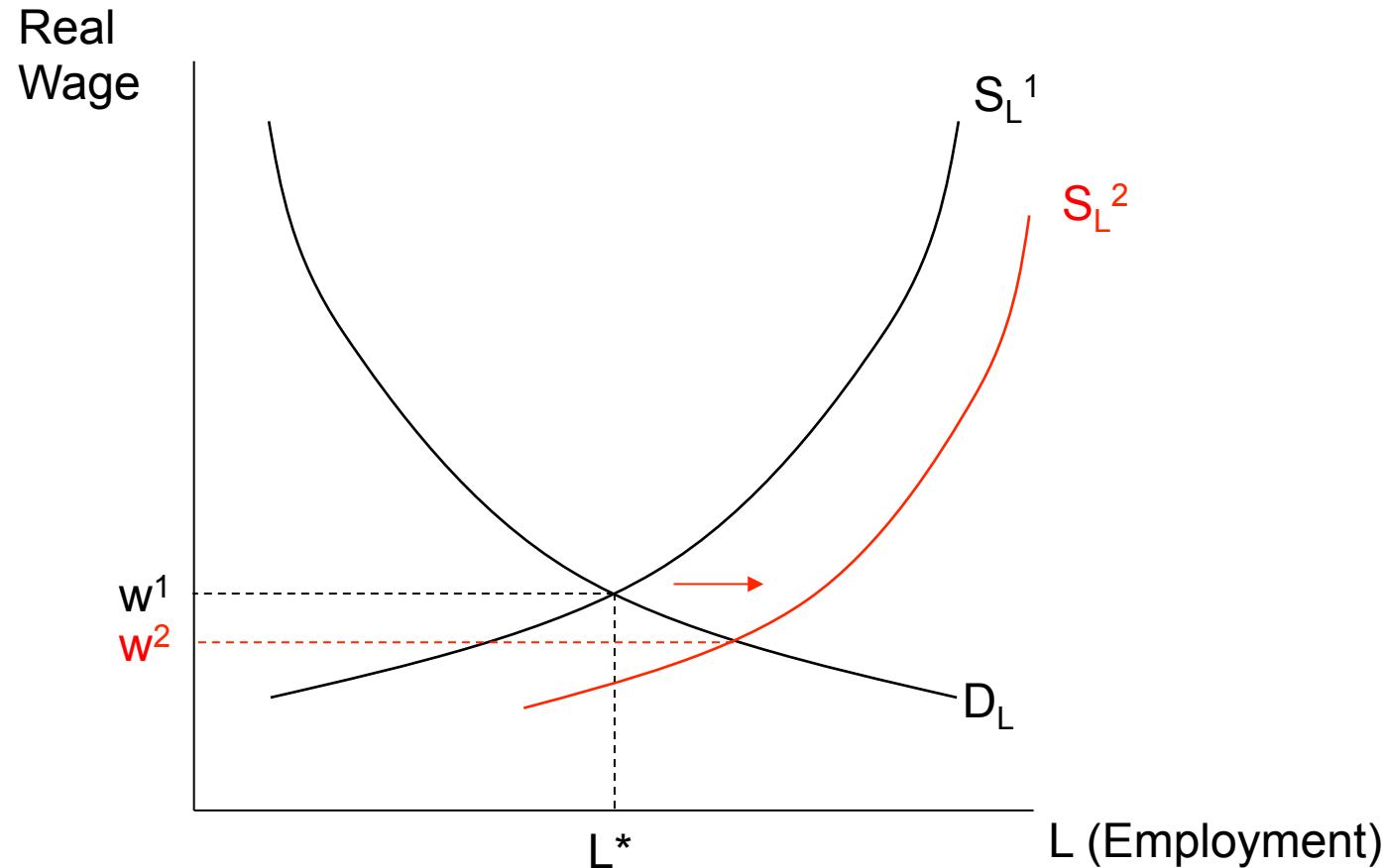


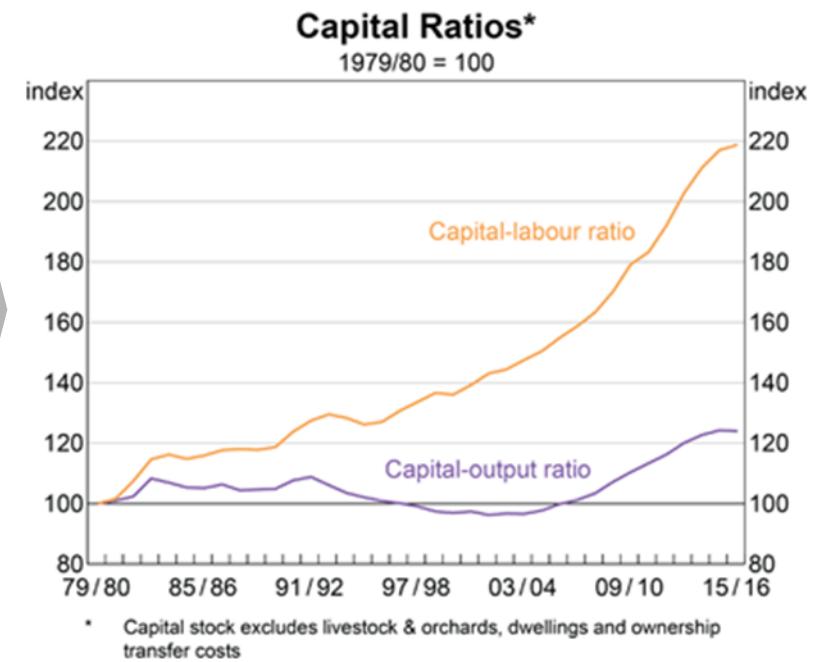
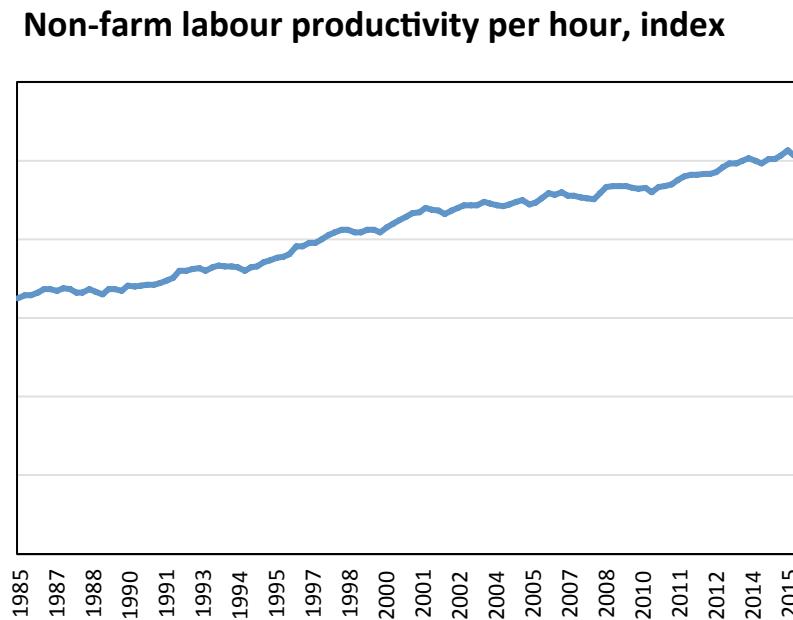
Figure 1.2 Female labour force participation, Australia The proportion of Australian women working outside the home has steadily increased.

Source: Australian Bureau of Statistics (2013), *Labour Force, Australia*, January, Cat. No. 6202.0, Table 01, Labour force status by sex—trend

Answer 1: The increase in female labour force participation has increased the supply of labour...

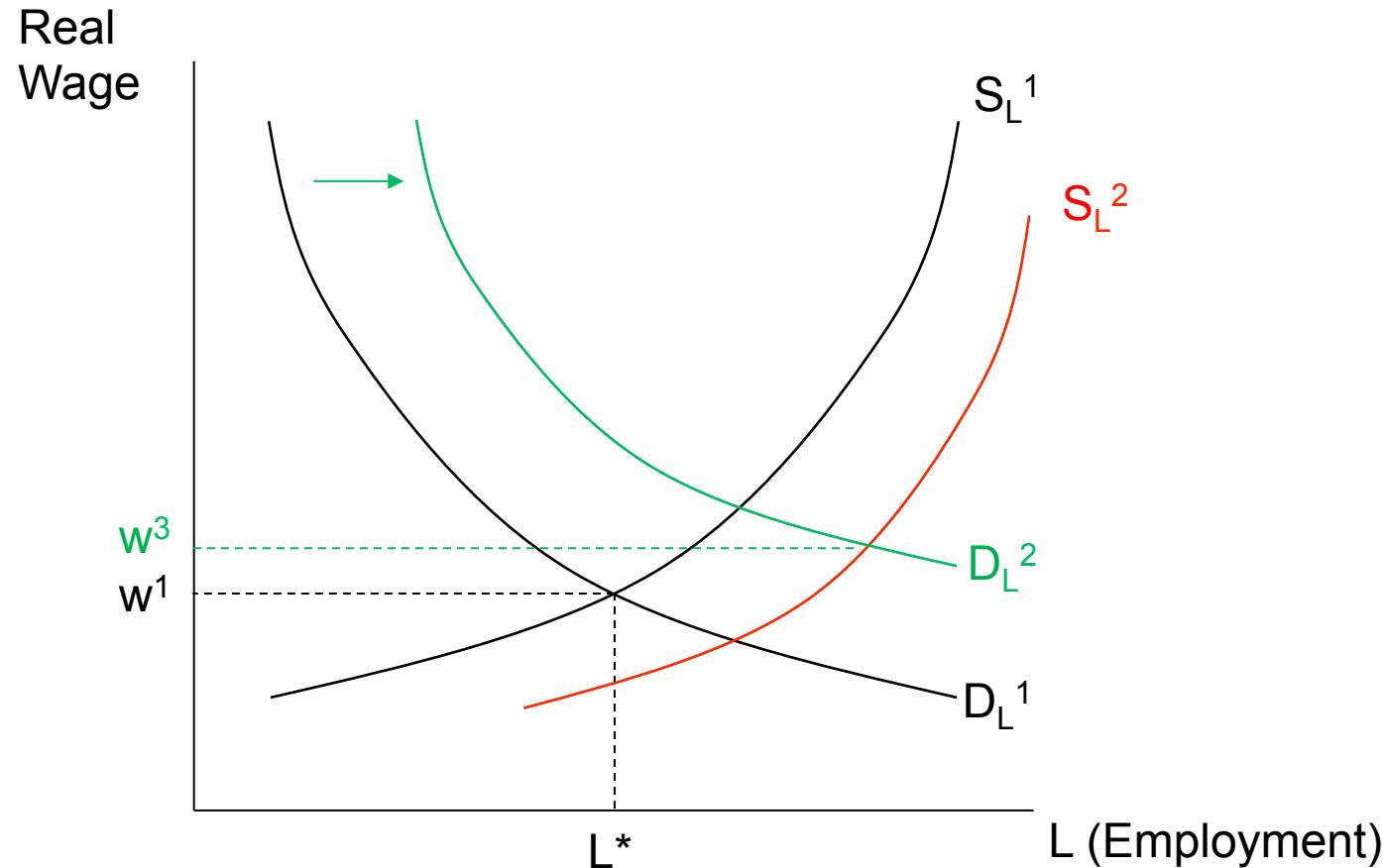


Answer 1: ...however, labour productivity has increased even more over this period, because of more capital and better tech. per worker



Source: RBA

Answer 1: ...which has increased the demand for labour more than the supply, causing real wages to rise (see slide 4)



Answer 1: Labour productivity and rose particularly quickly in WA in recent years because of the mining boom

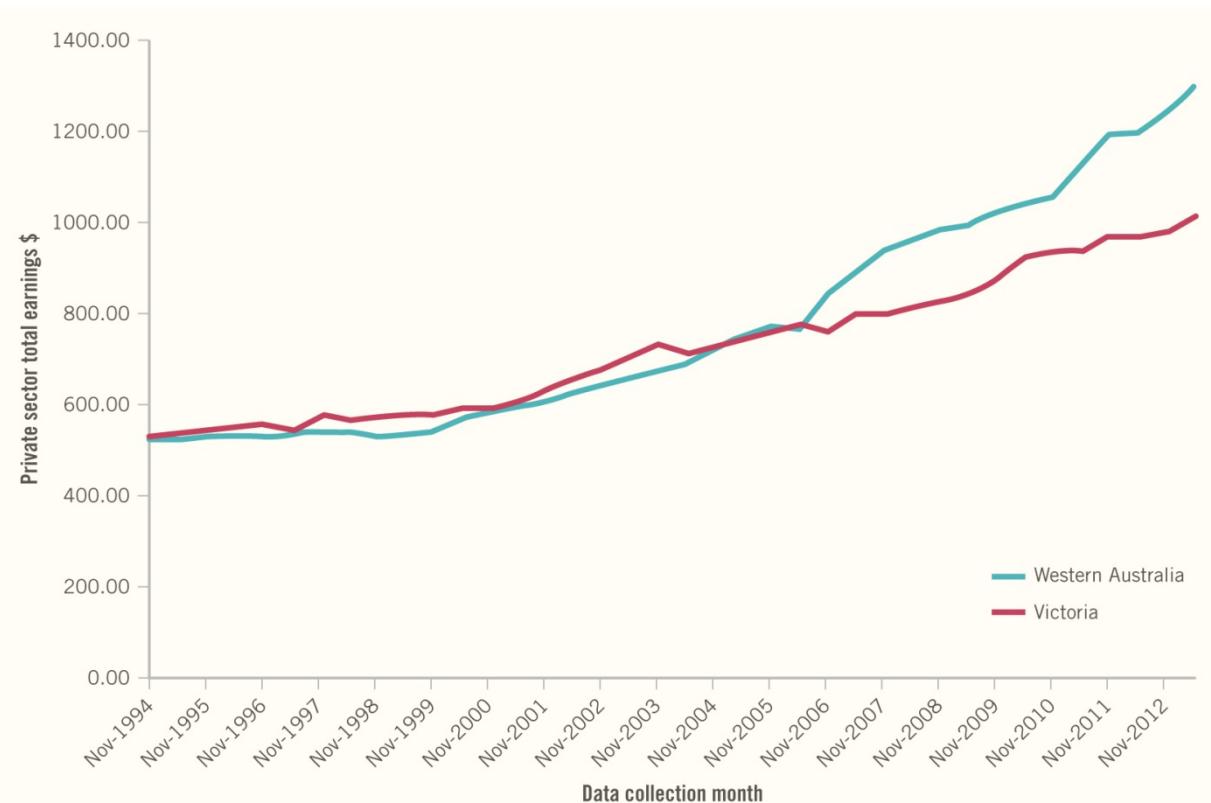


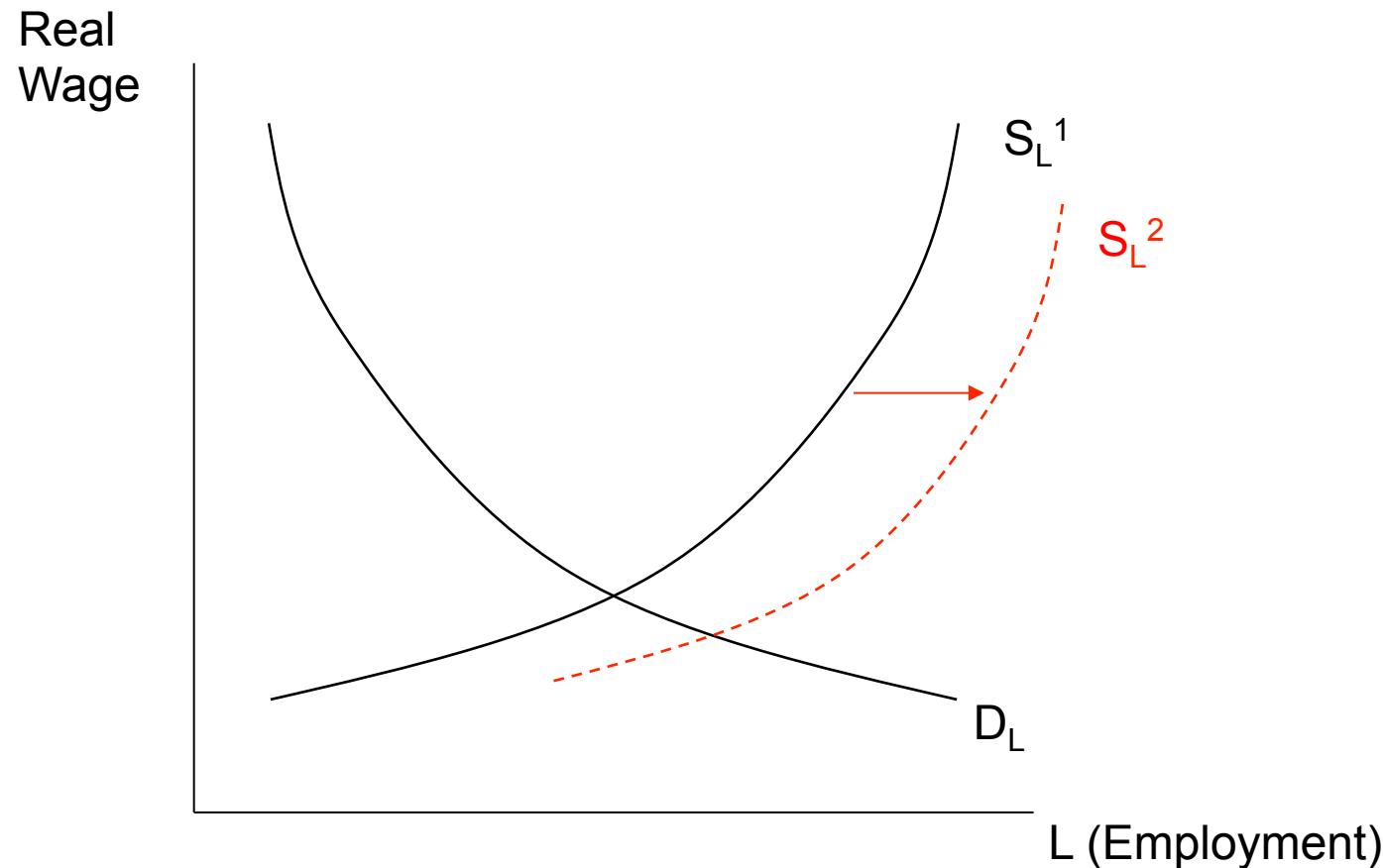
Figure 3.8 Earnings in Western Australia and Victoria The mining boom has resulted in a relatively more rapid rise in earnings in Western Australia, a state with a large amount of mining activity, than in Victoria, a state with very little mining.

Source: Australian Bureau of Statistics, *Average Weekly Earnings, Australia*, Cat. No. 6302.0, www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6302.0May%202013?OpenDocument

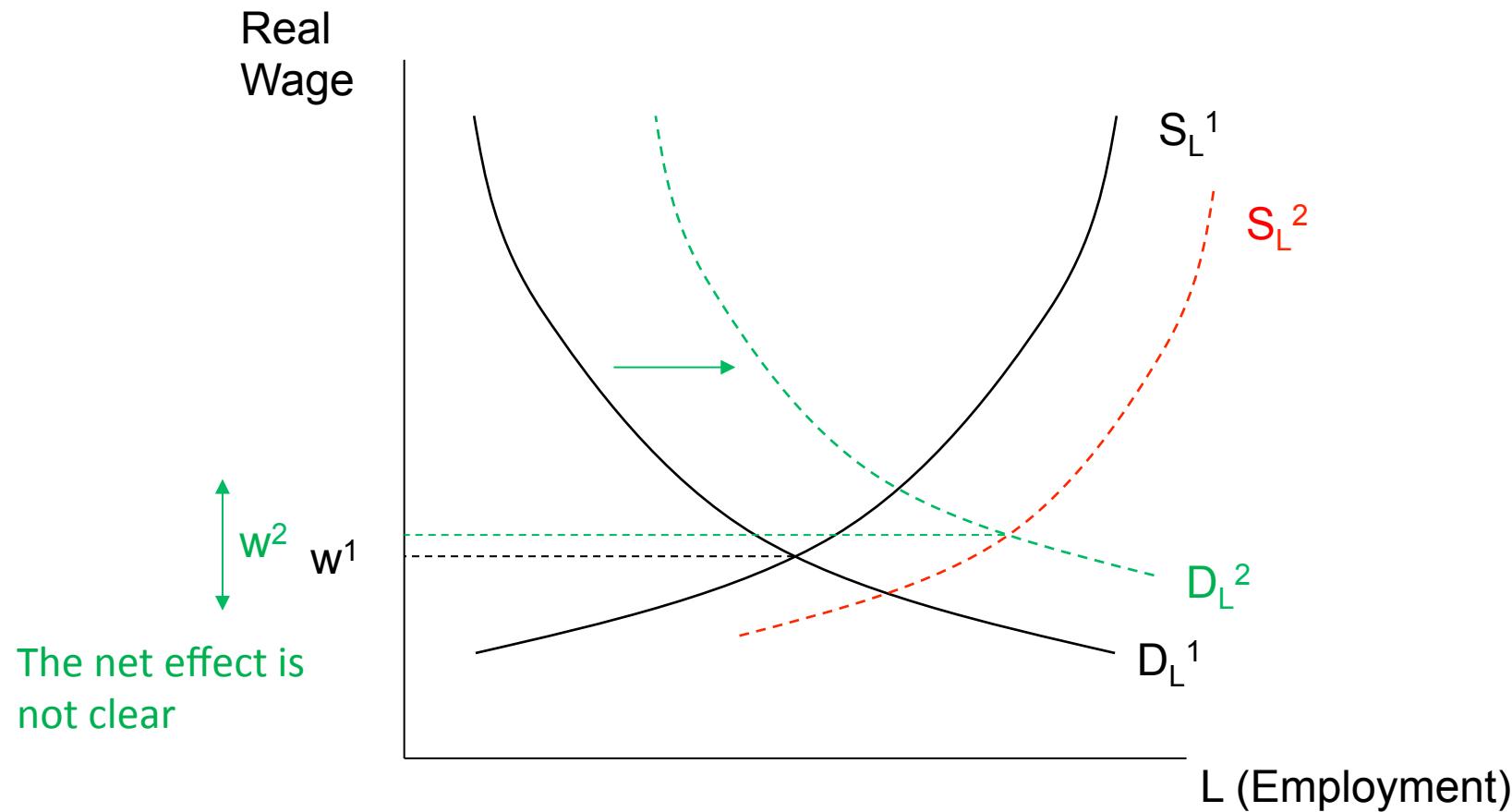
Question 2: Are Nigel Farage and Donald Trump right? Do immigrants steal jobs and reduce wages?



Answer 2: If Sydney (population ~5 million) received 500 million immigrants, the supply of labour would increase...



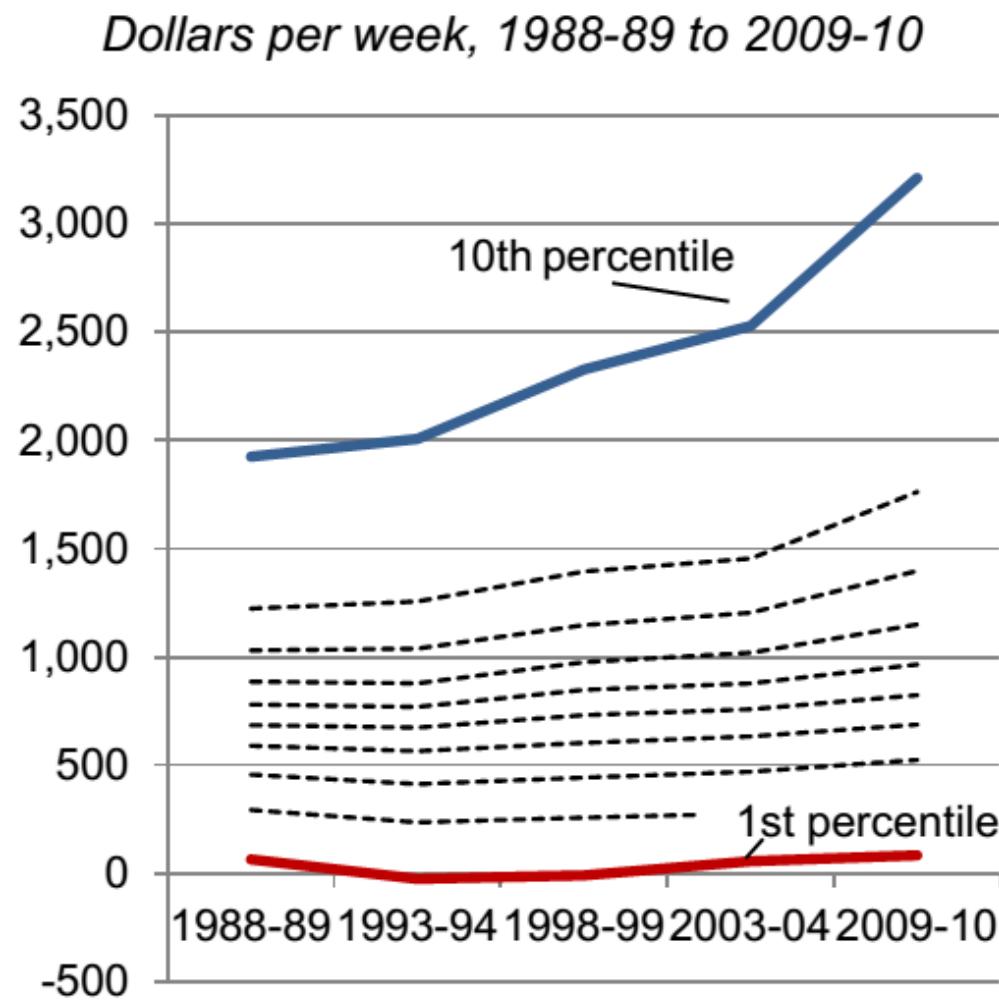
Answer 2: But! There aren't a fixed number of jobs! New immigrants will also demand goods and services, increasing demand for labour



Answer 2: The net effect of immigration depends on the specifics of the labour market, and will differ based on the skills of the workforce

- UK studies find that immigration has a small effect on average wages but more significant effects on the distribution of wages: low-wage workers lose and medium/high-wage workers gain
 - <http://www.migrationobservatory.ox.ac.uk/resources/briefings/the-labour-market-effects-of-immigration/>
- US studies find that wages go up if immigrants complement local workers, and fall if they are substitutes
 - <http://blogs.wsj.com/economics/2016/02/09/immigrants-push-down-wages-for-low-income-workers-but-how-much/>
 - <http://blogs.wsj.com/economics/2015/06/01/does-immigration-suppress-wages-its-not-so-simple/>
- In Australia, recent study found no robust evidence that skilled immigrants reduce wages
 - ISLAM, A. and FAUSTEN, D. K. (2008), Skilled Immigration and Wages in Australia. *Economic Record*, 84: S66–S82. doi:10.1111/j.1475-4932.2008.00485.x

Question 3: Can technology growth affect the distribution of income?



Technological change

- In general, technological advance has been a major source of improved productivity, which has driven up real wages.
- However, whether a particular technological innovation is good for a particular worker depends on what that innovation does for the value of his or her marginal product, and therefore his or her wage.
- The increased pace of technological change is biased toward skill-based technological change—replacing unskilled labour and increasing the demand for labour with skills to use and maintain that technology.

Answer 3: If technology complements high-skilled workers more than low-skilled workers... then yes!

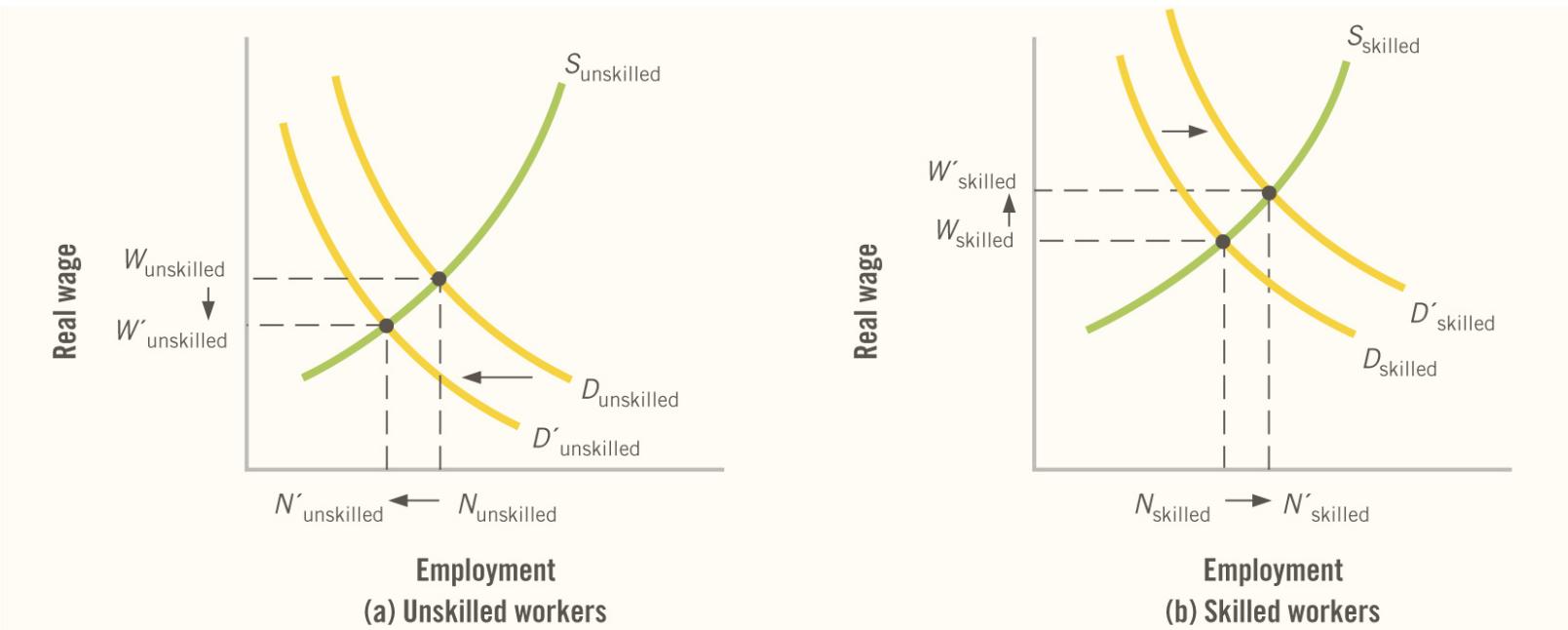
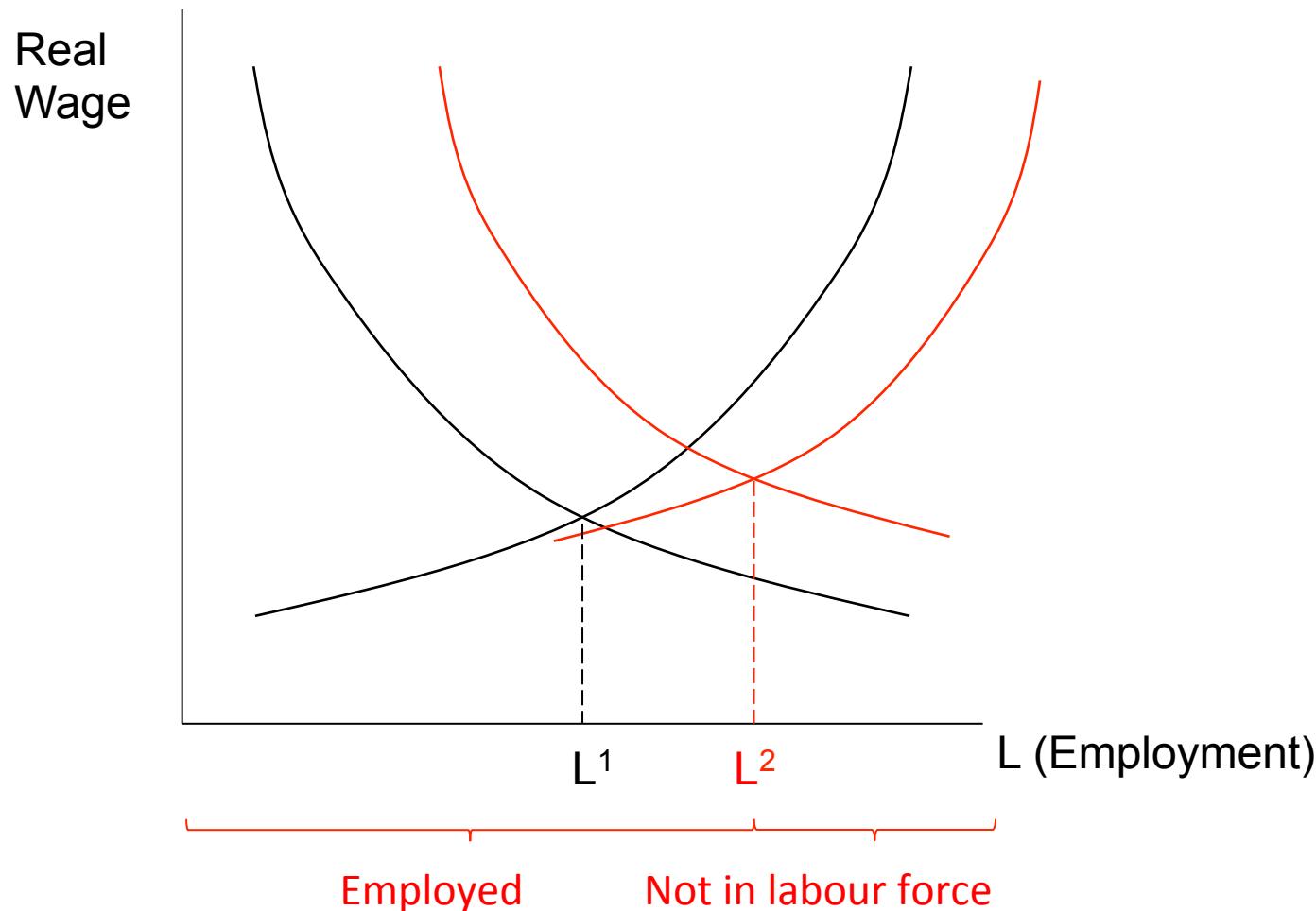


Figure 3.10 The effect of skill-biased technological change on wage inequality The figure shows the effects of a skill-biased technological change that increases the marginal product of skilled workers and reduces the marginal product of unskilled workers. The resulting increase in the demand for skilled workers raises their wages (b), while the decline in demand for unskilled workers reduces their wages (a). Wage inequality increases.

However, any change in employment so far is voluntary. None of this can explain involuntary unemployment.



The labour market is in equilibrium at both L^1 and L^2 : everyone who wants a job has one, everyone else is “out of the labour force”.

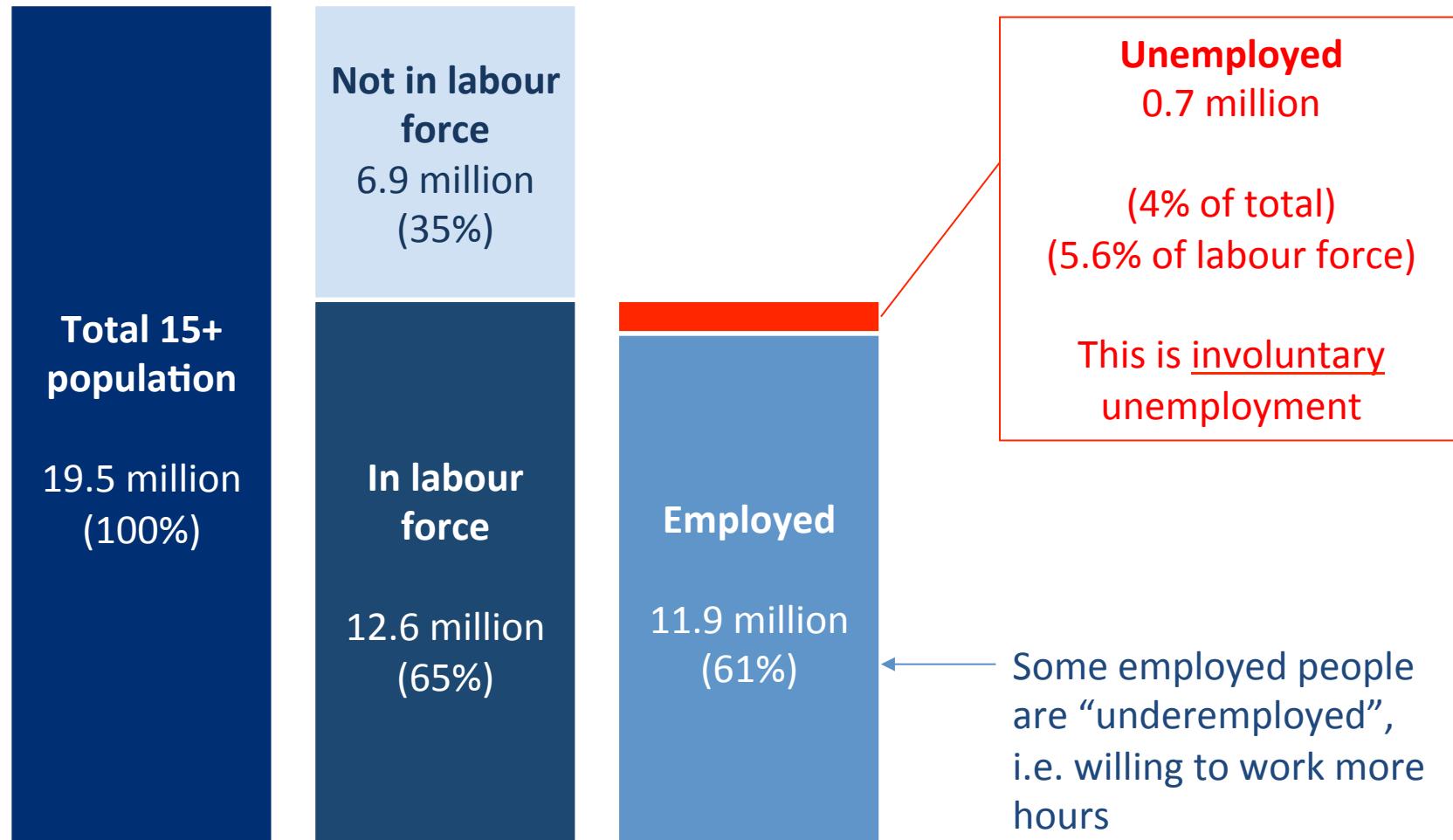
Unemployment

Measuring unemployment

- The Australian Bureau of Statistics (ABS) categorises people who are 15 years old or over into three categories:
 1. Employed: those who worked one hour or more in paid employment, or are on leave.
 2. Unemployed: those who did not work in paid employment, and actively sought work.
 3. Out of the labour force: those who did not work in paid employment and are not actively seeking employment.

Every person in Australia over the age of 15 is either in or out of the labour force

Breakdown of Australian labour force, December 2016



Source: ABS 6202

Some labour force definitions

Labour force = employed + unemployed

$$\text{Unemployment} = \frac{\text{Number of unemployed}}{\text{Labour force}}$$

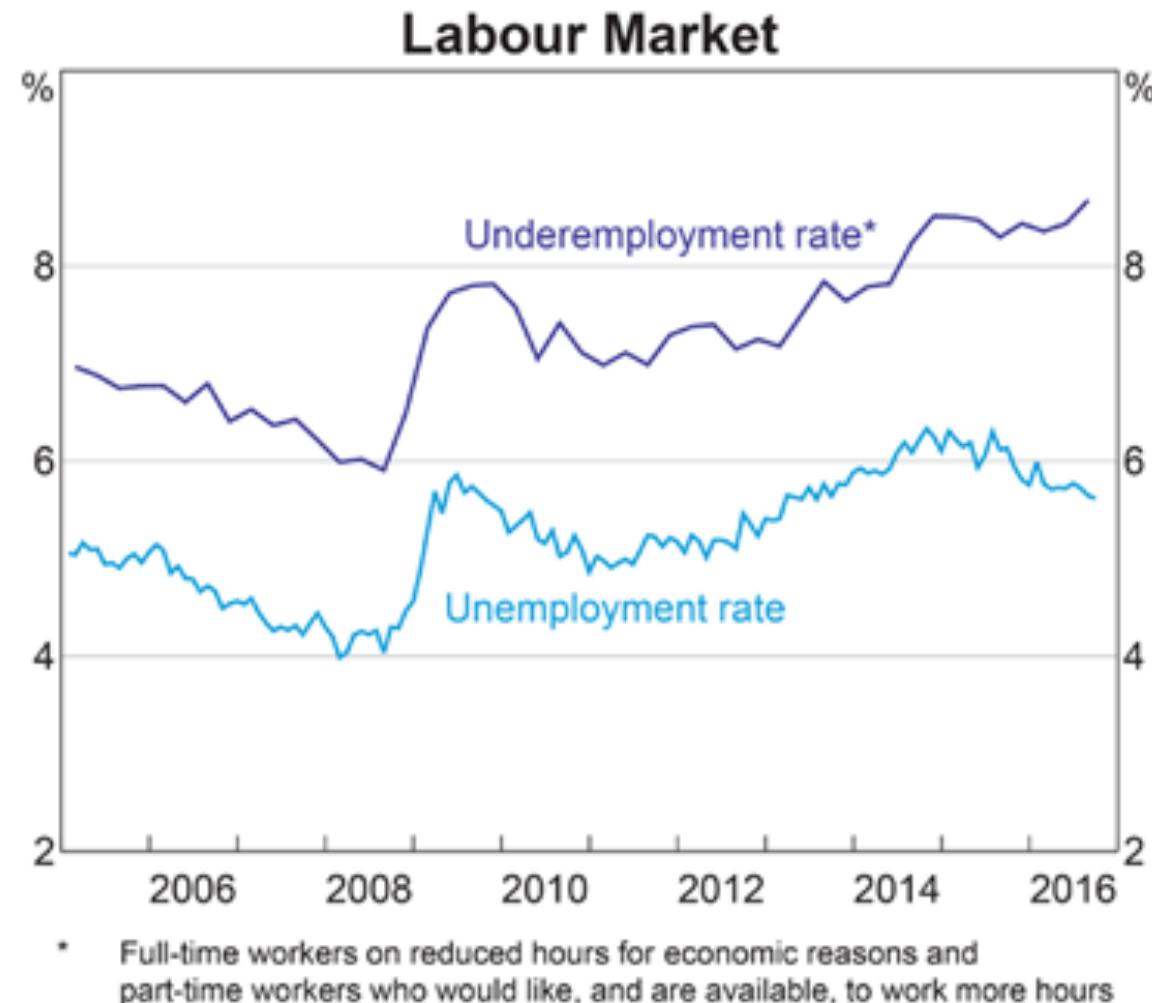
$$\text{Participation rate} = \frac{\text{Labour force}}{\text{Working-age population}}$$

Both participation and employment rates grew over the 2000s, but have stagnated in recent years....



Source: ABS

..while in recent years unemployment and underemployment have risen



Source: ABS

Australia's unemployment rate is historically ~5%. It peaked during the great depression, and was low during the post-WWII years

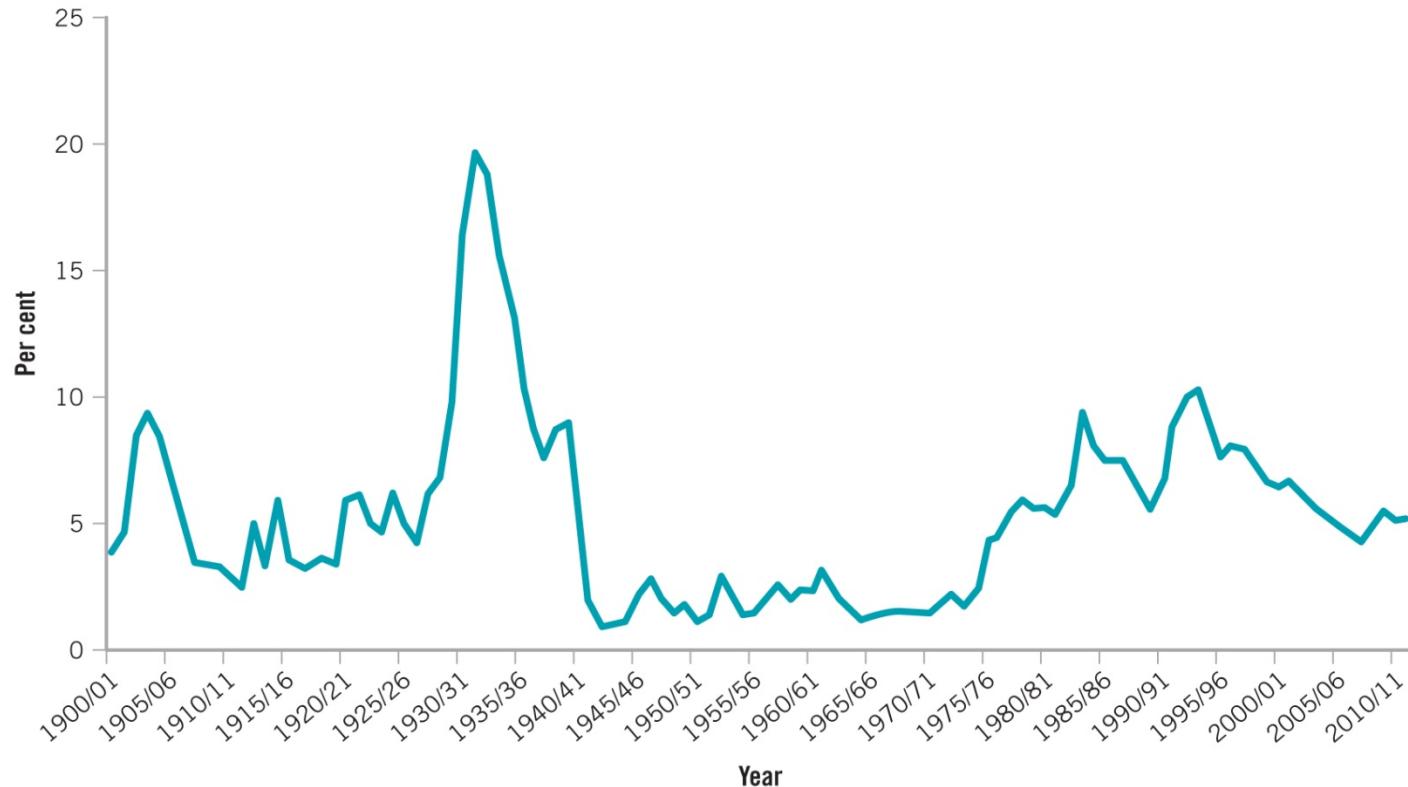
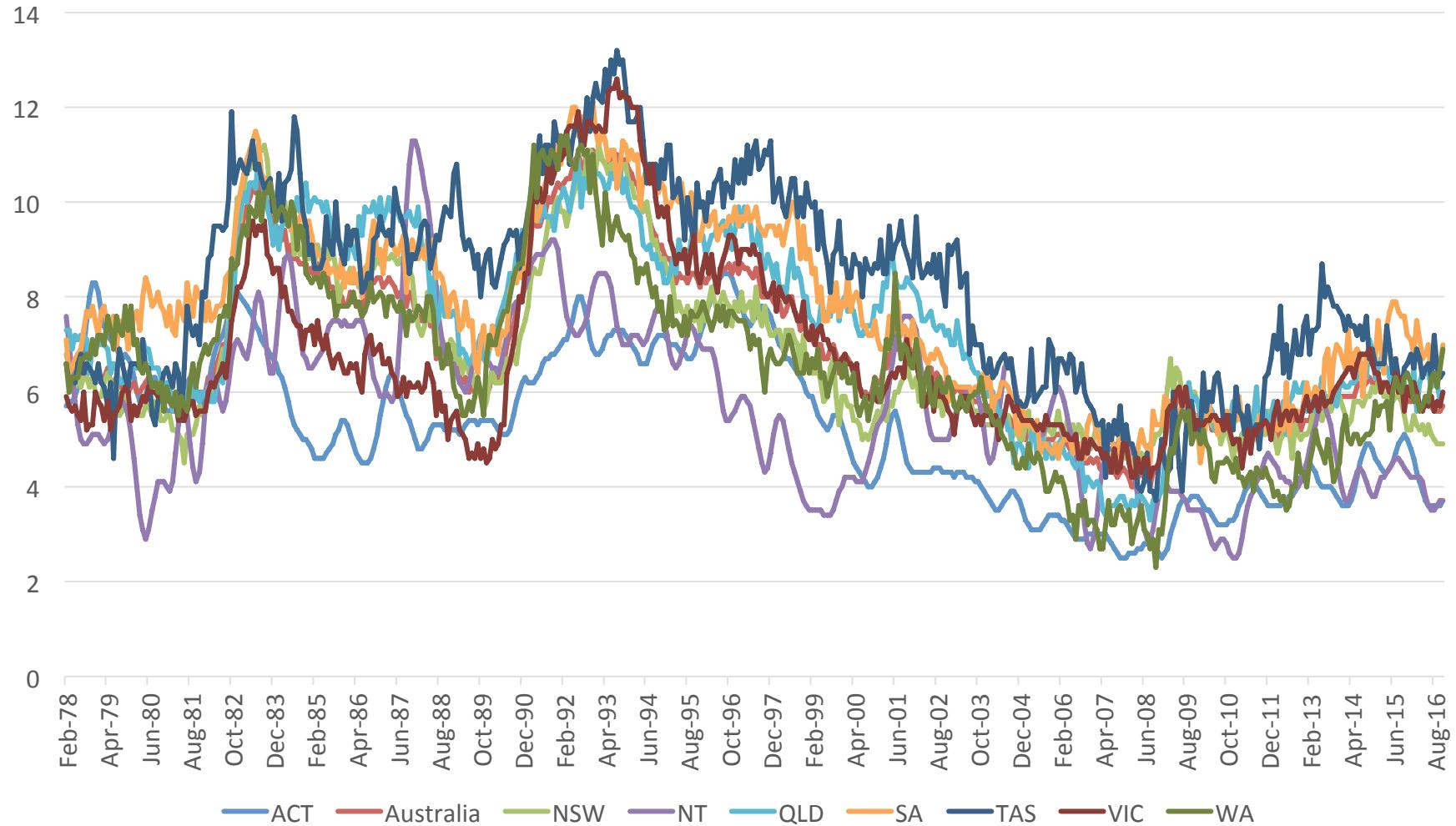


Figure 3.11 Australia's unemployment rate since 1901 The unemployment rate reached its peak in Australia during the Great Depression. The post-war decades saw the maintenance of a relatively low unemployment rate, a situation that has not been maintained since the mid-1970s.

Source: Reserve Bank of Australia (1977), *Preliminary Annual Database* (Reserve Bank RDP7701), and Australian Bureau of Statistics, *The Labour Force*, Cat. No. 6202.0, various issues

Australia's unemployment rate didn't jump too much during the GFC (Europe/US ~10%) but has recently begun to rise, particularly in WA



Unemployment is very bad for the country and its economy

Personal Costs

- Inability to meet financial obligations (e.g. mortgages/schools)
- Loss of skills and purpose
- Loss of self esteem and depression
- Can lead to family problems

Economic Costs

- Under-utilisation of workforce
- Lower tax income
- Higher welfare payments
- Loss of skills and know-how

Social Costs

- Crime
- Domestic violence
- etc

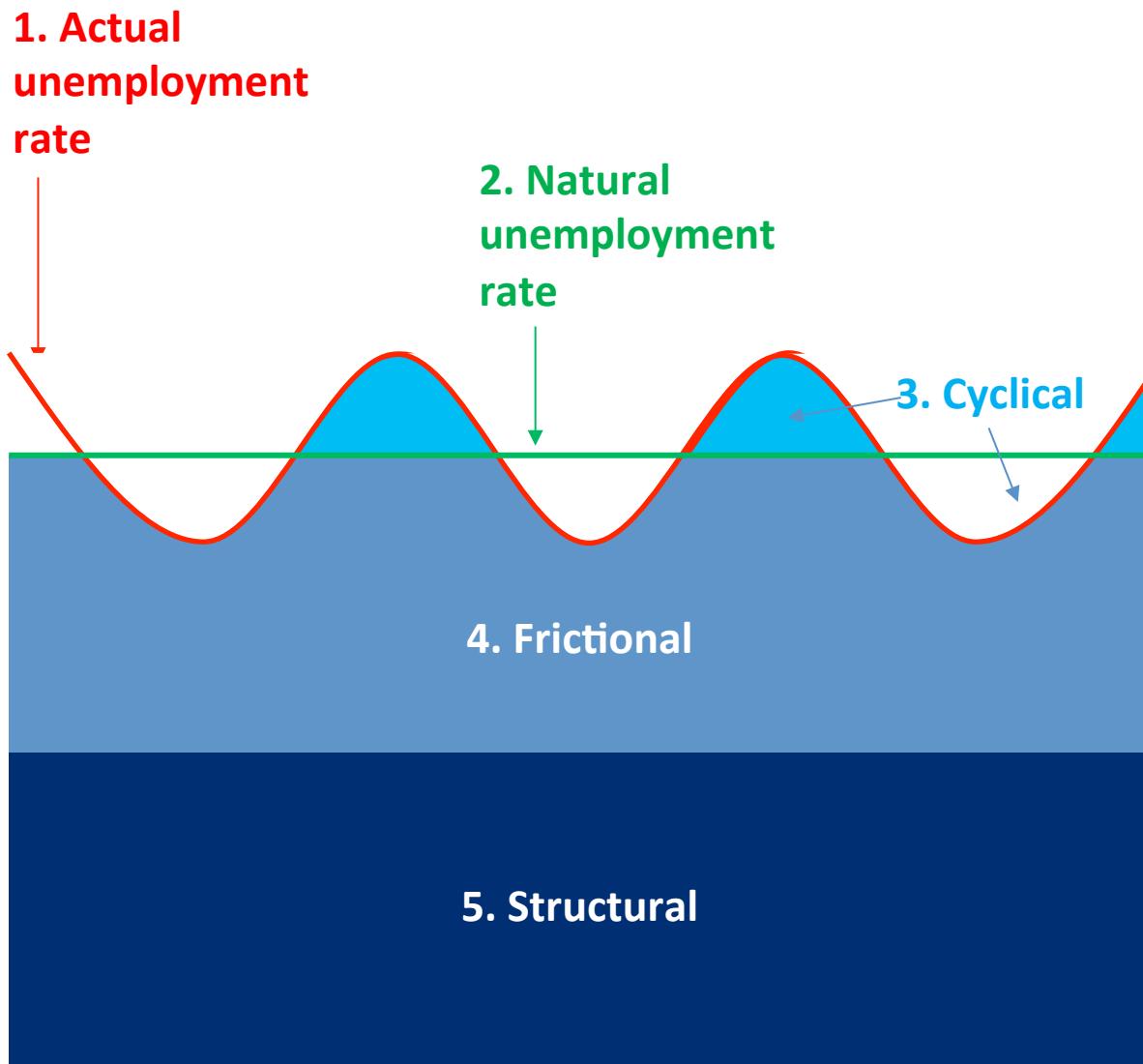
Types of unemployment

- Types of unemployment
 - Frictional unemployment refers to the short-term unemployment associated with the process of workers searching for the right job.
 - Structural unemployment refers to the long-term and chronic unemployment that exists when the skills or aspirations of workers are not matched to the jobs available in the economy.
 - Cyclical unemployment refers to the extra unemployment that occurs during periods of economic contraction and especially recessions.

Natural rate of unemployment

- The natural rate of unemployment exists independently of whether the economy is in an expansion or contraction.
 - The part of the total unemployment rate that is attributable to frictional and structural unemployment; equivalently, the unemployment rate that prevails when cyclical unemployment is zero, so that the economy has neither a contractionary nor an expansionary output gap.

Unemployment can be frictional, structural or cyclical, and be below or above the “natural rate”



1. Observed unemployment
2. Theoretical underlying unemployment
3. Short term: fluctuations in aggregate demand/output gap
4. Short term: workers finding the right job
5. Long term: structural distortions in the labour market (fixed wages, regulation, skills mismatch)

Natural rate of unemployment

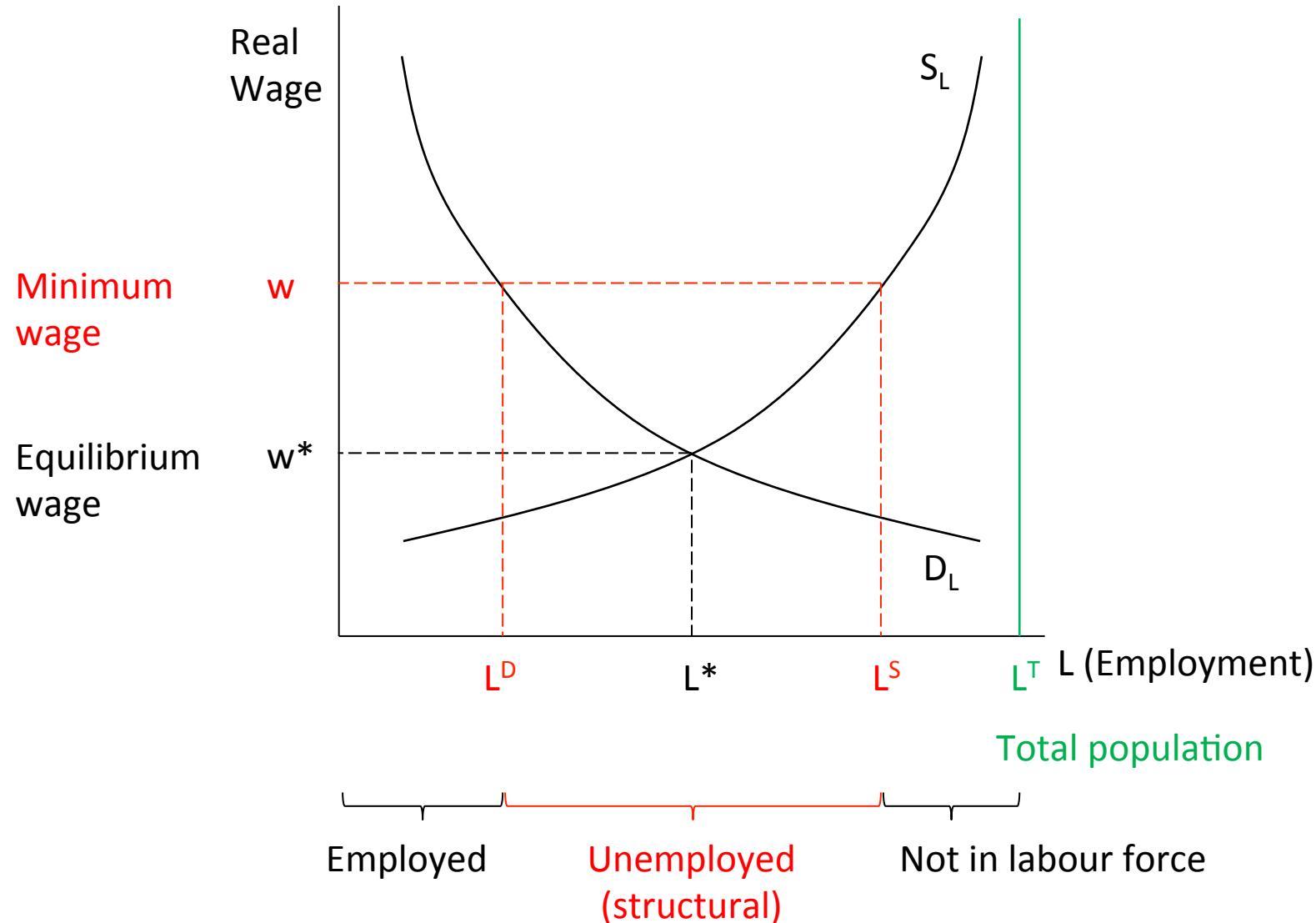
- Natural rate of unemployment = frictional + structural
- Frictional unemployment is when people are between jobs and currently searching for another job.
- Structural unemployment can be the result of:
 - a mismatch of skills demanded (including language and reliability) and job seekers' skills (if any)
 - minimum wage laws and other government regulation of employment conditions
 - high unemployment benefits which raise the opportunity cost of working
 - workplace discrimination

Frictional unemployment can be seen from the number of unfilled job advertisements

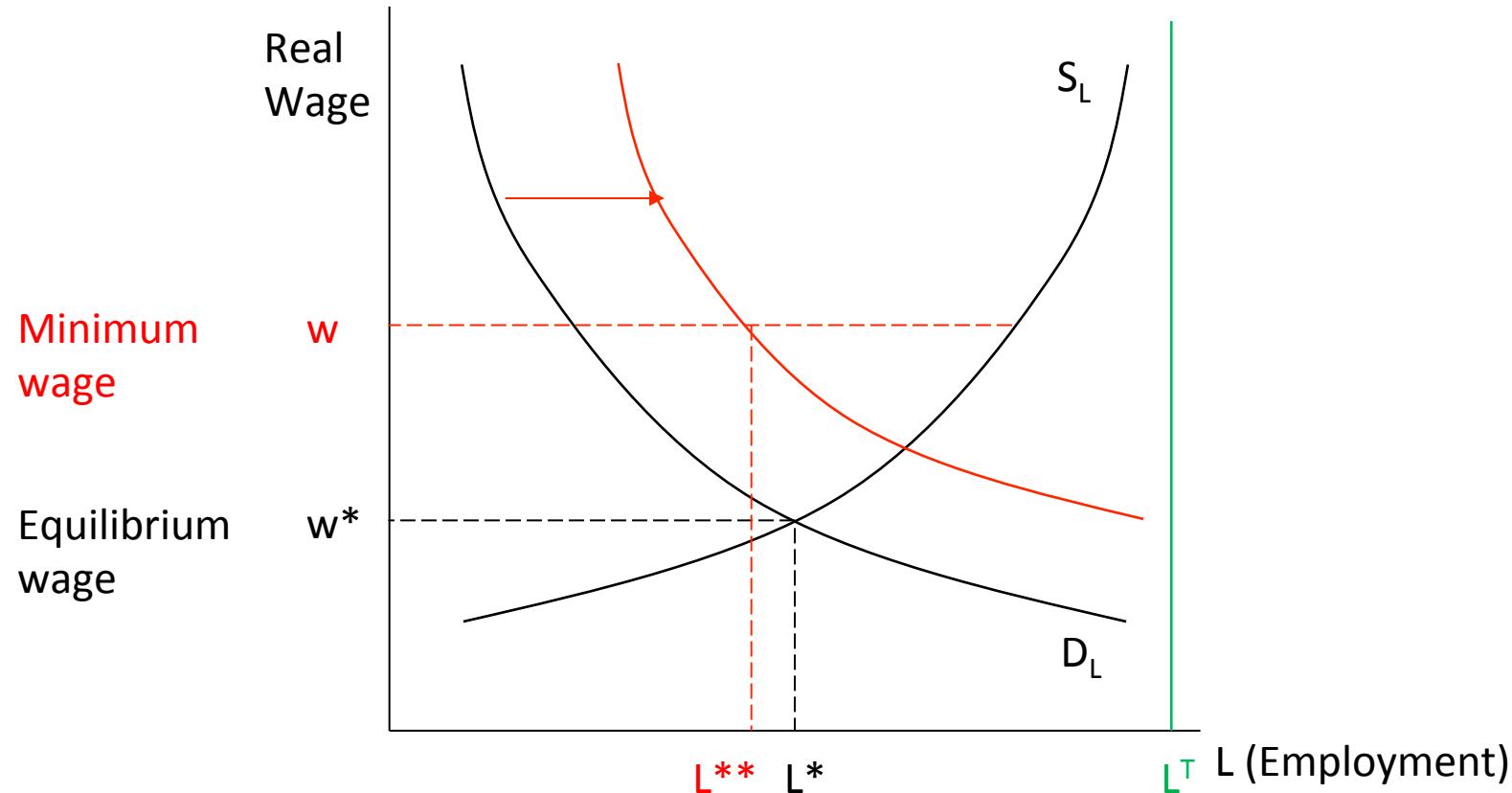


Source: RBA

Involuntary (structural) unemployment could be caused by a minimum wage would cause the supply of labour to exceed the demand for labour



..but that's not the whole story. A minimum wage also redistributes income from capital to (poorer) workers, who are more likely to spend it

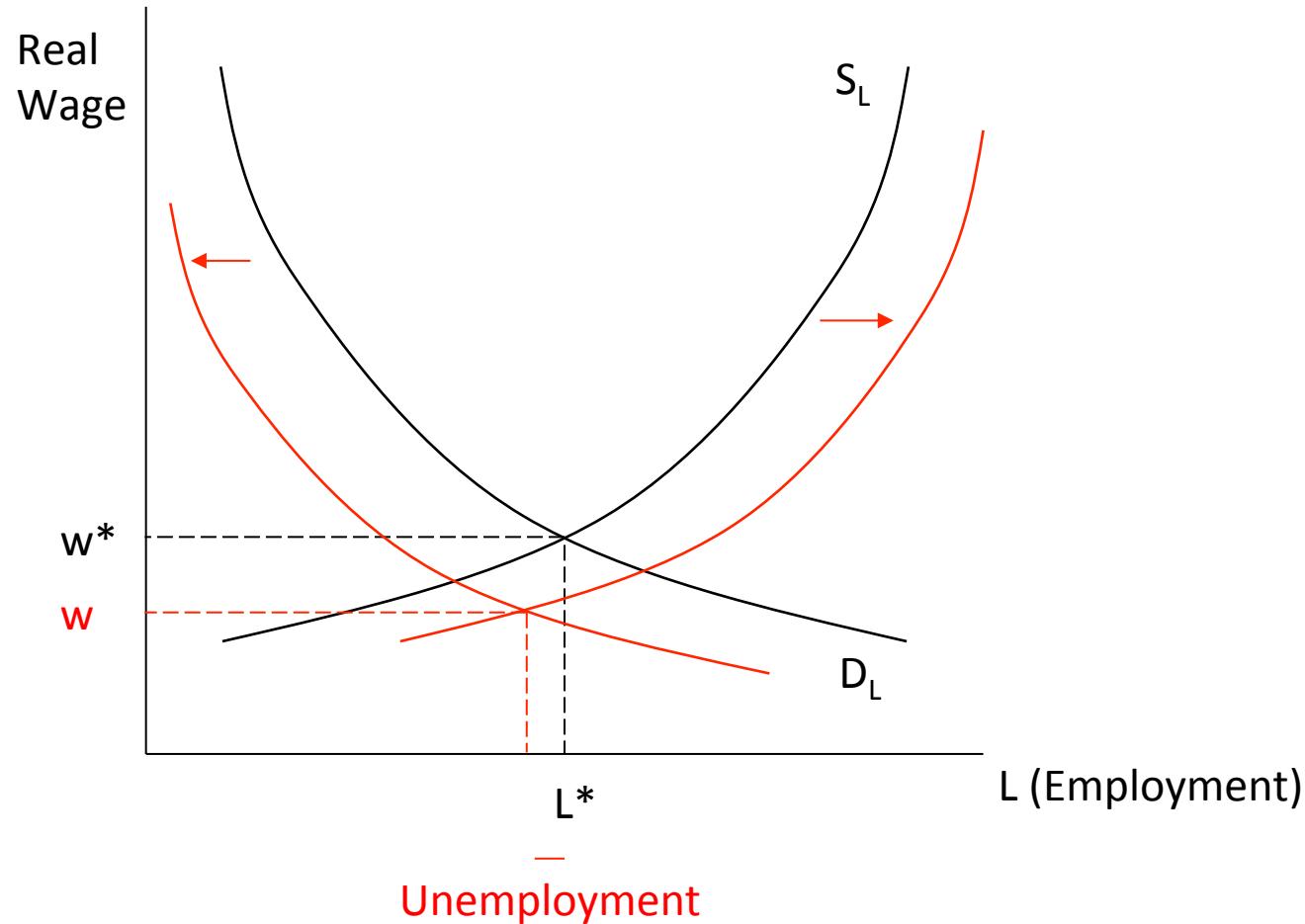


- People with low incomes have a higher “marginal propensity to consume”, i.e. they are more likely to spend their income. Redistribution can stimulate the economy.
- Might cause the economy to substitute from low skilled to higher-skilled jobs
- People with low incomes have a higher marginal utility from an additional dollar, so aggregate welfare will also be higher

There is little evidence that imposing minimum wages increases unemployment in practice

- Try these readings:
 - <http://www.abc.net.au/news/2015-03-12/minimum-wage/6290482>
 - <http://cepr.net/documents/publications/min-wage-2013-02.pdf>
 - <http://www.imf.org/external/pubs/ft/sdn/2014/sdn1411.pdf>

Health and safety regulations make it more expensive to hire workers (reduce labour demand), but makes them healthier (increases S+D)



- Health and safety regulations reduce increase the cost of each worker.
- But, it increases productivity by preventing unnecessary injuries (internalised?)
- It also increases the health of the overall workforce (externality), increasing L^S

The higher natural level of unemp. in Europe may be due to structural (minimum wage/unemp. benefits) or frictional (many languages) reasons

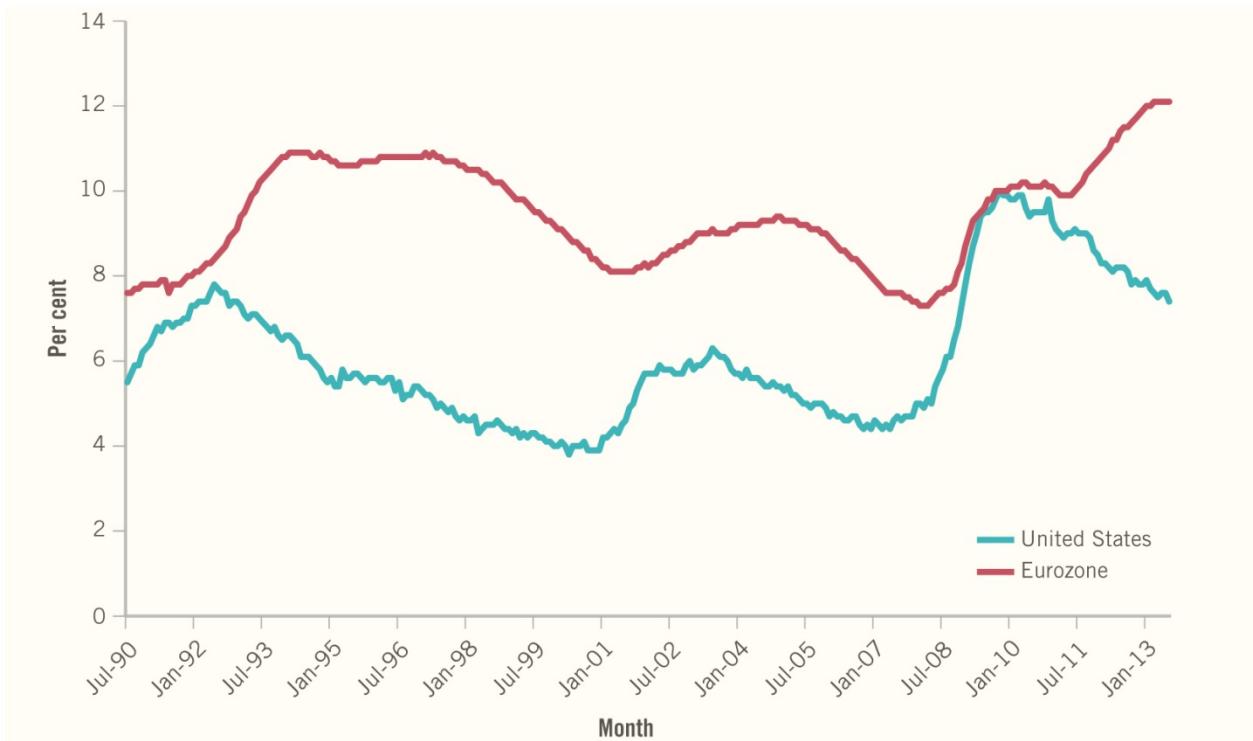


Figure 3.14 Unemployment rates in the United States and Western Europe In the major Western European countries, unemployment rates have been high for more than two decades. It is only during the global financial crisis that eurozone unemployment has looked similar to that in the United States, although, more recently, eurozone unemployment has continued to rise

Source: Standardised Unemployment Rates, OECD, *Main Economic Indicators*

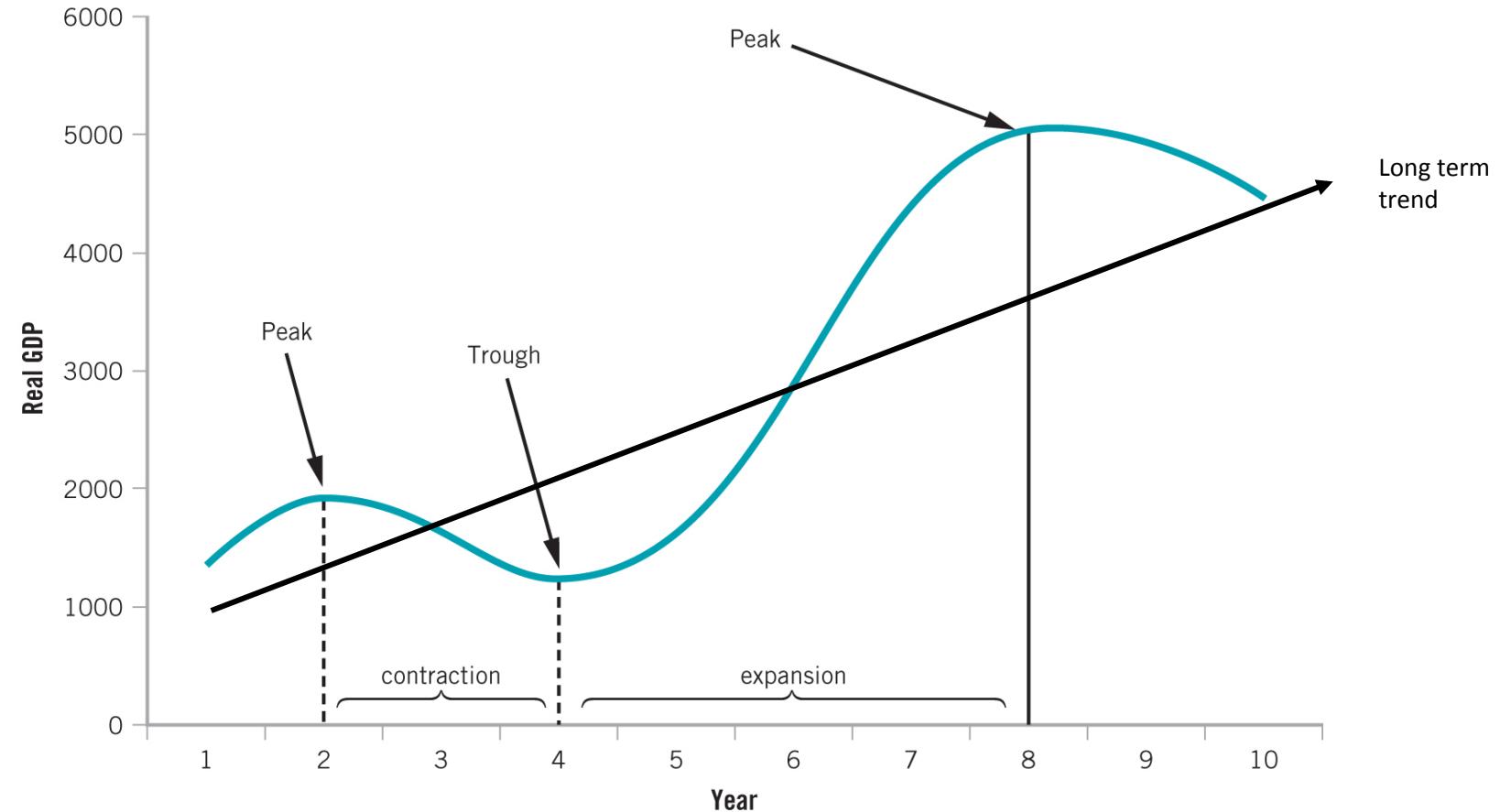
Chapter 4

Short-term economic fluctuations

Learning objectives

- 4.1 How do economists decide whether the economy is in recession?
- 4.2 What typically happens to the unemployment rate in recessions?
- 4.3 What caused the early 1990s recession in Australia?
- 4.4 What features seem to be common to most business cycle fluctuations in the economy?
- 4.5 How are output gaps and cyclical unemployment related?

The business cycle describe short-term fluctuations (expansions and contractions) of real GDP around the long-term trend



The business cycle can be expressed in terms of the growth rate or the level of GDP

TABLE 4.1 Recession dates in Australia

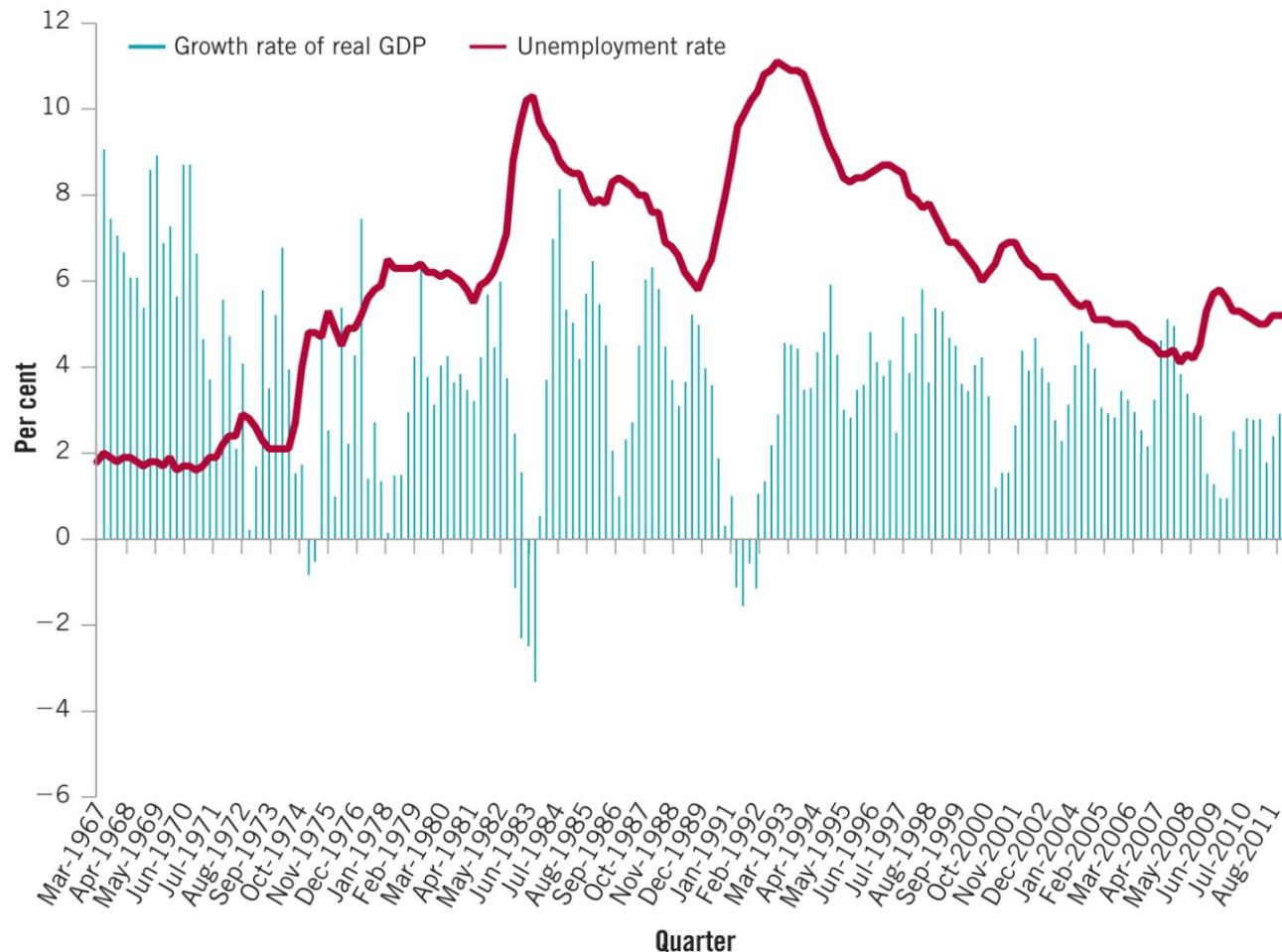
GROWTH CYCLES				CLASSICAL CYCLES			
DATES OF PEAKS AND TROUGHS BY MONTH/YEAR		DURATION IN MONTHS		DATES OF PEAKS AND TROUGHS BY MONTH/YEAR		DURATION IN MONTHS	
PEAK	TROUGH	CONTRACTION	EXPANSION	PEAK	TROUGH	CONTRACTION	EXPANSION
August 1960	June 1961	10	46	September 1960	November 1961	15	30
April 1965	January 1968	33	36				
January 1971	January 1972	12	25				
February 1974	October 1975	20	10	July 1974	October 1975	15	154
August 1976	February 1978	18	43	May 1976	November 1977	18	7
September 1981	December 1982	15	35	November 1981	May 1983	18	48
November 1985	November 1986	12	37				
December 1989	December 1992	36	32	February 1990	October 1991	20	81
August 1995	February 1997	18	40				
June 2000	January 2001	7	42				
July 2004	February 2006	19	24				
February 2008	September 2009	19	8				
Average		18	32	Average		18	60

Source: Melbourne Institute of Applied Economic and Social Research, University of Melbourne, *Phase of Business Cycles, Australia, 1960–2011*, www.melbourneinstitute.com/macro/reports/bcchronology.html

(slower than average GDP growth)

(falling GDP level)

Real GDP and unemployment, Australia



The severity of business cycle fluctuations around the world has moderated since the 1990s

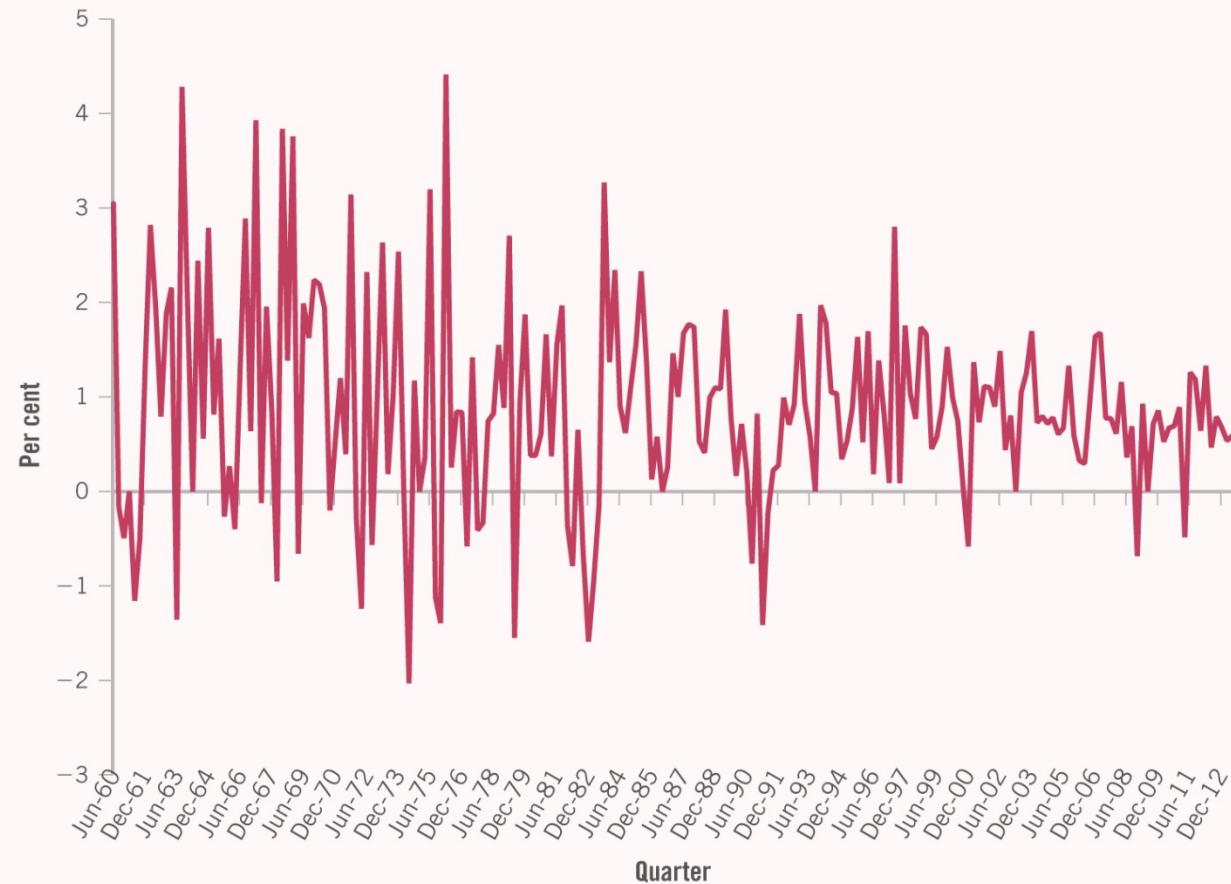


Figure 4.3 The Great Moderation A reduction in the economy's volatility is indicated by a fall in the percentage changes in real GDP from one quarter to the next since the early 1990s.

Source: Authors' calculations using data on real GDP from OECD, *Main Economic Indicators*, www.oecd.org/std/oecdmaineconomicindicatorsmei.htm

Reasons for the Great Moderation

- Central Bank independence
- Inflation-targeting monetary policy
- Trade openness and market liberalization (risk-sharing)
- Structural transformation (manufacturing to services)

When GDP growth falls, inflation typically does too. When it doesn't it is called “stagflation”

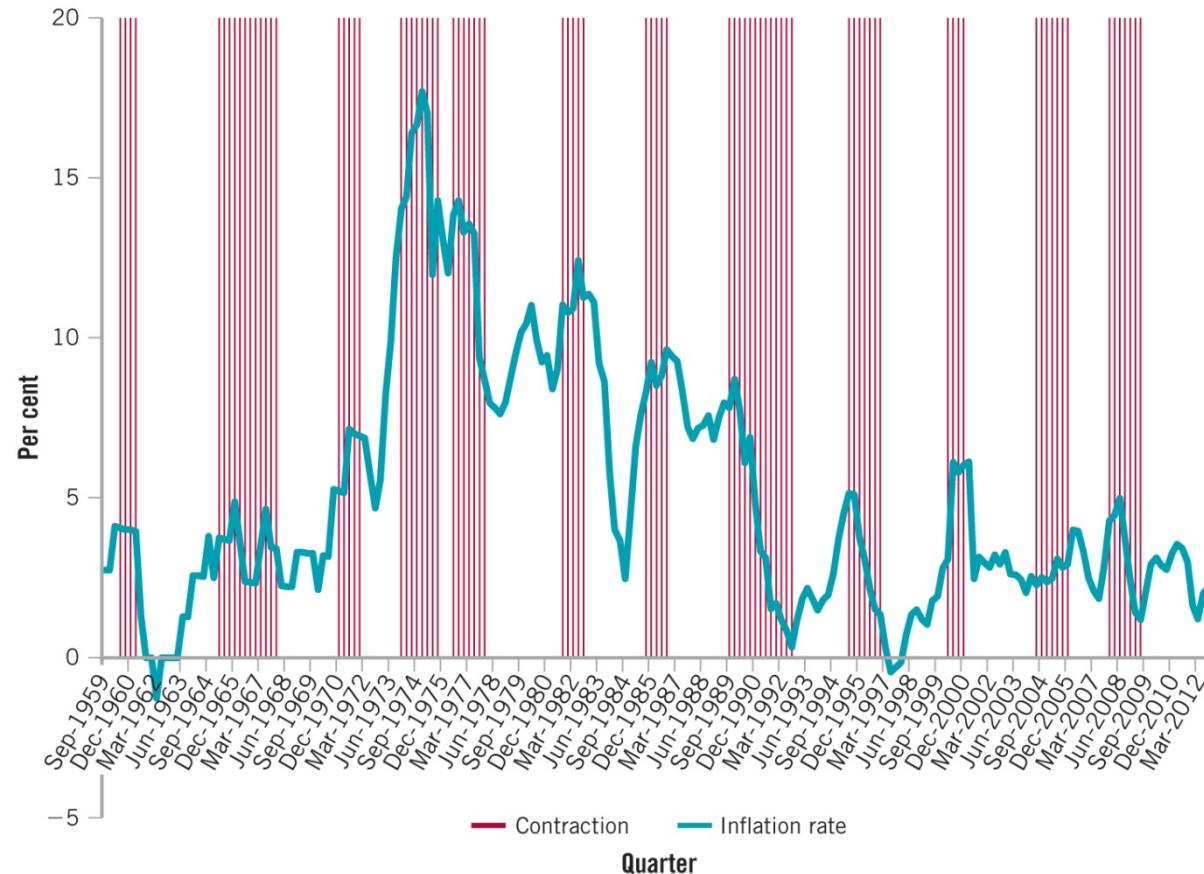
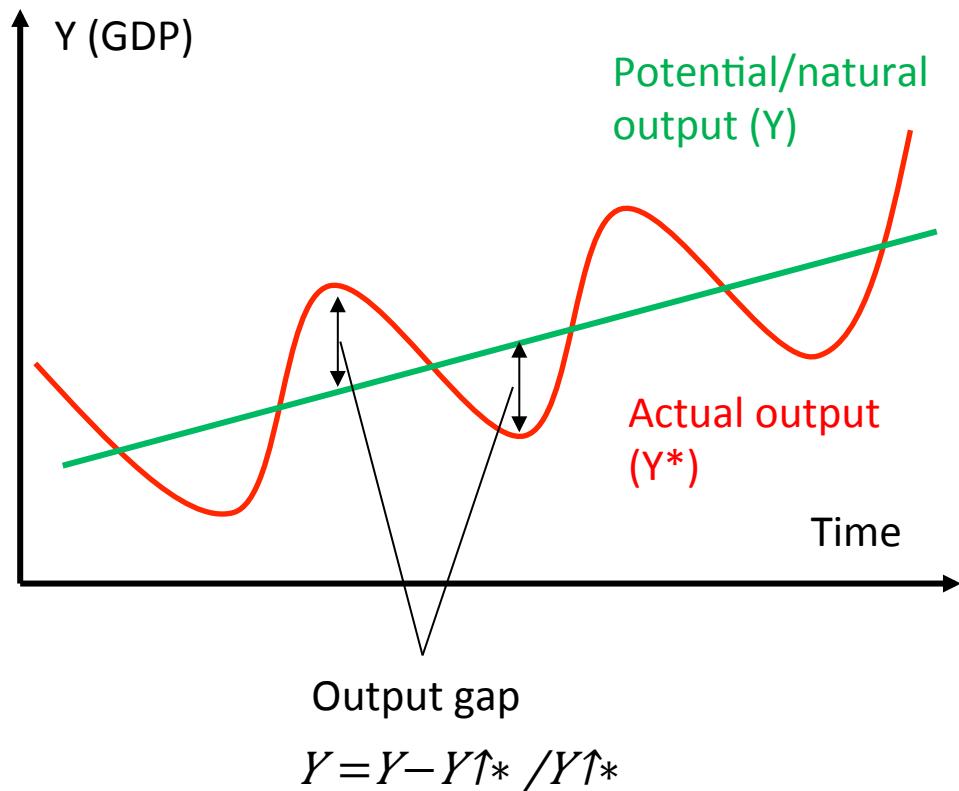


Figure 4.4 Inflation, 1960–2010 Australian inflation is measured by the percentage change in the consumer price index (CPI); periods of contraction are indicated by the shaded regions.

Source: Australian Bureau of Statistics (2010), *Consumer Price Index*, Cat. No. 6401.0; and Melbourne Institute of Applied Economic and Social Research, *Phase of business cycles, Australia*, www.melbourneinstitute.com/macro/reports/bcchronology.html

During a recession, “actual output” is below “potential output”.
The difference is called the “output gap”.



Potential/Natural Output

- Varies less than actual output
- Depends on capital stock (number of machines etc), real interest rates, population, skills, technology, natural resources
- Can jump up (new technology, discover oil) or fall (drought)
- Unemployment = natural level

Actual Output

- Can be below potential output (contraction/unemployment) or above potential output (expansion/ overtime/inflation). Both cause problems.
- Depends on nominal interest rates, aggregate demand, government spending

Potential output

- Potential output, y^* (or potential GDP or full-employment output)
 - The amount of output (real GDP) that an economy can produce when using its resources, such as capital and labour, at normal rates.
- Potential output can grow over time with increases in the number of labour and capital resources available and increases in their productivity.
- One reason for economic fluctuations is changes in the level of potential output, signified by y^* :
 - An extensive drought could cause a significant fall in potential output growth, leading to a contraction or recession.
 - A period of particularly rapid innovation could cause unusually large growth in potential output, leading to an expansion or boom.

Output gaps

- If economic fluctuations are usual and require a policy response, some way to identify the size of the fluctuation is needed.
- The output gap measures how far actual output is from its normal level at a particular time.
- The normal level of output is called the potential output, or potential GDP, which is also equal to full employment output.
- Recalling that y^* is the symbol for potential output and that y stands for actual output (real GDP), we can express the output gap as

$$100 * \left(\frac{y - y^*}{y^*} \right)$$

- Note: When measured this way, the output gap is being expressed in terms of the percentage deviation of actual real GDP from potential real GDP.

Output gaps

- Economic fluctuations arise when actual output does not always equal potential output:
 - When $(y - y^*) < 0$: There is an underutilisation of resources; a contractionary gap.
 - When $(y - y^*) > 0$: There is an overutilisation of resources; an expansionary gap.
- Both cause problems in the economy
 - A rise in unemployment in recession
 - A rise in inflation in booms

Actual output deviates from potential output, creating cyclical unemployment, because of “sticky prices” – one of Keynes’ key insights

If aggregate demand falls:

Aggregate demand can fall for a variety of reasons:

- Less confidence about future growth/income (expectations)
- A recession overseas
- An asset bubble bursts, reducing wealth (eg 2008)

In the short run:
prices stay the same, quantity falls

- Businesses respond to lower demand by selling less
- Sticky prices and wages: It takes time for them to change menus/contracts
- Higher unemployment: They tend to fire some people, before they lower wages for everyone (unemployment)

In the long run:
prices also fall, quantity falls less

- Businesses eventually lower prices and wages
- Lower prices and wages: quantity of output re-bounds
- Lower (involuntary) unemployment: lower wages

Natural rate of unemployment

- The natural rate of unemployment is equal to frictional plus structural unemployment.
- Natural rate of unemployment (u^*) occurs when the cyclical unemployment rate is zero, and neither a recessionary nor an expansionary gap exists:
 - $(u - u^*) > 0$: A contractionary gap
 - $(u - u^*) < 0$: An expansionary gap

Real GDP growth and unemployment typically have an inverse relationship

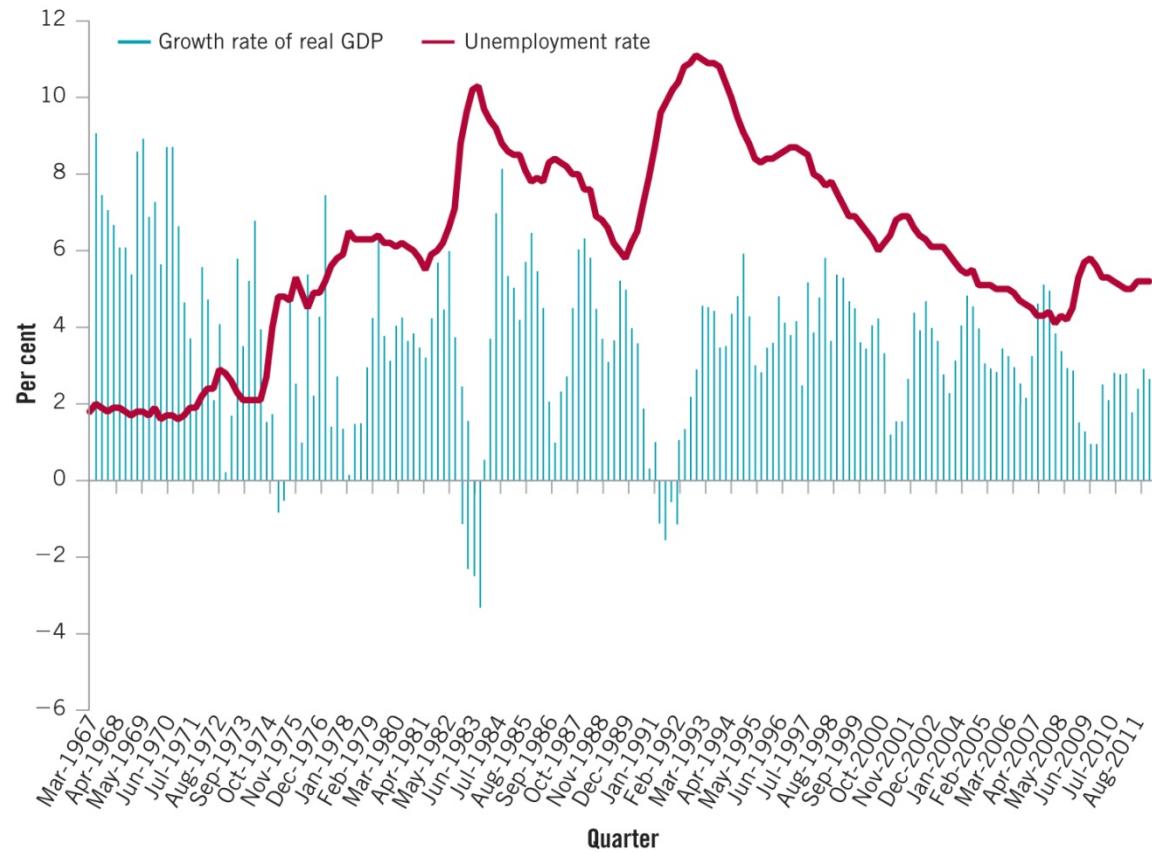


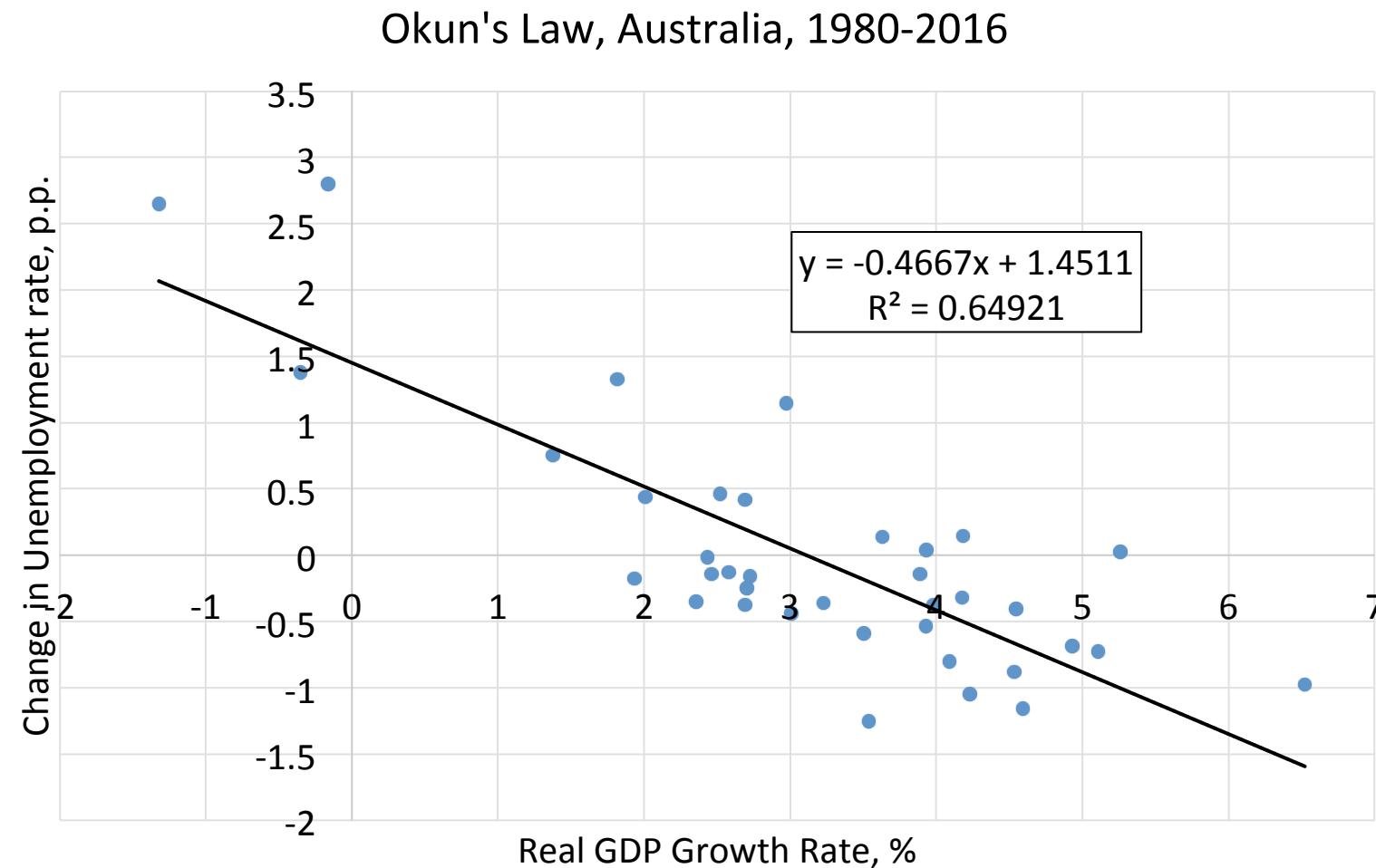
Figure 4.2 Real GDP growth and unemployment, Australia When GDP growth slows, the unemployment rate tends to increase.

Source: Federal Reserve Economic Data, Series AUSGDPQDSMEI and AUSURHARMQDSMEI, <http://research.stlouisfed.org/fred2>

Okun's law

- Okun's law
 - Each extra percentage point of cyclical unemployment is associated with approximately a 1.8 percentage point (for Australia) increase in the output gap, measured in relation to potential output.

Okun's law (1962) states that an increase in real GDP is associated with a fall in unemployment



Source: OECD

Question: what's the difference between "p.p." and %?

...in symbols, Okun's law is:

$$\frac{y - y^*}{y^*} = -\beta(u - u^*)$$

Example: Okun's law

QUARTER	<i>u</i>	<i>u*</i>	<i>y* (\$ MIL. 2006/2007 PRICES)</i>
June 1983	10.3%	8.08%	118 658.3
June 1992	10.5%	9.14%	155 972.3
March 2006	5.1%	4.93%	254 582.8

Sources: Unemployment rate, Australian Bureau of Statistics, *Natural unemployment rate and potential GDP*; authors' calculations

Example: Okun's law

Example: June 1983 Australia

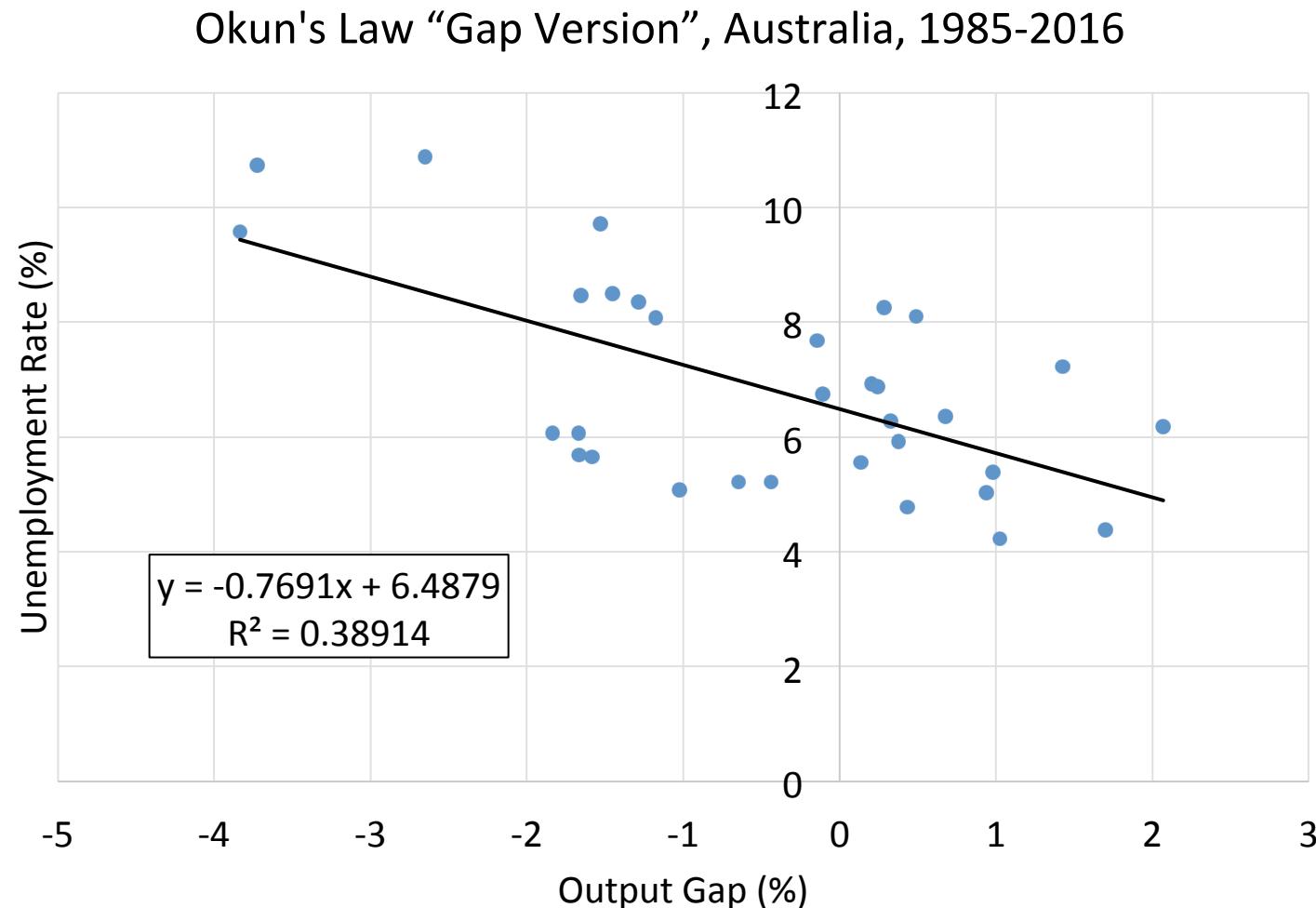
$$u = 10.3\%, u^* = 8.08\%, y^* = \$118,658.3m$$
$$-\beta(u - u^*) = -1.8(0.103 - 0.0808) = -0.04$$

This is a recessionary gap (negative sign).

Therefore, the output gap was -4% of y^*

$$= 4\% \times \$118,658.3m$$
$$= \$4,746.33 \text{ million}$$

Okun's law is also sometimes stated in terms of a relationship between the unemployment rate and the output gap (the “Gap Version”)



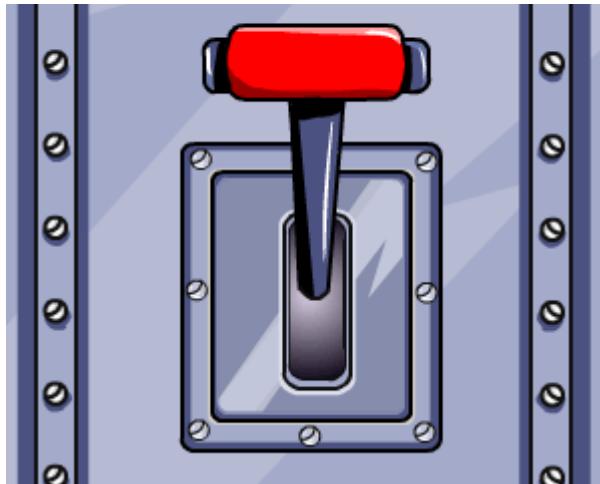
Source: OECD

Why do short-term fluctuations occur?

- Two reasons for changes in real GDP growth:
 - Growth in potential output itself differs from normal.
 - Potential output is growing at the normal rate, but actual output is above or below potential output.
- Later, we will look at changes in potential output.
 - For now, let's focus on fluctuations in actual output when we assume that potential output is constant.
- Governments can help to eliminate output gaps by influencing total spending.
- If demand continues to differ from potential output, firms will eventually adjust their prices to eliminate output gaps.
- Over the long run, changes in prices will bring the economy back to potential output.

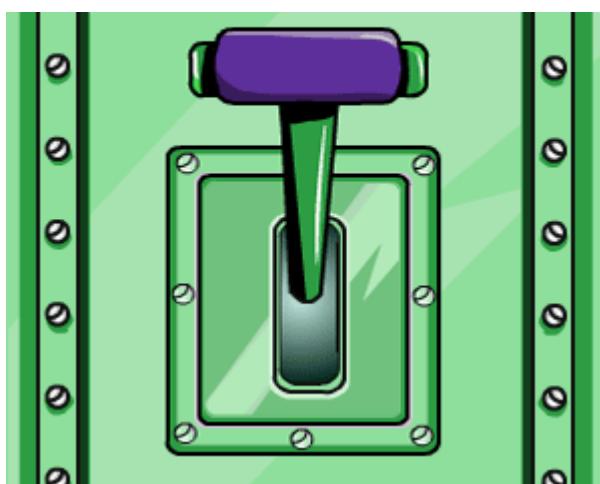
Managing unemployment is the main goal of macroeconomists and policymakers

There are two main “levers” of economic policy in the economy:



Fiscal Policy:

- **Engineer:** the government
- **Lever:** taxes and spending
- **Objective:** full employment
- **Considerations:** Balanced budget over the business cycle
- **Channel:** Aggregate government demand ($C_G + I_G$)
- **Reaction speed:** slow



Monetary Policy:

- **Engineer:** the central bank (RBA)
- **Lever:** nominal interest rates
- **Objective:** Stabilize inflation (neutralize sticky prices)
- **Considerations:** Asset price bubbles
- **Channel:** Aggregate private demand ($C+I$)
- **Reaction speed:** fast

Summary

- In a perfectly competitive labour market the real wage is determined by the demand and supply for labour.
- Changes to real wages lead to movements along the curves; change to relative prices/productivity shift the demand curve; and changes to population shift the supply curve
- Every economy goes through the business cycle in the short run, which are associated with cyclical unemployment
- Natural rate of unemployment occurs when all unemployed workers in the economy are either in frictional or structural unemployment, and the economy is at “potential output”
- Output gap is the difference between the actual level of output and the potential output.
- Okun’s law describes the trade-off between cyclical unemployment and output level.
- Minimising cyclical unemployment is the main concern for policymakers and macroeconomists.