

SACE TWO

ECONOMICS

WORKBOOK
SECOND EDITION

MARY PETTINGER
TROY SCHROEDER



THE AUTHORS

Troy Schroeder B,Acc. GDip Ed, GradDipAdminStud.

Troy has over 28 years of experience in teaching Economics. He has contributed to the development of teacher materials for the current SACE economics course and has presented many Professional Development sessions for economic teachers. His experiences include:

- SACE Board curriculum development
- Preparation of Teaching Resources for SACE Economics
- Vice President of the Economics Teachers Society of SA
- 10 years lecturing preservice teachers in teaching Economics.
- Teaching multiple merit recipients within the subject.

Mary Pettinger B Comm, B Ed (Secondary), Grad Cert (Cath Ed).

Mary has been teaching Economics for over 15 years, she has taught in a variety of different schools across all sectors.

Her experiences include:

- Committee member of the Economics Teachers' Society of South Australia roles have included Vice President, Secretary and BEA Representative.
- Committee member of the Business Enterprise Teachers Association of South Australia roles have included President, Vice President, Treasurer and BEA Representative
- Council Member on Business Educators Australasia, currently a member of the executive team as secretary and was involved in providing feedback for the Australian Curriculum.
- Presented at a variety of conferences and workshops for BETASA and ETSSA.
- Has been involved with SACE as a Lead Practitioner

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Contents

Topic 1: Introduction to Economics	1
1.1 The Economic Problem	1
1.2 The three fundamental questions (choices)	2
1.3 The problem of choice – Opportunity cost	3
1.4 Economic systems	3
1.5 Modelling the Economic Problem	6
Topic 2: Data analysis in Economics	11
2.1 Using data in economic decision making	11
2.2 Using graphs and charts to visualise data	11
2.3 Using statistical measures to analyse data	11
2.4 Interpreting linear regression	15
2.5 Correlation verse Causation	17
Topic 3: Microeconomics – Interaction between Consumers and Producers	20
3.1 Markets	20
3.2 Needs of Consumers and Producers	20
3.3 Demand and Supply Model	21
3.4 Elasticity	42
Topic 4: Microeconomics – Market Structures	56
4.1 Defining Market Structures	56
4.2 Types of Market Structures	59
4.3 Evaluating Market Structures	64
4.4 Behaviours of Duopolies	73
Topic 5: Microeconomics – Market Failure	82
5.1 Defining Market Failure	82
5.2 Uncompetitive Markets – Abuse of Monopoly Power	82
5.3 Externalities	83
5.4 Undersupply of Public Goods	86
5.5 Asymmetric Information	86
5.6 Solutions to Market Failures	88
5.7 Evaluating the Effectiveness of Solutions to Market Failures	94
Topic 6: Microeconomics – Government Intervention	101
6.1 Reasons for Government Intervention	101
6.2 Methods of Intervention	101
Topic 7: Microeconomics Review Test	118
Topic 8: Macroeconomic Indicators and Models	123
8.1 Business Cycle	123
8.2 Economic Indicators	130
8.3 Circular Flow Model	135
Topic 9: Macroeconomic Objectives	148
9.1 Full Employment	148
9.2 Price Stability	159
9.3 Economic Growth	168
9.4 Macroeconomic Objectives Overview	178

Topic 10: The Aggregate Demand and Aggregate Supply Model	179
10.1 Aggregate Demand and Aggregate Supply Model	179
10.2 Aggregate Demand (AD)	181
10.3 Aggregate Supply	187
10.4 The AD-AS Model in the Long-run with no Government Intervention	190
10.5 Applications of the AD-AS Model	191
Topic 11: Macroeconomics – Exchange Rates	201
11.1 Exchange Rate	201
11.2 The FOREX Market and Floating Exchange Rate Systems	201
11.3 Impacts of a Change in a Countries Exchange Rate	207
Topic 12: Demand-Side Economic Policies	217
12.1 Monetary Policy	217
12.2 Fiscal Policy	225
Topic 13: Supply-Side Policy	235
13.1 Supply-Side Policy	235
13.2 Market-Based Supply-Side Policies	235
13.3 Interventionist Supply-Side Policies	238
13.4 Advantages and Disadvantages of Supply-Side Policy	240
13.5 Comparison of Demand-Side Policies and Supply-Side Policy	243
13.6 Conflicts of Macroeconomic Objectives	243
13.7 Resolving Conflicts between the Macroeconomic Objectives	244
Topic 14: Macroeconomics Review Test	246
Answer Guides	250

Thinking Like an Economist

Learning Outcomes based on the SACE Economics Teaching and Learning Framework

- Students develop an understanding that economic systems are viewed through different social and political lenses and that these perspectives determine the decisions of stakeholders.
- Students develop economic thinking by using economic inquiry skills and economic concepts, principles, and models in different scenarios.
- Students apply economic concepts, including scarcity, choice, opportunity cost, and cause and effect of economic decisions, in a variety of economic contexts.
- Students apply principles, models, and terminology appropriately in a variety of economic contexts.

Topic 1: Introduction to Economics

There has been much written on the definition of economics and views vary as to whether Economics is a method (Posner & Keynes) describing rational decision making around choices or a topic made up of a series of questions (Marshall) which focus on finding out how people make choices.

In more recent times definitions have become more informal viewing Economics as a study with a focus on three aspects; production, consumption, and distribution (Viner) or at the most general level as being all about how people make choices (Duesenberry).

The commonality amongst these views centers on the notion of studying choices and as such the following course is viewed through the lens of “Making Choices” allowing a constant context for basing understanding.

Key Definition:

Economics is a social science that focuses on the production, distribution, and consumption of goods and services, and analyses the impacts and reasons for choices that individuals, businesses, governments, and nations make to allocate scarce resources.

<https://www.investopedia.com/terms/e/economics.asp>

1.1 The Economic Problem

The problem of choice which presents in many of the definitions of economics finds its origin in the basic underlying principle of Economic Scarcity. Scarcity in economics is a relative concept rather than an absolute and is a reference to resource availability compared to societal wants. Whilst not equal between individuals, communities, regions, or countries, it is universal and thus at an individual and society level, everyone faces the economic problem.

Key Point:

Scarcity in economics is a relative concept rather than an absolute.

“How to satisfy unlimited wants with limited or scarce resources”

Understanding this problem requires breaking down the terminology, particularly the terms Wants, Resources and Goods and Services.

Key Definition:

Economic Problem the problem of satisfying unlimited wants with scarce (limited) resources.

Wants

Wants are human material desires. These can be individual or collective and are classified as being essential (needs) or non-essential (desires). Wants are satisfied via the direct consumption of goods or services and are unlimited, due in part to their recurring and ever-changing nature.

Resources

Resources are inputs used to produce the goods and services wanted by society. They are often referred to as factors of production. They are split into 4 broad recognised categories: Land, Labour, Capital, and Entrepreneurship

- Land (N) – Land resources include all naturally occurring resources. These consist of agriculture, mining and forestry and fishing.
- Labour (L) – Represents all human effort placed into production.
- Capital (K) – All manufactured items that are used to produce something else. Known as Physical Capital these items remain at the end of a production process and thus differ to intermediate goods which are altered or used up in production.
- Entrepreneurship (E) – The process of combining land, labour, and capital in the production of a good or provision of a service.

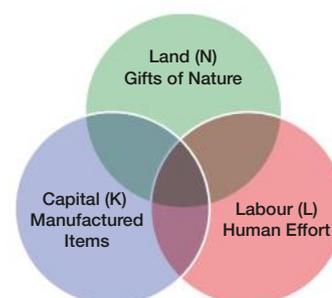


Figure 1.1.1: Resource types

Goods and Services

Goods and services are produced using resources and serve the purpose of being consumed to satisfy wants. When referring to goods economist use two broad terms, economic goods, and free goods. The distinction being that economic goods use scarce resources in their production, whilst free goods which include air and sunlight do not use scarce resources. This means that a price can in most cases be charged for the usage of economic goods. There are a number of differing types of economic goods including those shown in Table 1.1.1.

Table 1.1.1: Classifications of economic goods.

Classification	Definition	Examples
Consumer Goods (Final Goods)	Goods purchased by consumers that directly satisfy wants.	Food, Electronics, Household Appliances, Vehicles, Accommodation
Capital Goods	Goods that are used to produce something else. These goods satisfy wants indirectly through assisting in making consumer goods	Machinery, Equipment, Tools
Intermediate Goods	Goods that are used up in a production process having been refined or altered in producing a final good.	Flour in Bread, Nail in building
Public Goods	Goods that are both non-rivalrous and non-excludable and hence can generally not have a price charged for their provision.	Roads, Lighthouse, Parks

Key Point:
The classification of economic goods is context dependent. A good such as flour can be an intermediate good or a final good, whilst a car could be a capital good or consumer good.



Figure 1.1.2: Summary of the economic problem.

1.2 The three fundamental questions (choices)

Key Point:
There are three fundamental economic questions that must be answered by all economies:
What? How? and For Whom?

The existence of the economic problem requires society to answer three fundamental economic questions, WHAT, HOW and FOR WHOM?

The **What** question is a choice of What goods to produce and in What quantities, The **How** to Produce is a choice of resources and the combination of these to use in production.

The **For Whom** question is a choice of end consumer and relates to Who is going to receive the final goods and services.

These questions tie closely to our definition of economics which centered around choices associated with production, distribution, and consumption.

These decisions can be divided into two areas:

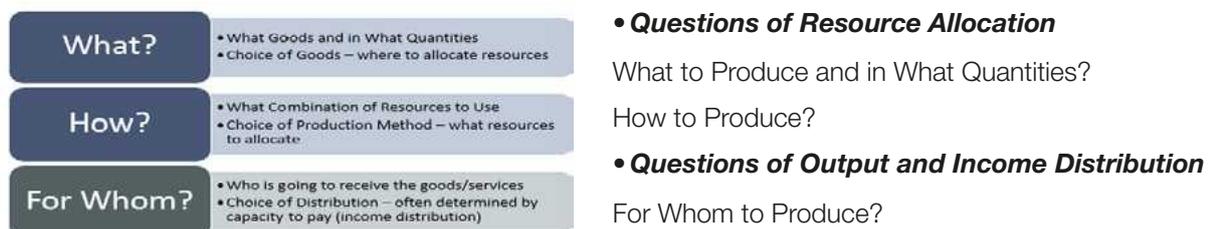


Figure 1.2.1: Three fundamental economic questions

Exercise 1.1 The Fundamental Economic Questions

Identify which fundamental question each of the following newspaper headlines is most associated with.

Newspaper headline	Fundamental economic question
“Economists Weigh In on the Benefits and Challenges of Diversifying Production in a Global Market”	
“Infrastructure Improvements: A Catalyst for Economic Expansion”	
“Experts Debate Best Strategies for Allocating Resources in an Ever-Changing Economy”	
“Ensuring Access to Essential Goods and Services for All”	
“Innovations in Technology and Manufacturing Driving Economic Growth”	
“Empowering Women in the Workforce: A Path to Economic Equity”	

1.3 The problem of choice – Opportunity cost

Individuals or societies attempts to address the economic problem.

The universal nature of Scarcity means that at any moment in time resources used in the production or provision of one good or service cannot simultaneously be used in the provision or production of another. Therefore, whether at an individual or collective level, when answering the three fundamental questions, each decision made leads to an alternative forgone.

In economics this is referred to as an opportunity cost, simplistically it is what we give up to gain something else, measured in terms of the next best alternative forgone.

Key Definition:

Opportunity cost is the benefit forgone or opportunity lost, of using something in a particular activity rather than for its next best alternative.

1.4 Economic systems

In its attempts to answer these questions all countries will adopt an economic system, a method or means by which society is able to organise, allocate and distribute resources, services, and goods across geographical locations. Economic systems encompass many institutions, agencies, entities, decision-making processes and patterns of consumption, (CFI Nov 2022) (<https://corporatefinanceinstitute.com/resources/economics/economic-system/>) however they can be often defined, classified or distinguishing by two characteristics, Resource Ownership and the Decision-Making Process.

Resources can be owned collectively by the state or government, or they can be owned privately by individuals. This gives rise to the terms Socialism and Capitalism. Where resources are privately owned, we have a capitalist system and when they are owned or controlled by the government, we have a Socialist System. No economic system is a pure form of either of these instead it better to view each system as a point along a continuum with varying degrees of state and private ownership of resources.

Decision-Making is characterised by two elements:

1. Who makes the decisions and 2. How the decisions are made (the Rationing mechanism). Where decisions are made by individuals (consumers and producers) and are coordinated by the price mechanism we have a market system. However, where decision making is made by government and coordinated by government the system is view as a planned or command system. Like resources ownership no economic system is a pure form of either of these instead it is again at a point on a continuum with varying degrees of government and private individual decision-making.

Key Definition:

Economic System a method or means by which society is able to organise, allocate and distribute resources, services, and goods across geographical locations.

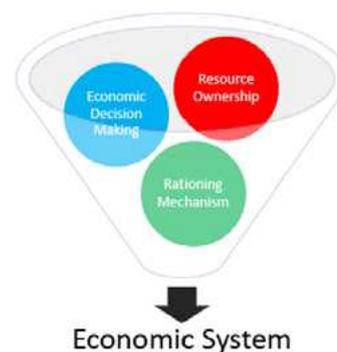


Figure 1.4.1: Characteristics that classify an economic system

		Resource Ownership	
		Capitalist	Socialist
Decision Making	Market	USA Australia UK Germany	Yugoslavia (pre 1990) China Vietnam
	Planned	Nazi Germany (1930s-40s) War Time Democracies	North Korea Cuba USSR (pre 1989)

Figure 1.4.2: The 4 broad economic systems

Whilst systems change and evolve over time and thus are perpetually moving within and between the quadrants in Figure 1.4.2, historically the most common systems found are Market Capitalist and Planned Socialist. The characteristics of these two systems result in fundamental differences in the way they answer the, **what, how and or whom** questions. These are summarised in Table 1.4.1.

Table 1.4.1: Summary of how economic systems attempt to answer three fundamental economic questions.

System	What to Produce	How to Produce	For Whom to Produce
Market Capitalist	Decided by consumer sovereignty where consumers cast dollar votes (demand) and producers respond by producing the products for which there are enough dollar votes.	Decided by producers who through their profit motivation will use the least cost principle. Choosing the combination of resources which results in the lowest cost of production.	Decided by capacity to pay, where allocation of scarce goods will be dictated by those who can pay the most. This question is therefore ultimately answered by income distribution.
Planned Socialist	Decided by government (or appointed authority) who set production targets (1 to 5 years) and prioritise products deemed most beneficial to society.	Decided by government (or appointed authority) who attempt to use resources in the process of maximising output.	Output is rationed according to social needs and priorities. Distribution requires a non-price rationing mechanism such as coupons or ration cards.

Key Definition:

Mixed Economic System

an economic system that combines elements of Socialism and Capitalism, and Market and Planned economies.

Key Point:

All economic systems are mixed systems, consisting of elements of government ownership, planning and decision making, as well as private ownership, individual decision-making and the use of the market mechanism.

Because all economic systems exist along a continuum all systems are in fact Mixed Systems and approach the choices of production, distribution, and consumption with a combination of the approaches displayed in Table 1.4.1. There is much debate between economist on which system is the most effective, but since the 1990s there has been a trend (Transition) towards Market Capitalism. However, debate remains about the role that government should play in these systems with issues of equity played off against efficiency.

Real World Considerations: The Process of Transition

The transition of the Soviet Union from a planned socialist economy to market-oriented capitalist economies, was a complex and challenging process that took place in the early 1990s. The inefficiencies of the Soviet economy and the declaration of independence by many former Soviet states acted as the stimuli for transition, as post-soviet states attempted to create more competitive and dynamic economies that would allow them to meet the demands of a rapidly changing world. The transition involved the liberalisation of prices (removal of price controls), the privatisation of state-owned enterprises, the removal of State support and the creation of legal frameworks to support private property and market transactions. It was a complex process that has become known today as “shock therapy” where the former Communist States were suddenly subject to the process of change towards a market system. The process led to increases in economic growth in some regions and improved living standards in parts of these countries, but the benefits were not evenly distributed and in many newly formed countries inequality widened significantly. Evidence of this still apparent today in the Oligarchical dominance of Russia. Beyond the creation of severe inequality and poverty in some regions, transition also brought challenges including inflation, unemployment and during this period many residents questioned whether the process to remove inefficiencies from the economy was worth the impact on their individual well-being.

Discussion Points

- What changes are necessary to transition from Planned Socialism to Market Capitalism?
- Why would a country go through a process of transition?
- Does transition always result in desirable outcomes?

Exercise 1.2 How differing systems impact What, How and For Whom

1

1. Complete the table below by identifying and justifying which economic system (market capitalism or planned socialism) more effectively attains the outcome listed?

Outcome	System that most effectively attains it	Justification
Productive efficiency		
Allocative efficiency		
Economic growth		
Full employment		
Price stability		
Equality		

2. In relation to the market for healthcare answer the following questions?
- Explain how resources would be allocated to goods and services within the healthcare market in a market capitalist system.
 - Explain how a planned socialist system would allocate resources within the healthcare market.
 - Outline the economic system that the country in which you live uses to allocate resources within the healthcare market.
3. Evaluate whether governments should intervene in markets to answer the, what, how or for whom questions.

1.5 Modelling the Economic Problem

Introduction to the Production Possibility Curve (Frontier)

Key Definition:

Production Possibility Frontier the maximum possible combinations of goods and services which can be produced from a given quantity of available resources at a given level of technology.

Economic models are used extensively in economics to study proposed theories in a hypothetical environment. These environments represent simplifications of the real world and are based on assumptions that are necessary to work out how a theory applies in a precisely known context. Assumptions are always stated so that the limitations of the analysis can be clearly seen.

The Production Possibility Curve or Frontier (PPC or PPF) is the first of the models introduced in this course. It is primarily a visual representation of the concepts of relative scarcity and the problem of choice, however, in addition it can be used to illustrate the concepts of:

- economic efficiency and inefficiency
- potential and actual production
- employment or unemployment of resources
- economic growth.

Key Point:

The PPC is a simplification of the real world and is based on the following assumptions:

1. Only two types of products are produced.
2. The quantity of available resources are fixed.
3. Resources can be transferred between the production of the two products.
4. The state of technology is constant.

The curve (Frontier) of the model (Figure 1.5.1) represents all the maximum possible combinations of goods and services which can be produced from a given quantity of available resources at a given level of technology. An economy can operate in two basic positions:

1. On the curve such as points A or B where all resources are fully utilised in production. This implies productive efficiency where there is no wastage of resources.
2. Somewhere inside the curve such as point C where there are unemployed (idle) resources, and the economy is not attaining productive efficiency.

Point D on the model represents a level of production that is unattainable as there are not enough resources to produce at this point. It reflects the concept of economic scarcity.

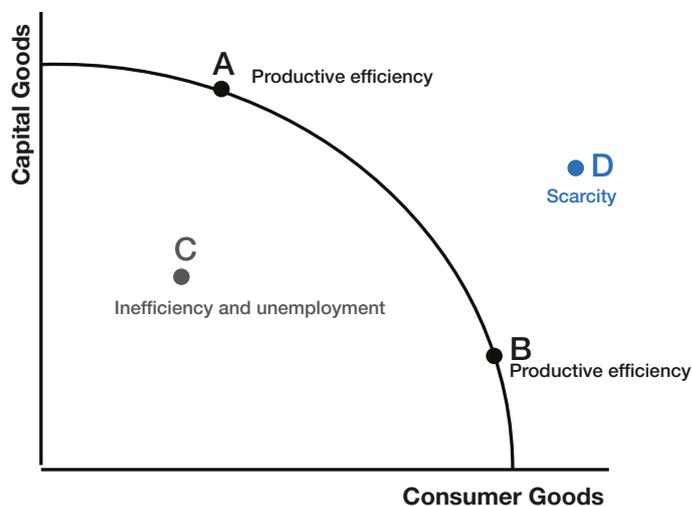


Figure 1.5.1: The Production Possibility Curve.

Using the PPC to demonstrate Opportunity Cost

In a market system the combination of production reflects demand and therefore the point will only shift if there is a change in preferences (demand) towards the alternate product.

If an economy is productively efficient and thus is operating on its PPC, any increase in the production of one good must result in resources being transferred from the production of the other good and hence a lower level of production of that good. If an economy was for example (Figure 1.5.2) to move from point A to Point B and thus increase the production of consumer goods it must transfer resources from the production of capital goods to do this and therefore capital goods production must fall.

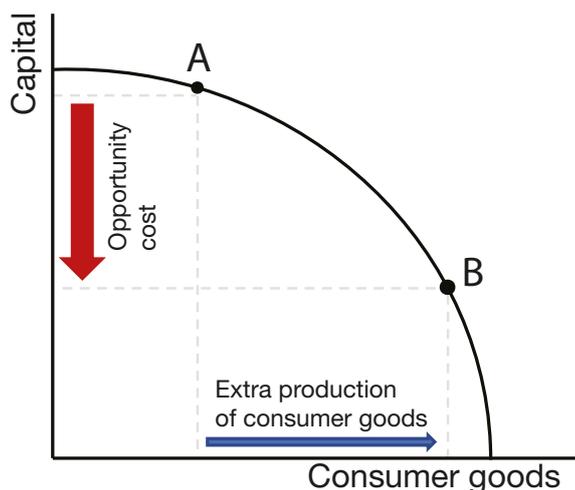


Figure 1.5.2: Illustrating Opportunity Cost.

Factors that Shift the PPC

If assumptions (2 and 4) of the model are relaxed the PPC model moves from being a static model to a dynamic model. This implies that rather than just showing changes in combinations of production the PPC can model changes in resources, and technology and thus the concepts of Potential Economic Growth and Productivity.

In a dynamic model the PPC shifts if there is any change in the productive capacity of the economy. At a simplified level an economies productive capacity is impacted upon by three components:

- The quantity of resources
- The quality of resources
- Technological change.

Some economists will simplify this further by say that anything that alters the quantity of resources or impacts on productivity will cause a shift in the PPC. Productivity is defined as output per unit of input and reflects the amount of a product that can be produced with a given quantity of resources. Changes in productivity are caused by quality changes in the three factors of production and much of this quality improvement is due to technology change that allows the same number of resources to produce more. The recognition of the fact that both quality and quantity of resources impact production volumes has led to the terms Human Capital, Natural Capital and Physical Capital being used to reflect both dimensions of factors of productions.

Key Point:

The combination of production reflects demand and thus shifts when there is more demand for a good.

Key Point:

When resources are fully utilised a change in the composition of production results in an opportunity cost.

Model explanation:

A movement in production from point A to point B (caused by increased demand for consumer goods) will increase the production of consumer goods. However, resources must be transferred from Capital goods production and hence there will be a decrease in the production of Capital goods This is the opportunity cost of increasing consumer goods production.

Key Definition:

Productive Capacity an economies maximum possible production using all resources to their full potential.

Key Definition:

Productivity an increase in output per unit of productive resource.

When there is an increase in Human, Physical or Natural capital which relate to the production of both goods the whole PPC shifts outwards to the right. This is represented in Figure 1.5.3. However, if resources are specific to the production of one good, then the curve only expands its maximum output potential for that product. (Figure 1.5.4)

Model explanation:

A shift of the PPC outward to the right as a result of an increase in the quantity or quality of resources relating to the production of both consumer and capital goods. This could be immigration of skilled labour, advancements in education and training, new technology improvements, or infrastructure development. Increases in productive capacity to not result in an automatic change to actual output hence the economies level of production remains at point B.

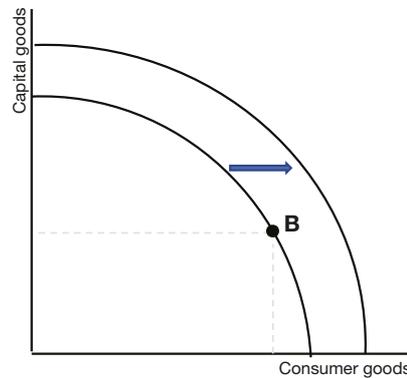


Figure 1.5.3: Illustrating increased productive capacity.

Model explanation:

A shift of the PPC outward to the right for consumer goods as a result of an increase in the quantity or quality of resources relating specifically to the production of consumer goods

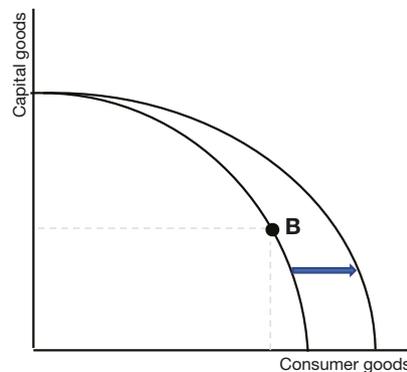


Figure 1.5.4: Illustrating increased productive capacity for one good.

A movement of the PPC outward to the right represents increased potential production, however unless the demand for goods changes simultaneously the level of production (point B) will not alter. This is why the movement of the PPC reflects potential growth, as an economy has the capacity for future output increases but does not have actual growth as output remains constant.

It is important to note that in economies productive resources can also decrease. natural disasters, human made disasters, disease can all impact on the quantity or quality of resources in negative ways and thus reduce the productive capacities of nations. When this occurs the PPC moves inward to the left and there may also be a change in actual production as it cannot occur beyond the new PPC. (Figure 1.5.5)

Model explanation:

A shift of the PPC inward to the left as a result of a decrease in the quantity or quality of resources relating to the production of both consumer and capital goods. This could be natural disasters such as floods, drought, earthquakes, fires, or human made disasters such as war. Disease that reduces labour quality or quantity could also be responsible. There must also be a decrease in actual output in this instance from B to B₁, as point B would now be beyond the new PPC.

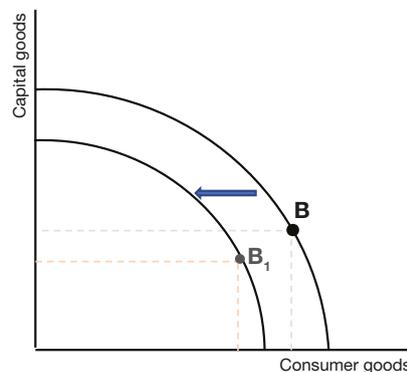


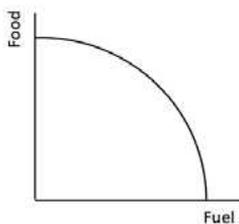
Figure 1.5.5: Illustrating decreased productive capacity.

Exercise 1.3 Using PPC's to model Economic Concepts and Change

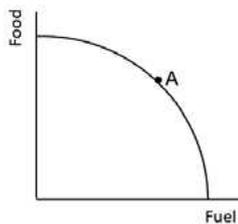
1. Complete the table below by using the PPC model to illustrate and assist in explaining the identified concept.

Concept	Illustrate on PPC	Explanation
Opportunity Cost		
Scarcity		
Productivity Increase		
Economic Growth		
Economic Efficiency		

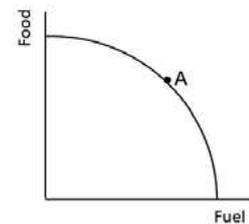
2. The PPC's below represent Country A which can produce only food or fuel. Illustrate on the PPC's the impact of the individual identified change in Country A.



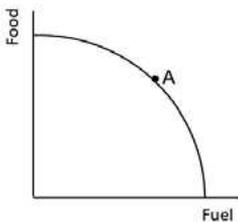
Canola crops destroyed by cyclone, impacts both industries



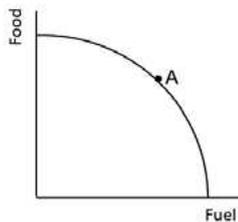
Consumer demand for Food rises significantly



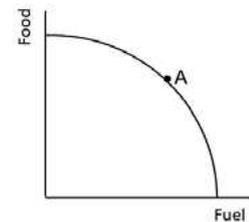
Net migration into Country A



Infrastructure essential for fuel production is destroyed by fire



Increasing unemployment in the fuel industry



Excellent growing conditions increase food yields.

Real World Considerations: War the PPC and Opportunity Cost

Economic Impact of War (Extract)

24 February 2022 by Tejvan Pettinger

Putting aside the very real human cost, war has also serious economic costs – damage to infrastructure, a decline in the working population, inflation, shortages, uncertainty, a rise in debt and disruption to normal economic activity. From some perspectives though, war can appear to be beneficial, especially in terms of creating demand, employment, innovation, and profits for business (especially when the war occurs in other countries.)

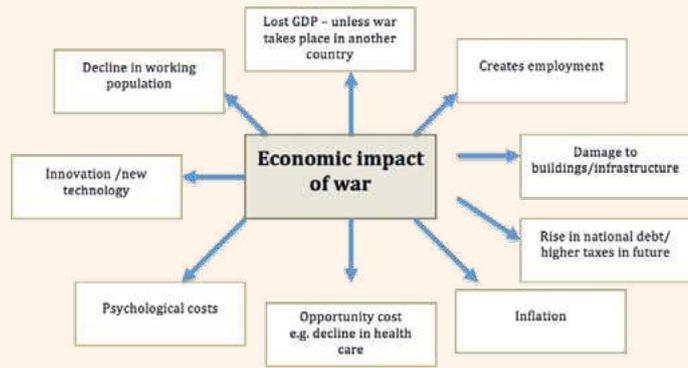
However, when we talk about the ‘economic benefits’ of war we must be aware of the ‘broken window fallacy’ – when we spend money on war, this creates demand, but it also represents a huge opportunity cost – rather than building bombs and rebuilding destroyed towns, we could have used this money to improve education or health care. For example, the opportunity cost of the Iraq war (1990s) was estimated at \$860 billion by end of 2009 (source: NY Times).

Source: <https://www.economicshelp.org/blog/2180/economics/economic-impact-of-war/#:-:text=Putting%20aside%20the%20very%20real,disruption%20to%20normal%20economic%20activity.>

Discussion Points

Model and describe the impacts of war on the PPC's of the countries involved.

Assess whether there are any real economic benefits of war.



Topic 2: Data analysis in Economics

Learning Outcomes based on the SACE Economics Teaching and Learning Framework

- Students develop an understanding of a range of qualitative and quantitative economic data.
- Students use data to understand economic activity, and the behaviour of people, businesses, markets, and governments.
- Students analyse data, identify patterns, and propose decisions, based on data contained in tables and graphs.
- Students explore the difference between causality and correlation.
- Students use appropriate graphs, diagrams, and tables to display results and make recommendations based on their data analysis.
- Students understand the use of (but are not required to calculate) the following statistical measures to analyse data:
 - mean
 - median
 - quantiles
 - variance
- Students develop a basic understanding of how to interpret linear regressions as an introduction to economic modelling. (Note: students are not required to calculate the coefficient of determination (R^2), or linear equations.)

2.1 Using data in economic decision making

Data and Data Analysis are critical to Economics because ultimately all decision-making in modern economies, at individual, local or national levels is based on data. Data (statistical) analysis provides an objective mechanism to assess a situation or project, or the impacts of differing decisions and it aids decision makers by making them more informed. However, despite its integral nature not all data is useful and consequently the quality of data is a fundamental consideration. An old saying goes “garbage in, garbage out”. So, no matter how good the process of using data, poor data will result in poor decision making.

Data is a collection of facts, this could be in the form of numbers, words, measurements, or observations. Data can be either quantitative or qualitative, with the key distinction being that quantifiable data is numerical in nature, whereas qualitative data represents descriptive information. The presentation of data is critical in allowing effective analysis and as such considerable time goes into determining the most effective way to present it. Whilst much of the data used in this course can be presented in table format, students also need to be able to analyse and interpret graphs, charts, and other forms of visual data.

Key Definition:

Data a collection of facts, which can be in the form of numbers, words, measurements, or observations.

2.2 Using graphs and charts to visualise data

Much of the quantitative data in the field of economics is presented in the form of graphs and charts, as these are effective in presenting information quickly and simplistically. Data can on many occasions be better understood when presented by a graph as it can reveal visually a trend or comparison that is not naturally identifiable in table format. Graphs are therefore a critical tool for displaying the relationship between variables or alternately showing the dispersion of a given variable.

Key Point:

Graphs are often used to present data as they can assist in easily identifying trends or making comparisons.

2.3 Using statistical measures to analyse data

There are multitudes of statistical measures that aid the analysis of data, but this course requires familiarity with the concepts of Mean, Median, Quantiles and Variance and the application of these in data analysis in a variety of differing contexts.

The first two statistical measures (Mean and Median) aim to summarise a dataset of a population or sample (group) with a single number that represent a ‘typical’ data point, they are measures of central tendency.

Mean

Key Definition:

Mean the sum of a group of numbers divided by the count of the numbers.

Often referred to as the Arithmetic Mean, the mean is one measure of the average of a set of numbers. It is essentially a calculated “central” value of a set of numbers and is arguably the most widely used measure of a central tendency. It is derived by taking the sum of a group of numbers, then dividing that sum by the count of the numbers used in the series. Understanding the calculation method is important as it provides insights into the advantages and disadvantages of the mean as a measure of a ‘central’ or ‘typical’ value.

The mean is useful because it allows you to estimate what the whole population is doing and is likely to be a more reliable estimate of an average or ‘typical’ value. A mean minimises the error of predicting any one value in a data set, that is, it is a value that produces the lowest amount of error from all other values. It is also particularly useful if tracking changes in a singular population overtime because any change in a singular value within the population will impact the value of the mean.

Using the mean as a measure of what is ‘typical’ can however, be problematic, especially when datasets are skewed or have outliers. This is perhaps why the mean is rarely or never used to represent housing prices for areas. If data is skewed the mean loses its ability to provide the best central location or typical value.

Median

Key Definition:

Median the middle score in a dataset which has been arranged in order of magnitude.

The median is an alternative measure of the ‘central’ point and is the “middle” of a sorted list of numbers. The median is a quantile (see below) placed (in a probability distribution) so that exactly half of the data is lower than the median and half of the data is above the median. The median cuts a distribution (numerically sequential dataset) into two equal areas. (<https://www.statisticshowto.com/quantile-definition-find-easy-steps/>)

The median is very useful for describing datasets where large or small data points (outliers) can distort the mean. It is therefore a better way of describing data sets with significant outliers and it is a better representative of the ‘typical’ value when there are large skews in data.

Key Point:

With normal distribution where the data is perfectly symmetrical, the mean and median are identical, and both equally represent the ‘typical’ or best central location. Skewed distribution however drags the mean towards the skew and thus the Median is a better indicator of central tendency.

Using Mean or Median - The Importance of Data Skew

Skewed data occurs where a dataset has a ‘tail’ and is not symmetrical (a normal distribution exists if data is perfectly symmetrical). Skewed data can have a negative (or left) skew or a positive (or right) skew. Skews are named after the direction of the tail, with a negative skew the tail points towards the negative values on the horizontal axis (or to the left) whilst with a positive skew the tail points towards the positive values on the horizontal axis (or right). (Figure 2.3.1)

Understanding skewness helps when deciding whether the Mean or Median should be used to represent the ‘typical’ value. The rule of thumb is where data has a skew the median should be used as the measure, as the mean will be distorted in the direction of the skew.

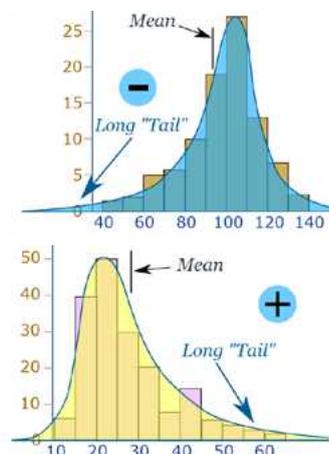


Figure 2.3.1:
Skews in Datasets

Model explanation:

A negative or left skew results in the mean being less than the median. In this case the very small numbers distort the mean and lower it compared to the median.

Model explanation:

In a normal distribution the mean and median are the same.

Model explanation:

A positive or right skew results in the mean being greater than the median. In this case the very large numbers distort the mean and raise it compared to the median.



Real World Considerations: Impact of data skew

The following table highlights the estimated median and mean house prices for the USA over 5 decades.

Year	Median House Price US\$	Mean House Price US\$
1980	63,700	74,200
1990	123,900	151,100
2000	165,300	209,700
2010	222,900	333,900
2020	329,000	441,700

Discussion Points

Describe the trend between Median and Mean house prices in the US as indicated in the above data.

Analyse the implications of the trend identified in the above data. Refer to skew in your answer.

Discuss whether it is better to use the mean or median house price as an indicator of US house prices.

Exercise 2.1 Mean, median and trends in data

- The following graph indicates the actual and projected trends in Electrical Vehicle (EV) Sales in the US.



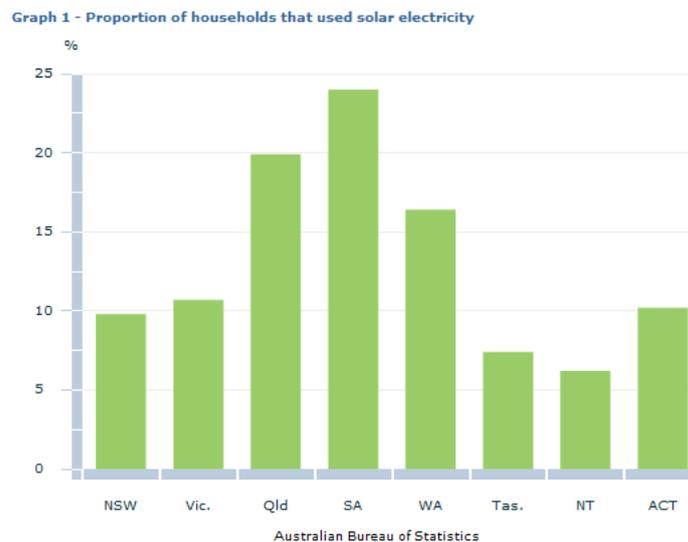
- Describe what the above data suggests about the vehicle market in the USA.

- Outline how the trend in the above data could be used by car manufacturers in the USA.

(c) Identify how the trend in the above data would impact two other businesses.

(d) State how future consumers of vehicles may react to the trend in the above data.

2. The following graph indicates the proportion of households (%) that have solar panels connected to their homes by Australian State.



(a) Estimate the mean and median proportion of household across Australia that used solar electricity.

(b) Outline which of these measures is a better reflection of solar electricity use by Australian households.

(c) Outline how Australia's Federal government may use the information to encourage solar panel installation in homes.

Quantile

A quantile is statistical measure which divides a sample into equal-sized, adjacent, subgroups. The primary reason for dividing observations (samples) into groups by quantiles is to define cohorts that can then be followed over time.

Commonly used quantiles include quartiles (4 groups), quintiles (5 groups) and deciles (10 groups). (The median is the 2nd quantile). One of the most common uses of quantiles is in income groupings where groups are often split into quintiles (equal 20% groupings).

Key Definition:

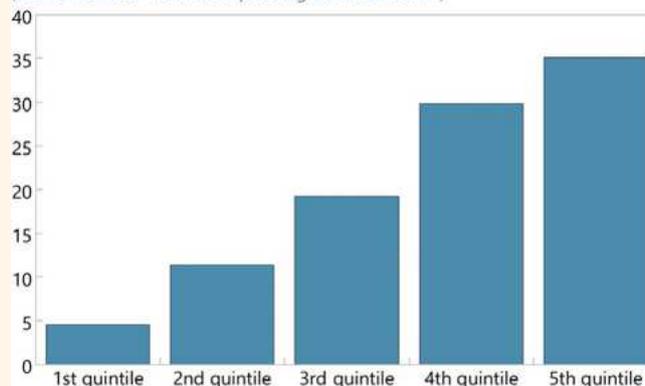
Quantile a sample that has been divided into equal sized adjacent sub-groups.

Real World Considerations: Importance of quantiles

There is a disconnect between the role Air Travel plays in adding to emissions at personal and collective levels. Air travel tends to dominate a frequent traveller's individual contribution to climate change, but aviation collectively accounts for only 2.5% of global carbon dioxide (CO₂) emissions. This is because there are large inequalities in how much individuals fly. (Adapted Our World in Data 2023 found at <https://ourworldindata.org/transport>).

The same is true for passenger vehicle emissions, where the top 60% of income earners contribute almost 85% of all vehicle emissions.

Passenger Car Emissions by Household Income Quintile
(Percent of total household passenger car emissions)



Discussion Points

Why are quantiles useful in data analysis?

How might Government use this data to better formulate policies to reduce emissions?

Variance

Variance measures how far a dataset is spread out (dispersion). It is mathematically defined as the average of the squared differences from the mean and specifically measures how far each number in the dataset is from the mean, and therefore from every other number in the set.

Variance is used to analyse how individual numbers relate to each other within a dataset. It has the distinct advantage over other measures of dispersion because all deviations from the mean are positive. This eliminates the potential appearance of no variability, which can occur when deviations in data are both positive and negative and directionally cancel each other. (For the mathematicians - the squared sums can-not add to zero).

Variance use does however have its limitations or deficiencies, the primary one being the added weight it gives to outliers and the potential for this to skew data. In addition, variance is often difficult to precisely interpret, as it must have a comparison point to have analytical value.

Key Definition:

Variance is a measure of dispersion that takes into account all of the data points in a data set.

2.4 Interpreting linear regression

Linear regression models the relationship between two variables (by fitting a linear equation). These two variables are a dependent variable (the variable trying to be predicted) and an independent variable (the variable being used to make the prediction with).

Linear regression ultimately serves three major purposes:

1. Determining the strength of predictors
2. Forecasting an effect
3. Trend forecasting.

Key Point:

A Regression analysis is primarily used to predict the value of a dependent variable based on the value of the independent variable.

Correlation Coefficient - r

Key Definition:

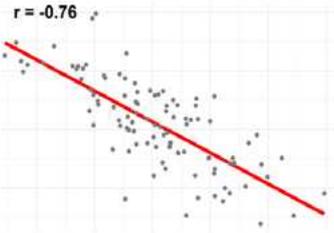
Correlation Coefficient

r a numerical measure of the strength of the linear relationship between 2 variables.

One way of determining a numerical measure of the strength of relationship between two variables is the correlation coefficient r . The correlation coefficient r is a measure that quantifies the strength of the linear relationship between 2 variables.

r is a number between -1 and 1 ($-1 \leq r \leq 1$):

- A value of r close to -1: means that there is strong negative correlation between the variables. Negative correlations are also referred to as inverse or indirect.
- A value of r close to 0: indicates that the 2 variables are not correlated.
- A value of r close to 1: indicates a strong positive linear relationship between the 2 variables. Positive relationships are also referred to as direct.

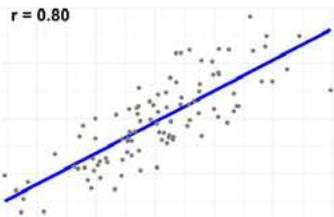
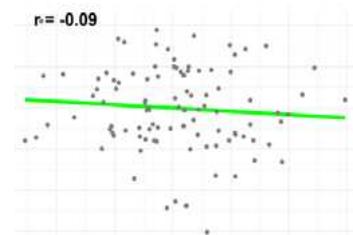


Model explanation:

A moderate negative correlation. Negative correlations may also be referred to as inverse or indirect. It implies that as the independent variable increases the dependent variable decreases.

Model explanation:

In this model with a r value nearly equal to zero the linear relationship shows a very weak negative correlation.



Model explanation:

A moderate to strong positive correlation. Positive correlations may also be referred to as direct. It implies that as the independent variable increases the dependent variable also increases.

Figure 2.4.1: Data correlations

Coefficient of determination - R-squared

Key Definition:

Coefficient of Determination R^2

a value depicting the proportion of variance of the outcome Y explained by the linear regression model.

R^2 or the coefficient of determination is a measure of how well a linear regression model fits the data. It can be interpreted as the proportion of variance of the outcome Y explained by the linear regression model. In simple terms it allows us to quantify and analyse the extent to which variations in data of variable A can be explained by its relationship to variable B . This is particularly useful in quantifying the likelihood of future events falling within a predicted outcome. R^2 values are always positive, but the significance of the value is dependent on two things:

1. The purpose/objective of the regression
2. The field of study.

Key Point:

An R^2 value of 0.93 indicates that 93% of the variance of the dependent variable is explained by the variation in the independent variable.

In relation to purpose or objective, R^2 can be used for two basic goals a) explaining a relationship between the dependent and independent variable, b) predicting the dependent variable. Where the primary purpose is to predict, the higher the R^2 value the more accurate the prediction of the dependent variable. However, how high the value needs to be to be reliable depends on how precise the prediction must be. In some scientific studies, R^2 values are required to be greater than 0.95 to be considered reliable, whereas in some social sciences 0.3 may be sufficient for reliability. As Economics is a social science much of what is investigated is likely to have low R^2 values, in fact it would be readily accepted that the R^2 value would often be less than 0.5, as economics studies human behaviour and predicting this is an uncertain task. In an economic context a generalised rule of thumb indication of the strength of relationship demonstrated by R^2 is summarised in Figure 2.4.2.

R ² Value	Strength of Relationship
Greater than 0.85	Very Strong Relationship
Greater than 0.6	Strong Relationship
Greater than 0.5	Moderate Relationship
Greater than 0.3	Some Relationship
Less than 0.3	Weak Relationship

Figure 2.4.2: The Meaning of an R² value.

Model explanation:

Where there is a low R² value the data points are more dispersed around the linear regression.

Model explanation:

Where there is a high R² value the data points are less dispersed around the linear regression.

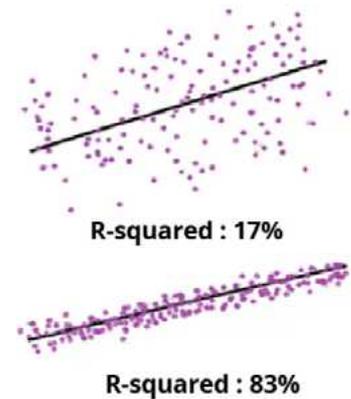


Figure 2.4.3: The meaning of an R² value. Source: Unknown

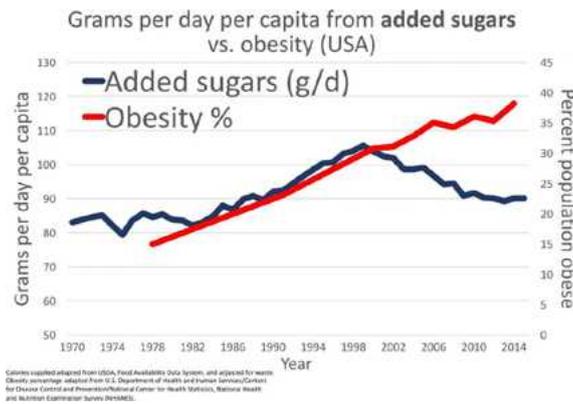
It should be noted that this course only requires a simple introduction into the use of linear regression and that there is much literature and debate on the significance and importance of R² in economic research. There are distinct draw backs of using R² to explain or predict the relationships of X to Y and mathematicians among you may wish to do further reading on this.

2.5 Correlation verse Causation

As has been discussed in this chapter correlation shows a relationship between two variables and whilst we can use R values to determine the strength and direction of the relationship (with some limitations), we cannot deduce causation from these values. It is often mistakenly assumed that because two variables have a strong correlation there is causation. Causation is where one variable has the capacity to influence another, and it is most effectively established by way of a control study. However, studying some variable relationships (particularly harmful impacts on humans), pose significant ethical problems. In these situations, observational studies are utilised to provide additional statistical information to establish causality. Whilst establishing a correlation is important for economists, this by itself should not be the basis of policy change to manipulate behaviour or outcomes. A causal relationship (or cause and effect) is the critical element required to allow effective evidence-based decision making and more appropriate policies to improve outcomes for society.

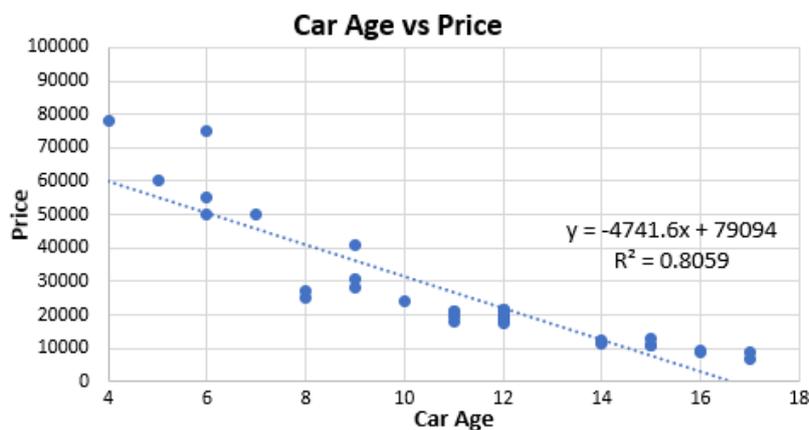
Exercise 2.2 Correlation and Causation

1. The following graph indicates the relationship between the consumption of added sugars and obesity in the USA.



- (a) State the relationship (correlation) that exists between added sugar and obesity in the USA up until 1999.
- (b) State the relationship (correlation) that exists between added sugar and obesity in the USA after 1999.
- (c) Use this data to explain why using correlations to formulate social policy is problematic.

2. The following graph indicates the relationship between Car age and Resale prices.



- (a) State the relationship (correlation) that exists between Price and Car age.
- (b) Explain the meaning of the R^2 value.

- (c) Explain whether the R^2 value would differ if the data set only included values up to seven years.
- (d) Evaluate the statement “based on the data a seller of this model of car should only sell after holding the vehicle for more than 14 years”.
- (e) (i) Identify two outliers to the data set.
- (ii) Outline one reason that could account for the outlier identified in part (i).

Topic 3: Microeconomics – Interaction between Consumers and Producers

Learning Outcomes based on the SACE Economics Teaching and Learning Framework

- Students analyse the interaction between consumers and producers in a market, and the way in which this can be illustrated in demand and supply diagrams.
- Students use supply and demand curves to identify changes that affect equilibrium prices and quantities.
- Students develop an understanding of the concept of price elasticity of demand and the price elasticity of supply.
- Students predict the pricing behaviour of producers, using the total revenue method in relation to price elasticity of demand.

3.1 Markets

Key Definition:

Market an arrangement that brings together buyers and sellers for the purpose of exchange.

Key Definition:

Competitive Market a market for a homogeneous product where a large number of individual sellers and buyers exist such that no one seller or buyer can exert influence over the market.

Markets are an important institution in modern economic systems because they are usually the primary mechanism used to facilitate the production and distribution of goods and services. A market is an arrangement that brings together buyers and sellers for the purpose of exchange. Competitive markets have the capacity to solve the conflicting needs of consumers and producers via the functioning of the price mechanism and, in so doing, achieve allocative efficiency. Competitive markets are markets where a large number of individual sellers and buyers exist such that no one seller or buyer can exert influence over the market.

3.2 Needs of Consumers and Producers

All markets are characterised by the interaction of buyers (consumers) and sellers (producers), and each has conflicting needs. It is assumed that both consumers and producers will act in self-interest, so for the consumer, the overall motivation is utility (satisfaction) maximisation, whereas for producers, the overall motivation is profit maximisation. The consequence of these motivations is that consumers' and producers' needs/desires from markets differ, as summarised in Figure 3.2.1.

Table 3.2.1: The needs of Consumers and Producers.

System	Overall Motivation	Needs/Desires in a Market
Consumers	Maximise Utility (Satisfaction)	Consumers will therefore desire the following: <ul style="list-style-type: none"> • Competition • Lowest Prices • Highest Quality • Choice • Efficiency • Innovation
Producers	Profit Maximisation	Producers will therefore desire the following: <ul style="list-style-type: none"> • Market Power • Price Control • Barriers to Entry • Highest Quality • Efficiency • Innovation

Key Point:

Competition in markets results in lower prices, better quality products, greater efficiency, and greater choice through innovation.

The reasoning behind the differing desires of consumers and producers is clearly linked to attaining the overall motivations of both sides. Consumers can gain the highest utility (satisfaction) when they get the product that best matches their wants, with the highest quality and at the lowest possible price. To attain this, consumers need competition, as competition will force sellers to lower prices to prevent buyers from moving to competitors. In addition, competition forces sellers

to produce with the highest quality, as variations in quality will also see sellers lose market share to competitors. Innovation is also competition dependent, as to attract buyers, sellers will differentiate their products through innovation, creating better quality products and greater choice. Efficiency, as you will later learn, is only attained in competitive markets, which for consumers means minimised wastage and hence lower overall prices, which adds to utility.

3.3 Demand and Supply Model

The demand and supply model (also referred to as the price mechanism) is a model used to explain how price (and quantity traded) is determined in a singular market. The model is specific to competitive markets, with other market structures likely to have differing models and market outcomes.

Market Equilibrium

The demand and supply model models the interaction between consumers who demand goods and producers who supply goods. The logic of the model is simple: these interactions result in the determination of an equilibrium price in a market, where the quantity demanded, what consumers are willing and able to purchase, equals the quantity supplied, what producers are willing to offer for sale.

The two sides of the market, namely demand and supply, will be broken down later in this topic, but initially, the focus will be on the market as a whole and how and why equilibrium emerges in a market.

Model explanation:

The interaction between consumers (demand) and producers (supply) results in a singular point (price) where what consumers are willing and able to purchase (Q_d) equals what the producer is willing to offer for sale (Q_s). This is the equilibrium point (P_e, Q_e) in the market and is where the market will remain in the absence of any change.

The price in the market will be P_e and the quantity traded Q_e .

If a market is not at equilibrium, the prevailing price is either above or below P_e and Q_d will not equal Q_s and a shortage or surplus will exist in a market. Where the price is above P_e , then the quantity supplied Q_s will exceed the quantity demanded Q_d , and there will be a surplus. Where the price is below P_e , then the quantity supplied Q_s will be less than the quantity demanded Q_d , and there will be a shortage. This is illustrated and explained in Figure 3.3.2.

Price will adjust to disturbances in markets to ensure that a market returns to equilibrium. In markets where a shortage exists, prices will rise resulting in a decrease (contraction) in the quantity demanded and an increase (expansion) in the quantity supplied. The reverse holds true in markets where a surplus exists, in this situation price will fall and the quantity supplied will decrease (contract) and the quantity demanded will increase (expand). These adjustments to price continue until a market returns to equilibrium.

Model explanation:

Where price is above P_e at P_2 then the quantity supplied Q_2 will exceed the quantity demanded Q_1 and there will be a surplus as Q_2 is greater than Q_1 .

Where price is below P_e at P_1 then the quantity supplied Q_1 will be less than the quantity demanded Q_2 and there will be a shortage as Q_2 is greater than Q_1 .

Key Definition:

Market Equilibrium a situation where at a specific price level in the market the quantity demanded equals the quantity supplied.

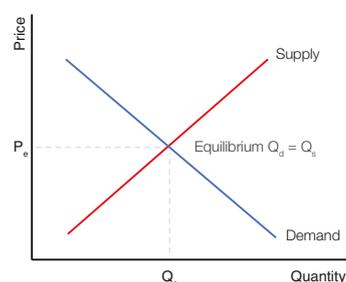


Figure 3.3.1: The Demand and Supply Model and Equilibrium.

Key Definition:

Shortage a situation where at a specific price level in the market the quantity demanded is greater than the quantity supplied.

Key Definition:

Surplus a situation where at a specific price level in the market the quantity supplied is greater than the quantity demanded.

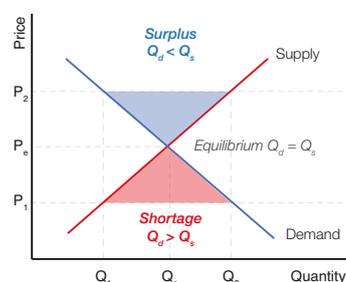


Figure 3.3.2: The Demand and Supply Model and Shortages and Surpluses.

Consumer Surplus, Producer Surplus, and Allocative Efficiency

Key Definition:

Allocative Efficiency

a situation where resources are allocated to the production of goods and services most desired by society. This implies that all markets are maximising Social Surplus and that there is an optimal allocation of resources to production in each individual market.

Equilibrium in competitive markets is also the point where there is no shortage or surplus existing in a market and as such it is the point where the allocative efficiency is attained. Allocative efficiency is a critical concept to understand because the absence of it reflects a market failure, a significant topic in the microeconomics core section of this book. Allocative efficiency is attained when resources are allocated to the production of goods and services most desired by society. This implies that all markets are maximising Social Surplus and that there is an optimal allocation of resources to production in each individual market. For this to occur, there can be no shortages or surpluses existing, meaning no under or over-allocation of resources. Understanding this concept requires breaking down the terminology, particularly the terms Social Surplus, Consumer Surplus, and Producer Surplus.

Consumer Surplus

Key Definition:

Consumer Surplus the difference between the price consumers are willing to pay for a good minus the price actually paid.

Consumer Surplus is the benefit derived from the difference between the price consumers are willing to pay for a good minus the price actually paid. In a perfectly competitive market, the price paid will be the equilibrium price and at this price, some consumers benefit by paying a price that is lower than what they are willing to pay. In a simplistic example, if consumer A was willing to pay \$3 for a good but the equilibrium price was \$1, then the consumer surplus would be \$2.

When we sum the consumer surplus of each individual consumer, we get the total consumer surplus in the market, as illustrated in Figure 3.3.3.

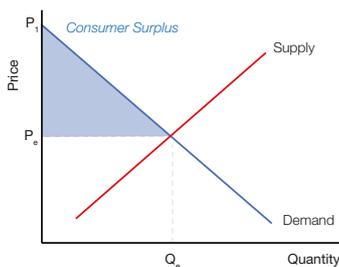


Figure 3.3.3: Consumer Surplus (perfectly competitive market).

Model explanation:

The consumer surplus is represented by the blue triangular area above P_e and enclosed by the demand curve up to Q_e . This is the sum of the differences between the price all consumers are willing to pay (up to a maximum of P_1) less the price actually paid P_e .

To enhance your understanding not required in examination.

In a mathematical sense if P_1 was \$3, P_e was \$1 and Q_e was 10 then the consumer surplus would be equal to: $\{(\$3-\$1) * 10\}/2$ (area of a triangle $A = \frac{1}{2}bh$). This would give a consumer surplus of \$10.

In imperfectly competitive markets, consumer surplus is still represented by the price consumers are willing to pay less the price actually paid, (this however is likely to no-longer be the equilibrium price) but is limited to the quantity traded in the market rather than the equilibrium quantity. This will be touched on further in later topics, but an example is illustrated in Figure 3.3.4.

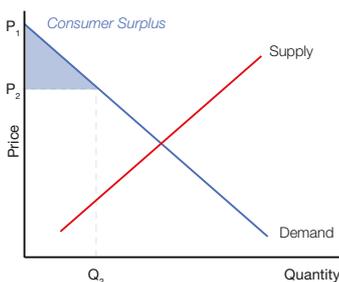


Figure 3.3.4: Consumer Surplus (market failure or imperfectly competitive market).

Model explanation:

In an imperfectly competitive market where price is set at P_2 and the quantity traded at Q_2 the consumer surplus is represented by the blue triangular area above P_2 and enclosed by the demand curve up to a quantity of Q_2 . This is less than the consumer surplus at equilibrium because P_2 is higher than P_e and there are less consumers at Q_2 than at Q_e .

To enhance your understanding - not required in examination.

In a mathematical sense if P_1 was \$3, P_2 was \$2 and Q_2 was 5 then the consumer surplus would be equal to: $\{(\$3-\$2) * 5\}/2$. This would give a consumer surplus of \$2.50.

Key Definition:

Producer Surplus the difference between the price producers receive for selling the good less the lowest price that they are willing to accept to sell the good.

Producer Surplus

Producer Surplus is the benefit derived by the producer from selling a good at a price higher than they would have otherwise been willing to sell it. It is represented by the difference between the price producers receive for selling the good less the lowest price that they are willing to accept to sell the good. In a perfectly competitive market, the price received will be the equilibrium price, and at this price, some producers benefit by receiving a price which is higher than what they are willing to sell it for. In a simple example, if producer A was willing to sell the good for \$5 but the equilibrium price was \$8, then the producer surplus would be \$3.

When we sum the producer surplus of each individual producer, we get total producer surplus in the market, as illustrated in Figure 3.3.5.

Model explanation:

The producer surplus is represented by the red triangular area below P_e and enclosed by the demand curve. This is the sum of the differences between the price producers receive for selling their good P_e less the price they are willing to sell it for (to a minimum of P_1).

To Enhance your Understanding - not required in examination.

In a mathematical sense if P_e was \$8, P_1 was \$0 and Q_2 was 5 then the producer surplus would be equal to $\{(\$8-\$0) * 5\}/2$. This would give a consumer surplus of \$20.

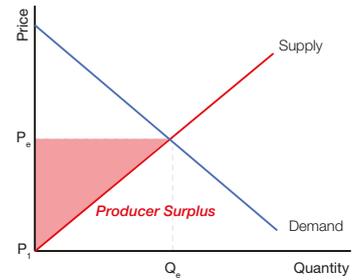


Figure 3.3.5: Producer Surplus.

In imperfectly competitive markets, producer surplus is still represented by the price producers receive for selling the good, less the price they would have been willing to sell it for, however is likely to no-longer be the equilibrium price. Producer surplus is now limited to the quantity traded in the market rather than the equilibrium quantity. This will be touched on further in later topics, but an example is illustrated in Figure 3.3.6.

Model explanation:

In an imperfectly competitive market where price is set at P_2 and the quantity traded at Q_2 the producer surplus is represented by the red area below P_2 and enclosed by the supply curve up to a quantity of Q_2 . This is likely to be more than the producer surplus at equilibrium because P_2 is higher than P_e resulting in greater benefits for producers.

To Enhance your Understanding - not required in examination.

In a mathematical sense if P_2 was \$10, P_1 was \$0, P_3 was \$3 and Q_2 was 5 then the producer surplus would be equal to $\{(\$3-\$0) * 5\}/2 + \{(10-3)*5\}$. This would give a producer surplus of \$42.50.

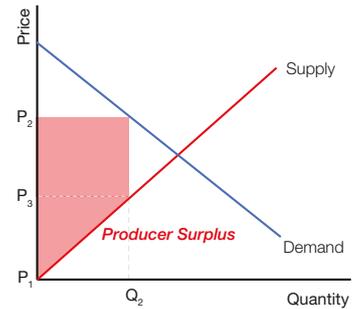


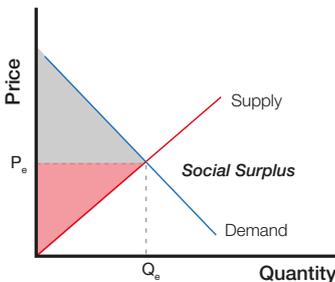
Figure 3.3.6: Producer Surplus (market failure or imperfectly competitive market).

Social Surplus

Social Surplus (or economic surplus) is the sum of consumer and producer surpluses and when this is maximised allocative efficiency is attained. It is important to note that allocative efficiency does not necessitate both consumer and producer surpluses to be equal. (Figure 3.3.7).

Key Point:

When there is allocative efficiency social surplus is maximised, but this does not mean that consumer and producer surpluses are equal, but rather the sum of them is maximised.

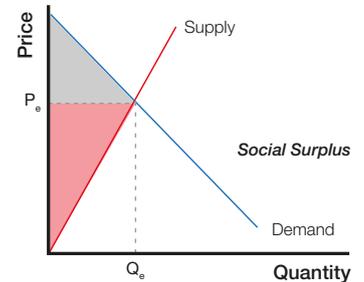


Model explanation:

Social Surplus is the sum of the consumer and producer surplus' and when it is maximised there is allocative efficiency. This occurs in a perfectly competitive market at equilibrium $P_e Q_e$. In this model there is an almost equal value to the consumer and producer surpluses with the red and blue triangles essentially equal in size.

Model explanation:

Social Surplus is still maximised in this model, as the market is operating at equilibrium and as such there is allocative efficiency. However, in this instance Producer surplus is larger than Consumer surplus with the red triangle being larger than the blue.



Model explanation:

Social Surplus is still maximised in this model, as the market is operating at equilibrium and as such there is allocative efficiency. However, in this instance Consumer surplus is larger than Producer surplus with the blue triangle being larger than the red.

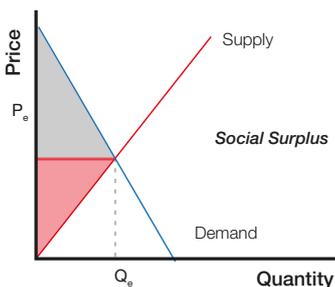


Figure 3.3.7: Social Surplus and Allocative Efficiency.

Demand

Key Definition:

Demand the quantity of a product which buyers are willing and able to purchase at a given price over a given period of time.

Demand is the quantity of a product, service, or resource that buyers are willing and able to purchase at a given price over a given period. Demand is not the same as a want. In Economics, demand is characterised by two important attributes:

- a willingness to purchase
- the ability to purchase.

This implies that demand reflects what consumers will buy rather than what they desire.

Price as a Determinant of Demand

Key Definition:

Law of Demand as the price of a product increases the quantity demanded decreases (contracts), (vice versa).

The market demand curve is the sum of all individual buyers' demand curves, and as your introduction to the model has already noted, the demand curve slopes downwards to the right. This illustrates that as the price falls, the quantity demanded increases (and vice versa). This inverse relationship between price and quantity demanded is reflected in the law of demand: as the price of a product increases, the quantity demanded decreases (contracts), (and vice versa).

This relationship also implies that price is a determinant of demand and that changes in price result in changes in the quantity demanded. It is important to note that these changes occur along the same demand curve and are known as contractions or expansions and are reflected in Figure 3.3.8.

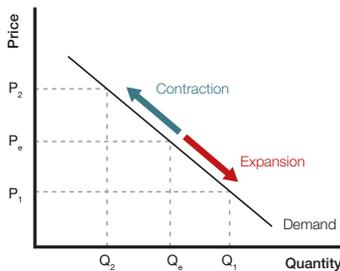


Figure 3.3.8: The Impacts of a Price Change on Demand.

Model explanation:

As the price of the product increases from P_e to P_2 there is a contraction in demand Q_e to Q_2 , this indicates that there is less quantity demanded at P_2 than there was at the equilibrium price P_e .

Alternately as price falls to P_1 there is an expansion in demand Q_e to Q_1 , this indicates that there is more quantity demanded at P_1 than there was at the equilibrium price P_e .

Key Point:

The inverse or indirect relationship between price and quantity demanded is the result of two substitutions a) a product substitution and b) an income substitution.

The inverse relationship demonstrated by the law of demand illustrated in Figure 3.3.8 is primarily the result of two substitutions that consumers do as the price rises for a good. Firstly, there is a product substitution where consumers who aim to maximise utility will switch from product A to alternatives, as product A's price rises. This behaviour results from consumers gaining comparatively more utility from the substitute goods because they are relatively lower in price. Secondly, there is an income substitution. If the price of good A rises, consumers gain more utility from holding their income for future purchases rather than spending it now on product A. The income substitution's size depends on the extent to which the buyer can go without good A. In contrast, product substitution depends on the number and closeness of other products that can satisfy the same want. The existence of these two substitutions means that nearly all goods or services will have a downward-sloping demand curve.

Non-Price Determinants of Demand

There are other factors beyond the price of a good that can affect demand. Changes in these factors (known as non-price determinants) result in a shift of the entire demand curve, either left or right. Changes in non-price determinants cause either an increase or decrease in demand. An increase in demand occurs when the entire demand curve shifts to the right, increasing demand at all price levels (Figure 3.3.9). A decrease in demand occurs when the entire demand curve shifts leftward, resulting in a decrease in demand at all price levels (Figure 3.3.10).

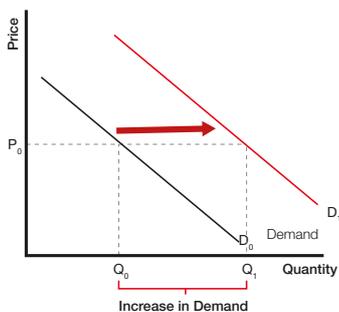


Figure 3.3.9 Increase in demand caused by a change in a non-price determinant of demand.

Model explanation:

When a change in a non-price determinant of demand results in an increase in demand the entire demand curve shifts to the right (D_0 to D_1). There is now greater demand at every price level, for example at P_0 quantity demanded has increased from Q_0 to Q_1 .

Model Explanation:

When a change in a non-price determinant of demand results in a decrease in demand the entire demand curve shifts to the left (D to D_2). There is now less demand at every price level, for example at P_0 quantity demanded has decreased from Q_0 to Q_2 .

As demand reflects a buyer's willingness and ability to buy a good, any factor outside of the price of the good that impacts on either of these two aspects will shift the whole demand curve. These factors are known as non-price determinants of demand and can be grouped under four primary headings:

- Changes in Income
- Changes in Demographics
- Changes in Tastes and Preferences
- Changes in the Price of Related Goods.

Each of these groups has multiple aspects or factors that may increase or decrease demand, summarised below.

Changes in Income

As income is used to purchase goods, it impacts the ability of buyers to demand goods. In most situations, an increase in income will lead to an increase in demand (or, alternately, a decrease in income will lead to a decrease in demand). Where this positive relationship between income and demand for a good exists, a good is known as a Normal Good. Most goods are normal goods; however in some cases, the relationship between income and the demand for a good can become negative. That is as income increases, the demand for the good decreases. These goods are known as inferior goods and result from the fact that as incomes increase, consumers can switch away from these inferior goods to purchase superior goods. Secondhand clothing is often considered an example, although research shows that the concept of inferior goods is not the same for all income groupings.

Changes in income occur because of increases in income from any source (land, labour, capital, or enterprise). They are also influenced by income taxes and expectations of income changes. Unless indicated, we assume that a good is a normal good when discussing income changes.

Changes in Demographics

Demographics are a statistical category/grouping of a population. Changes in the makeup of these statistical groups can impact the demand for specific products. An increase in population size alters the number of buyers in every market and, therefore increases demand; the reverse is true for a decrease in population. Changes in demographic factors that can significantly impact demand include, age, gender, and ethnicity. The important point is that if the number of buyers of a particular product increases or decreases, so does the demand for that product.

Changes in Tastes and Preferences

Tastes and preferences greatly influence the demand for a product, as they influence the willingness to purchase a particular good. As preferences shift towards a product, its demand will increase. If preferences shift away or fall for a product, then demand decreases. Many factors influence a buyer's tastes and preferences including the following: advertising, trends, fashion, seasons, weather and even peer pressure. These factors tend to relate to changes in the psychology of the buyer and are therefore susceptible to abrupt, significant, and unexpected change.

Changes in the Price of Related Products

The change in price of a related product can also increase or decrease demand for a specific good. Two primary relationships exist between goods: a) the two goods are substitutes or b) the two goods are complementary goods. The nature of the relationship will dictate whether an increase in the price of the related good will increase or decrease the demand for good A.

Substitute goods are goods that can be used to satisfy the same want; buyers see them as serving the same purpose. Where the related good (good B) is a substitute, an increase in its price will see the demand for the other good (good A) increase. In a simplistic example an increase in the price of Pepsi will see the

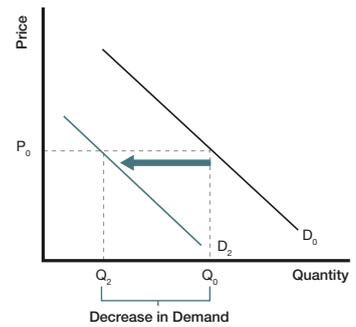


Figure 3.3.10: Decrease in demand caused by a change in a non-price determinant of demand.

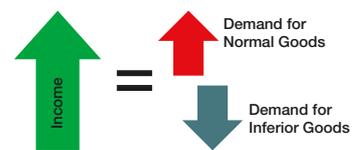


Figure 3.3.11: Impact of Income Changes on Demand.



Figure 3.3.12: Direct Relationship between Number of Buyers and Demand

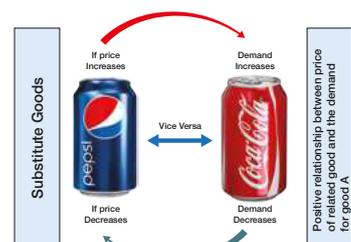


Figure 3.3.13: Impact of Substitute



Figure 3.3.14: Impact of Complementary Goods

demand for Coca Cola increase. There is a positive relationship between the price of B and the demand for A.

Complementary goods are goods that are used by a consumer in conjunction with another good to satisfy a want. Where the related good (good B) is a complementary good, an increase in its price will see the demand for the other good (good A) decrease. In a simplistic example, an increase in the price of tennis racquets will see the demand for tennis balls decrease. There is an inverse or negative relationship between the price of B and the demand for A.

Table 3.3.1: The Non-price Determinants of Demand.

Primary Determinant	Individual Factor/s	Relationship to Demand of a Good
Changes in Income	Income from Resources	Normal Good – Direct relationship
	Income Taxes	Inferior Good – Inverse relationship
Changes in Number of Buyers and Demographics	Income Expectations	
	Population	Number of Buyers – Direct Relationship
	Age	
	Gender	
Ethnicity		
Changes in Tastes and Preferences	Advertising	Tastes and Preferences - Direct Relationship
	Trends	
	Fashion	
	Seasons	
	Weather	
	Peer Pressure	
Changes in Price of Related Goods	Substitute Goods	Substitute Good Prices – Direct Relationship
	Complementary Goods	Complementary Good Prices – Inverse Relationship

Key Definition:

Supply the quantity of a product, service, or resource which sellers are willing and able to offer for sale at a given price over a given time period.

Supply

Supply is the quantity of a product, service, or resource which sellers are willing and able to offer for sale at a given price over a given time period. Supply is not the same as production, as in Economics supply is characterised by a willingness to offer for sale. This implies that supply reflects what producers will sell, rather than what they produce.

Key Definition:

Law of Supply as the price of a product increases the quantity supplied increases (expands). (vice versa).

Price as a Determinant of Supply

The market supply curve is the sum of all individual seller’s supply curves and as already noted, the supply curve slopes upwards to the right. This illustrates that as price falls the quantity supplied decreases (vice versa). This direct relationship between price and quantity supplied is reflected in the law of supply, which states that as the price of a product increases the quantity supplied increases (expands), (vice versa).

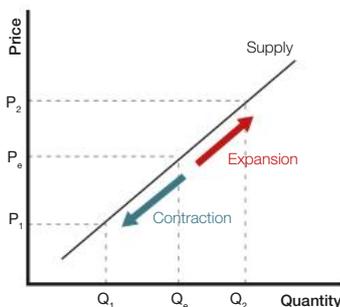


Figure 3.3.15: The impacts of a Price Change on Supply.

This relationship also implies that price is a determinant of supply and that changes to price result in changes in the quantity supplied. It is important to note though that these changes occur along the same supply curve and are known as contractions or expansions and are reflected in Figure 3.3.15.

Model Explanation:

As the price of the product rises from P_e to P_2 there is an expansion in supply Q_e to Q_2 , this indicates that there is more quantity supplied at P_2 than there was at the equilibrium price P_e .

Alternately as price falls to P_1 there is a contraction in supply Q_e to Q_1 , this indicates that there is less quantity supplied at P_1 than there was at the equilibrium price P_e .

Real World Considerations: Are Children a Normal or Inferior Good?

Economic theory offers great insights into why fertility in recent history behaves contrary to common sense predictions. Yet, universally predicting childbearing behaviour can be troublesome as childbearing behaviour has not followed a consistent pattern in recent economic history.

The first question to tackle is how a population's total fertility rate (number of children per woman) reacts to income. The behaviour of total fertility rates (TFR) is dependent on whether households view children as normal or inferior goods. While this terminology may sound sadistic, understanding how fertility reacts to changes in income will allow us to make predictions about how fertility will behave in the future. In the United States, many two parent households enjoy raising children and therefore maximise the number of children they have. As incomes rise, we expect the average household to have additional children. However, this behaviour is not consistent, as in some periods of economic boom, we can see that the TFR fell. For example, in the 1920's the TFR fell by approximately 1.3 children per woman. This suggests that children may be inferior goods: as income rises, demand for children decreases. Yet, thirty years later in the Baby Boom, we see that fertility increased during a period of strong growth.

The reason that the demand for children is inconsistent is because children, in addition to their monetary costs, also come with an opportunity cost. Perhaps more importantly, research demonstrates that increases in wage income increase our willingness and ability to have children while also increasing the opportunity cost of raising children. The opportunity cost of raising your children is the reason fertility does not have a fixed relationship with economic well-being. As one's income increases, the opportunity cost of spending time away from work to be with one's kids grows larger and larger.

One of the most effective strategies for raising total fertility rate of developed countries with low fertility rates, such as Japan, is the implementation of professional childcare. Childcare allows parents to work and raise children at the same time, so the opportunity cost of children is capped at the fees of the childcare and does not rise or fall with your wage. The implementation of childcare services in nations such as Japan could help raise the fertility rate back to the replacement rate (2 children per couple) if wages remain high in the future.

The model used for prediction does leave some unanswered questions. It mostly describes fertility rates at the microeconomic level, household to household, and becomes difficult to evaluate if we extrapolate its principles to entire populations. For instance, not all families optimize utility at the same fertility rates, because all goods do not have a fixed cost. The amount that a family wishes to "invest" in their children may also alter the predicted fertility rate. The choice to send a child to private school may lead to the family not having another child, changing predicted fertility rate. Finally, estimating the "fixed" cost of children is nearly impossible to do. However, the relationship presented between fertility and economic prosperity gives us new insights into explaining population trends over the course of history as well as predict demographic transitions in developing nations.

Source

The Cost of Kids

Posted On : April 18, 2018 Published By : BER staff

JACOB FAJNOR – APRIL 18TH, 2018

<https://econreview.berkeley.edu/the-cost-of-kids/#:~:text=The%20opportunity%20cost%20of%20raising%20your%20children%20is%20the%20reason,kids%20grows%20larger%20and%20larger.>

Discussion Points

What is the relationship between having children and income levels?

How does this extract highlight the economic problem of scarcity?

According to the extract what is the opportunity cost of having children?

Describe the limitation of using utility maximisation for consumers as an indicator of an entire market or population.

The direct relationship demonstrated by the law of supply, illustrated in Figure 3.3.15, is primarily the result of producers aiming to maximise profit. This aim incentivises producers to offer more products for sale as price increases because it increases profit.

Key Point:

The direct or positive relationship between price and quantity supplied reflects producers desire to maximise profit, this results in them being willing to supply more at higher prices.

Non-Price Determinants of Supply

There are other factors beyond the price of a good that can impact supply. Changes in these factors (known as non-price determinants) result in a shift of the entire supply curve, either left or right. This implies that changes in the non-price determinants cause either an increase or decrease in supply. An increase in supply occurs when the entire supply curve shifts to the right and results in an increase in supply at all price levels (Figure 3.3.17). A decrease in supply occurs when the entire supply curve shifts leftward and results in a decrease in supply at all price levels (Figure 3.3.18).

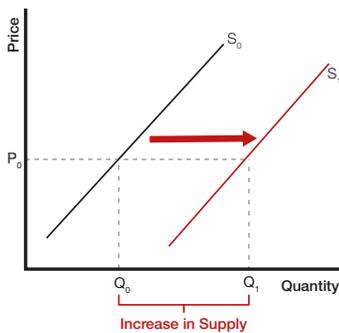


Figure 3.3.16: Increase in supply caused by a change in a non-price determinant of supply.

Model Explanation:

When a change in a non-price determinant of supply results in an increase in supply the entire supply curve shifts to the right (S_0 to S_1). There is now greater supply at every price level, for example at P_0 quantity supplied has increased from Q_0 to Q_1 .

Model Explanation:

When a change in a non-price determinant of supply results in a decrease in supply the entire supply curve shifts to the left (S_0 to S_2). There is now less supply at every price level, for example at P_0 quantity supplied has decreased from Q_0 to Q_2 .

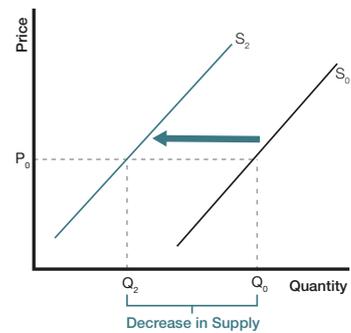


Figure 3.3.17: Decrease in supply caused by a change in a non-price determinant of supply.

As supply reflects a producer's willingness and ability to offer a good for sale, any factor (outside of the price of the good) that impacts these will shift the whole supply curve. These factors are known as non-price determinants of supply and can be grouped under the following five primary headings:

- Cost of Production
- Availability of Resources
- Market Size and Number of Sellers
- Technology Change
- Indirect Taxes and Producer Subsidies

Some of these groups have multiple aspects or factors that may increase or decrease supply, and these are summarised below.

Cost of Production

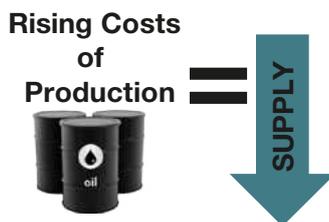


Figure 3.3.18: Impact of Costs of Production.

Costs of production represent all the costs that a producer incurs in manufacturing a good or providing a service. Production costs present themselves largely as expenses, including the cost of labour, costs of raw materials, costs of land resources and what are classed as general overhead costs. Whenever the cost of production rises, regardless of its source, supply will decrease as there is now less profit to be made at every price level. This is reversed if production costs fall as supply will increase with more profit now possible at every price level. Some of the more significant and common costs of production include wages, fuel, energy, insurance, raw materials, business taxes and water.

Changes in Availability of Resources

As resources are necessary for the production of goods to occur, any change in the availability of these is likely to impact the supply curve of a product. This tends to relate to natural disasters that destroy resources, often land or capital or human-made catastrophes that often impact all resource groups. However, resource availability can also increase, particularly regarding agriculture, where excellent growing seasons can improve yields. Equally, disease can impact resource availability both in terms of human disease and also disease that affects natural resources. In addition, there is a link between resource availability and cost of production, as often resource availability translates to costs of production

changes as shortages of resources push costs up, and an abundance of resources lowers costs.

Changes in Market Size and Number of Sellers

The market supply curve is determined by the sum of each individual seller in the market. If there is a fall in the number of sellers, then there will be a decrease in supply. Equally, an increase in the number of sellers will increase supply. Supply is not just a reflection of the number of sellers entering and or leaving a market, but it also reflects sellers from overseas importing goods and domestic seller's intentions to export. When imports (products from overseas) rise, it is the equivalent of increasing the size of the market and therefore supply, whilst when domestic firms export (domestic products sold overseas) more, there is essentially a decrease in market size and therefore supply.

Changes in Technology

Changes in technology is included as its own category, but it is often representative of an addition to capital resources or something that aids in improving the productivity of labour (output per labour input). Technology can, therefore be viewed as both an increase in resource availability and as something that leads to a decrease in the cost of production.

Technology can at times add to production costs in the short term, particularly where rapid changes require firms to update obsolete technology. However, in the long term it is largely accepted that production costs fall as technology use increases, resulting in an increase in supply.

Indirect Taxes and Producer Subsidies

Taxes and subsidies could also be grouped as costs of production but are separated here as they reflect government intervention impacting costs as distinct from changes in prices of factors of production resulting from market forces.

Indirect taxes are taxes that are levied on expenditure and whilst paid by the producer, some of the cost of them is ultimately indirectly borne by the consumer in the form of higher prices. Indirect taxes represent a cost of production to producers and as such increases in indirect taxes increase the cost of production and decrease supply. Examples of indirect taxes include Sales Taxes, broad based consumption taxes such as the GST and Excise taxes such as those on petrol, tobacco, alcohol and in some countries, sugar.

A producer (or production) subsidy is a payment by government to producers that lowers the cost of production and increases supply. Producer subsidies are most often provided with the aim of encouraging output of particular products, especially in industries deemed essential to the economy. Whilst provided with the aim of supporting producers often in industries where fluctuations and uncertainty of income exist, producer subsidies also benefit consumers who are the recipient of lower prices and increased output.

Key Definition:

Indirect Tax is a tax that is levied on expenditure but paid by the producer thus impacting the cost of production and supply.

Key Definition:

Producer Subsidy is a payment by government to producers that lowers the cost of production and increases supply.

Table 3.3.2: The Non-price Determinants of Supply.

Primary Determinant	Individual Factor/s	Relationship to Supply of a Good
Cost of Production	Energy Costs – oil, fuel, gas, electricity Insurance Wages Rent Capital Good Costs	Cost of Production - Inverse relationship
Resource Availability	Natural Disasters – floods, earthquakes, drought, fires, cyclones Human Made Disasters – war, disease. Growing Seasons	Resource Availability – Direct Relationship
Changes in market size and the Number of Sellers	Volume of Exports Volume of Imports Number of Sellers	Number of Sellers - Direct Relationship
Changes in Technology	Technological Development	New Technology - Direct Relationship Rapid Technological Development – Inverse Relationship
Indirect Taxes and Producer Subsidies	Indirect Taxes Excise Taxes Sales Taxes GST Subsidies Input Subsidy Grant Bail Out Price Guarantee	Indirect Taxes - Inverse Relationship Producer Subsidies – Direct Relationship

Impacts on the Market of Changes in Demand and Supply

A change in any of the non-price determinants of demand or supply will shift the entire demand or supply curve and form a new equilibrium position.

The reasoning behind the formation of a new equilibrium position is that with a shift of either the demand or supply curve, the original equilibrium price now results in either a shortage or a surplus existing. This can be explained further by focusing on the impacts of demand and supply changes.

Changes in Demand

An increase in demand results in the entire demand curve shifting to the right, as indicated in Figure 3.3.20. The increase in demand results in a shortage at the original price level, and as such, it will cause price to increase (rise). It is important to note that in any market where there is an increase in demand, the resulting impact in the market is an increase in price and an increase in the quantity traded.

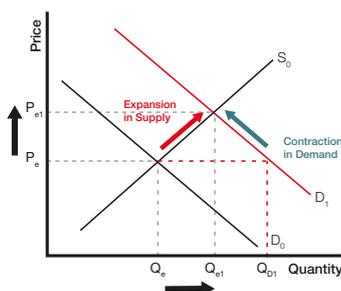


Figure 3.3.20: Impacts of an Increase in Demand.

Model explanation:

An increase in demand shifts the whole demand curve to the right D_0 to D_1 . The outcome in the market is that a new equilibrium is formed as prices rise to P_{e1} and quantity traded increases to Q_{e1} .

The reason for the change in equilibrium is brought about by the fact that the increase in demand (D_0 to D_1) has resulted in a shortage at the original price equilibrium of P_e as quantity demanded now equals Q_{D1} , which is greater than the quantity supplied at Q_e . In response to the shortage, suppliers can raise price and as price rises to P_{e1} , the quantity supplied expands and the quantity demanded contracts until a new equilibrium quantity forms at Q_{e1} . The impact of the price increase following the increase in demand is important to understand as it explains why the total increase in demand (Q_e to Q_{D1}) does not translate to an equal increase in the quantity traded (Q_e to Q_{e1}). The price rise to remove the shortage impacts both the quantity supplied, and the quantity demanded.

A decrease in demand results in the entire demand curve shifting to the left as indicated in Figure 3.3.21. The decrease in demand results in a surplus at the original price level and as such it will cause price to decrease (fall). It is important to note that in any market where there is a decrease in demand, the resulting impact in the market is a decrease in price and a decrease in the quantity traded.

Model explanation:

A decrease in demand shifts the whole demand curve to the left D_0 to D_1 . The outcome in the market is that a new equilibrium is formed as prices fall to P_{e1} and quantity traded decreases to Q_{e1} .

The reason for the change in equilibrium is bought about by the fact that the decrease in demand (D_0 to D_1) has resulted in a surplus at the original price equilibrium of P_e as quantity demanded now equals Q_{D1} which is less than the quantity supplied at Q_e . In response to the surplus suppliers will lower price and as price falls to P_{e1} the quantity demanded expands and the quantity supplied contracts, until a new equilibrium quantity forms at Q_{e1} . The impact of the price decrease following the decrease in demand is important to understand as it explains why the total decrease in demand (Q_e to Q_{D1}) does not translate to an equal decrease in the quantity traded (Q_e to Q_{e1}). The price fall to remove the surplus impacts both the quantity supplied, and the quantity demanded.

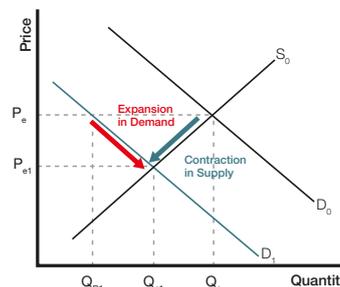


Figure 3.3.21: Impacts of a Decrease in Demand.

The important take away from this, is that changes in demand have a positive relationship to price level. An increase in demand causes an increase in equilibrium price and quantity, whereas a decrease in demand causes a decrease in equilibrium price and quantity.

Changes in Supply

An increase in supply results in the entire supply curve shifting to the right, as indicated in Figure 3.3.22. The increase in supply results in a surplus at the original price level and as such it will cause price to decrease (fall). It is important to note that in any market where there is an increase in supply, the resulting impact in the market is a decrease in price and an increase in the quantity traded.

Model explanation:

An increase in supply shifts the whole supply curve to the right S_0 to S_1 . The outcome in the market is that a new equilibrium is formed as prices fall to P_{e1} and quantity traded increases to Q_{e1} .

The reason for the change in equilibrium is bought about by the fact that the increase in supply (S_0 to S_1) has resulted in a surplus at the original price equilibrium of P_e as quantity supplied now equals Q_{S1} which is greater than the quantity demanded at Q_e . In response to the surplus suppliers will lower price and as price falls to P_{e1} the quantity demanded expands and the quantity supplied contracts, until a new equilibrium quantity forms at Q_{e1} . The impact of the price decrease (following the increase in supply) is important to understand as it explains why the total increase in supply (Q_e to Q_{S1}) does not translate to an equal increase in the quantity traded (Q_e to Q_{e1}). The price fall to remove the surplus impacts both the quantity supplied, and the quantity demanded.

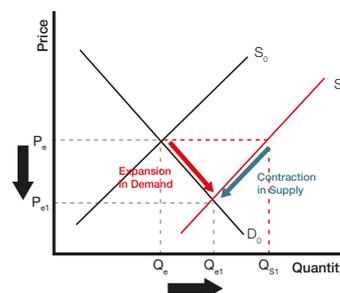


Figure 3.3.22: Impacts of an Increase in Supply

A decrease in supply results in the entire supply curve shifting to the left, as indicated in Figure 3.3.23. The decrease in supply results in a shortage at the original price level and as such it will cause price to increase. It is important to note that in any market where there is a decrease in supply, the resulting impact in the market is an increase in price and a decrease in the quantity traded.

Model explanation:

A decrease in supply shifts the whole supply curve to the left S_0 to S_1 . The outcome in the market is that a new equilibrium is formed as prices rise to P_{e1} and quantity traded decreases to Q_{e1} .

The reason for the change in equilibrium is bought about by the fact that the decrease in supply (S_0 to S_1) has resulted in a shortage at the original price equilibrium of P_e as quantity supplied now equals Q_{S1} which is less than the quantity demanded at Q_e . In response to the shortage suppliers will raise price and as price increases to P_{e1} the quantity supplied expands and the quantity demanded contracts until a new equilibrium quantity forms at Q_{e1} . The impact of the price increase (following the decrease in supply) is important to understand as it explains why the total decrease in supply (Q_e to Q_{S1}) does not translate to an equal decrease in the quantity traded (Q_e to Q_{e1}). The price rise to remove the shortage impacts both the quantity supplied, and the quantity demanded.

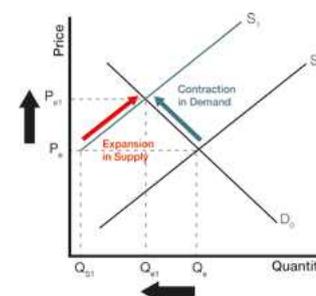


Figure 3.3.23: Impacts of a Decrease in Supply

The important take away from this is that changes in supply have an inverse relationship to impacts on price. An increase in supply causes a decrease in equilibrium price and but an increase quantity traded, whereas a decrease in supply causes an increase in equilibrium price but a decrease quantity traded.

Table 3.3.3: Summary of Impacts of Demand and Supply Changes.

Change	Reason for Change in Market	Impact on Price	Impact on Quantity Traded
Decrease Demand	Creates a surplus at original equilibrium price	Decrease	Decrease
Increase Demand	Creates a shortage at original equilibrium price	Increase	Increase
Decrease Supply	Creates a shortage at original equilibrium price	Increase	Decrease
Increase Supply	Creates a surplus at original equilibrium price	Decrease	Increase

Simultaneous Changes in Supply and Demand

In the instances shown so far, we have assumed that markets have experienced singular changes and as such the impact on equilibrium is clear (refer to Table 3.3.3 for summary). However, markets are more complex and often changes in demand and supply can occur simultaneously. In these instances, the magnitude of each change is important. Changes that can occur simultaneously include:

- Increased Demand and Increased Supply
- Increased Demand and Decreased Supply
- Decreased Demand and Increased Supply
- Decreased Demand and Decreased Supply

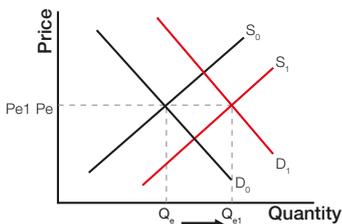
Because the market outcomes of individual changes in supply and demand are not consistent, the impacts of multiple changes on both price and quantity traded cannot be accurately determined, rather there is only certainty of impact on one element in the market, either price or quantity traded. This can be explained by viewing the impacts that each change has individually.

Increased Demand and Increased Supply

Table 3.3.4: Summary of Impacts of Simultaneous Increases in Demand and Supply.

Change	Impact on Price	Impact on Quantity Traded
Increase Demand	Increase	Increase
Increase Supply	Decrease	Increase

In this scenario, the impact on quantity traded is clearly apparent as both changes cause an increase in quantity traded. However, the impact on price can only be determined if we consider the relative magnitudes of the supply and demand changes. Price will ultimately rise, or fall based on which of the demand or supply change is largest. This is indicated in the following three diagrams (Figure 3.3.24).

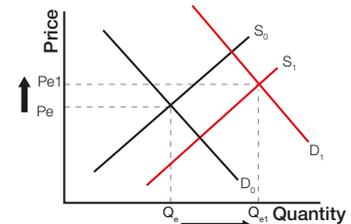


Model explanation:

Where the increase in demand (D_0 to D_1) and the increase in supply (S_0 to S_1) are of equal magnitude (size), quantity traded rises (Q_e to Q_{e1}) but price levels do not change ($P_e = P_{e1}$). This is bought about by the fact the increase in price caused by the demand increases is equally offset by the price decrease bought about by the increase in supply.

Model explanation:

Where the increase in demand (D_0 to D_1) is larger than the increase in supply (S_0 to S_1) quantity traded rises (Q_e to Q_{e1}) and price levels also rise (P_e to P_{e1}). This is bought about by the fact the increase in price caused by the demand increases is greater than the price decrease bought about by the increase in supply.



Model explanation:

Where the increase in demand (D_0 to D_1) is smaller than the increase in supply (S_0 to S_1) quantity traded rises (Q_e to Q_{e1}) but price levels decrease (P_e to P_{e1}). This is bought about by the fact the increase in price caused by the demand increases is less than the price decrease bought about by the increase in supply.

Figure 3.3.24: Illustration of Impacts of Simultaneous Increases in Demand and Supply.

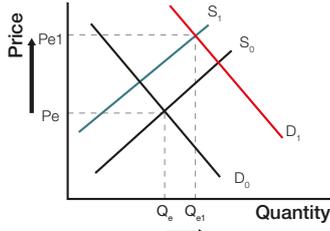
Increased Demand and Decreased Supply

Table 3.3.5: Summary of Impacts of a Simultaneous Increases in Demand and Decrease in Supply.

Change	Impact on Price	Impact on Quantity Traded
Increase Demand	Increase	Increase
Decrease Supply	Increase	Decrease

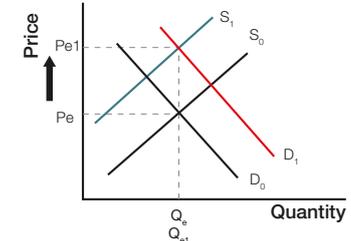
Model Explanation:

Where the increase in demand (D_0 to D_1) and the decrease in supply (S_0 to S_1) are of equal magnitude (size), price rises (P_e to P_{e1}) but quantity traded does not change ($Q_e = Q_{e1}$). This is bought about by the fact the increase in quantity traded caused by the demand increases is equally offset by the quantity traded decrease bought about by the decrease in supply.



Model Explanation:

Where the increase in demand (D_0 to D_1) is larger than the decrease in supply (S_0 to S_1) price rises (P_e to P_{e1}) and quantity traded decreases (Q_e to Q_{e1}). This is bought about by the fact the increase in quantity traded caused by the demand increases is greater than the decrease in quantity traded bought about by the increase in supply.



Model Explanation:

Where the increase in demand (D_0 to D_1) is smaller than the increase in supply (S_0 to S_1) price rises (P_e to P_{e1}) but quantity traded decreases (Q_e to Q_{e1}). This is bought about by the fact the increase in quantity traded caused by the demand increases is less than the quantity traded decrease bought about by the decrease in supply.

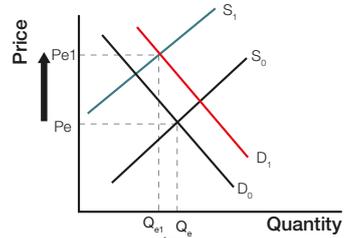


Figure 3.3.25: Illustration of Impacts of Simultaneous Increases in Demand and Decrease in Supply

In this scenario, the impact on price is clearly apparent as both changes cause an increase in price. However, the impact on quantity traded can only be determined if we consider the relative magnitudes of the supply and demand changes. Quantity traded will ultimately increase or decrease based on which of the demand or supply change is the largest. This is indicated in the following three diagrams (Figure 3.3.25).

Decreased Demand and Increased Supply

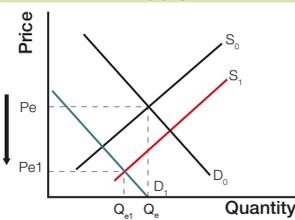
Table 3.3.6: Summary of Impacts of a Simultaneous Decrease in Demand and Increase in Supply.

Change	Impact on Price	Impact on Quantity Traded
Decrease Demand	Decrease	Decrease
Increase Supply	Decrease	Increase

In this scenario, the impact on price is clearly apparent, as both changes cause an increase in price. However, the impact on quantity traded can only be determined if we consider the relative magnitudes of the supply and demand changes. Quantity traded will ultimately increase or decrease based on which of the demand or supply change is the largest. This is indicated in the following three diagrams (Figure 3.3.26).

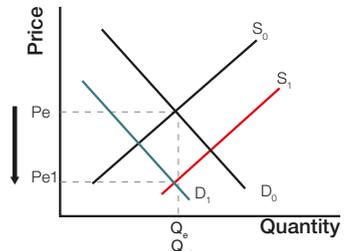
Model Explanation:

Where the decrease in demand (D_0 to D_1) and the decrease in supply (S_0 to S_1) are of equal magnitude (size), price falls (P_e to P_{e1}) but quantity traded does not change ($Q_e = Q_{e1}$). This is bought about by the fact the decrease in quantity traded caused by the demand decreases is equally offset by the quantity traded increase bought about by the increase in supply.



Model Explanation:

Where the increase in demand (D_0 to D_1) is larger than the decrease in supply (S_0 to S_1) price falls (P_e to P_{e1}) and quantity traded decreases (Q_e to Q_{e1}). This is bought about by the fact the increase in quantity traded caused by the demand increases is greater than the decrease in quantity traded bought about by the increase in supply.



Model Explanation:

Where the decrease in demand (D_0 to D_1) is smaller than the increase in supply (S_0 to S_1) price falls (P_e to P_{e1}), but quantity traded increases (Q_e to Q_{e1}). This is bought about by the fact the decrease in quantity traded caused by the demand decreases is less than the quantity traded increase bought about by the increase in supply.

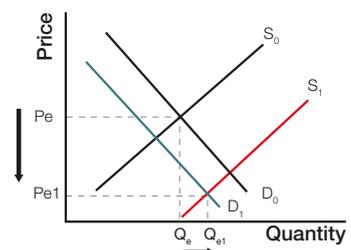


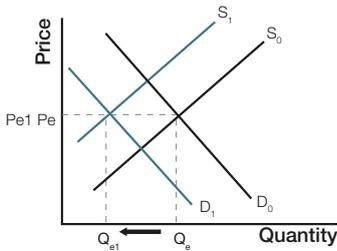
Figure 3.3.26: Illustration of Impacts of Simultaneous Decreases in Demand and Increase in Supply.

Decreased Demand and Decreased Supply

Table 3.3.7: Summary of Impacts of Simultaneous Decreases in Demand and Supply.

Change	Impact on Price	Impact on Quantity Traded
Decrease Demand	Decrease	Decrease
Decrease Supply	Increase	Decrease

In this scenario, the impact on quantity traded is clearly apparent, as both changes cause a decrease in quantity traded. However, the impact on price can only be determined if we consider the relative magnitudes of the supply and demand changes. Price will ultimately rise or fall based on which of the demand or supply change is largest. This is indicated in the following three diagrams (Figure 3.3.27).

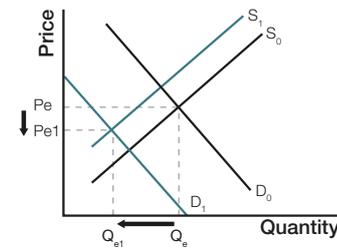
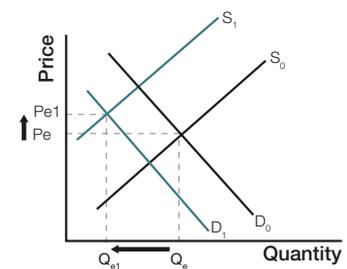


Model Explanation:

Where the decrease in demand (D_0 to D_1) and the decrease in supply (S_0 to S_1) are of equal magnitude (size), quantity traded decreases (Q_e to Q_{e1}) but price levels do not change ($P_e = P_{e1}$). This is bought about by the fact the decrease in price caused by the demand decrease is equally offset by the price increase bought about by the decrease in supply.

Model Explanation:

Where the decrease in demand (D_0 to D_1) is less than the decrease in supply (S_0 to S_1) quantity traded decreases (Q_e to Q_{e1}) and price levels increase (P_e to P_{e1}). This is bought about by the fact the decrease in price caused by the demand decrease is less than the price increase bought about by the decrease in supply.



Model Explanation:

Where the decrease in demand (D_0 to D_1) is larger than the decrease in supply (S_0 to S_1) quantity traded decreases (Q_e to Q_{e1}) and price levels also decreases (P_e to P_{e1}). This is bought about by the fact the decrease in price caused by the demand decrease is greater than the price increase bought about by the decrease in supply.

Figure 3.3.27: Illustration of Impacts of Simultaneous Decreases in Demand and Supply.

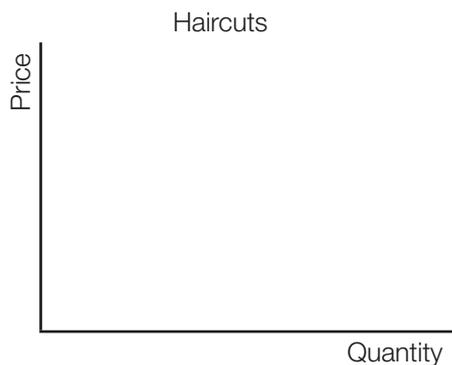
Exercise 3.1 Changes in Demand and Supply and Consumer and Producer Surplus

1. Use the demand and supply schedules in the table below to answer the following questions.

Men's Haircuts		
Price \$	Quantity Demanded (per day)	Quantity Supplied (per day)
110	20	320
90	70	270
70	120	220
50	170	170
30	220	120
10	270	70

- (a) State the equilibrium price.
- (b) State the quantity that will be traded at this price.

- (c) Sketch a demand and supply diagram that indicates the equilibrium position (identified in parts a and b) and shade the consumer and producer surplus on this diagram.



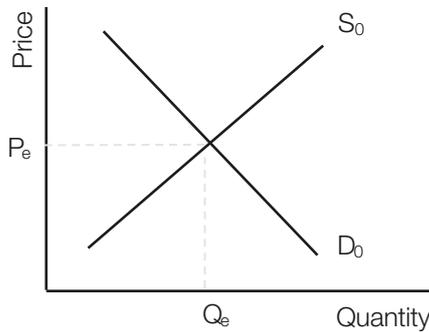
- (d) Outline the market outcome if prices were set at \$70.
- (e) Outline the impacts to consumer surplus and producer surplus if price is at \$70.
- (f) Explain how the price mechanism works to return the market to equilibrium if price was currently at \$70.
- (g) Outline the market outcome if prices were set at \$10.
- (h) Outline the impacts to consumer surplus and producer surplus if price is at \$10.
- (i) Explain how the price mechanism works to return the market to equilibrium if price was currently at \$10.

2. The following questions relate to the market for free-range eggs.

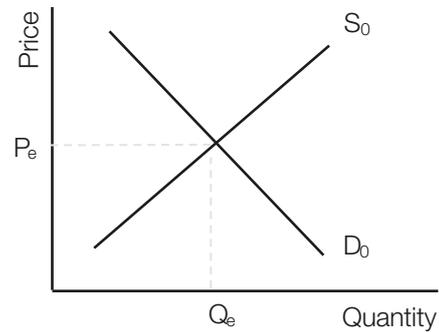
(a) Complete the following demand and supply models to show the impact of the event on the market.

- (i) Price of Transport rises due to diesel fuel price rise (ii) Many Bakeries reopen after closing for COVID-19

Free-Range Eggs

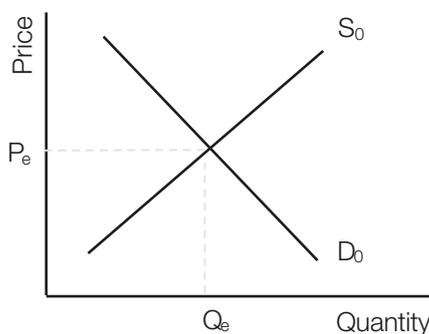


Free-Range Eggs



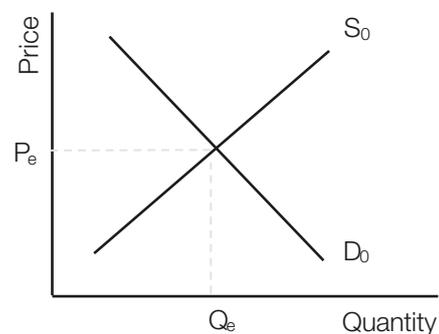
- (iii) Avian Flu outbreak causes culling of Chickens

Free-Range Eggs



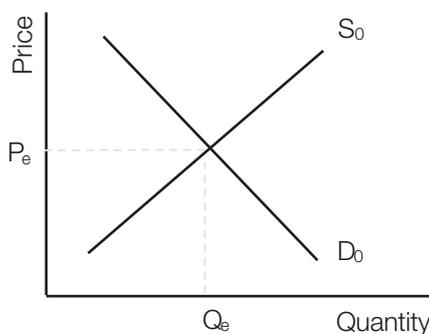
- (iv) Feed prices for chickens rise by 70%

Free-Range Eggs



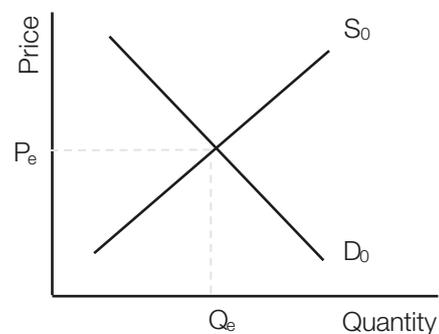
- (v) Other sources of protein have seen significant relative cost increases.

Free-Range Eggs



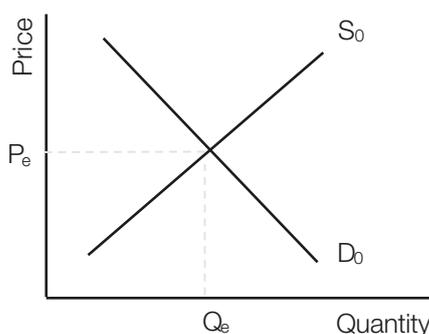
- (vi) Government Ban on cage farmed eggs

Free-Range Eggs



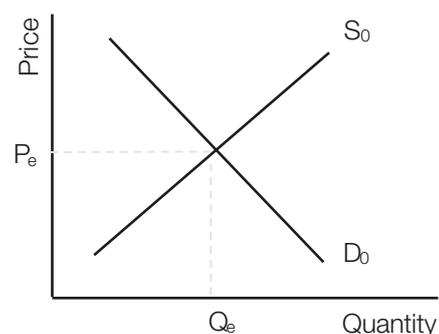
- (vii) Government to Subsidise Free Range Chicken Farmers

Free-Range Eggs



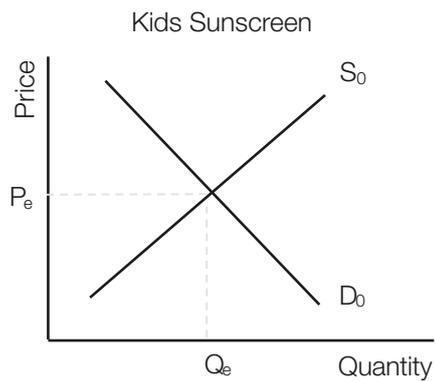
- (viii) Reports from CSIRO show egg consumption has minimal to no impact on cholesterol levels.

Free-Range Eggs

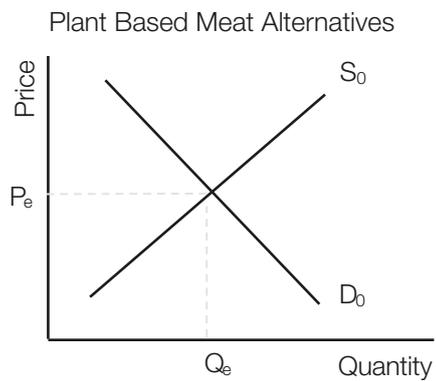


3. Given the news headline, illustrate and explain the likely change in the market for the identified product.

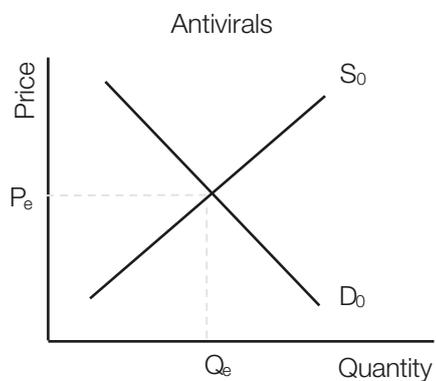
(i) Recall Issued for Popular kids



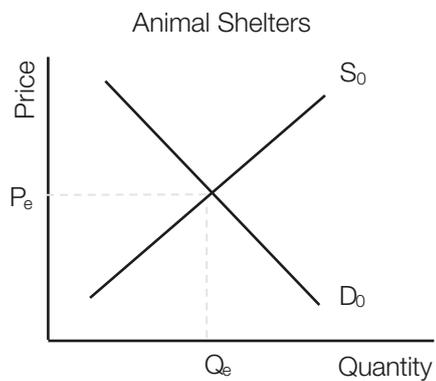
(ii) Population turning Vegan



(iii) As Flu surges Pharmacies run out of Antivirals

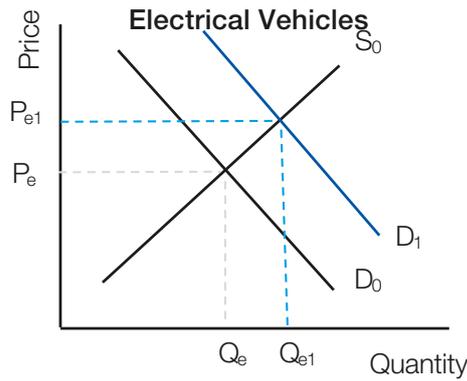


(iv) Animal Shelters see influx as tight rental markets force owners to give up pets

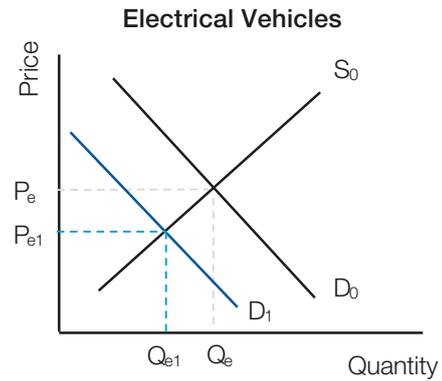


4. The following demand and supply diagrams represent the market for Electric Vehicles. Briefly describe what may have caused the change in each of the scenarios illustrated. Part (i) has been done for you.

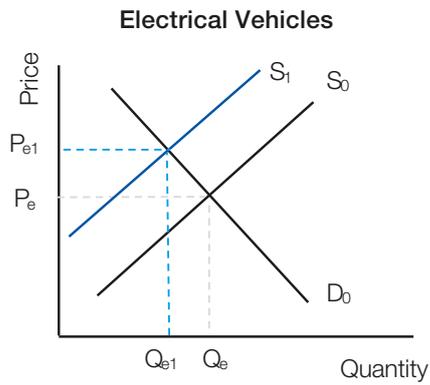
(i) Government Increases Petrol Taxes



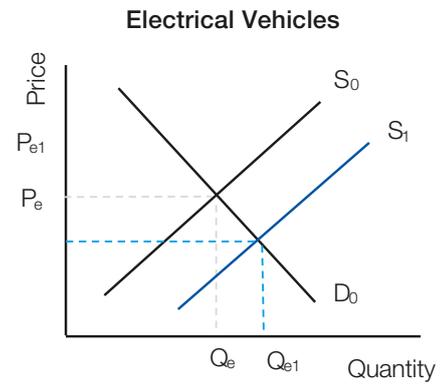
(ii)



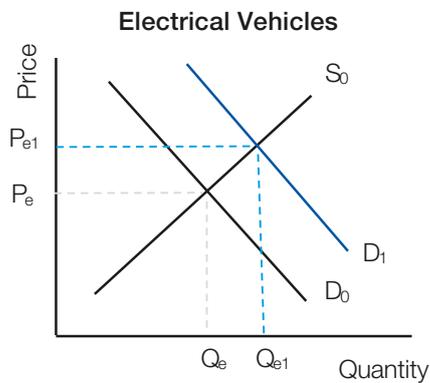
(iii)



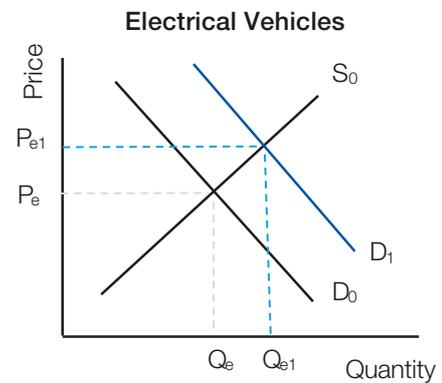
(iv)



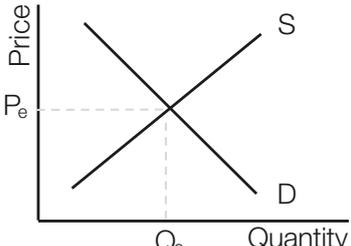
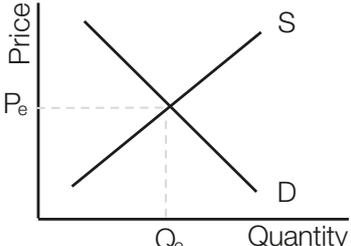
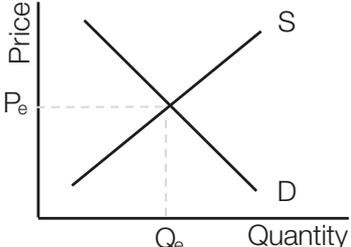
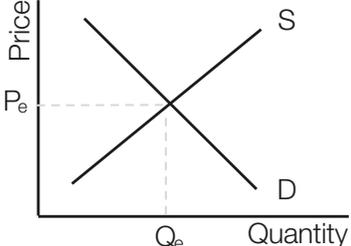
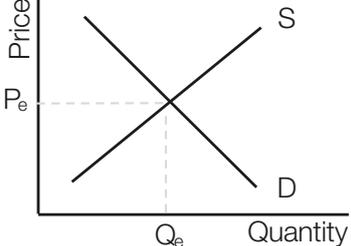
(v)



(vi)



5. The following information relates to the market for Flu Vaccinations. Illustrate and explain the impact of each event on the market.

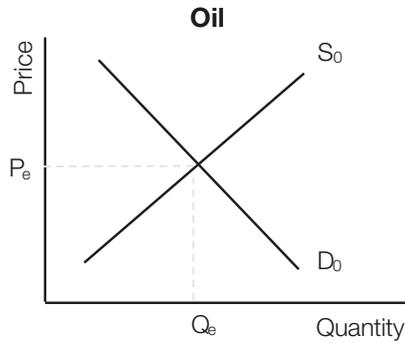
Event	Illustrated	Explanation
Flu season begins early	<p style="text-align: center;">Flu Vaccinations</p>  <p>The graph shows a downward-sloping demand curve (D) and an upward-sloping supply curve (S). The equilibrium price is P_e and the equilibrium quantity is Q_e.</p>	
Several deaths related to the flu are heavily publicised in the media	<p style="text-align: center;">Flu Vaccinations</p>  <p>The graph shows a downward-sloping demand curve (D) and an upward-sloping supply curve (S). The equilibrium price is P_e and the equilibrium quantity is Q_e.</p>	
Government regulations change to allow flu vaccines to be administered at pharmacies	<p style="text-align: center;">Flu Vaccinations</p>  <p>The graph shows a downward-sloping demand curve (D) and an upward-sloping supply curve (S). The equilibrium price is P_e and the equilibrium quantity is Q_e.</p>	
Adverse reactions to other vaccines cause concerns for consumers	<p style="text-align: center;">Flu Vaccinations</p>  <p>The graph shows a downward-sloping demand curve (D) and an upward-sloping supply curve (S). The equilibrium price is P_e and the equilibrium quantity is Q_e.</p>	
Shortage of hens eggs impacts vaccine production	<p style="text-align: center;">Flu Vaccinations</p>  <p>The graph shows a downward-sloping demand curve (D) and an upward-sloping supply curve (S). The equilibrium price is P_e and the equilibrium quantity is Q_e.</p>	

6. Outline how price adjusts to return a market to equilibrium if there is a shortage.

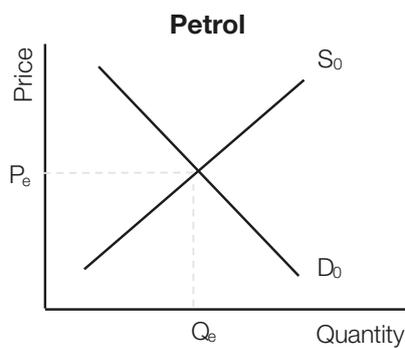
7. Refer to the extract to answer the following questions.

Global oil prices have surged due to a multitude of factors in the global economic landscape. Whilst energy consumption from major economies where oil is a contributor to energy generation, has begun to increase, supply disruptions have played a much more significant role in the market. Global conflict, production cuts, and natural disasters have all impacted oil extraction and transportation.

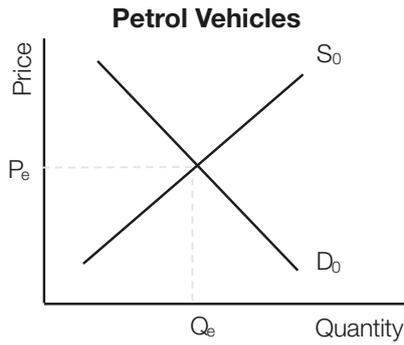
- (a) Use a demand and supply model to illustrate and assist in explaining the impact of the events identified in the extract on the market for Oil.



- (b) Explain and illustrate the impact identified in part (a) on the market for Petrol. (Note: Oil is used in Petrol production).



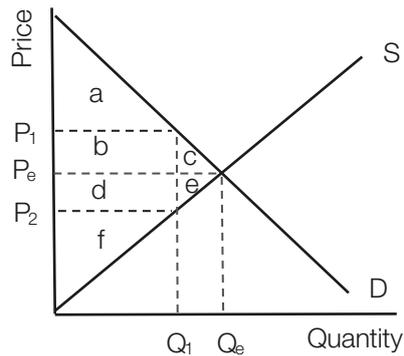
- (c) Explain and illustrate the impact of a change in Petrol Prices identified in part (b) on the market for Petrol Vehicles.



3

8. Refer to the following diagram to answer the questions that follow.

- (a) Identify the consumer and producer surplus at each price level.



Price Level	Consumer Surplus	Producer Surplus
P_1		
P_e		
P_2		

- (b) Using the information from part (a) to assist, explain at which price level allocative efficiency is attained.

3.4 Elasticity

Key Definition:

Elasticity a measure of the responsiveness of variable A to a change in variable B.

Elasticity in Economics is a measure of responsiveness of variable A to a change in variable B. Like the general use of the term ‘elastic’ the more responsive variable A is, the more elastic it is. This course deals with two types of elasticity; Price Elasticity of Demand and Price Elasticity of Supply. In each of these instances, elasticity is measuring how responsive quantity (demanded or supplied) is to a change in price.

Price Elasticity of Demand (PED)

Defining PED

Key Definition:

Price Elasticity of Demand a measure of the responsiveness of quantity demanded to a change in price.

Price Elasticity of Demand is defined as a measure of the responsiveness of quantity demanded to a change in price. Where quantity demanded is responsive and changes at a rate proportionately more than price, it is said to be price elastic. Alternately where quantity demand is less responsive and changes proportionately less than price, it is said to be price inelastic.

Whilst you do not need to calculate the PED coefficient in this course, understanding the formula and the values of the PED coefficient allows a better understanding of the notion of whether demand is price elastic or price inelastic.

The formula for the PED coefficient is represented as follows:

$$PED = \frac{\text{The percentage change in the quantity of a good demanded}}{\text{The percentage change in the price of a good}}$$

This can be abbreviated and represented in symbols as: (where Δ represents change)

$$\dots \frac{\% \Delta Qd}{\% \Delta P}$$

Using this formula as a base, we note that anytime the percentage change in demand is greater than the percentage change in price the value of the PED coefficient would be greater than 1. This shows that quantity demanded is responsive to price changes and thus is Price Elastic. The reverse of this, where the percentage change in quantity demanded is less than the percentage change in price results in the PED coefficient being less than 1, representing quantity demanded being less responsive to price changes and hence Price Inelastic.

The values of the PED coefficient and what they imply about the relative elasticity of demand are summarised in Figure 3.4.1. Note that due to the inverse relationship between price and quantity demanded the PED coefficient is always negative, as such we ignore the negative and use the absolute value. PED values exist between 0 being perfectly inelastic and an infinite value being Perfectly elastic.

We can visually represent these values by looking at the shape of the demand curve. It is however not possible to compare PED of differing demand curves unless they are on the same axis. In addition, as is explained later, the PED is not constant along the length of a demand curve, so in the following models in Figure 3.4.2 we are making generalisations about the overall elasticity of each demand curve.



Figure 3.4.1: The Meaning of PED Coefficients

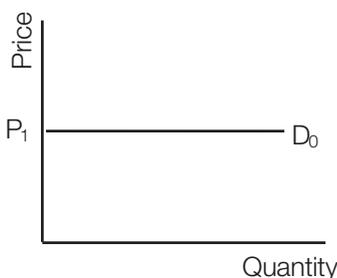


Figure 3.4.2: Perfectly Elastic Demand.

Model explanation:

Where the demand curve (D_0) is horizontal then the PED is Perfectly Elastic (Figure 3.4.2). This means any price change results in an infinite change in quantity demanded. In reality this is a theoretical extreme as the conditions necessary for it are essentially impossible to replicate.

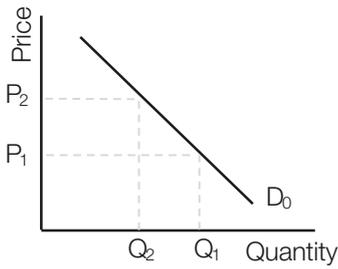


Figure 3.4.4: Unitary Elastic Demand.

Model explanation:
Where the demand curve (D_0) is vertical then the PED is Perfectly Inelastic meaning any price change results in no change in quantity demanded. This implies that no matter what the price the quantity demanded remains at Q_1 . This is also in reality a theoretical extreme as the conditions necessary for it are also highly improbable to be replicated.

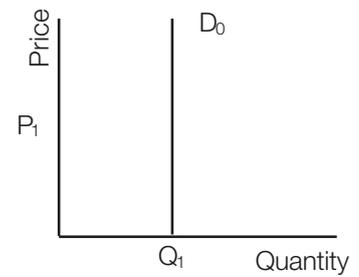


Figure 3.4.3: Perfectly Inelastic Demand.

Model explanation:
In this model, the demand curve (D_0) represents close to Unitary Elasticity where the percentage change in quantity demanded (Q_1 to Q_2) is equal to the percentage change in Price (P_1 to P_2).

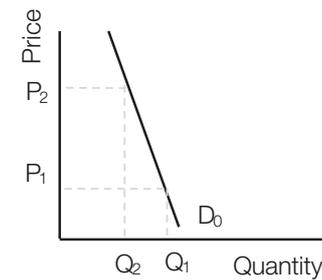


Figure 3.4.6: Relatively Inelastic Demand.

Model explanation:
In this model, the demand curve (D_0) is relatively price elastic where the percentage change in quantity demanded (Q_1 to Q_2) is greater than the percentage change in Price (P_1 to P_2).

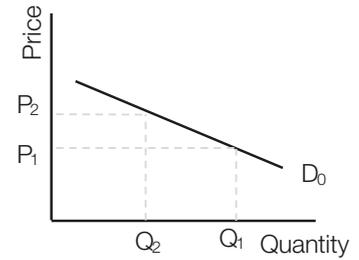


Figure 3.4.5: Relatively Elastic Demand.

Model Explanation:
In this model the demand curve (D_0) is relatively price inelastic where the percentage change in quantity demanded (Q_1 to Q_2) is greater than the percentage change in Price (P_1 to P_2).

PED and Total Revenue

One of the applications of PED for firms is that it enables them to determine the impact a price change will have on total revenue. Total revenue (TR) is calculated by multiplying quantity demanded by the selling price of the good ($TR = P \times Qd$). As there is an inverse relationship between price and quantity demanded, a change in price and the resulting change in quantity demanded will have an opposite impact on Total Revenue. For example, an increase in price will increase total revenue, but the decrease in quantity demanded will decrease total revenue. Thus, the impact on Total revenue is dependent on the PED and whether the percentage change in quantity demanded is larger or smaller than the percentage change in price.

Key Definition:
Total Revenue (TR) the amount of money received by a seller for selling goods to buyers. It is calculated by multiplying quantity demanded by the selling price of the good.
($TR = P \times Qd$).

The following table (Table 3.4.1) summarises these changes. Note the arrow size depicts the relative percentage change in each variable and the direction of the arrow shows whether the variable has increased or decreased.

Table 3.4.1: Relationship of PED and Total Revenue.

PED	Change in Price	Change in Quantity Demanded	Impact on Total Revenue	Explanation
Relatively Inelastic	↑	↓	↑	The increase in total revenue caused by the price increase is greater than the decreases total revenue caused by the decrease in quantity demanded.
Relatively Elastic	↑	↓	↓	The increase in total revenue caused by the price increase is less than the decreases total revenue caused by the decrease in quantity demanded.
Relatively Inelastic	↓	↑	↓	The decrease in total revenue caused by the price decrease is greater than the increases total revenue caused by the increase in quantity demanded.
Relatively Elastic	↓	↑	↑	The decrease in total revenue caused by the price decrease is less than the increase in total revenue caused by the increase in quantity demanded.

The conclusions that can be reached from the above table are twofold.

1. If there is a price inelastic demand curve raising price will increase total revenue.
2. If there is a price elastic demand curve, then lowering price will increase total revenue.

It is also clear that if we know what happens to total revenue after a price change, we can also determine what this implies about the overall PED. The table demonstrates that if total revenue is positively related to the price change, then PED is relatively inelastic. (For example, if an increase in Price increases total revenue, then $PED < 1$ or inelastic) On the other hand if there is an indirect relationship between Price and Total Revenue changes then the PED must be relatively elastic. (For example, if an increase in Price decreases total revenue, then $PED > 1$ or elastic)

The relationship between PED and total revenue can also be demonstrated with the use of a demand curve. Shown below are the impacts of a price increase on revenue for a) a price elastic demand curve and b) a price inelastic demand curve. These models support and reinforce the observations noted below.

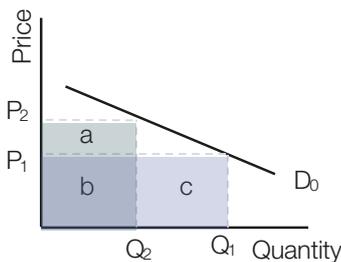
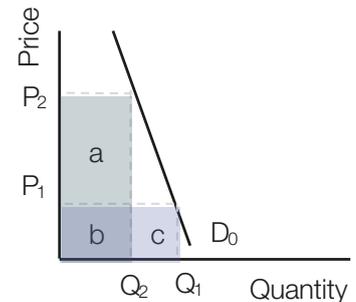


Figure 3.4.7: Relatively Elastic PED and Total Revenue.

Model explanation:

At price of P_1 the total revenue is equal to area $b+c$, ($TR = P_1 \times Q_1$). As price increases to P_2 total revenue becomes area $a+b$ ($TR = P_2 \times Q_2$). This represents a loss of revenue area c due to quantity demanded contracting from Q_1 to Q_2 , but a gain in revenue of area a as price increases from P_1 to P_2 . As area a is less than area c there is a net loss in revenue resulting from the price increase. This is the result of the change in quantity being proportionately larger than the change in price.

Figure 3.4.8: Relatively Inelastic PED and Total Revenue.



Model explanation:

At price of P_1 the total revenue is equal to area $b+c$, ($TR = P_1 \times Q_1$). As price increases to P_2 total revenue becomes area $a+b$ ($TR = P_2 \times Q_2$). This represents a loss of revenue area c due to quantity demanded contracting from Q_1 to Q_2 , but a gain in revenue of area a as price increases from P_1 to P_2 . As area a is greater than area c there is a net gain in revenue resulting from the price increase. This is the result of the change in quantity being proportionately larger than the change in price.



Degree of necessity

Factors Determining PED

There are four primary factors that influence the PED of a product. These include:

- Extent of Necessity (luxury or necessity, addictive or habitual)
- Portion of Income (relative cost)
- Number and Closeness of Substitutes
- Time.



Brand loyalty

Extent of Necessity

Extent of necessity refers to the degree to which a good will be purchased, irrespective of consumer income levels or price. Goods and services will fit on a continuum between necessity and luxury, with products that are essential, addictive or habit-forming or are branded, falling towards the end of necessity. Those goods that are classed as a necessity will have a relatively inelastic PED, whereas those that are luxuries will have a relatively elastic PED. The reasoning is simple, if the price of the good rises and it is a necessity, then consumers will continue to purchase this good, resulting in the change in price being larger than the change in quantity demanded and hence, inelastic.



Habitual demand

Percentage (Portion) of Income (Relative Cost)

This factor refers to price as a percentage (portion) of overall income, or the price relative to a buyer's income. Goods and services will fit on a continuum between low price and high price, with those being low priced representing a smaller percentage of income and high-priced goods a higher percentage of income. The lower the relative cost, the more price inelastic the demand of the good becomes. For example, if matches are 5 cents each and they rise by 20% to 6 cents, this will cause a decrease in quantity demanded of less than 20%, as a 1 cent increase in price is a very small percentage of income. Alternately a 20% increase in the price of a \$1 million dollar home is \$200,000 and as a percentage of income this is significant, resulting in a decrease in quantity demanded by more than 20%.



Percentage of income spent

Number and Closeness of Substitutes

As mentioned previously, substitute goods are goods that can be used to satisfy the same want; buyers see them as serving the same purpose. Product substitution was one of the reasons that accounted for the downward-sloping nature of the demand curve. Extending this understanding to PED, we can conclude that the more substitutes and the closer these are to one another, the more price elastic the PED of a product. This is the resultant effect of an increase in the price of product A, seeing consumers switch demand to product B. If there are no substitutes for a product, then the PED will be highly inelastic, as consumers have no choice but to continue to purchase the good or go without.



Availability of substitutes

Purchase Timeframe

The purchase timeframe is the amount of time the consumer has before buying the product. The longer the timeframe, the higher the PED (more elastic). One key factor that impacts this is whether the product is a replacement product or a new purchase, and for replacement products, the durability of the existing purchase. For durable existing products, the timeframe for purchase can be extended and as such, a price increase will see consumer demand fall by a proportionately greater amount as consumers can delay their purchase. Equally, the longer the timeframe becomes, the greater the number of substitutes and thus the higher the PED. Consider a petrol vehicle, if the price of petrol rises then in the short run, you cannot go without it as you cannot fill your car up with gas or diesel. However, in the longer-term you can switch, as you can convert your car's fuel type. The conclusion is that all products will have a higher PED in the long-run relative to the short-run.



Time frame when making a choice

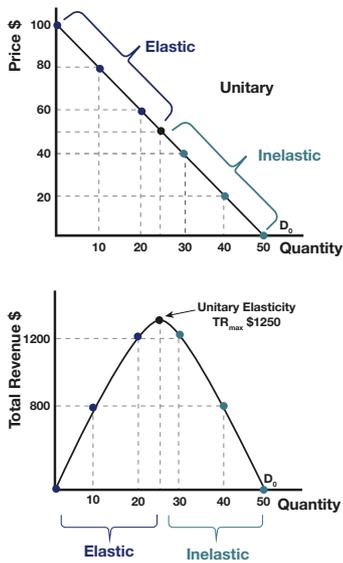
Changing PED along the length of a Demand Curve

It is important to note that the PED varies along the length of any demand curve that slopes downward to the right. Mathematically, the percentage change in a numerically sequenced set of numbers gets smaller as the numbers get larger. Conversely the percentage change in a sequence of numbers increases as the numbers become smaller. The inverse relationship that exists between price and quantity demanded results in the percentage change in one variable getting larger, whilst the percentage change in the other variable gets smaller; thus, the coefficient will not be constant along a curve's length. Consider the following simplistic example:

Table 3.4.2: PED Variances Along a Demand Curve.

Price \$	Percentage Change	Quantity Demanded	Percentage Change	PED Coefficient	Overall Elasticity
1	-	300			
2	100	250	16.6	0.16	Inelastic
3	50	200	20	0.4	Inelastic
4	33.3	150	25	0.75	Inelastic
5	25	100	50	2	Elastic
6	20	50	100	5	Elastic

What is clear is that as price increases (\$1 through to \$6), the percentage change in price becomes smaller with every price rise. However, as price rises the quantity demanded contracts (300 to 50) but the percentage change in quantity demanded gets larger. This results in the PED becoming larger as price increases. Understanding this is critical for firms because as mentioned previously, it allows them to determine the impact of price changes on total revenue. It is also apparent that a firm will maximise revenue when the PED unitary (a coefficient of 1). Consider the diagram below in Figure 3.4.9.



Model explanation:

At price of $P=\$50$ the demand curve displays unitary price elasticity, at all price levels above this the PED is >1 (elastic) meaning any price rise above 50 results in total revenue falling. For example, at a price of \$60 and quantity of 20 total revenue is \$1200, ($TR = 60 \times 20$) this is lower than total revenue at a price of \$50 where it was \$1250 ($TR = 50 \times 25$).

At all prices below \$50 the PED is <1 (inelastic) meaning any price fall below \$50 results in total revenue falling. For example, at a price of \$20 and quantity of 40 total revenue is \$800, ($TR = 20 \times 40$) this is lower than total revenue at a price of \$50 where it was \$1250 ($TR = 50 \times 25$).

The conclusion is that TR is maximized when $PED=1$ and that a firm aiming to maximise revenue will continue to raise price through the inelastic portion of the demand curve but will not raise price beyond unitary elasticity and operate in the elastic portion of the same curve.

Figure 3.4.9: PED and the impact on Total Revenue.

Exercise 3.2 Price Elasticity of Demand

1. Complete the table below by stating the likely Price Elasticity of Demand (PED) for the identified product and outline the main factor/s that determines the PED.

Product	PED	Factor/s Determining
Legal Services		
Coffee		
Haircuts		
Restaurant Meals		
Insulin		
Overseas Holiday		
Sugar		
Toothpicks		

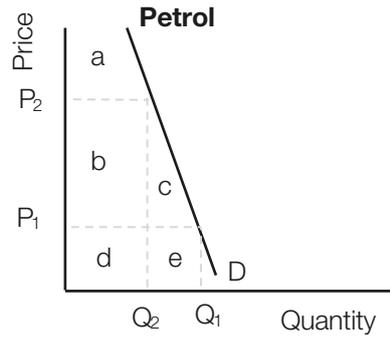
2. Refer to the estimates of the PED of petrol in the Short-run and Long-run when answering the following questions.

PED Petrol in Short run	0.11
PED Petrol Long-run	0.18

- (a) Compare and contrast the PED of petrol in the short run and long run.

- (b) Outline the determinants of PED that impact most significantly on Petrol.

- (c) Use the diagram below to assist in explaining the impact on total revenue of petrol prices rising from P_1 to P_2 .



3. Refer to the demand schedule below to answer the following questions.

Price (\$)	Quantity Demanded
10	1800
20	1600
30	1400
40	1200
50	1000
60	800
70	600
80	400

- (a) Use the total revenue method to justify the price elasticity of demand from \$30 to \$40.
- (b) Use the total revenue method to justify the price range where the PED is unitary.
- (c) Explain why the PED is not constant along the length of this demand curve.

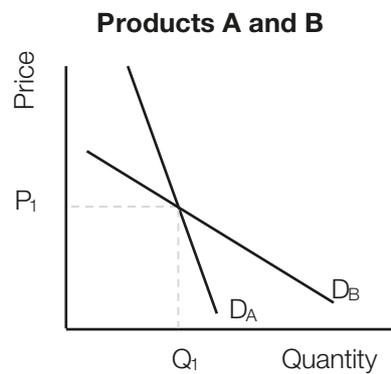
4. The following table shows the estimated PED of Food for 3 countries.

Year	PES
USA	0.17
Spain	0.39
Tanzania	0.78

- (a) Compare and contrast the PED coefficients for food for each of the three countries.

- (b) Referring to the characteristics that determine PED justify why the PED for food varies across the three countries.

5. The following model illustrates the demand curves for a branded product and a generic product in the same market.



- (a) Justify which of these two demand curves represents the branded product.

- (b) Explain referring to the concepts of PED and total revenue which of these two products will be sold at a price above P_1 .

6. The following table represents fictional PEDs related to cars.

Product	PED
Cars	0.39
SUV's	0.75
Subaru SUV's	1.93

- (a) State the meaning of the PED coefficients for cars and Subaru SUVs.

- (b) Explain why the PED coefficients for SUVs and Subaru SUVs vary.

Price Elasticity of Supply (PES)

Defining PES

Price Elasticity of Supply is defined as a measure of the responsiveness of quantity supplied to a change in price. Where quantity supplied is responsive and changes at a rate proportionately more than price, it is said to be price elastic. Alternately, where quantity supplied is less responsive and changes proportionately less than price, it is said to be price inelastic.

Whilst you do not need to calculate the PES coefficient in this course, understanding the formula and the values of the PES coefficient allows a better understanding of the notion of whether supply is price elastic or price inelastic.

The formula for the PES coefficient is represented as follows:

$$\text{PES} = \frac{\text{The percentage change in the quantity of a good supplied}}{\text{The percentage change in the price of a good}}$$

This can be abbreviated and represented in symbols as: (where Δ represents change)

$$\frac{\% \Delta Q_s}{\% \Delta P}$$

The PES coefficient values have the same meaning as those of PED, so where the percentage change in quantity supplied is greater than the percentage change in price the coefficient will be greater than 1, representing a relatively elastic PES.

The value of the PES coefficient and what it implies about the relative elasticity of supply are summarized in Figure 3.4.10. Note that due to the positive relationship between price and quantity supplied, the PES coefficient is always positive and is constant along the length of the supply curve. PES values exist between 0 being perfectly inelastic and an infinite value being perfectly elastic.

We can visually represent these values by looking at the shape of the supply curve and unlike PED, we can compare the PES of supply curves on differing axes. Any supply curve that runs through the origin will have unitary price elasticity, any curve running through the price axis will be relatively price elastic and any curve that crosses the quantity axis will be price inelastic. These are illustrated in Figures 3.4.11 to 3.4.15 below.

Key Definition:

Price Elasticity of Supply
the responsiveness of quantity supplied to a change in price.

0	Perfectly Inelastic
<1	Relatively Inelastic
=1	Unitary Elasticity
>1	Relatively Elastic
∞	Perfectly Elastic

Figure 3.4.10: The Meaning of PES Coefficients.

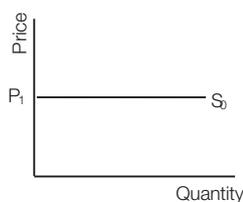


Figure 3.4.11:
Perfectly Elastic
Supply.

Model explanation:
Where the supply curve (S_0) is horizontal then the PES is Perfectly Elastic. This means any price change results in an infinite change in quantity supplied.

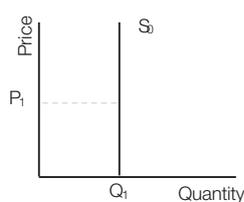


Figure 3.4.12: Perfectly
Inelastic Supply.

Model explanation:
Where the supply curve (S_0) is vertical then the PES is Perfectly Inelastic meaning any price change results in no change in quantity supplied. This implies that no matter what the price the quantity supplied remains at Q_1 .

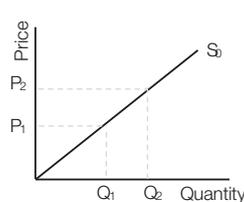


Figure 3.4.13:
Unitary Elastic
Supply.

Model explanation:
In this model the supply curve (S_0) runs through the origin and thus the PES is Unitary, where the percentage change in quantity supplied (Q_1 to Q_2) is equal to the percentage change in Price (P_1 to P_2).

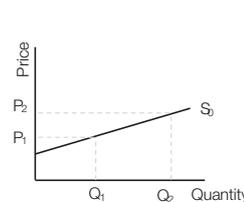


Figure 3.4.14:
Relatively Elastic
Supply.

Model explanation:
In this model the supply curve (S_0) intersects the price axis and therefore the PES is relatively elastic, where the percentage change in quantity supplied (Q_1 to Q_2) is greater than the percentage change in Price (P_1 to P_2).

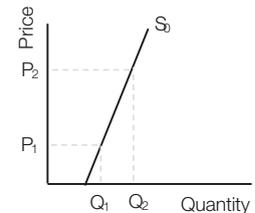


Figure 3.4.15:
Relatively Inelastic
Supply.

Model explanation:
In this model the supply curve (S_0) intersects the quantity axis and therefore the PES is relatively inelastic, where the percentage change in quantity supplied (Q_1 to Q_2) is greater than the percentage change in Price (P_1 to P_2).

Factors Determining PES

There are five primary factors that influence the PES of a product. These include:

- Time frame
- Length of production cycle
- Mobility of resources
- Unused capacity (Availability of resources)
- Ability to store stock.

Time Frame

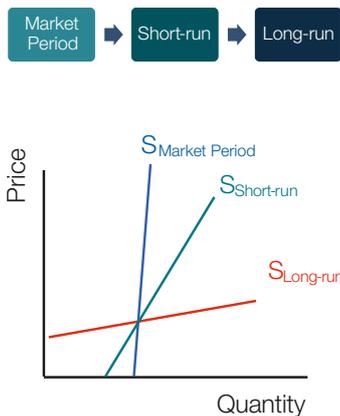


Figure 3.4.16:

Microeconomic Time Frames.

Three timeframes are readily identifiable in microeconomics, and the variability of resources distinguishes them. The timeframes are the Market Period, sometimes referred to as the immediate period, the short-run, and the long-run. In the market period, all resources are fixed and thus cannot be altered to increase supply. In the short-run, at least one resource is fixed, often land or capital so output can increase by adding variable resources, but there is still a limit to increasing supply due to the fixed resource. In the long-run all resources are variable and thus supply can be altered more easily by producers. All products have these timeframes but the length of these will vary considerably.

In the example of wheat production, once the crops are planted, we are in the short-run period where the fixed land resource limits the crop size. However, fertilisers, water and pesticides can all be used to increase crop size. Once harvested, we are in the market period and all resources are fixed, and the crop size cannot be altered. In the long-run, however, land can be transferred into wheat production, thus increasing the potential size of the next crop.

The implication for PES is that the longer the timeframe, the more price elastic supply becomes. This links closely to two other determinants of PES: length of production cycle and mobility of resources.

Mobility of Resources

Mobility refers to the ease at which resources can be transferred between geographical locations or between productive activities. Where resources are mobile, then the PES of products becomes more elastic, whereas a lack of resource mobility it creates products with relatively price-inelastic supply. The mobility of resources often impacts the length of time that exists between the short-run and the long-run.

Length of Production Cycle



Short Production Cycles

The production cycle is the length of time taken to process raw materials into finished products. The longer the production cycle, the more price inelastic supply becomes. This is because whilst firms would like to supply more of a product as price rises the time taken to produce the product limits this capacity. For agricultural goods, the production cycle can be quite long (often 12 months) so the PES of these products tends to be relatively inelastic. On the other hand, some manufactured goods can be produced within minutes; thus, the PES of these tends to be relatively elastic.

Unused Capacity – Resource Availability



Spare Capacity

Excess capacity occurs when a firm produces at an output level below what the firm's existing resource base is designed to produce. Where excess capacity exists, firms can easily scale up operations and increase production and thus supply, making the product's PES more elastic. However, where there is no excess capacity, a firm's output is already maximised and thus, they cannot increase supply in the short-run.

Linked closely to this factor is resource availability. Where resources are not accessible, then there is a fixed capacity to increase supply, and the product's supply curve will be price inelastic. This is also the case for products that have been produced historically and can-not be reproduced in the present, for example, rare coins, paintings or stamps; the supply of these products will be perfectly price inelastic.

Ability to Store Stock

The ability to store stock is defined as the capacity to withhold already produced products from sale. The extent to which this can be achieved is dependent on whether a product is perishable and, thus the length of its shelf-life or the rate of obsolescence of a product. For products that can be stored, the PES of the product increases (it becomes more price elastic). This is because the producer can increase or decrease stock levels in response to price changes. Products that cannot be stored leave the producer with little alternative than to sell the product regardless of the price level. In addition, these producers cannot use previously stored stock to increase supply if prices were to rise, resulting in a relatively inelastic PES.



Storage of Stock

3

Exercise 3.3 Price Elasticity of Supply

- Complete the table below by stating the likely Price Elasticity of Supply (PES) for the identified product and outline the main factor/s that determines the PES.

Product	PES	Factor/s Determining
Nuclear Reactors		
Dental Services		
Limited Edition Coins		
Uber Services		
Fidget Spinners		

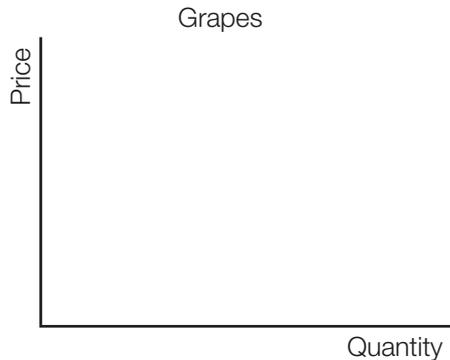
- Refer to the estimates of the PES of Grapes in the Short-run and Long-run when answering the following questions.

PES Grapes in Short run	0.432
PES Grapes Long-run	1.045

- Compare and contrast the PES of Grapes in the short run and long run.

(b) Outline the determinant of PES that causes the change identified in the table.

(c) Illustrate on the following model the Supply Curves for Grapes in the Short-run and Grapes in the Long run.



3. The following table shows fictional changes in the PES of Wine for 3 consecutive years.

Year	PES
1	0.8
2	1.2
3	0.9

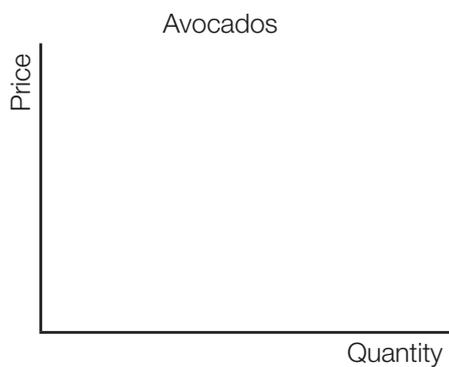
(a) State the meaning of the PES coefficients of years 1 and 2.

(b) Referring to the determinants of PES, explain how and why the PES coefficients for wine can vary from year 2 and 3.

4. Refer to the extract when answering the following questions.

Avocados are unusual compared to other fruits such as peaches as they do not ripen on the tree, they only ripen once they are picked. This allows growers to delay harvest to gain potentially higher prices. However, once picked avocados generally ripen quickly over a 3 day to 2-week period. Unlike other fruits like apple, Avocados can-not be stored in refrigerated conditions to delay ripening they simply become mushy unripened wastage. Whilst the length of time for ripening cannot easily be slowed, it can be increased, by altering the ripening conditions including placing them in paper bags next to bananas. The main harvest season for Hass avocados (the main variety) in the Southern Hemisphere is September to April.

- (a) Outline how the unusual ripening characteristic of avocados is likely to alter the PES compared to other fruits such as peaches in the market period.
- (b) Explain how the likely PES of Hass avocados will vary between the time periods September to April and May to August.
- (c) Compare and contrast the PES of apples and avocados once fruits have been picked.
- (d) Use an appropriate demand and supply model for avocados to assist in explaining why changes (increases or decreases) in demand will have significant impacts on avocado prices.



Topic 4: Microeconomics – Market Structures

Learning Outcomes based on the SACE Economics Teaching and Learning Framework

- Students develop an understanding of different market structures and how the market structure influences the behaviour of consumers and producers.
- Students explore the features of:
 - monopolies
 - oligopolies
 - monopolistic competition
 - perfect competition.
- Students analyse how market structures meet the needs of consumers and producers, using criteria such as price, choice, quality, efficiency, and the use of new technology.
- Students develop an understanding of the duopoly market structure through a basic study of game theory.
- Students solve simple 2×2 games.
- Students explore and understand the concepts of payoff, preferences, and Nash equilibrium.

4.1 Defining Market Structures

Key Definition:

Market Structure a classification of a market based on the different characteristics that determine the relationship between and amongst buyers and sellers.

Up until this point, we have assumed markets were always perfectly competitive. That is, they were markets where a large number of individual sellers and buyers existed, and as such, no one seller or buyer could exert influence over the market. These markets, therefore, attained allocative efficiency. The reality of markets is that they are rarely, if ever, perfectly competitive. Instead, markets fit along a continuum of competitiveness and can be classified into four differing structures. These four broad market structures are: Perfect Competition, Monopolistic Competition, Oligopoly, and Monopoly.

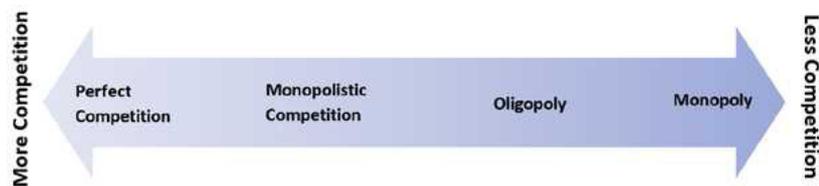


Figure 4.1.1: Market Structures on a Continuum of Competition.

A market structure is simply a classification of a market based on the different characteristics that determine the relationships between and amongst buyers and sellers. Many characteristics can distinguish market structures, but ultimately, the classification reflects the extent and nature of competition within the market. The following characteristics are widely used when characterising or classifying a market:



Figure 4.1.2: Defining Characteristics of Market Structures.

- The number of sellers (firms) and buyers in the market
- The size of the sellers in the market (market share and market concentration)
- The degree of product differentiation in the market
- The presence of significant barriers to entry into and out of the market
- The influence or control the seller has over the price of their products
- The knowledge possessed by participants (buyers and sellers) in the market
- The nature of marketing used by sellers (price versus non-price competition)
- The level of profit able to be generated in the long-run.

These characteristics are more broadly explained in Table 4.1.1.

Table 4.1.1: Characteristics of Market Structures.

Characteristic	Described
Number of Firms	The number of firms can be a simple measure of the count of firms in a market. However, it is important to consider the market concentration ratio , which is widely regarded as a measure of the competitiveness between firms in the market. Investopedia defines it as follows “The concentration ratio is calculated as the sum of the market share held by the largest specified number of firms in an industry”. (Note market share is the volume of sales of a firm divided by the volume of sales for all firms in the market multiplied by 100). The number of specified firms refers to the number of firms that the concentration ratio is measuring, for example, a two-firm concentration ratio refers to the combined market share percentage of the two largest firms, whereas a four-firm concentration ratio relates to the market share percentage of the largest 4 firms. A concentration ratio can range from 0% to 100%, where a four-firm concentration ratio is less than 40% the markets are considered competitive whereas above 60% the market is uncompetitive.
Size of Firms	The size of firms has many potential measures including revenue generation, profit generation, capital value, and number of employees. It is important however to remember that the size of firms is relative to the market size and as such, the most used measure tends to be market share . Market share is a measure of one firm’s sales expressed as a percentage of total market sales. The larger the market share the larger the size of the firm in that market.
Extent of Product Differentiation	Product differentiation is a process used by firms to make their product or service appear different to competitors. In most cases it involves introducing distinctive features to a product that ensures a unique selling point (USP). Product differentiation enables firms to create a competitive advantage and results in the PED of their product becoming more inelastic. In the absence of product differentiation in a market, products are homogeneous (identical). However, this is almost an impossibility, as virtually all known products or services will have unique differences between the firms producing them. Differentiation can be real, where there are clearly identifiable quality differences between products, or perceived where firms are able to convince consumers of differences that do not really exist. Branding is often considered to be an example of perceived differentiation.
Market Power Influence Over Price	Influence over price is often referred to as market power and is the extent to which an individual firm can manipulate (control) its price through altering supply, demand, or both. Firms who have market power can control prices and therefore their profit margins, these firms are referred to as “price makers”. At the other end of the spectrum are firms who have no influence over price, and these are referred to as “price takers”.

Key Definition:

Market Concentration Ratio the sum of the market share percentages held by the largest specified number of firms in an industry. Investopedia

Characteristic	Described
<p>Barriers to Entry</p>	<p>Barriers to entry represent factors that impede or restrict other firms from entering a market (or industry). Barriers to entry restrict the emergence of competition through the imposition of costs that new entrants must incur before being able to sell their products. There are many barriers that can exist that prevent new entrants, but they can be broadly classified into three areas, Natural, Artificial, and Government. Natural barriers are the structural barriers that occur in the set-up of a market, Artificial barriers are the strategic barriers created by existing firms, whilst Government barriers are the legal requirements imposed by government. Some of the more common barriers to entry include:</p> <p>Natural - Large Set Up Costs (capital requirements), Economies of Scale, Monopoly Power in supply chains (including distribution channels)</p> <p>Artificial - Legal Protections such as copyrights, patents, trademarks, Brand Loyalty (through product differentiation), Predatory Pricing Strategies, Switching Costs,</p> <p>Government - Tax benefits to existing firms, Licences for production or sale.</p> <p>Whilst being able to classify these barriers is not important it is critical to understand how their existence impedes new firms from entering a market.</p>
<p>Knowledge and Information</p>	<p>Knowledge or information refers to the extent to which participants in the market have complete and up-to-date information about products and prices in a market. This can range from perfect information through to asymmetric information. The importance of perfect information is in the notion that a participant in the market can only make a truly rational choice when they have all information. Therefore, in markets where perfect information does not exist, (asymmetric information) rational choices may not be made, and allocative efficiency is unlikely to exist.</p>
<p>Level of Profit</p>	<p>Accounting profit is calculated by subtracting expenses from revenues, however, in economics the term profit differs from this as it subtracts both explicit costs (expenses) and implicit costs (the opportunity costs of engaging resources in the current business) from revenue. Whilst the distinction between accounting and economic profit is not a part of this course, it is important to understand that when we use the term profit, we are viewing it from the economic perspective. The two levels of profit achieved by a firm are a normal profit or an economic profit (abnormal profit). To simplify the meaning, we are going to use the term normal profit to refer to a level of profit sufficient to keep a firm in that line of business. This means the firm can cover its total costs and remain competitive in a market. Its profit level is equal to both explicit and implicit costs. With a normal profit a firm has a profit level that discourages it from transferring resources to an alternative market, industry, or investment. An economic profit or abnormal profit on the other hand, occurs where the return to the firm is above the normal profit. In the absence of barriers to entry any economic profit would attract new firms to the market as they would benefit from higher profits than they are getting on the current use of resources.</p>

Key Definition:

Implicit Costs the cost of resources already owned by the firm that could have been put to some other use.

Characteristic	Described
Nature of Marketing	The extent and nature of Marketing will also vary across structures. Widely accepted to consist of the four Ps of Product, Price, Place, and Promotion, marketing is broadly the activities or processes, that create, communicate, and deliver goods or services of value to customers. It's about getting the right product, at the right price, in the right place, at the right time. The capacity to engage in marketing beyond pricing (especially the promotional element) is often dependent on the profits generated by firms, this results in the major distinction across market structures being the use of either price or non-price methods of competition . Note that as profits vary across market structures so too will the extent and nature of marketing.

4.2 Types of Market Structures

Perfect Competition

The Oxford dictionary defines Perfect competition as “a structure prevailing in a market in which buyers and sellers are so numerous and well informed that all elements of monopoly are absent, and the market price of a commodity is beyond the control of individual buyers and sellers.” As the definition notes, Perfect Competition is characterised by a market where there are a large number of small firms, none of whom have any market power and all of whom are selling homogeneous products. In addition, there is perfect information for all participants and no entry or exit barriers, it is a market where market forces entirely determine its operations.

Perfect Competition is, however, a purely theoretical construct and cannot exist in the real world. It is often the characteristic of homogenous products that precludes a market from being perfectly competitive, it is also challenging to find markets where perfect information is present. There are markets, however, that get close to being perfectly competitive, with the most common examples being found in agricultural production. However, even in these markets, the quality of the product will vary between producers and consumers may not be fully informed about the product.

Perfect competition is the most competitive of all market structures and because the products are identical between firms and perfect information exists, consumers in this market can buy at the lowest price and with consistent quality. Individual producers are unable to influence price as any attempt to raise price would see consumers switch to an alternative firm selling an identical product at a lower price. Equally, selling at a lower price would create economic losses for the firm and force the firm out of the market. This means firms are “price takers” and must accept the prevailing price in the market. The individual firm is faced with a perfectly elastic demand curve reflecting their complete lack of market power.

Number of Firms	• Many
Size of Firms	• Small
Extent of differentiation	• No differentiation - Homogeneous products
Market Power - Influence over Price	• No influence - Price Takers
Barriers to Entry	• No barriers
Knowledge and Information	• Perfect Information
Level of Profit	• Normal Profit only
Nature of Marketing	• Price competition



Orange Production is close to Perfectly Competitive

Figure 4.2.1: Defining Characteristics of Perfect Competition.

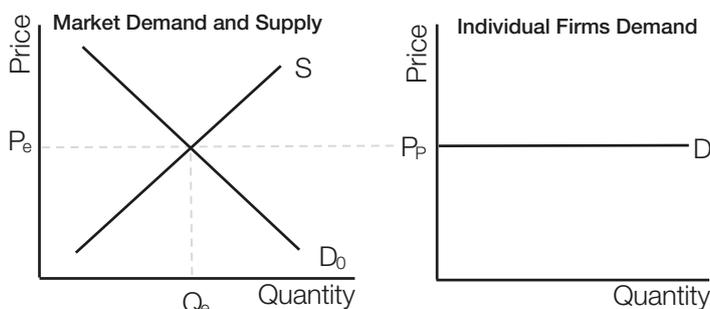


Figure 4.2.3: The Demand Curve of an Individual Firm in Perfect Competition.

Model explanation:

Due to the characteristics that define a perfectly competitive market, individual firms are unable to exert any influence over price and must accept the price that is determined in the market. Each individual firm is faced with a perfectly price elastic demand curve due to the existence of many identical product substitutes available to consumers.

Not only does the individual firm have no control over price, but even when prices rise in the market allowing them to experience higher individual prices and therefore make potentially higher profits, the absence of barriers to entry will simply allow new firms to enter the market increasing supply and returning profits to a normal level. Firms will therefore only ever make normal profits in perfectly competitive markets. (See Figure 4.2.4)

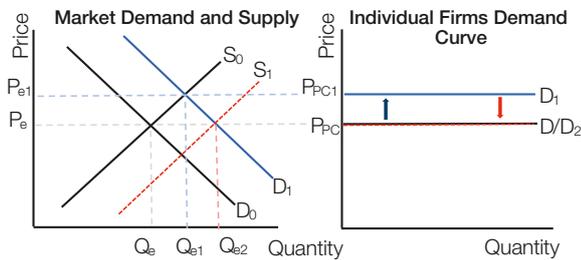


Figure 4.2.4: Normal Profits in the Long-run.

Model explanation:

At the original market equilibrium of P_e , the individual firms demand curve is D , at the price P_{PC} . The individual firm like all others in the market is generating only a normal profit. However, as the market demand increases D_0 to D_1 the equilibrium price rises to P_{e1} , and the individual firms demand curve shifts upwards to the new price at P_{PC1} . This allows firms to sell at a higher price and generate short-term economic profit. However, these profit levels, in the absence of any barriers to entry will attract new firms to the market, increasing supply to S_1 and returning the equilibrium price to P_e . For the individual firm, this will see their demand curve shift back to D_2 at a Price P_{PC} and thus only achieve normal profit.

The ability to generate only normal profits is a restrictive element for marketing, as firms do not have the financial capacity to undertake advertising. Equally, no one firm would be inclined to advertise, as the identical nature of products would see them advertising for competitors. The competitors, who would not be bearing any costs for advertising, would now make larger profits, whilst the firm advertising would make economic losses. Individual firms therefore do not advertise in this market structure and any advertising that is done would be by an industry body or the government on behalf of all firms.

- Number of Firms**
 - Many
- Size of Firms**
 - Small
- Extent of differentiation**
 - Some differentiation - close substitute products
- Market Power - influence over Price**
 - Limited Influence - Price Maker
- Barriers to Entry**
 - Few barriers
- Knowledge and Information**
 - Imperfect Information
- Level of Profit**
 - Economic Profit Short-run, Normal Profit Long-run
- Nature of Marketing**
 - Price competition and Non-price competition

Figure 4.2.5: Defining Characteristics of Monopolistic Competition.

Monopolistic Competition

The Oxford dictionary defines Monopolistic competition as “a market for a particular product or service in which there are many competing sellers offering a similar but not-identical good.” This market structure is very common, particularly in service industries and as the definition notes, Monopolistic Competition is characterised by a market where there are many small firms who are selling slightly differentiated products. This means that this structure is an example of imperfect competition and as its name suggests, it combines elements of a monopoly with elements of competition. The unique element or elements of an individual firm’s product provides the firm with some market power and represents a barrier to entry for other firms. However, beyond this differentiation, there are minimal barriers to entry, meaning that in the long-run economic profits cannot be made. This is because the absence of barriers to entry allows new firms to enter the market attracted by these high profits. These characteristics mean that the individual seller is faced with a downward-sloping demand curve, but one that is relatively price elastic due to the existence of close substitutes.

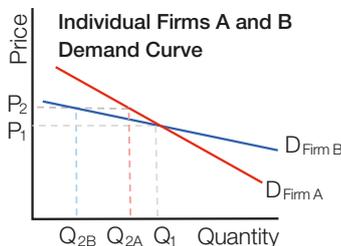


Figure 4.2.6: The Demand Curve of Individual Firms in Monopolistic Competition.

Model explanation:

Due to product differentiation the individual firms demand curve becomes less price elastic. Firms gain some market power, so a price increase from P_1 to P_2 does not lose the firm all market sales, quantity demanded falls from Q_1 to Q_2 . The more effective a firm is at differentiating its product (in this instance Firm A) the less price elastic their demand curve becomes, and the more market power they have (the decrease in quantity to Q_{2A} is less than Q_{2B}). However close substitutes will always remain and as such the overall PED will remain relatively elastic.

As firms have differentiated products there are quality differences within the market and consumers gain through increased choice. However, quality differences may only be perceived, or they may not be clearly apparent, and consumers may end up acting irrationally in their purchases due to the absence of information. Firms will engage in non-price competition, but the existence of normal profits, in the long run, restricts the financial capacity of firms to market and innovate heavily. What innovation is done will be immediately implemented and, in some cases, adopted quickly by competitors. Firms will compete on price, quality, and marketing and it is critical that firms continue to appeal to their target market. The more successful firms are at innovating, the more price inelastic their demand

curve becomes providing them with increased market power. Firms will be both productively and allocatively inefficient in this market. Advertising and innovation often duplicate processes being undertaken by other firms, resulting in resource wastage. In addition, firms tend to operate with excess capacity, and as firms are price makers, they will set prices at a higher point than a perfectly competitive firm would do. This results in an allocative inefficiency, with an underproduction of the good from what would be socially optimal. Each firm has a low market share; therefore, no one firm can influence the overall product price. There is a very low concentration ratio, and each firm operates and makes decisions independently and without considering the actions of other firms.



Figure 4.2.7: Hairdressing in Australia is Monopolistically Competitive.

Oligopoly

The OECD defines an Oligopoly as “a market which is dominated by a small number of suppliers.” As Oligopolies are characterised by a market where a few large firms dominate market share, many countries use the concentration ratio of the four largest firms (the four-firm concentration ratio) as a defining characteristic. Australian government research within the last decade points to oligopolies existing when the four-firm concentration ratio is greater than one-third. As a rule of thumb, 40% is often used as a guiding figure, meaning if the combined market shares of the 4 largest firms exceed 40% an oligopoly market structure exists. Putting this into perspective, in Australia, banking, supermarkets, newspapers, domestic airlines, health insurance, department stores, internet providers, baby food, and beer all have four firm concentration ratios exceeding 80%. Whilst not as highly concentrated, the following industries have ratios close to two-thirds (66%): petrol, cinemas, liquor, telecommunications, bottled water, and fruit juice. If 40% is used as an indicator of an Oligopoly, this would make over half of Australia’s industries Oligopolistic in nature.

Whilst Oligopolies may be identified by their concentration ratio, they also can be defined by other unique features they display. Oligopolies are an example of imperfect competition, but unlike monopolistically competitive markets, individual firms in Oligopolies cannot act independently. The size of competitors means individual firms must take the likely actions of other firms into consideration. This means they display interdependent behaviour or mutual interdependence, where the output, pricing and non-price competition decisions of each firm impact the pricing and output decisions of their competitors. This behaviour adds significant complexity to predicting decision-making and there are many theories and models of oligopolistic decision making. The behaviour of a single firm is likely to vary depending on the behaviour of competitors. If there is a price war, an individual firm is likely to act like they are in a competitive market and lower price in response to competitors. During other periods of time, firms may act more like a pure monopoly with minimal price competition. This uncertainty can be perhaps best explained and represented in a kinked demand curve theory shown in Figure 4.2.10.



Figure 4.2.8: Defining Characteristics of Oligopolies.



Banking in Australia is Oligopolistic

Figure 4.2.9: Internet Provision in Australia is Oligopolistic.

Model explanation:
 Due to the existence of mutual interdependence in an Oligopoly, individual firms will take the likely actions of competitors into consideration. If a single firm (Firm A) was to raise price to P_2 , then it is likely other firms will maintain their prices at P_1 and gain market share from firm A. This will result in a loss of revenue for firm A, as the price increase would see a proportionately larger demand fall (Q_1 to Q_2). The individual firm is therefore faced with a relatively price elastic demand curve above P_1 . Alternately if firm A lowered price to P_3 , then it would be likely that other firms would follow this behaviour and lower their prices. This would also see a loss of revenue to firm A, as the price decrease results in a proportionately smaller increase in quantity demanded (Q_1 to Q_3). The individual firm is faced with a relatively price inelastic demand curve below P_1 . Based on this explanation no individual firm is incentivised to alter prices, raising price sees a loss of market share and falling revenue and lowering price is matched by competitors resulting in little gain in market share and again falling revenue.

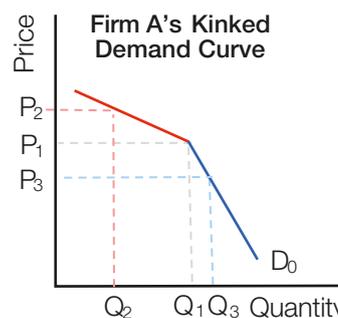


Figure 4.2.10: The Demand Curve of Individual Firm in an Oligopoly.

Mutual Interdependence is a commonly accepted behaviour in Oligopolistic markets, but it does make predicting behaviour in these markets very complex. There are many theories of behaviour but, if we accept the above model as explaining Oligopoly behaviour, we should expect relatively stable prices to exist. Whilst there may be brief spells of competitive pricing behaviour, no firm benefits

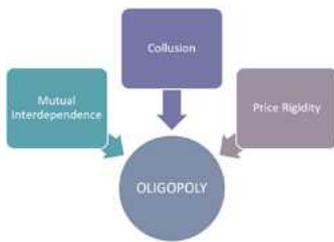


Figure 4.2.11: Unique Features of Oligopolies.

Key Definition:

Collusion an agreement between firms to cooperate in pricing, output, or non-price competitive decisions.

Key Definition:

Cartel an organisation of independent producers who agree to cooperate to manipulate supply and or prices to increase profits for all.

from a price war over an extended period as it results in lower revenue for all firms. Nor do individual firms benefit from raising prices, so it is likely that price rigidity is the longer-term outcome, adding to the likelihood of price rigidity is the emergence of collusive behaviour in Oligopolies. Collusion is an agreement between firms to cooperate in pricing, output, or non-price competitive decisions. Overt collusion is illegal in most countries and represents a formal and explicit cooperation between firms to limit competition. Price-fixing or cartel formation are examples of overt collusion. However, collusion can also be tacit (or silent) where there is no formal agreement, but rather it occurs because of repeated interactions between firms, which creates an informal acceptance or agreement. Price leadership is an example of tacit collusion, occurring where a dominant firm establishes pricing and price changes. Collusive behaviour is unique to oligopolies as it requires both the existence of a few large firms with market power and barriers to entry to protect the monopoly behaviour that collusion creates. Whilst collusion is illegal, it is also very difficult to prove and still occurs in many markets.

Collusion reduces the uncertainty in behaviour that would otherwise exist for firms within Oligopolies and whilst it allows individual firms to increase their profit levels it more importantly, reduces the potential for revenue fluctuations. In extreme cases, collusion can create a monopoly (where firms form a cartel) with all firms acting without competition. This increases the economic profits already experienced by firms, but is at the detriment of consumers, who face higher prices and less output than under competitive conditions.

Economic profits allow firms to spend money on innovation, which is generally necessary, as firms often compete on product differentiation and quality. Differentiation from innovation also acts as a barrier to entry, as new entrants must spend large sums of money on replicating product quality. As existing firms spend large sums of money on product innovation, they protect this investment with legal patents, further restricting competitors from replicating their products. Non-price competition of which product innovation is an example, is present in many Oligopolistic markets. Advertising and branding are heavily used to inform, persuade, and remind customers of an individual firm's products. Advertising provides information for consumers and enhances rational choice by reducing any information asymmetry. However, where money and resources are spent on reminder and persuasive advertising, this can often be to the detriment of efficiency as it results in duplication and resource wastage.

Branding is critical in most Oligopoly markets as brand recognition creates a further barrier to entry. Potential entrants must attract customers who may be heavily connected to existing brands. Firms will also spend money on maintaining this branding. Registering trademarks, for example, not only allows further brand recognition but also precludes competitors from using them in marketing.

Another barrier to entry present in Oligopoly markets is the existence of Economies of Scale, which means firms' average total costs fall as output rises. The large-scale production present in most Oligopolies means that these firms are producing at very low average costs, making it difficult for other firms to enter the market and compete on price. Whilst economies of scale can reduce potential competition in Oligopolies, a firm's lower production costs may benefit consumers in the form of lower retail prices, particularly in non-collusive Oligopolies.

Key Definition:

Economies of Scale cost advantages gained by a firm as a result of being able to increase output.

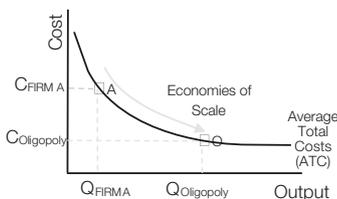


Figure 4.2.12: Economies of Scale in an Oligopoly.

Model explanation:

Firms in an Oligopoly can produce large output volumes, point O and quantity $Q_{Oligopoly}$. This large output allows them to attain economies of scale as their long-run average total costs fall to $C_{Oligopoly}$. Firms, such as Firm A, who wish to enter the market and compete are often unable to produce at this output volume and instead have a lower volume at $Q_{Firm A}$ this causes them to experience higher average total costs at $C_{Firm A}$. It is now very difficult for Firm A to compete as the Oligopolist could sell the product at a price below the cost of producing it for Firm A, this would result in losses for Firm A and therefore an inability to enter the market.

Monopoly

A Monopoly is a market in which only one seller is offering a unique product or service. This market structure rarely exists in its pure form, as most markets have more than one seller. Due to the absence of competition, a Monopoly has complete market power and thus control over price. This means that a Monopoly can generate economic profits in the long run by charging higher prices than what would occur with competition. In addition, consumers will be further disadvantaged by a lower quantity traded. This market will be both allocatively and productively inefficient, an underproduction of the good or service will occur, and resource wastage is likely. It is also common in the absence of competition for the quality of the product to decline. Although Monopolists have the profits to spend on research and development and improve quality, the absence of competitors reduces the incentive to do so. Despite this, the threat for some Monopolies of the potential emergence of products that may supersede theirs can encourage the Monopoly to innovate to reduce the potential threat of new entrants.

The threat of new entrants for a Monopoly is, in most cases rare, as significant barriers to entry exist. Like Oligopolies, Monopolies can achieve economies of scale and have significant legal barriers preventing the use of research and trademarks. Monopolies also have the potential to engage in predatory pricing, which, whilst illegal, is difficult to prove and, therefore, continues to act as a deterrent to any new competitor. In the absence of competition, firms do not engage heavily in advertising and marketing. However, doing so can establish strong brand recognition via building awareness and stronger customer relations, creating a further barrier to entry into the market. The uniqueness of the product and the lack of any real substitutes mean that the individual seller is faced with a relatively price-inelastic demand curve. As a Monopoly is a single firm, the individual firm's demand curve is also the market demand curve.

Model explanation:

Due to being the only supplier in the market with a unique product, a Monopolist has no substitutes, therefore the demand curve will be relatively price inelastic. The firm is a price maker and is able to raise price (P_1 to P_2) without losing significant sales (Q_1 to Q_2). A Monopoly can therefore make economic profits and the existence of significant barriers to entry allows them to do so in the long run also.

It is rare for a Monopoly to exist, as legislation often exists to prevent their emergence. Large economic profits can encourage firms from other industries to diversify into these markets. Firms that diversify into these markets are already large, so can overcome the economic barriers that prevent smaller entrants. Government policies of privatisation and deregulation have also made many former monopolies more competitive.

There are, however, some markets that are best served by a Monopoly. These are referred to as Natural Monopolies, where efficiency is best attained by a singular firm. In these cases, there are normally high fixed costs like large-scale infrastructure and so economies of scale are needed to allow the product or service to be sold at an affordable price. These economies of scale can only be achieved if there is a single firm, as two or more firms would need to split market share and, therefore, produce at a lower output and thus higher average costs. Natural Monopolies tend to be highly regulated by the government or alternately owned by the government. Common examples exist in essential services such as utilities and include electricity supply, railways, water supply and gas supply. In these markets, opening them up to competition would result in significant resource wastage in duplicating the existing infrastructure. It is, therefore, more common for governments to regulate and 'open the infrastructure up' to allow the existing infrastructure to be rented and used by competitors.

Key Point:

Note that in this course the focus is on market structures classified from the perspective of the seller's side of the market. Market structures can however also be classified according to the buyer's side of the market and where this occurs you may hear terms such as oligopsony, monopsony to reflect situations where there are only a few large buyers or in the case of a monopsony one buyer.

Number of Firms	• One
Size of Firms	• Large
Extent of differentiation	• Unique Singular Product
Market Power - influence over Price	• Total - Price Maker
Barriers to Entry	• High barriers
Knowledge and Information	• Asymmetric Information
Level of Profit	• Economic Profit
Nature of Marketing	• Possible Non-price Competition

Figure 4.2.13: Defining Characteristics of a Monopoly.



Figure 4.2.14: Railways in Poland are a Monopoly.

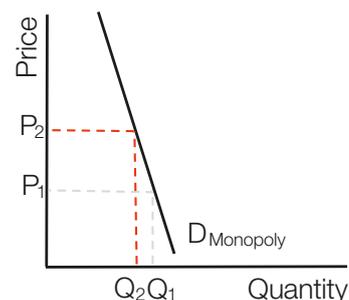


Figure 4.2.15: The Demand Curve of a Monopoly



Figure 4.2.16: Standard Letter Delivery in Australia is a Monopoly.

4.3 Evaluating Market Structures

Market structures meet the needs of consumers and producers to varying degrees. The competing needs of these two groups were summarised in Figure 3.2.1 in an earlier chapter. In a simplified situation, consumers who want to maximise utility prefer more competitive markets, whilst producers who want to maximise profit prefer imperfectly competitive markets where market power exists. This would suggest that perfect competition would be most beneficial for consumers whereas a Monopoly would best serve a producer. This simplification holds true for the producer, but some elements desired by consumers are more effectively achieved in other market structures. The extent to which the needs of consumers and producers are met in each market structure are summarised in Tables 4.3.1 and 4.3.2.

Table 4.3.1: How Market Structures Meet the Needs of Consumers.

Consumer Needs	Perfect Competition	Monopolistic Competition	Oligopoly	Monopoly
Competition	High Competition. The existence of homogeneous products and large number of competitors results in no market power for individual firms.	High Competition. There is a degree of product differentiation which firms some market power. Firms will compete on price and non-price factors.	Varying Levels of Competition. Firms are likely to compete primarily through non-price competition as price wars are detrimental for all firms. Extensive branding and product quality and development are usually common. Collusion is possible which has the potential to reduce competition between firms particularly if illegal cartels form.	No Competition. Only one firm and the existence of considerable barriers to entry allows Monopolies to be price makers.
Lowest Prices	Lowest Prices. Any attempt to raise price by a firm results in loss of complete market share as consumers can switch to identical cheaper substitutes.	Low Prices. Firms who successfully differentiate their products can charge higher prices leading to some variation in prices across firms, but this is still limited by the existence of close substitutes.	Higher prices and probable price rigidity. Firms can charge higher prices to reflect the quality of products allowing for price variation between firms. The potential for collusion may result in higher prices.	High Prices. Prices are at levels that maximise profits. There is little incentive for firms to lower price unless it is regulated by government.
Highest Quality and Innovation	Standardised Quality. There will be a consistent level of quality across all firms any reduction in quality for a firm would result in complete loss of market share. Firms have minimal financial capacity to spend on quality improvements.	Range of Quality. Quality variations will exist as firms are able to successfully differentiate their products. This will mean some increase in product quality. Firms are still financially constrained by normal profits so cannot invest substantially in innovation.	High Quality. Firms tend to compete on quality and range of products. This results in some of the highest quality and innovative products of all market structure. Firms also have the financial capacity to be innovative.	Unique quality. There is only one seller so unless there is a threat of new entrants there is a lack of incentive to provide a quality product or service.

Consumer Needs	Perfect Competition	Monopolistic Competition	Oligopoly	Monopoly
Choice	Choice of Seller. There are a large range of suppliers, so consumers have significant choice from whom to buy. However, products are homogeneous, so no choice of products exist.	High Choice. There is both product and supplier choice in these markets. The large number of small firms gives choice in who to buy from and as products are differentiated there is also choice in product quality and function.	Significant Product Choice. Whilst there are only a few large firms dominating the market, other smaller firms may still exist providing choice of supplier. High innovation levels also adds to product choice with individual firms often having multiple products in the same range.	No Choice. One supplier creates no choice of seller and product choice will be limited to what the producer is willing to produce.
Efficiency	Allocative and Productive Efficiency. Results in the lowest prices for Consumers	Neither Productive nor Allocative efficiency achieved. Firms need to spend money on non-price competition, and this often replicates practices done by competitors resulting in resource wastage.	Neither Productive nor Allocative efficiency are achieved. Market power results in a higher price which means less output than is socially optimal.	Neither Productive nor Allocative efficiency are achieved. The absence of competition reduces the motivation to produce at the lowest per unit cost as inefficiencies can be passed on to consumers as higher prices without impacting profits.

Table 4.3.2: How Market Structures Meet the Needs of Producers.

Producer Needs	Perfect Competition	Monopolistic Competition	Oligopoly	Monopoly
Market Power and Limited Competition	No Market Power - High Competition. The existence of homogeneous products and large number of competitors results in no influence over price. Firms must accept the market price; they are price takers.	Limited Market Power - High Competition. There is a degree of product differentiation which allows some influence over price. However, large number of close substitutes exist, limiting market power. Firms are price makers.	High Market Power - Non-Price Competition. The size of firms and the existence of barriers to entry allows firms control over price. Firms are price makers, although mutual interdependence and the potential for collusion complicates price influence. Non-price competition is often prevalent as firms compete on branding and product quality, success in this allows greater market power.	Complete Market Power - No Competition. Only one firm and the existence of considerable barriers to entry allows Monopolies to be price makers. They can set output at a level that maximises profits. The absence of competitors means that Monopolies will only engage in non-price competitive practices if it increases market sales or adds to creating a barrier to competition.

Producer Needs	Perfect Competition	Monopolistic Competition	Oligopoly	Monopoly
Highest Prices	Lowest Prices - High Competition. Any attempt to raise price results in loss of complete market share as consumers switch to identical cheaper substitutes.	Low Prices but variation in prices across firms. Firms who successfully differentiate their products can charge higher prices, but this is still limited by the existence of close substitutes.	Higher prices and probable price rigidity. Firms can charge higher prices to reflect the quality of products allowing for price variation between firms. Firms tend not to compete on price as price wars reduce profit levels. The potential for collusion may also result in higher prices.	High Prices. Prices are at levels that maximise profits this will be at a higher price than competitive market conditions. There is little incentive for firms to lower price unless it is regulated by government.
Barriers to Entry	No Barriers to Entry. Perfect information and no Economies of Scale allows new firms to enter market at low to no cost.	Minimal Barriers. Firms can enter the market if they can differentiate their product to gain market share. Almost perfect information allows firms to replicate existing advancements in competitor products.	Significant barriers to entry. Economies of scale, high set up costs, legal restrictions and even trade secrets (recipes and ingredients) act to prevent new entrants.	Significant barriers to entry. Economies of scale, high set up costs, legal restrictions and even trade secrets (recipes and ingredients) act to prevent new entrants.
Efficiency	Allocative and Productive Efficiency. Firms cannot benefit from this in terms of increased profits due to small scale production.	Neither Productive nor Allocative efficiency achieved. Firms need to spend money on non-price competition, and this often replicates practices done by competitors resulting in resource wastage.	Neither Productive nor Allocative efficiency are achieved. Firms tend to spend large amounts of money on non-price competition, and this often replicates practices done by competitors resulting in resource wastage. Market power results in a higher price which means less output than is socially optimal. The existence of economies of scale allows firms to lower per unit costs which adds to productive efficiency and therefore profits.	Neither Productive nor Allocative efficiency are achieved. Firms can achieve economies of scale and potentially lower costs to a minimum; however, the absence of competition reduces the motivation to produce at the lowest per unit cost as inefficiencies can be passed on to consumers as higher prices without impacting profits. Natural Monopolies can be more productively efficient than other market structures as they attain the scale of production necessary to cover large, fixed costs.

Producer Needs	Perfect Competition	Monopolistic Competition	Oligopoly	Monopoly
Innovation	Innovation only from industry body or government. Innovation benefits all producers so no one firm can increase profits from this. Absence of economic profits prevents individual firms from engaging in innovation, perfect information would allow any benefits gained to be replicated by all other firms.	Some innovation occurs but a lack of long run economic profits inhibits firms from engaging in this significantly. Any advancements that increase product quality are quickly implemented, but these advancements tend to be minor adjustments rather than significant improvements in quality or function.	High Innovation. Firms due to the existence of competitors and economic profits have both the capacity and incentive to engage in product innovation. Firms who are not able to continually adapt to changes in consumer preferences will fall out of the market. Product innovation acts to prevent new firms from entering the market, but also increases market share by attracting new customers to the market or away from competitors.	Limited Innovation. Firms have the capacity to spend on innovation as they generate large economic profits, however, there is minimal incentive to do this. As there are no competitors to decrease market share Monopolies who spend money on product innovation are likely to increase costs without adding sales resulting in profit declining. Innovation will however still occur. Monopolies will be keen to protect their Monopoly status by adding to barriers and in some instances, innovation can increase the size of the market.
Economic Profits	Only Normal Profits. Any economic profits attract new entrants which lowers the market price and prevents individual firms from attaining economic profits in the long run.	Economic profits can be attained in the short run however, the lack of barriers allow new entrants which will increase the number of competitors. Increases in competitors will decrease the demand for each firm and increase the overall price elasticity of demand. This means only normal profit in the long run.	Economic Profits in both short and long runs. Firms will need to continually innovate to maintain market share which will impact on the level of scale of profits. The existing barriers to entry will prevent new competitors and in cases where firms collude even larger economic profits can be attained.	Economic Profits in both short and long runs. Complete market power allows firms to maximise profit and the presence of large barriers to entry prevents other firms from competing to reduce these levels. Economies of scale allow the Monopoly to lower costs of production potentially adding to profit margins.

As is indicated in Table 4.3.1 (highlighted in blue), the individual needs of the consumer are not best met by any one market structure. Whilst Perfect competition will provide consumers with the lowest prices, efficiency and a standardised quality product, consumers have less choice of products in these markets. Oligopolies have the ability to innovate and improve the quality of products and product choice exists in monopolistic competition. The conclusion is that whilst competitive markets are highly beneficial to consumers, product innovation and quality improvements will not exist in these markets.

For producers, Table 4.3.2 clearly indicates (highlighted in red) that a Monopoly provides the most desirable outcomes. The absence of any competition and with high barriers to entry, a Monopolist has complete market power and the capacity to maximise profits.

Exercises 4.1 Market Structures

1. Referring to the characteristics that define market structures, complete the following table by stating and justifying the market structure that exists in each of the following markets.

Market	Market Structure	Justification – Defining Characteristics
Banking		
Doctors (GP's)		
Public Transport		
Supermarkets		
Pizza Shops		

2. Referring to the extract, answer the following questions.

Airports in most cities in Australia tend to be Monopolies. They also tend to be heavily regulated by government especially in terms of pricing.

(a) Explain why Airports are likely to be Monopolies in most cities in Australia.

(b) Using a model of a demand curve to assist, explain why the Government needs to regulate (control) prices for Airports in Australian cities.



(c) Discuss the extent to which Airport Monopolies in Australian cities meet the needs of producers.

3. Referring to the extract, answer the following questions.

The smartphone market in the USA can be divided into three distinct markets, handset manufacturers, operating systems, and service providers. Each of these markets vary in terms of the firms operating within them yet have similar overall market structures, Handsets are dominated by Apple, Samsung, LG, and Motorola who between them account for an estimated 85% of market sales. In terms of operating systems two systems Google's Android and Apples iOS combine for over 95% of all systems used, whilst for service providers AT&T Mobility, Verizon Wireless, T-Mobile US, and Sprint Corporation combine for over 70%.

(a) State the dominant market structure present in all three markets.

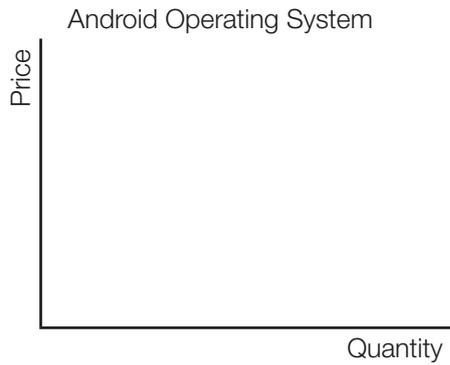
(b) Outline the characteristic that best explains this classification.

(c) Referring to the market for service providers explain what other characteristics are likely to exist that would confirm the market structure identified in part a).

(d) Assess whether there will be significant price competition in the handset market.

(e) Assess whether the handset market is likely to meet the needs of consumers.

(f) Illustrate and explain the nature of the demand curve for Google’s android operating system.



4. The following table shows the market structure for retailers of soft drinks in three locations.

Location	Market Structure	Actual Location
1	Monopoly	
2	Oligopoly	
3	Monopolistic Competition	

- (a) The three locations above are, a Zoo, a Food Court, and Service Stations on a busy corner. Complete the table above by identifying which location correctly matches the market structure.
- (b) Explain why the market structure for retailers of soft drinks can vary by location.

(c) Explain why consumers may prefer to have a Monopolistic market over the other two alternatives.

5. Referring to the extract, answer the following questions.

The Chicken/Egg Problem with Google Search That Prevents Competition

BY FILIPPO LANCIERI

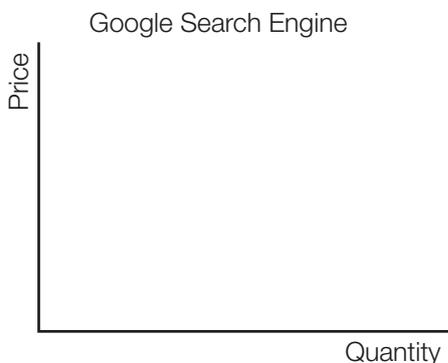
February 12, 2020

Google controls the British search market, according to the UK's Competition and Markets Authority. Its 90 percent market share and profits from general search are protected by significant barriers to entry and expansion: economies of scale and scope, access to a large scale of query and click data and payments to Apple to have Google as the default search engine in its smartphones.

Source: <https://www.promarket.org/2020/02/12/the-chicken-egg-problem-with-google-search-that-prevents-competition/>

(a) Justify the likely market structure of the UK search market.

(b) Given your answer to part a) illustrate the demand curve faced by Google in the UK search market.



(c) Explain how the nature of the demand curve illustrated in part b) provides Google with Market power.

(d) Explain how economies of scale allow Google to maintain market power.

- (e) Assess the impact that this market structure may have on innovation.

Real World Considerations: Fruit Markets are Rarely Perfectly Competitive

Adapted Extract from:

Why don't Indian fruit sellers make it big despite good profits? Imperfect competition, says study.

NIKHIL RAMPAL

30 August, 2022 12:06 pm IS

Source: **The Print**

<https://theprint.in/economy/why-dont-indian-fruit-sellers-make-it-big-despite-good-profits-imperfect-competition-says-study/1106895/>

A survey of over a thousand vendors across multiple locations has identified some key characteristics of the fruit market in Delhi.

Sellers charge a premium of about 21%, there is huge competition among sellers, with a fruit vendor likely to find about three to four competitors within a radius of 25 metres. On average, a fruit seller attends to 15 customers an hour, with evenings and mornings generally being the busiest times, but the top 5 per cent of fruit vendors can attend to up to 42 customers an hour. There is also a high degree of product differentiation among fruit sellers, even given the number of sellers in a 25-meter radius it is likely only one of these will sell the same fruit.

What was most “puzzling” though, was that vendors have the capacity to serve more customers, the leeway to lower their prices to grab more market share from their neighbours, and to also the capacity to stock a greater variety of products. Yet, they do not try these methods to maximise their profits.

Some possible explanations for this included: inelastic customer demand due to factors like “loyalty” to particular vendors, a lack of knowledge/capacity/funds on the part of vendors to diversify their products (despite knowing this to be profitable), “Explicit or implicit” collusion between vendors or inertial business practices arising from a number of behavioural factors.

To understand why these markets do not exhibit ‘perfect competition’, where sellers cannot charge a premium for long, an experiment in the vegetable markets of Kolkata, the capital of West Bengal was conducted. The major conclusion reached was that risk aversions was a key factor that inhibited individuals from undertaking expansion.

“The ease of colluding and/or inertial business practices may be reasons why interventions aimed at making markets more competitive have had at best limited success so far,”

Discussion Points

Why is Perfect Competition a theoretical concept only?

Why can a firm in perfect competition only make normal profits?

Why is the Fruit Market not considered Perfectly Competitive?

How does the demand curve for an individual firm in the fruit market vary from one in perfect competition?

Why does brand loyalty act as a barrier to entry?

What market structure is most likely to collude and why?

Given the information what market structure does the fruit vendor market best represent?

4.4 Behaviours of Duopolies

The market behaviour of Oligopolies can be further analysed by focusing on the behaviour of Duopolies. A duopoly is a type of oligopoly where two firms have dominant or exclusive control over the market. A pure duopoly exists if there are only two firms, however, most economists accept a two-firm concentration ratio of 70% as reflective of a duopoly. The two firms in a Duopoly maintain the features of an oligopoly, but the following characteristics tend to be enhanced.

- Chance of Collusion
- Interdependence
- Non-Price Competition.

The origins of one of the more accepted theories explaining Duopoly behaviour emerged in the 1950s when Merrill Flood and Melvin Dresher, working for the RAND Corporation, began investigations into game theory and its potential applications to strategic interaction and particularly global nuclear strategy. Game theory is defined by the Oxford dictionary (2023) as *“the branch of mathematics concerned with the analysis of strategies for dealing with competitive situations where the outcome of a participant’s choice of action depends critically on the actions of other participant”* The Encyclopedia Britannica defines it as a *“branch of applied mathematics that provides tools for analysing situations in which parties, called players, make decisions that are interdependent.”* The key element of these definitions is that it is a study of interdependent decisions.

Albert Tucker was to later build on the work of Flood and Dresher in creating what is now known as the “prisoner’s dilemma”. Much of his work pertains to the presentation of the ‘Social Dilemma’ and the clash between individual rationality (maximising personal utility) and collective rationality (maximising collective utility). These dilemmas have been represented as a 2 by 2 matrix game that displays relative payoffs for each individual. This element of game theory forms the basis of the rest of this chapter, which will focus on applying game theory and simple 2 by 2 player games modelled primarily on the prisoner’s dilemma to explain the behaviour of Duopolies.

The Prisoner’s Dilemma

The Prisoner’s Dilemma sees two individuals choosing between furthering their own interests or furthering the collective interests. It has traditionally been viewed as choice between defecting and cooperating, but its expansion to business has seen it applied to areas such as pricing, marketing, expansion, and product choice.

An adapted version of the prisoner’s dilemma is described well in the following extract from the Stanford Encyclopedia of Philosophy (2023):

Prisoner’s Dilemma

First published Thu Sep 4, 1997; substantive revision Tue Apr 2, 2019

Tanya and Cinque have been arrested for robbing the Hibernia Savings Bank and placed in separate isolation cells. Both care much more about their personal freedom than about the welfare of their accomplice. A clever prosecutor makes the following offer to each: “You may choose to confess or remain silent. If you confess and your accomplice remains silent, I will drop all charges against you and use your testimony to ensure that your accomplice does serious time. Likewise, if your accomplice confesses while you remain silent, they will go free while you do the time. If you both confess, I get two convictions, but I’ll see to it that you both get early parole. If you both remain silent, I’ll have to settle for token sentences on firearms possession charges. If you wish to confess, you must leave a note with the jailer before my return tomorrow morning.”

What this scenario illustrates is the ‘dilemma’ that the two individuals face; each is individually better off confessing than remaining silent, but the outcome that is achieved if both confesses is worse than if they both remain silent. This is perhaps easier to visualise when illustrated as a payoff matrix.



The Global Aeroplane market is a duopoly.



The US Softdrink market is a duopoly.

		Prisoner B	
		Confess	Remain Silent
Prisoner A	Confess	5 Years, 5 Years	0 Years, 25 Years
	Remain Silent	25 Years, 0 Years	1 Year, 1 Year

Figure 4.4.1 The Prisoner's Dilemma.

Model explanation:

Prisoner A has two options confess or remain silent. If Prisoner A confesses, they either receive 5 years in jail, (if Prisoner B confesses) or 0 years (if Prisoner B remains silent). Alternately Prisoner A could remain silent, in this case they either get 25 years in jail (if Prisoner B confesses) or 1 year (if Prisoner B remains silent). The reality for Prisoner A is that if Prisoner B confesses, they are better off confessing (5 years versus 25 years) and if Prisoner B remains silent, they are also better off confessing (0 years versus 1 year). Prisoner A will therefore confess assuming they act in rational self-interest. Prisoner B faces the same scenario as Prisoner A, if Prisoner A was to confess Prisoner B will confess (5 years versus 25 years) and if Prisoner A was to remain silent Prisoner B will confess (0 years versus 1 year). Prisoner B acting in rational self-interest will also confess. If both prisoners follow this behaviour, then the outcome will be both confessing and they receive 5 years in jail each.

The above example indicates that when both individuals act in rational self-interest, they end up with an inferior outcome than if they had acted contrary to rational self-interest (5 years each verse 1 year each).

		Firm B	
		i	ii
Firm A	i	5, 5	3, 7
	ii	6, 4	4, 6

Constant Sum Game –

Total Sum of Payoff is always equal (10).

		Firm B	
		i	ii
Firm A	i	17, 20	7, 23
	ii	19, 11	10, 14

Variable Sum Game –

Total Payoff sums vary dependant on choices

Figure 4.4.2: Constant sum verse Variable sum games.

Game Theory and Pay-Off Matrices

Applying game theory and the principles of the Prisoner's Dilemma allows economists to study the actions of businesses in several situations. The analysis of 2 by 2 games emphasises the likely behaviours of participants based on the payoff matrices provided. In game theory, the 'games' can be classified according to certain significant features, these include:

- The number of players (2 player games are the focus of this course)
- The extent to which the goals of the players coincide or conflict.
- Whether the games are Cooperative (In which players can communicate and, make binding agreements) or non-cooperative (in which players may communicate, but they cannot make binding agreements).
- The Extent of information (Perfect information or Imperfect information)
- Whether the game is a Constant-sum game (games of pure competition) or a Variable-sum game (in which participants may all be winners or losers).

Before exploring games that explain Duopoly behaviour, it is important to distinguish between Constant-sum games and Variable-sum games in more detail. In constant-sum games, the sum of all player's payoffs remains the same, but the distribution may vary according to the decisions made. Constant sum games, where perfect information exists, allow participants to determine optimal strategies, resulting in outcomes that are predetermined. In variable-sum games, the sum of all player payoffs differs depending on the strategies utilised. The outcome of these games often depends on the existence of cooperative or non-cooperative behaviour, the extent of information and even the order in which participants communicate. In variable sum games, it is also likely that through cooperation, both players may be able to benefit mutually. Both types of games are possible in Duopolies but variable sum games are more likely, and in these situations, the extent of communication and cooperation can impact outcomes. Consider the following pay-off matrix for a variable-sum 2-player game.

		Player B	
		i	ii
Player A	i	4, 5	5, 4
	ii	4, 3	3, 2

Figure 4.4.3: The Importance of Communication in Variable-sum games.

Model explanation:

Player A has two options I or II, whilst it does not matter the choice if Player B does i (4 and 4), if Player B was to do ii then Player A is best to go with option I (5 verse 3). For Player B option i provides the best return regardless of Player A's strategy (5 verse 4) or (3 verse 2). The most likely outcome if there is no communication is (ii 4 and 5) the top left quadrant. However if we allow communication to occur Player A is likely to attempt to create an agreement (cooperation) with Player B to go with strategy ii whilst they go with strategy I. Whilst on face value this looks like a poor decision for B as A gets 5 and B now gets 4 (top right quadrant) a reversal of what was originally likely, the threat of A playing option II if player B does not play option ii could end with B only getting 3 the bottom left quadrant. For Player A the best outcome is 5 and if Player B refused to play option ii, then it does not matter to A if they do option I or II as they get 4 in both situations. Player B is unlikely to risk getting 3 when agreeing to Player A's offer allows them to receive 4. The consequence of this is that communication and the order it occurs can influence the outcome of the behaviour in the game.

Whilst a payoff matrix as above can occur, in most business situations the actions of one firm will have some impact upon the other, so having the same payoff for two actions is likely to be rare. The following example may be more reflective of two firms in a duopoly market.

Model explanation:

Just as is the case in the prisoner's dilemma, in this matrix firms who are acting in rational self-interest receive a poorer outcome than if they acted in the collective interest. 8 and 8 instead of 10 and 10.

Nash Equilibrium and Pareto Optimum

The two most likely outcomes are referred to as the Nash Equilibrium and the Pareto Optimum. The Nash equilibrium is named after John Nash, a mathematician whose game theory work awarded him a Nobel prize. It is defined as a stable state in a game where no player can gain an advantage by unilaterally changing their strategy, assuming the other participant does not change their strategy. This implies that neither player has an incentive to change their strategy if the other player stays with the current strategy. The Nash Equilibrium assumes a non-cooperative game and can be explained and illustrated using the matrix from Figure 4.4.5.

Model explanation:

In the top left quadrant (I and i) both firms receive a payoff of 10, however if Firm A maintains strategy I Firm B can switch to strategy ii and gain 5 (10 to 15). Equally if firm B was to maintain strategy i Firm A could switch to II and gain 5 (10 to 15). This implies that this strategy (I and i) is not the Nash equilibrium as either firm can switch and gain if the other firm maintains their strategy.

In the bottom left quadrant (II and i) the payoff is 15 and 3, if Firm B was to change strategy to ii they would gain 5 (3 to 8) thus this is not a Nash equilibrium. If Firm B chooses strategy ii and we begin in the top right quadrant (I and ii) then the payoff is 3 and 15 in this instances firm A can change strategy to II and gain 5 (3 to 8) meaning this is also not a Nash Equilibrium. From this analysis we can deduce that the bottom right quadrant in this Matrix is the Nash Equilibrium. Here both firms attain 8 and 8 and neither firm can gain if the other firm maintains their strategy. Both will lose 5 and drop to a payoff of 3 if they change strategy and the other firm maintains theirs.

		Firm B	
		i	ii
Firm A	i	10 10	3 15
	ii	15 3	8 8

Variable Sum Game

Figure 4.4.4: Common Pay-off Matrix in a Duopoly.

Key Definition:

Nash Equilibrium a stable state in a game where no player can gain an advantage by unilaterally changing their strategy, assuming the other participant does not change their strategy.

4

		Firm B	
		i	ii
Firm A	i	10 10	3 15
	ii	15 3	8 8

Nash Equilibrium

		Firm B	
		i	ii
Firm A	i	10 10	3 15
	ii	15 3	8 8

		Firm B	
		i	ii
Firm A	i	10 10	3 15
	ii	15 3	8 8

Figure 4.4.5: Explaining Nash Equilibrium.

It is important to note that the Nash Equilibrium is not always the bottom right corner of the Matrix, nor is there always one Nash equilibrium in a game. In some situations, a Nash equilibrium may not exist and in other situations there can be multiple Nash Equilibria. The important element that defines Nash Equilibrium is that neither Firm (player) can make themselves better off by changing strategy if the other Firm (player) maintains their current strategy. It is likely that in any further study of game theory the term Dominant strategy will also be used. A dominant strategy assumes no knowledge of the other players strategy and instead each player chooses the best outcome for themselves. To be a dominant strategy the decision must provide greater utility to the player regardless of what the other players strategy is (or at least the same utility as some strategies and more than others). For this course it is important to remember that any dominant strategy equilibrium (coinciding dominant strategies for both players) is always the Nash equilibrium, however not all Nash Equilibria are dominant strategy equilibria.

It is also apparent that the Nash Equilibrium is not always the best collective outcome or individual outcome. If co-operation and communication are allowed, then the Nash Equilibrium is unlikely to emerge, rather it is more common for a Pareto optimum to eventuate. Pareto optimum (or Pareto efficiency) occurs where both players cannot do better simultaneously. More specifically it is an outcome

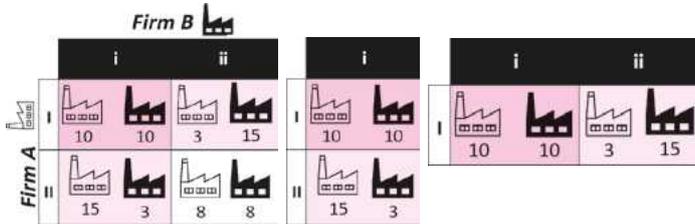
Key Definition:

Dominant Strategy a strategy in which the utility to the player is higher regardless of the other player's strategy.

Key Definition:

Pareto Optimum an outcome in which neither player can make themselves better off without making the other player worse off.

that makes every player at least as well off and at least one player better off. That is an outcome that cannot be improved upon without hurting at least one player. Pareto Optimality assumes a cooperative game and can be explained and illustrated using the matrix from figure 4.4.6.



Model explanation:

In the top left quadrant (i and i) both firms receive a payoff of 10, however if Firm A changes strategy to ii to gain 5 (10 to 15) this will make Firm B worse off by 7 (10 to 3). Alternately if Firm B changed strategy to ii to gain 5 (10 to 15) Firm A will be worse off by 7 (10 to 3). This is Pareto efficiency as there is no outcome of dual strategies that makes one player better off without making the other player worse off. Note that (i and ii) and (ii and i) are also pareto optimums.

Game Theory and the Behaviour of Duopolies



Figure 4.4.7: Mastercard and VISA control over 80% of the European market.

The use of payoff matrices, Nash equilibrium and Pareto Efficiency can be applied to Duopoly behaviour in many situations. Some of the more common examples include:

- Pricing Decisions
- Marketing Decisions
- Product Release Decisions
- Market Sharing Decisions
- Expansion Decisions.

While cooperative duopolies (collusion or cartels) are mostly illegal, as discussed in the Oligopoly section, agreements can still eventuate in Duopolies through tacit collusion, where in the absence of a formal binding agreement between participants, each relies on trust. It is, therefore, possible to have either a Nash equilibrium or Pareto Optimality exist in a Duopoly, but for Pareto efficiency to exist, there would need to be a cooperate game (collusion). The following table (Table 4.4.1) explains the basic rationale of the common decisions firms may make in a duopoly. The payoff matrix for each decision shows profits in dollars, with the m denoting millions. The Nash equilibrium is highlighted in blue, whilst Pareto Optimum is highlighted in red.

Table 4.4.1

Decision	Explanation	Matrix													
Pricing Decisions	The two basic options for a firm are to raise price or have a low price. In a duopoly if Firm A raises price, it is likely Firm B will maintain the lower price and will gain market share from Firm A increasing profits whilst the profits of Firm A will fall as they lose market share. Equally if Firm A lowers price it is likely that Firm B will also lower price to ensure they don't lose market share and the profits of both firms would probably fall as they sell their products for a lower price. If both firms agreed to raise price and have a higher price strategy, they would both gain, but this requires collusion.	<table border="1"> <tr> <td colspan="2" rowspan="2"></td> <td colspan="2">Firm B</td> </tr> <tr> <td>High Price</td> <td>Low Price</td> </tr> <tr> <td rowspan="2">Firm A</td> <td>High Price</td> <td>10m 10m</td> <td>5m 15m</td> </tr> <tr> <td>Low Price</td> <td>15m 5m</td> <td>8m 8m</td> </tr> </table>			Firm B		High Price	Low Price	Firm A	High Price	10m 10m	5m 15m	Low Price	15m 5m	8m 8m
					Firm B										
High Price	Low Price														
Firm A	High Price	10m 10m	5m 15m												
	Low Price	15m 5m	8m 8m												
Marketing Decisions	The two basic options in this situation are to Advertise more or to not Advertise more. If Firm A increases advertising, they will attract market share away from Firm B so their profits will rise, despite the additional costs of advertising. Firm B, however, is likely to follow the decision of Firm A and advertise to maintain market share. This will mean both firms advertising more to maintain their market shares, but as they both incur costs in advertising it will result in both of their profit levels falling. Alternately if Firm A does not increase advertising, Firm B will, as they will be able to gain market share from Firm A and increase their profits. If this was to occur Firm A would then be forced to follow this behaviour of advertising, resulting in both firms again advertising. However, if both firms agreed to not advertise, they would both gain, but this requires collusion.	<table border="1"> <tr> <td colspan="2" rowspan="2"></td> <td colspan="2">Firm B</td> </tr> <tr> <td>Advertise</td> <td>No Advertising</td> </tr> <tr> <td rowspan="2">Firm A</td> <td>Advertise</td> <td>17m 12m</td> <td>24m 10m</td> </tr> <tr> <td>No Advertising</td> <td>14m 16m</td> <td>21m 15m</td> </tr> </table>			Firm B		Advertise	No Advertising	Firm A	Advertise	17m 12m	24m 10m	No Advertising	14m 16m	21m 15m
					Firm B										
Advertise	No Advertising														
Firm A	Advertise	17m 12m	24m 10m												
	No Advertising	14m 16m	21m 15m												

Decision	Explanation	Matrix													
Expansion Decisions	The two basic options in this situation are to expand the size of the business or maintain the current operations. If Firm A does an expansion, they will attract market share away from Firm B so their profits will rise despite the additional costs of expansion. Firm B, however, is likely to follow the decision of Firm A and also expand to maintain market share. This will mean both firms expanding to maintain their market shares, but as they both incur costs in expansion without adding to sales revenue it will result in both their profit levels falling. Alternately if Firm A does not expand, Firm B will, as they will be able to gain market share from Firm A and increase their profits. If this was to occur Firm A would then be forced to follow this behaviour and expand, resulting in both firms again expanding. However, if both firms agreed to not expand, they would both gain, but this requires collusion	<table border="1"> <thead> <tr> <th colspan="2" rowspan="2"></th> <th colspan="2">Firm B</th> </tr> <tr> <th>No Expansion</th> <th>Expansion</th> </tr> </thead> <tbody> <tr> <th rowspan="2">Firm A</th> <th>No Expansion</th> <td>20m 32m</td> <td>11m 47m</td> </tr> <tr> <th>Expansion</th> <td>26m 28m</td> <td>17m 29m</td> </tr> </tbody> </table>			Firm B		No Expansion	Expansion	Firm A	No Expansion	20m 32m	11m 47m	Expansion	26m 28m	17m 29m
		Firm B													
		No Expansion	Expansion												
Firm A	No Expansion	20m 32m	11m 47m												
	Expansion	26m 28m	17m 29m												

The above scenarios could result in very different payoff matrices than those given, particularly where the decision of the firm could alter the size of the market. Marketing and Expansion decisions can potentially increase the overall size of markets by attracting customers who previously did not buy the product, lower pricing strategies from both firms can also potentially do the same. This could therefore see both firms gain from marketing or expansion (or lowering prices) and are therefore result in a better outcome than not marketing or expanding.

What this analysis shows is that Duopolies gain when they engage in cooperative game situations (collude), however this requires trust amongst the participants and there is always the potential for one of the Firms to cheat the arrangement. Trust is likely to be more common in Duopolies where there is a more dominant Firm and equally the game is repetitive rather than a once off. For those interested in how trust forms in markets you may wish to read the evolution of trust. It is also worth noting that cooperation is heavily regulated and so in most situations a Nash Equilibrium position will emerge in Duopoly markets.

Real World Considerations: How Kodak Failed

Chunka Mui

Kodak management not only presided over the creation of digital technological breakthroughs but was also presented with an accurate market assessment about the risks and opportunities of such capabilities. Yet Kodak failed in making the right strategic choices.

Source: Forbes Jan 18, 2012

<https://www.forbes.com/sites/chunkamui/2012/01/18/how-kodak-failed/?sh=5500912a6f27>

Discussion Points

How would an understanding of Game Theory have assisted Kodak in making the correct strategic decision?

Exercise 4.2 Duopoly Behaviour

1. Referring to the extract and payoff matrix below, answer the following questions.

Our cosy duopoly's not going anywhere. (Extract)

Sergio Biggemann

March 11, 2022

Foodstuffs and Woolworths NZ have been for years enjoying a duopolistic situation that economic theory has well proven encourages collusion instead of competition, maximising profits for the sellers.

To protect their position, these dominant players have developed a habit of purchasing land where potentially a supermarket could be opened, building much higher entry barriers for potential competitors.

Source: Ideas Room <https://www.newsroom.co.nz/ideasroom/our-cosy-duopolys-not-going-anywhere>

Payoff matrix for Foodstuff and Woolworths NZ – Profits in \$millions

		Woolworths	
		Collude	Compete
Foodstuff	Collude	180 / 160	110 / 190
	Compete	190 / 100	120 / 110

- (a) Explain what is meant by a duopolistic situation.
- (b) Explain why it is best for Foodstuff and Woolworths to collude.
- (c) Outline why economic theory suggests that firms in a Duopoly are likely to collude rather than compete.
- (d) (i) State the Nash Equilibrium position.
- (ii) Explain why this is the Nash Equilibrium

(e) Outline why both firms would buy land they are likely to not build on.

2. Referring to the payoff matrix below, answer the following questions.

Payoff matrix for Firm A and Firm B – Profits in \$millions

		Firm B	
		Raise Prices	Maintain Prices
Firm A	Raise Prices	100 120	80 140
	Maintain Prices	120 0 100	85 105

(a) Identify and explain Nash Equilibrium.

(b) Identify and explain Pareto efficiency.

(c) Identify and explain the Dominant strategy for each firm.

(d) Provide justified reasoning for the payoffs present in the payoff matrix.

3. Referring to each of the payoff matrices below, answer the following questions.

Each payoff matrix shows two competing firms Samsung and Motorola with Profits in millions of dollars.

In (i) firms are choosing to either focus on the Service Provider (phone company) or the End User (customer who uses the phone). In part (ii) they are deciding on whether to release a new phone.

<p>(i)</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td colspan="2" rowspan="2"></td> <th colspan="2" style="text-align: center;">Motorola</th> </tr> <tr> <th style="text-align: center;">Carrier Needs</th> <th style="text-align: center;">User Needs</th> </tr> <tr> <th rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Samsung</th> <th style="writing-mode: vertical-rl; transform: rotate(180deg);">Carrier Needs</th> <td style="text-align: center;">6 / 6</td> <td style="text-align: center;">4 / 16</td> </tr> <tr> <th style="writing-mode: vertical-rl; transform: rotate(180deg);">User Needs</th> <td style="text-align: center;">16 / 4</td> <td style="text-align: center;">10 / 10</td> </tr> </table>			Motorola		Carrier Needs	User Needs	Samsung	Carrier Needs	6 / 6	4 / 16	User Needs	16 / 4	10 / 10	<p>(ii)</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td colspan="2" rowspan="2"></td> <th colspan="2" style="text-align: center;">Motorola</th> </tr> <tr> <th style="text-align: center;">New Phone</th> <th style="text-align: center;">Maintain</th> </tr> <tr> <th rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Samsung</th> <th style="writing-mode: vertical-rl; transform: rotate(180deg);">New Phone</th> <td style="text-align: center;">190 / 0</td> <td style="text-align: center;">280 / 100</td> </tr> <tr> <th style="writing-mode: vertical-rl; transform: rotate(180deg);">Maintain</th> <td style="text-align: center;">160 / 260</td> <td style="text-align: center;">240 / 200</td> </tr> </table>			Motorola		New Phone	Maintain	Samsung	New Phone	190 / 0	280 / 100	Maintain	160 / 260	240 / 200
			Motorola																								
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		Motorola																									
		New Phone	Maintain																								
Samsung	New Phone	190 / 0	280 / 100																								
	Maintain	160 / 260	240 / 200																								

(a) State the Nash equilibrium, Pareto Efficiency, and Dominant Strategy of each firm.

Nash Equilibrium

Nash Equilibrium

Pareto Efficiency

Pareto Efficiency

Dominant Strategy

Dominant Strategy

(b) Referring to Matrix (ii) explain how Samsung could convince Motorola to use a strategy of maintain whilst they use a strategy of New Phone.

4. Referring to the payoff matrix below, answer the following questions.

Each payoff matrix shows two competing firms Firm A and Firm B with Profits in millions of dollars, and each firm with two strategies (I or II and i or ii).

		Firm B	
		i	ii
Firm A	I	 9 / 5	 1 / 2
	II	 0 / 0	 6 / 10

(a) Explain why there is no dominant strategy.

(b) Identify the Nash equilibrium/s.

5. Referring to the payoff matrix below, answer the following questions.

The following matrix represents potential losses in billions of dollars for Boeing and Airbus based on whether they maintain or lower advertising during COVID restrictions.

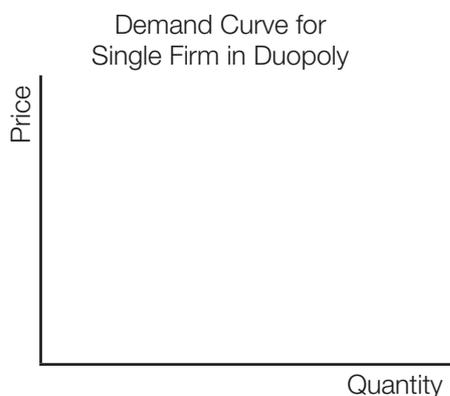
		Boeing 	
		Maintain	Lower
Airbus 	Maintain	 1  1.2	 0.7  1.4
	Lower	 1.3  0.9	 0.8  1.0

- (a) Explain why the Nash Equilibrium is the strategy combination of Maintain, Maintain.

- (b) Outline why the Nash Equilibrium is not pareto optimum.

- (c) Outline why collusion is less likely to occur in this situation.

6. (a) Illustrate the demand curve faced by a single firm in a Duopoly



- (b) Explain how this demand curve reflects the notion of Nash Equilibrium based on a payoff matrix.

Topic 5: Microeconomics – Market Failure

Learning Outcomes based on the SACE Economics Teaching and Learning Framework

- Students develop an understanding of the effects of market failure on consumers, producers, and efficiency, with direct reference to consumer surplus, producer surplus and deadweight loss (welfare loss). Market failures include:
 - undersupply of public goods
 - uncompetitive markets
 - externalities — positive and negative, and production and consumption
 - asymmetric information.
- Students evaluate the measures taken to address market failure and undesirable market outcomes.

5.1 Defining Market Failure

Key Definition:

Market Failure a situation that arises in a market where the market fails to allocate resources efficiently.

A market failure occurs when the market fails to allocate resources efficiently. This means that a market failure results in allocative inefficiency, where either too much or too little of a good or service is produced and consumed from the point of view of what is socially most desirable. All market failures result in a deadweight loss (DWL), a loss in total welfare or social surplus. Market failures are often the result of a failure to achieve the theoretical conditions of perfect competition, and as such, the price the market operates at is not the true optimal position for society.

Key Definition:

Deadweight Loss (DWL) the loss of social (societal) surplus (welfare) that arises due to allocative inefficiencies in a market.

Market failures that are studied in this course include the following:

- Uncompetitive Markets - Abuse of monopoly power
- Externalities
 - Negative externalities of production and consumption
 - Positive externalities of production and consumption
- Lack of public goods
- Asymmetric information.

5.2 Uncompetitive Markets – Abuse of Monopoly Power

Key Definition:

Monopoly Power When a single firm controls a large share of the total market for a particular good, that firm can charge a HIGHER PRICE and produce a LOWER QUANTITY than what is socially optimal.

In markets where there are an insufficient number of firms to create perfectly competitive conditions, firms gain a degree of market power. This means they have the capacity to become a price setter, and the price that exists in the market is not the equilibrium price. When there is an absence of competition, firms can make abnormal profits and do so in part by setting prices at a higher level than what would exist in Perfect Competition. The resulting impact is that the quantity traded in this market will be lower than would otherwise have occurred, resulting in an under-allocation of resources to this market and, thus, allocative inefficiency and a market failure. Uncompetitive markets can occur in Monopolistic Competition, Oligopolies or Monopolies, but the focus is often on Monopoly markets.

Whilst simplistic in its economic representation, the following model emphasises the impact of firms with Monopoly Power setting a price above equilibrium.

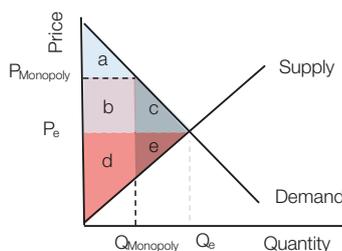


Figure 5.2.1: DWL from Monopoly Power.

Model explanation:

When a firm has Monopoly power and the aim to profit maximise the price they charge in the market (P_{Monopoly}) will be greater than P_e . The consequence is that the quantity traded will be a Q_{Monopoly} which is less than the allocatively efficient output of Q_e . There is ultimately an under-allocation of resources to the production of this product.

This is also representative of a DWL loss of area $c+e$. This loss of welfare is explained by the fact that the consumer surplus at P_e , Q_e was $a+b+c$ and the producer surplus was area $d+e$, giving a social surplus of $a+b+c+d+e$. However, with the price set at P_{Monopoly} the consumer surplus becomes area a (losing $b+c$) and the producer surplus becomes $b+d$ (losing area e but gaining b), the social surplus is now area $a+b+c$. The consequence is that there is a loss of social surplus (welfare) of area $c+e$.

Key Point:

Monopolists (or firms with significant market power), are both productively and allocatively inefficient, since without competition, such firms are likely to charge higher prices and produce smaller quantities.

Negative Consumption Externalities



Figure 5.3.3: DWL of Negative Externalities of Consumption.

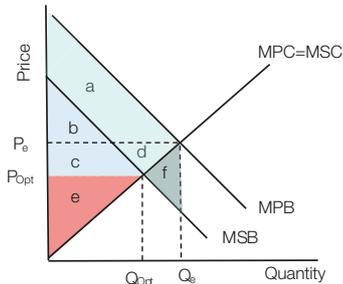
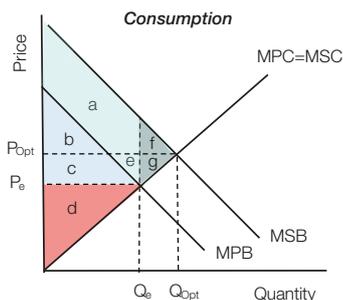


Figure 5.3.4: Vaccinations and education are examples of positive externalities of consumption.

Positive Consumption Externalities



Figure 5.3.5: DWL of Positive Externalities of Consumption



Production Externalities



Key Point:

Negative externalities of consumption result in an over-allocation of resources to the production of the good, with Q_e being greater than Q_{opt} .

Model explanation:

At the market equilibrium (P_e, Q_e) the Consumer surplus equals $a+b$ and the Producer surplus equals area $c+d+e$, therefore the social surplus = $a+b+c+d+e$. However, at equilibrium there are External costs (negative consumption externalities) of $a+d+f$.

Total benefits to society (Social surplus less the externality) are therefore equal to $(a+b+c+d+e)$ minus $(a+d+f)$ this leaves a social benefit of $(b+c+e)-f$.

At the Social Optimal level of output (P_{opt}, Q_{opt}) Consumer surplus equals $b+c$

Producer surplus equals e , therefore social surplus (and Total Social benefits) equal $b+c+e$. This is larger than at Q_e by the value of (f) .

At market equilibrium there is a DWL/welfare loss equal to area f . The market is not allocatively efficient and there is an over allocation of resources equal to the distance Q_e to Q_{opt} .

Positive Externalities of Consumption

Positive externalities of consumption arise where an individual's consumption increases the wellbeing of others, but the individual is not compensated by those whose well-being is increased. Examples include vaccinations, education, home renovations that increase the value of neighbours' properties and creating beautiful surrounds that others can enjoy. In each of these situations the consumption results in direct external benefits to third parties, but the individual consuming the good or service only considers the benefits that they derive from consumption (the MPB) and ignore the external benefits gained by others. The consequence of this is that MPB will be less than the MSB and the equilibrium level of output will be less than the optimal level. An under consumption of the good and an under allocation of resources to this area of production occurs. It will also result in a Dead Weight Loss as illustrated and explained in the diagram below. (Figure 5.3.5).

Key Point:

Positive externalities of consumption result in an under-allocation of resources to the production of the good, with Q_e being less than Q_{opt} .

Model explanation:

At the market equilibrium (P_e, Q_e) the Consumer surplus equals $b+c$ and the Producer surplus equals d , therefore the social surplus equals $b+c+d$. However, at equilibrium there are External benefits (negative consumption externalities) of $a+e$ meaning that total social benefits (Social surplus add the externality) equal $a+b+c+d+e$.

At the Social Optimal level of output (P_{opt}, Q_{opt}) Consumer surplus equals $a+b+f$ and Producer surplus equals $c+d+e+g$, therefore social surplus (also Total Social benefits) equal area $a+b+c+d+e+f+g$. This is larger than at Q_e by the value of $(f+g)$. This means there is a DWL (potential welfare gain) at market equilibrium equal to the triangular area $f+g$. The market is not allocatively efficient and there is an under allocation of resources and under production equal to the distance Q_e to Q_{opt} .

Production Externalities

Production Externalities are impacts on third parties that arise from the production of a good or service by a producer. Production externalities result in the Marginal Private Cost ($S=MPC$) not equaling the Marginal Social Cost (MSC). Production externalities can be both positive and negative.

Negative Externalities of Production

Negative externalities of production arise when a firm's production decreases the wellbeing of others, but the producer does not compensate those others. Examples include air and noise pollution from the production process, the dumping of waste and the effects of deforestation. In each of these situations, the production results in direct external impacts such as loss of habitat and ecosystem destruction, devaluation in property values due to excessive noise and health issues that arise from pollution. The producer only considers the costs that they directly incur from the production of the good (the MPC), and ignores the external costs felt by others. The consequence of this is that MPC will be less than the MSC and the equilibrium level of output is larger than the optimal level. An overproduction of the good and an overallocation of resources to this area of production occurs. It will also result in a Dead Weight Loss, as illustrated and explained in the diagram below. (Figure 5.3.7).

Key Point:

Negative externalities of production result in the overallocation of resources to the production of the good, with Q_e being greater than Q_{opt} .

Model explanation:

At the market equilibrium (P_e, Q_e) the Consumer surplus equals $a+b+c+d$ and the Producer surplus equals $e+f+g$, therefore the social surplus equal to area $a+b+c+d+e+f+g$. However, at equilibrium there are External costs (negative production externalities) of area $c+d+f+g+h$. Total benefits to society (Social surplus less the externality) are therefore equal to area $(a+b+c+d+e+f+g)$ minus $(c+d+f+g+h)$ this leaves a social benefit of area $(a+b+e)-h$

At the Social Optimal level of output (P_{opt}, Q_{opt}) Consumer surplus equals a and the Producer surplus equals area $b+e$, therefore social surplus (and Total Social benefits) equals area $a+b+e$. This is larger than at Q_e by the value of (h) .

At market equilibrium there is a DWL/welfare loss equal to area h . The market is not allocatively efficient and there is an over-allocation of resources equal to the distance Q_e to Q_{opt} .



Figure 5.3.6: Air pollution and noise pollution are examples of negative externalities of production.

Negative Consumption Externalities

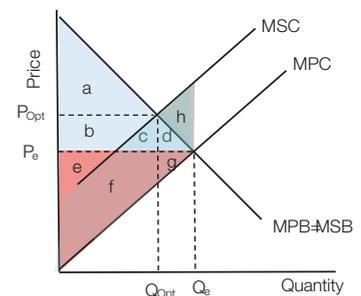


Figure 5.3.7: DWL of Negative Externalities of Production.

Positive Externalities of Production

Positive externalities of production arise when a firm's production increases the wellbeing of others, but the firm is not compensated by those others. Examples include beehives established by honey producers, which increase agricultural production through pollination and research and development by companies that lead to the introduction of new technologies that other companies can benefit from.

Due to the fact the producer only considers the costs that they directly incur from the production of the good (the MPC), they ultimately ignore the external benefits felt by others. The consequence of this is that MPC will be greater than the MSC and the equilibrium level of output will be less than the optimal level. An underproduction of the good and an under-allocation of resources to this area of production occurs. It will also result in a Dead Weight Loss, as illustrated and explained in the diagram below. (Figure 5.3.9).

Key Point:

Positive externalities of production result in the under-allocation of resources to the production of the good, with Q_e being less than Q_{opt} .

Model explanation:

At the market equilibrium (P_e, Q_e) the Consumer surplus equals a and the Producer surplus equals $b+e$, therefore the social surplus = $a+b+e$. However, at equilibrium there are also External benefits (positive production externalities) of $c+f$. Total benefits to society (Social surplus plus the externality) are therefore equal to $(a+b+e)$ plus $(c+f)$ this leaves a social benefit of $a+b+e+c+f$.

At the Social Optimal level of output (P_{opt}, Q_{opt}) Consumer surplus equals $a+b+c+d$ and the Producer surplus equals $e+f+g$, therefore social surplus (Total Social benefits) equals area $a+b+c+d+e+f+g$. This is larger than at Q_e by the value of $(d+g)$.

At market equilibrium there is a DWL/welfare loss equal to area $d+g$. The market is not allocatively efficient and there is an under-allocation of resources equal to the distance Q_e to Q_{opt} .



Figure 5.3.8: Honey production and new technologies are examples of positive externalities of production.

Positive Consumption Externalities

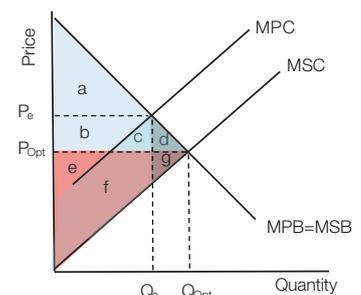


Figure 5.3.9: DWL of Positive Externalities of Production

5.4 Undersupply of Public Goods

Key Definition:

Public Goods are goods which provide benefits to society which are non-rivalrous, and the benefits of which are non-excludable by the provider of the good.



Sanitation Infrastructure



Crime control for a community



Figure 5.5.1: Insurance is a common market with Asymmetric Information.



Figure 5.5.2: Less care is often taken by individuals with insurance.

Key Definition:

Moral Hazard a situation in which one party engages in risky behavior or fails to act in good faith because it knows the other party bears the economic consequences of their behavior.

(Investopedia)

Public goods are goods that provide benefits to society that are non-rivalrous, and the benefits of which are non-excludable by the provider of the good. Because of these characteristics, public goods will not be provided by the free market at all. This is because producers will not be able to charge a price for them and, hence, cannot generate profit. The consequence is an under-provision of public goods and a market failure. Public goods may also have positive externalities associated with their consumption and are sometimes modelled using a positive consumption externality diagram. However, the key defining features of public goods are that they are non-rivalrous, and their benefits are non-excludable in nature.

- Non-rivalrous in consumption: This means that one consumer's enjoyment of the benefits of a good does not diminish any other consumer's enjoyment of its benefits.
- Non-excludable by the provider: This means that once a good has been provided, it is not possible to exclude any individuals from enjoying its benefits. In other words, you can't make individuals pay for the good once it is made available.

The consequence of these characteristics is that there will be free-riders or individuals who enjoy the good's benefits without ever paying for it. In reality, there are very few examples of pure public goods or services, as the defining characteristics identified above, especially non-excludability, are often not entirely applicable. There are, however, many goods that are close to being pure public goods or services. Services such as fire and police, goods such as infrastructure and parks and national defence services all display the characteristics of non-excludability and being non-rivalrous.

Key Point:

Public goods suffer from 'free riders' due to their non-rivalrous and non-excludable nature. They will not be provided in a market as no profit can be generated from their provision.

5.5 Asymmetric Information

Asymmetric Information, also known as information failure, results from one side of the market having more information than the other. Whilst it is often the case that a seller has more information or knowledge about a product than the buyer, there are occasions where the imbalance sits in favour of the buyer.

In those instances where the seller holds more information, it can result in buyers buying products they would otherwise not have purchased or alternatively avoiding buying products altogether had they had full information. The consequence is that there is either an overconsumption or underconsumption of goods in these situations and, hence, a market failure.

Two common examples of asymmetric information are:

- Moral hazard and
- Adverse selection.

A Moral Hazard is a situation where the behaviour of one of the participants in the agreement changes after the agreement is made. In the case of Moral Hazard, the individual entering into an arrangement is often incentivised to increase their exposure to risk because they do not bear the costs of that risk. This is common in insurance markets where people will behave in a riskier way, knowing that the insurance company will bear any potential negative outcome.

Not knowing the risk behaviour of the other participant in the market results in moral hazard, leading to an inefficient allocation of resources because one party is creating larger costs for another.

Adverse selection, on the other hand, occurs when one participant in the market has relevant information the other participant lacks. This often occurs in the presence of a lack of information for buyers. In these cases, there is increased potential for consumers to buy 'bad' products. The potential to purchase poor-quality products leads to higher costs for consumers who consequently may avoid high-priced products or buying products altogether. An underconsumption of the product therefore occurs. In some instances, consumers may be excluded from purchasing, as they do not have access to or cannot afford access to information, which would lead to improved purchasing decisions. Adverse selection from a buyer's perspective is often seen in areas such as vaccinations, where consumers may wrongly overvalue risks and choose not to be vaccinated. Asymmetry of information and, more specifically, adverse selection can also impact producers, particularly in insurance markets where buyers withhold information that leads sellers to do business with riskier individuals or with less profitable groups. The outcomes of adverse selection are higher costs to one side of the market and, thus an inefficient allocation of resources.

Key Definition:

Adverse Selection a situation in which one party in the market has relevant information the other party lacks. This increases the cost for the party who lacks the information.

(Investopedia)

Real World Considerations: The Problem of Lemons

George Akerlof paper, "The Market for "Lemons": Quality Uncertainty and the Market Mechanism" is a study of asymmetric information and adverse selection. Its focus is on how untrustworthy used car dealers would be able to push out more honest salespeople and thus create a market failure. He argued that a feedback loop would be created in the market for used cars, where the market would be flooded with poor quality cars (lemons) and ultimately no customers would buy used cars.

The basis for this conclusion is that the average consumer of used cars can not tell the difference between a quality used car and a defective used car, a Lemon. The seller, however, knows the quality of the car, so asymmetric information exists. Some sellers (untrustworthy ones) can exploit the asymmetry leading to adverse selection. These sellers can make Lemons look like quality purchases hiding flaws that only become apparent after purchase. There is a clear incentive for the seller to engage in this practice as it will after all lead to higher profits. The buyer, however, is aware of this incentive and as they cannot themselves determine the quality of the vehicle, they will act rationally and only be willing to pay an average price (the average between the quality and lemon cars prices) as they attempt to minimise any potential loss.

The resulting outcome is that the consumer won't pay top dollar for a used car on the basis it could be a lemon and nor will the producer be able to sell quality cars as they will make losses from consumers who are only willing to pay the average price. Some of the trusted dealers will ultimately leave the market as they can not sell quality used cars and more untrustworthy dealers will exist. Overtime consumers will realise that more lemons are being sold and will ultimately lower the average price they are willing to pay.

This research paved the way for many legislative changes, yet the problem of lemons still exists, and it is not unique to used car markets. There are many markets characterised by information asymmetries including:

- Used merchandise sold online
- Home improvement
- Vehicle repairs

Discussion Points

What is the likely impact of the problem of lemons on market prices?

What is the likely impact of the problem of lemons on quantity traded?

What strategies exist in the three markets identified to address the potential for adverse selection?

Real World Considerations: The Problem of Poor Drivers in Company Cars

Research suggests that drivers of company cars may be more likely to speed than drivers of privately owned cars.. Possible reasons include reduced personal ownership accountability, job-related time pressures, and the perception that company cars face fewer consequences for speeding violations. (Chat GPT 2023) Poorer driver behaviour in company cars is further supported by the fact that fleet vehicles are involved in more accidents than any other type of vehicle and with 90% of company car drivers admitting to speeding regularly, it is not surprising that ‘unidentified driver’ fines increased markedly in the first half of this decade. The ability to evade demerit points and license suspension for company car drivers, is minimising the effectiveness of the deterrent that private vehicle owners face.

Discussion Points

How is driver behaviour in company cars an example of Moral Hazard?

What likely actions have and should government use to address this issue?

5.6 Solutions to Market Failures



Market failures, regardless of their cause, create allocative inefficiencies and result in Dead Weight Losses. The consequence is that the solution to each failure is to address the cause of the inefficiency through government intervention. Options available to the government include the following broad strategies:

- Regulation
- Advertising
- Taxes
- Subsidies.

Solving Uncompetitive Markets

Uncompetitive markets arise because there are an insufficient number of firms to create perfectly competitive conditions. This allows firms the capacity to set prices at a level higher than the allocatively efficient price. The result is that the quantity traded will be lower than the socially optimal level in the market. The solutions broadly are to increase the level of competition or alternately restrict the ability of the Monopolist (or other uncompetitive firm) to exploit their market power. Common strategies used include regulating prices, particularly in natural monopolies, the government acting as a producer or using legislation to restrict or prevent monopoly power. These solutions are summarised in Table 5.6.1 below.

Table 5.6.1: Solutions to Uncompetitive Markets.

Solution	Operation
Government as a Producer	Because Monopolies often have economies of scale and large set up costs, it is often difficult for, profit motivated firms to establish themselves as a competitor. In these instances, government may elect to establish a public firm to compete in this market. Alternately the government may decide to convert the private monopoly into a public firm through a process of nationalism. As solutions both strategies tend to create further inefficiencies as public enterprises (GBE's) often become bureaucratic and productively inefficient. They are therefore rarely used as a strategy, especially the process of nationalism as this tends to create a disincentive for private firms to establish themselves in markets for fear of being taken over by government. Governments have however, historically run Monopolies particularly natural monopolies in utilities, but many of these monopolies have been privatised in recent decades.

Solution	Operation
Regulation	<p>Regulation is often seen as the preferred method to address uncompetitive markets. Most market-based economies have introduced legislation that aims to prevent business activities or practices that seek to create or strengthen a Monopoly (abuse of Monopoly power). Anti-trust laws in the United States and Australia's Competition and Consumer Act are examples of these. There are considerable commonalities between different countries enacted legislation, some of the common practices that are restricted include: Mergers and Takeovers, Resale Price Maintenance, Price Fixing, Collusion and Cartels, Predatory Pricing, Exclusive Dealing, and Price Discrimination. Businesses found guilty of engaging in these activities are faced with significant fines, this acts as a deterrent for firms to engage in these practices. The enforcement of this legislation requires government agency oversight, in Australia this is the role of the Australian Competition and Consumer Commission (ACCC).</p> <p>Government may also regulate firms in other ways to promote competition, newly privatised natural monopolies are often subject to price caps set by Government or a regulator. These caps legally restrict price increases and prevent exploitation of consumers. Governments have also in rare circumstances attempted to have Monopolies broken up. In circumstances where the Monopoly is deemed to be too powerful the government may attempt to split the firm; this is however extremely rare and in the case of Microsoft was ultimately not pursued.</p>

Key Definitions:

Price-fixing is an agreement among business participants in a particular market to restrict supplies to maintain prices.

Market division (sharing) occurs when several competitors divide up territories in which each agrees to sell in a particular territory, or to a specific group of buyers.

Resale price maintenance agreements between the manufacturer and distributors or retailers of the product where the manufacturer stipulates the minimum price that must be charged.

Predatory pricing a strategy where a manufacturer will sell its products at substantially lower market prices to eliminate competitors.

Price discrimination charging different prices to different buyers to substantially lessen competition.

Exclusive dealing an agreement where the seller forbids a buyer to purchase products from the seller's competitors.

Mergers are prohibited if the purpose of the merger is to lessen competition.

<https://thismatter.com/economics/monopoly-regulation.htm>

5

Real World Considerations: Why Breaking Up (Google) is so hard to do.

Extract - The Justice Department's suit against Google marks the first time in more than 20 years that the government is looking at splitting up a company for quashing competition. And if the judge decides that Google is an illegal monopoly, the case could be the first time in more than 100 years that a court actually orders a company breakup. **Source: Politico** - LEAH NYLEN

10/20/2020 <https://www.politico.com/news/2020/10/20/doj-antitrust-suit-against-google-430545>

Discussion Points

Why would a government want to split up Google?

Why does the government not split business?

Solving Negative Externalities of Consumption and Production

Negative externalities result in an over-allocation of resources to the production or consumption of the good, with the quantity traded exceeding the optimal level of output. The solution broadly is to decrease the quantity traded so that the equilibrium quantity traded equals the optimal level of output. It is possible to achieve this by either decreasing demand or alternately decreasing supply. The most common strategies suggested include taxing the product or pollutant, subsidising alternative products, advertising to create awareness, or regulations that restrict or ban usage or production. These solutions are summarised in Table 5.6.2 and illustrated in Figures 5.6.2a and 5.6.2b.

Table 5.6.2: Solutions to Negative Externalities

Solution	Operation	Examples
Indirect Taxes	Indirect taxes are taxes on expenditure that increase the cost of production for producers and therefore decrease supply . As producers are forced to pay the tax to government, indirect taxes internalise the externality, that is, the tax forces producers to account for the external costs and as such the external costs become private costs for the producer. The resulting impact is an increase in price and a reduction in the quantity traded back to the optimal level.	<ul style="list-style-type: none"> • Excise taxes on tobacco (cigarettes) • Excise taxes on alcohol • Excise taxes on sugar • Excise taxes on petrol • Emission Taxes such as carbon taxes
Advertising	Advertising serves to inform or persuade consumers to alter the demand for a particular good. In the case of negative externalities, advertising can be used to inform consumers of the negative external costs of their consumption working to decrease demand through an increased awareness of these impacts. Alternatively, advertising can also be used to persuade consumers to decrease demand by using negative advertising that plays on the emotions of the consumer.	<ul style="list-style-type: none"> • Negative Advertising for Gambling • Negative Advertising for Cigarettes • Advertising promoting recycling • Negative Advertising for drink driving
Regulations	Regulations are rules or directives from government that compel or restrict behaviours in markets. In the case of negative externalities, regulations can be used to prohibit consumption of a product by a population or a subset of a population. They can also be imposed to ban production of a good or alternately restrict where consumption may take place. Regulations can also be used to make licenses a requirement to engage in a certain activity thus decreasing production and also adding to the costs of production. Depending on the regulation the impact will be a decrease in demand or a decrease in supply .	<ul style="list-style-type: none"> • Ban on alcohol and cigarette consumption in public places • Age restrictions on product purchases such as: alcohol, tobacco, gambling. • Licenses for fishing, hunting, forestry • Permits for pollution such as: CO₂ • Bans on advertising of products such as: tobacco, fast food • Restrictions on place of purchase, such as: pharmacy medication • Ban on using asbestos or CFC's
Subsidies	Subsidies are payments to producers or consumers that result in either an increase in supply due to lower costs of production or alternatively an increase in demand due to more spending power. Subsidies are often used to promote the consumption or production of a product that does not have the negative externalities associated with an alternative. Where successful this will decrease the demand for products with negative externalities associated with their production or consumption.	<ul style="list-style-type: none"> • Subsidies for electric vehicles • Subsidies for solar panels • Subsidies for gas installation in homes

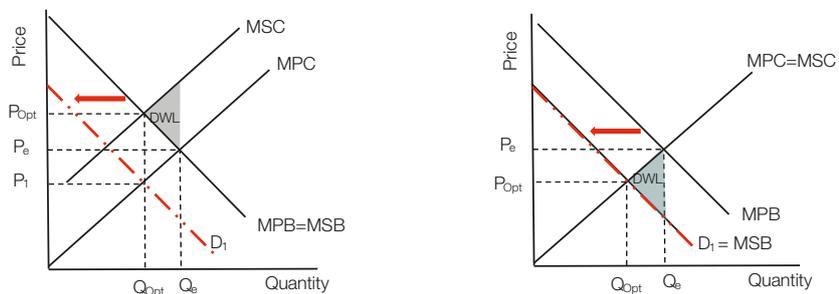


Figure 5.6.2a: Modelling the Solutions to Negative Externalities – Decreasing demand.

Model explanation:

Negative externalities of production and consumption result in Q_e being greater than Q_{opt} and an overallocation of resources to the market. Decreasing demand from MPB to D_1 results in the quantity traded falling from Q_e to Q_{opt} and eliminates the DWL.

The decrease in demand can be done through advertising, regulations to restrict consumption or via switching demand to alternatives often by subsidising the alternative product.

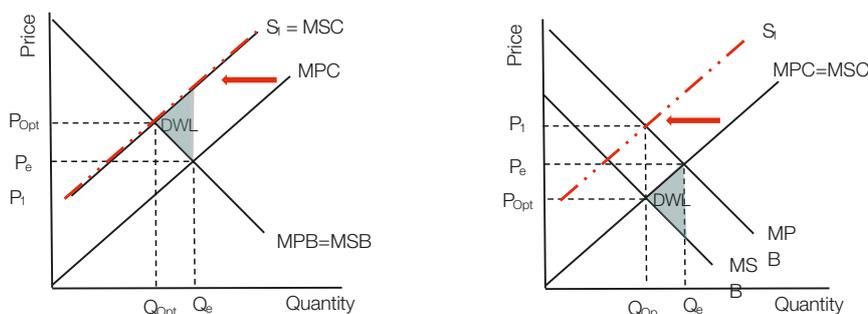


Figure 5.6.2b: Modelling the Solutions to Negative Externalities – Decreasing Supply.

Model explanation:

Negative externalities of production and consumption result in Q_e being greater than Q_{opt} and an overallocation of resources to this market. Decreasing supply from MPC to S_1 results in the quantity traded falling from Q_e to Q_{opt} and eliminates the DWL.

The decrease in supply can be done through increasing indirect taxes or imposing regulations that restrict production or increase the cost of production to the producer.

Solving Positive Externalities of Consumption and Production

Positive externalities result in an under allocation of resources to the production or consumption of the good, with the quantity traded being less than the optimal level of output. The solution on a broad level is to increase the quantity traded so that the equilibrium quantity traded equals the optimal level of output. It is possible to achieve this by either increasing demand or alternately increasing supply. The most common strategies suggested include, subsidising the products, advertising to persuade or create awareness, or regulations that compel consumption, in some instances governments may directly provide these goods. These solutions are illustrated in Figures 5.6.3.a and 5.6.3.b and summarised in Table 5.6.3 below.

Table 5.6.3: Solutions to Positive Externalities

Solution	Operation	Examples
Advertising	Advertising serves to inform or persuade consumers to alter the demand for a particular good. In the case of positive externalities, advertising can be used to inform consumers of the positive external benefits of their consumption working to increase demand through an increased awareness of these impacts. Alternatively, advertising can also be used to persuade consumers to increase demand by using positive advertising that plays on the emotions of the consumer.	<ul style="list-style-type: none"> • Negative Advertising for Gambling • Negative Advertising for Cigarettes • Advertising promoting recycling • Negative Advertising for drink driving
Regulations	Regulations are rules or directives from government that compel or restrict behaviours in markets. In the case of negative externalities, regulations can be used to prohibit consumption of a product by a population or a subset of a population. They can also be imposed to ban production of a good or alternately restrict where consumption may take place. Regulations can also be used to make licenses a requirement to engage in a certain activity thus decreasing production and adding to the costs of production. Depending on the regulation the impact will be a decrease in demand or a decrease in supply .	<ul style="list-style-type: none"> • Ban on alcohol and cigarette consumption in public places. • Age restrictions on product purchases such as: alcohol, tobacco, gambling. • Licenses for fishing, hunting, forestry • Permits for pollution such as: CO₂. • Bans on advertising of products such as: tobacco, fast food. • Restrictions on place of purchase, such as: pharmacy medication • Ban on using asbestos or CFC's
Subsidies	Subsidies are payments to producers or consumers that result in either an increase in supply due to lower costs of production or alternatively an increase in demand due to more spending power. Subsidies are often used to promote consumption or production of a product and where successful this will increase the supply or demand for the product depending of who the subsidy is provided to.	<ul style="list-style-type: none"> • Subsidies for electric vehicles • Subsidies for solar panels • Subsidies for gas installation in homes

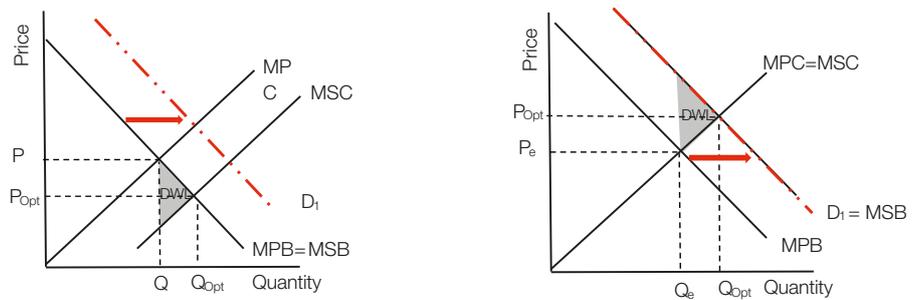


Figure 5.6.3a: Modelling the Solutions to Positive Externalities – Increasing Demand.

Model explanation:

Positive externalities of production ($MSC > MPC$) and consumption ($MSB > MPB$) result in Q_e being less than Q_{opt} and an under allocation of resources to the market. Decreasing demand from MPB to D_1 results in the quantity traded increasing from Q_e to Q_{opt} and eliminates the DWL .

The decrease in demand can be done through advertising, regulations to restrict consumption or via switching demand to alternatives often by subsidising the alternative product.

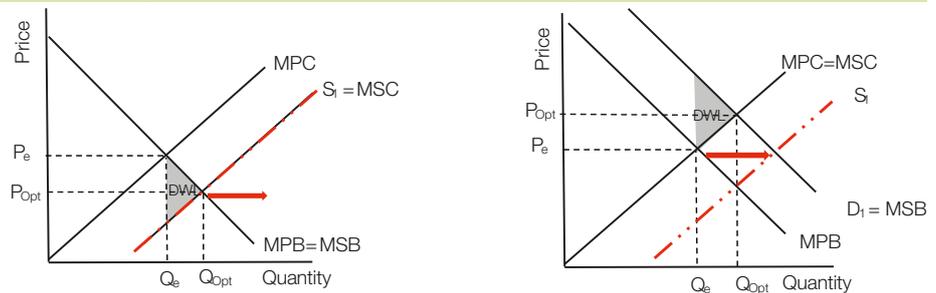


Figure 5.6.3b: Modelling the Solutions to Positive Externalities – Increasing Supply.

Model explanation:

Positive externalities of production ($MSC > MPC$) and consumption ($MSB > MPB$) result in Q_e being less than Q_{opt} and an under allocation of resources to the market. Increasing supply from MPC to S_1 results in the quantity traded falling from Q_e to Q_{opt} and eliminates the DWL .

The decrease in supply can be done through increasing indirect taxes or imposing regulations that restrict production or increase the cost of production to the producer.

Solving the Under-supply of Public Goods

As has been previously explained public goods are non-rivalrous and their benefits non-excludable, therefore, they will not be provided by private firms, as firms cannot charge a price for their use and therefore cannot generate a profit from their provision. This results in the responsibility for providing these goods falling to government, who must use taxpayers' money to ensure these goods are produced at optimal levels. This can be done in the following ways, direct government provision, subsidising private firm provision, outsourcing or through regulation.

Table 5.6.4 Solutions to Under-supply of Public Goods

Solution	Operation	Examples
Direct Government Provision	This occurs where government engages in providing the good directly to the public. Direct provision does not always entail government production of the good, but in many cases associated with public goods it does. Equally direct provision does not always mean free provision, this is the case with Healthcare and Education, but in the case of Public Goods provision must be free. Given that public goods are non-rivalrous, the marginal cost of provision is zero, therefore, to achieve allocative efficiency the price must be zero.	<ul style="list-style-type: none"> • Street Lighting • National Defence • Law enforcement
Subsidising Private Firms and Outsourcing	In some situations, the government may lack the expertise to provide the goods to the public. In these instances, they may elect to pay private firms to provide the good or service on their behalf. The government is effectively generating a demand for the good which will see private firms motivated to produce the good on governments behalf. This process is known as outsourcing where the government pays for a private firm to complete a task it would normally have done internally.	<ul style="list-style-type: none"> • National Jails • Parks Maintenance • Fire Services • Fire Works Displays

Solving Asymmetric Information

As Asymmetric Information results from one side of the market having more information than the other, the basic solution is to reduce the asymmetry and ensure all sides of the market are equally informed. The most widely applied solutions include:

- Regulation and compulsory information provision,
- Signalling through warranties, guarantees, certification and branding,
- Information provision and screening via third-party groups
- Providing incentives to encourage moral behaviour or penalties for immoral behaviour.

Table 5.6.5: Solutions to Asymmetric Information

Solution	Operation	Examples
Regulation	<p>This occurs where government legislates to make the provision of certain information compulsory. This is often done where producers/suppliers have more information than the consumer. The aim is not to alter consumption but rather to increase the extent of informed consumption. In these cases, it becomes the responsibility of the buyer or seller to disclose the information required.</p> <p>Regulation can also be used to make certain behaviours punishable, and this can be an effective way of reducing moral hazard. This is well known in medical fields where doctors can be sued for providing wrong advice. Equally there are legal guarantees provided to consumers on product quality and remedies if consumers have been misled.</p>	<ul style="list-style-type: none"> • Mandatory Labelling laws • Provision of credit Histories • Health Checks for Employment or Insurance • Statutory Guarantees
Information provision and Screening	<p>In some situations, the provision of information may come from an external group. Government has taken on this responsibility in some markets and there are now many businesses that have been set up to provide information on particular industries. The internet is argued to have helped reduce asymmetry of information by making information more readily available, and the emergence of AI is likely to further assist in information provision.</p> <p>Consumers themselves are also a part of information provision with product and service reviews now being found on most websites. This information allows potential customers to gain information from users who are independent of supplier and retailer.</p> <p>More industries are also allowing customers to use independent third-party assessors to ensure product quality. Mechanics and building inspectors are often used by customers to address the asymmetry of information in these car and housing markets.</p> <p>Asymmetry can also be addressed through screening. This sees the uninformed party require the disclosure of information before engaging in the transaction. Insurers collect information on potential customers before offering a product, employers will use interviews before hiring a new employee. The purpose of screening is to reduce the gap in the information between the two parties by forcing disclosure.</p>	<ul style="list-style-type: none"> • Consumer Reviews • Government Provision of Information • Compare the Industry Websites • Expert Third party advice – mechanics, building reports. • Screening – future employee interviews, information sheets for potential customers
Incentivise Behaviour	<p>To reduce moral hazard, it is accustomed for suppliers to build in incentives to encourage moral behaviour. This is often the case in insurance where companies may not insure the good or service for the full value, this forces the consumer to bear some of the cost of any action that they may undertake.</p>	<ul style="list-style-type: none"> • No Claim Bonuses • Excesses on Insurance Policies
Provide Signals	<p>Businesses can also reduce asymmetry by encouraging confidence in the purchase for the consumer. Warranties and guarantees are examples of these, as they provide assurance to the consumer of the products quality. Equally businesses can send signals to consumers to establish credibility. This can be done through investment/expansion or branding which emphasises the businesses long-term focus and its need for quality of products or services because they want to avoid negative impacts on their reputation. Equally, qualifications or awards can signal consumers of the expected quality of a good or service. Restaurants and many professions display awards and qualifications to signal to consumers.</p>	<ul style="list-style-type: none"> • Warranties and Extended warranties • Signals of Quality – qualifications, awards, branding • Certificates of compliance • Guarantees

5.7 Evaluating the Effectiveness of Solutions to Market Failures

It is important to note that whilst each of the solutions identified in the previous section can result in the correction of the market failure, every solution has its own limitations that impact its effectiveness. One of the major contentions is the extent to which market failure can be valued and, thus, the effectiveness of the solutions used to address this. Equally, many solutions involve direct government intervention, which, according to some economists, is likely to create more inefficiency. A summary of the limitations is shown in Table 5.7.1, which strongly suggests that no one solution will effectively address a specific market failure and that a combination of strategies is necessary.

Table 5.7.1: Limitations of Solutions to Market Failures

Solution	Market Failure Addressed	Limitations
Regulation	Uncompetitive Markets Negative Externalities Positive Externalities Asymmetric Information	<ul style="list-style-type: none"> • Costs associated with enforcement and ensuring compliance. • Incentives for compliance (motivate behaviour) needs to be sufficient. • Non-compliance can still occur and not be detected. • Restricting access to products can create parallel markets.
Advertising	Negative Externalities Positive Externalities Asymmetric Information	<ul style="list-style-type: none"> • Expensive – there are high costs associated with funding advertising. • Ineffective – need to choose the best medium and message for the advertising, some people may not be impacted by the advertising message or may not even see the advertisement.
Indirect Taxes	Negative Externalities	<ul style="list-style-type: none"> • Indirect taxes are regressive meaning that those on low incomes pay a high portion of their income in tax. This creates equity issues, as these taxes impact low-income earners more substantially. • Many products with negative externalities have relatively inelastic PED's meaning minimal reduction in quantity traded when taxes are imposed. • Determining the correct value to set as the tax can be difficult. It needs to equal the marginal external cost, but identifying and valuing externalities is difficult. The tax could be too high and create an under-allocation of resources to the market or too low and not remove the overallocation
Subsidies	Negative Externalities Positive Externalities Lack of Public Goods	<ul style="list-style-type: none"> • Direct cost of funding will put pressure on government budget. • There is an Opportunity cost of the funding spent on subsidising the good • Like taxes the relative PED of the product can significantly impact the amount by which quantity traded increases. • Sometimes for consumers the price is not the motivating factor behind non-consumption. Access to and/or concerns about the product may prevent people from buying rather than a high price. • Determining the correct value to set the subsidy can be difficult. It needs to equal the marginal external benefit, but identifying and valuing externalities is difficult. The subsidy could be too high and create an overallocation of resources to the market or too low and not remove the under allocation.

Solution	Market Failure Addressed	Limitations
Information provision and Screening	Asymmetric Information	<ul style="list-style-type: none"> • Compulsory information provision is a regulation and thus faces many of limitations associated with legislation. • The information provided may not be independently verified so may not address the asymmetry if it is not complete or accurate. • In some instances, the format of the information provided can be more confusing for customers. • Screening relies on the ability to discern useful information from false information
Direct Government Provision Government as a Producer	Uncompetitive Markets Lack of Public Goods Positive Externalities	<ul style="list-style-type: none"> • Provision is likely to be inefficient creating shortages or surpluses. • Can result in a government run monopoly. • Opportunity cost of the funding spent on providing the good • Over reliance of consumers on the good (using emergency medical centers for colds). • Need to be able to distribute the product or service to customers – some people may not be able to access.
Outsourcing	Lack of Public Goods	<ul style="list-style-type: none"> • Direct cost of funding will put pressure on government budget. • There is an Opportunity cost of the funding spent on outsourcing the good or service. • The quality of the good or service may fall as private firms look to cut costs to maximise their returns.

Real World Considerations: Multiple Solutions to Reduce Cigarette consumption

The Australian government has used and continues to use strategies like graphic health warnings, plain packaging, high tobacco excise taxes, anti-smoking advertising campaigns, age restrictions on purchase, bans on smoking in certain public places to assist in reducing cigarette consumption.

Discussion Point

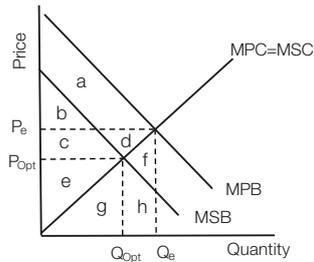
Why would a government need to adopt multiple strategies to reduce cigarette consumption?

Exercise 5 Market Failures

1. Complete the model to illustrate the existence of externalities in the identified market and assist in explaining how this results in a market failure.

Market	Externality Illustrated	Market Failure Explained
Honey Production		
Vaccinations		
Motor Vehicles		
Lead Production		

2. Referring to the model below, answer the following questions.



- (a) State which of the following markets the above diagram is most likely to represent.
Airports, Steel, Sugar, Defence.

- (b) Identify with reference to the labeled areas each of the following.

Consumer Surplus	
Producer Surplus	
Externality	
Dead Weight Loss	

- (c) Explain why the market identified in part a) experiences a market failure.

- (d) Evaluate the statement that the most effective strategy to address the market failure in this market is through Government Regulation.

5

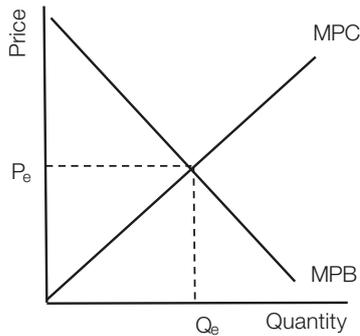
3. Referring to extract below, answer the following questions.

Education – The Positives for Society

As an individual there are many direct benefits of completing secondary education and these benefits increase as your education journey through tertiary study is completed. Higher paid jobs, more career advancement opportunities are two of the obvious ones. But, like many your decision to complete education tends to ignore the spill over benefits to society. Higher educated people make better societal decisions, there are lower crime rates in educated populations and labour productivity increases benefiting business and consumers. Evidence even suggests that the pressure on the health system decreases as populations become more educated. Despite these external benefits providers of education such as schools and universities do not benefit from them in the form of revenue and consumers do not gain personally from them. The inability for these benefits to be internalised results in there being an under allocation of resources to this market.

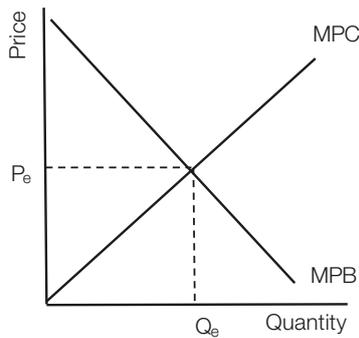
- (a) Identify the private benefits that arise from education.
- (b) Identify the external benefits that arise from education.

- (c) Illustrate on the model below how the existence of external benefits of education creates a market failure.



- (d) Outline one strategy that could be used to address this market failure.

- (e) Illustrate how the strategy identified in part d) would impact the market for education.



4. Referring to extract below, answer the following questions.

Asymmetric Information – It occurs in almost every economic transaction.

When you think about asymmetry of information and transactions it is actually hard to come up with a real-world situation where it does not exist. So human behaviour has adapted and signalling and screening are now commonplace, and they have had success in many instances in reversing the problem of Lemons, quality products and good sellers are now dominating.

- (a) Explain what is meant by the term asymmetric information.
- (b) Explain how signaling and screening address the problem of asymmetric information.

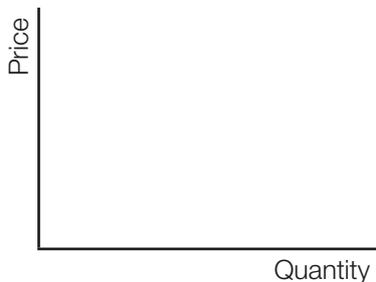
- (c) Explain how warranties may be able to reduce the problem of Lemons.
- (d) Distinguish between Moral Hazard and Adverse selection using real-world examples.

5. Referring to extract below, answer the following questions.

Blame it on the Monopoly.

Recent research shows that electricity prices in South Australia, Victoria and Queensland are going to continue to rise. The same research suggests that for residential customers anywhere up to a third of bill rises could be avoided if monopoly electricity networks were no longer allowed to extract supernormal (economic) profits.

- (a) Explain using an appropriate diagram why higher prices charged in a Monopoly are considered a market failure.



- (b) Outline one strategy government might use to address this market failure.

6. Referring to extract below, answer the following questions.

Court finds nothing sweet about Peters icing out their competition. (Extract)

Joanne Jary and Kayla Plunkett - March 2022

Source: Holding Redlich <https://www.holdingredlich.com/court-finds-nothing-sweet-about-peters-icing-out-their-competition>

Peters Ice Cream received a just dessert from the Federal Court – a \$12 million penalty and a three-year competition law compliance program undertaking – after admitting to certain anti-competitive exclusive dealing behaviour in proceedings brought by the Australian Competition and Consumer Commission (ACCC).

- (a) Explain what is meant by the term exclusive dealing.

- (b) Outline how exclusive dealing may result in a market failure.
- (c) Assess the effectiveness of using legislation and fines as a mechanism for reducing anticompetitive behaviour such as exclusive dealing.

7. (a) Complete the table by identifying (ticking) which of the following are public goods.

Education	
Defence	
Streetlights	
Roads	
Healthcare	

- (b) Referring to your answers to part a) explain why one of the products is not a Public good.
- (c) Explain using one of the public goods from part a) how this results in a market failure.
- (e) Justify the most appropriate solution to the market failure identified in part c).

Topic 6: Microeconomics – Government Intervention

Learning Outcomes based on the SACE Economics Teaching and Learning Framework

- Students analyse and evaluate the intended and unintended consequences of the following government interventions in markets, including consumer and producer surplus and deadweight loss using supply and demand diagrams:
 - price ceilings
 - price floors
 - subsidies
 - taxes.

6.1 Reasons for Government Intervention

In the previous chapter, we have noted how government intervention occurred in specific markets to resolve market failures. In those instances, the intervention represented an attempt by the government to attain allocative efficiency where the market resulted in a deadweight loss to society. Governments, however, also intervene in markets for reasons beyond addressing market failures. These reasons are identified in Figure 6.1.1 and include assisting the attainment of equity, reducing poverty, protecting firms and collecting revenue. Government Intervention attempting to attain these outcomes often occurs in markets where there is no market failure. In these situations, government intervention causes a reallocation of resources and thus will always create allocative inefficiencies. For this reason, these types of interventions invoke differing views from economists and the broader public about their necessity. The basic contention between the differing perspectives lies in the trade-off that occurs between the reason for the intervention and the resulting inefficiency that it creates.



Figure 6.1.1: Reasons for Government Intervention.

6

The mechanisms by which government intervention occurs include:

- Price Controls
 - Price Floors (Price Minimum)
 - Price Ceilings (Price Maximum)
- Taxes
- Subsidies.

Key Point:

Where government intervention occurs in a market that is allocatively efficient, the intervention will redistribute resources and create a Deadweight Loss (DWL) and therefore allocative inefficiency.

6.2 Methods of Intervention

Price Controls

A price control is a legalised restriction of the price of a good, service or resource. The restriction is placed and enforced by the government and results in the price that can be charged in the market having either a maximum or minimum limit. There are two types of price controls imposed by governments in markets.

- Price Floors (Price Minimum)
- Price Ceilings (Price Maximum).

Price Floor (Price Minimum)

A price floor, also known as a price minimum, is the legalised lowest price that can be charged in the market for a good, service or resource. Price floors operate primarily to benefit suppliers by guaranteeing a price that provides a sufficient income. To be effective, a Price floor must be set above equilibrium otherwise, the market would simply settle at the equilibrium price and the minimum price

Key Definition:

Price Floor a legalised lowest price that can be charged in the market for a good, service or resource.

would not impact the market. The two most recognised reasons for imposing a price floor are summarised in Figure 6.2.2 and include supporting supplier income and preventing the establishment of markets for undesirable products through low prices. Floor prices are common in agricultural markets, but also occur in labour markets where minimum wages are used to ensure equitable and just wages for employees.



The imposition of a price floor limits the effective operation of the price mechanism and therefore, impacts on efficiency, creating a dead weight loss (DWL). In addition, stakeholders such as consumers, producers and governments are also impacted. The operation and impacts of imposing a price floor are explained in Figure 6.2.3.

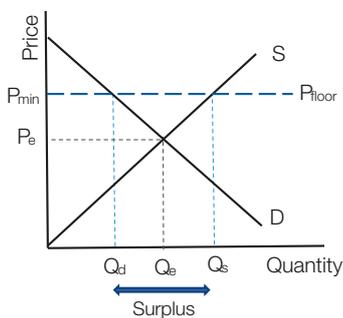
◀ Figure 6.2.1: Minimum Wages represent a price floor.

Key Point:

The imposition of a price floor only impacts a market if it is set above equilibrium. When set below equilibrium the market price will gravitate to equilibrium.

Price floors are able to increase the price of a product that is deemed social undesirable and therefore prevent producers from charging low prices to establish a market.	Price floors can also be used to guarantee a price that is sufficient for a supplier to remain in the market (such as agriculture) or provide low skilled (paid) workers with an equitable income
Decrease Quantity Traded	Support Supplier Incomes

Figure 6.2.2: ► Reasons for Price Floors.



Model explanation:

The imposition of a price floor P_{floor} (P_{min}) above the equilibrium price P_e , results in the quantity demanded contracting to Q_d and the quantity supplied expanding to Q_s . This is consistent with the laws of demand and supply and results in a surplus in the market of $Q_s - Q_d$.

Figure 6.2.3: Impacts of a Price Floor on Demand and Supply.

The impact on the market efficiency and stakeholders is now dependent on how the government responds to the surplus. The government has two choices:

- They may choose to purchase the surplus to maintain producer income.
- They do not purchase the surplus and the quantity traded falls to Q_d .

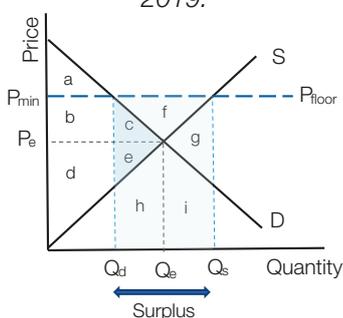


Figure 6.2.4: Price floor in Taiwan Cabbage market 2019.

This choice is primarily determined by why the government has imposed the price control in the first instance. Where it is supporting suppliers, the government will purchase the surplus, but where it is designed to restrict consumption, the government will not purchase the surplus.

Model explanation:

Prior to the imposition of a price floor P_{floor} (P_{min}) the consumer surplus was area a+b+c and the producer surplus was area d+e. Social surplus of area a+b+c+d+e was maximised, and allocative efficiency was attained. The imposition of the price floor results in quantity demanded being Q_d and quantity supplied being Q_s .

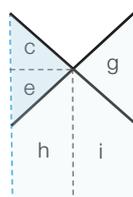


Where the government elects to purchase the surplus, the cost to government will be equal to the P_{floor} multiplied by the surplus ($Q_s - Q_d$). This is represented by area c+e+f+g+h+i. The consumer surplus will fall to become area a, but the producer surplus increases to area b+c+d+e+f. The government expenditure will add area c+e+f to producer surplus but as area c+e was already apart of social surplus only area f is adding to social surplus. The resulting effect is a loss in social surplus (DWL) of area c+e+g+h+i.

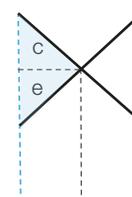
Where the government does not purchase the surplus (mostly in situations where prices are set to prevent consumers buying undesirable products - demerit goods) producers are only able to sell quantity demanded Q_d . This results in the consumer surplus falling to area a, a loss of area b+c. Producer surplus becomes b+d a gain of area b from the consumer but a loss of area e. The resulting impact is a loss of social surplus (DWL) of area c+e.

Figure 6.2.5: Impacts of a Price Floor on Market efficiency.

DWL Surplus Purchased



DWL Surplus Not Purchased



Impacts of Price Floor – The government does not purchase surplus.

Beyond the impacts on efficiency, there are further impacts on consumers, producers, and government. In instances where the government does not buy the surplus, consumers are impacted negatively, the fall in consumer surplus reflects both, a higher price P_{\min} compared to P_e and a lower quantity traded Q_d compared to Q_e . For the producer, they receive a higher price P_{\min} rather than P_e but also now only trade Q_d instead of Q_e .

Impacts of Price Floor – The government does purchase surplus.

In the instances where the government purchases the surplus production, the producers gain from both, a higher price P_{\min} compared to P_e and a larger quantity traded Q_s instead of Q_e . Whilst consumers are impacted in the same way as if the surplus production was not purchased (higher price and lower quantity traded). There are now clear impacts on the government. The government has a direct cost associated with the purchase and maintenance of the surplus production and an opportunity cost of this expenditure. In addition, the government must now determine how to deal with the surplus. There are three basic options available:

- Destroy the surplus
- Dump it into international markets or
- Stockpile it in the hope that demand will increase in future periods and that the surplus can be sold back into the market.

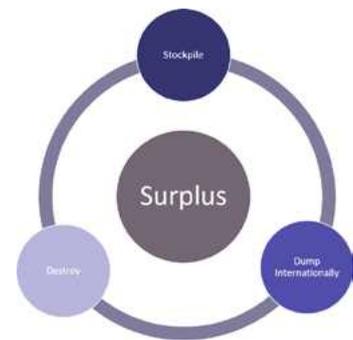


Figure 6.2.7: Government reactions to surplus created by price floor.



Figure 6.2.6: “Butter Mountain” Storage of butter surpluses, Europe

6

Table 6.2.1: Summary of Government Options for Dealing with Surplus Production.

Stakeholder	Surplus Not Purchased
Destroy the Surplus	Destroying the excess clearly highlights the inefficiencies created by the imposition of the price floor and is often viewed unfavorably by society due to the significant wastage.
Dumping in International Markets	Dumping the product in international markets (selling the product at a price below the domestic market price (normal price) in overseas markets) impacts on international relations and is likely to result in some form of retaliatory action from the foreign country.
Stockpile	In cases where the product can be stockpiled (stored) this is preferred by government as it can be sold back to the market in periods of higher demand or lower supply. Stockpiling does however incur additional costs including warehousing and insurance and there are many instances where the stockpile continues to grow as demand never increases to allow the resale.

Table 6.2.2: Summary of Impacts of Price Floor on Stakeholders.

Stakeholder	Surplus Not Purchased	Surplus Purchased
Consumer	<ul style="list-style-type: none"> • Loss of Consumer Surplus • Higher Price • Lower Quantity 	<ul style="list-style-type: none"> • Loss of Consumer Surplus • Higher Price • Lower Quantity 
Producer	<ul style="list-style-type: none"> • Likely Gain in Producer Surplus • Higher Price • Lower Quantity Traded 	<ul style="list-style-type: none"> • Gain in Producer Surplus • Higher Price • Higher Quantity Traded 
Government	<ul style="list-style-type: none"> • Not impacted 	<ul style="list-style-type: none"> • Direct Dollar Cost of Purchase and Opportunity cost • Decision of how to Manage Surplus • Potential Costs of Warehousing (Stockpiling) 

Real World Considerations: How Scotland cut alcohol related deaths by 13% in less than 3 years

A study has found that minimum alcohol pricing likely saved 156 lives annually.

Scotland’s plan to become one of the first countries to introduce minimum pricing of alcohol met with a “storm of protest” before it finally became law in 2018. The alcohol industry threw up legal challenges, while those on low incomes expressed anger that they were being unfairly penalized.

Cassie Werber March 21, 2023

Source: Quartz <https://qz.com/how-scotland-cut-alcohol-related-deaths-by-13-in-less-1850247506>

Discussion Point

What is the purpose of a price floor in an alcohol market?

What are the arguments against implementing such a price control?

Key Definition:

Price Ceiling a legalised maximum price that can be charged in the market for a good, service or resource.

Price ceilings are able to decrease the price of a product that is deemed a necessity so that those on low incomes can afford the product.

Promote Equity



Figure 6.2.8: Reasons for Price Ceilings.

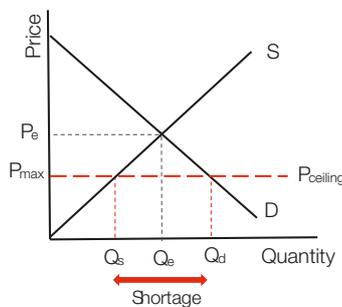


Figure 6.2.10: Impacts of a Price Ceiling on Demand and Supply.



Figure 6.2.9: Price ceiling for prescription medications and rental markets.

Price Ceiling (Price Maximum)

A price ceiling, also known as a price maximum, is the legalised maximum price that can be charged in the market for a good, service or resource. Price ceilings operate primarily to benefit consumers by guaranteeing a price that makes products affordable. To be effective, a Price ceiling must be set below equilibrium, otherwise the market would simply settle at the equilibrium price and the maximum price would not impact the market. The most recognised reason for imposing a price ceiling is to promote equity by making the product affordable, especially for those on low incomes. Price ceilings are common in markets for necessities such as food and rental accommodation.

Key Point:

The imposition of a price ceiling only impacts a market if it is set below equilibrium. When set above equilibrium the market price will gravitate to equilibrium.

The imposition of a price ceiling limits the effective operation of the price mechanism and, therefore, impacts on efficiency, creating a dead weight loss (DWL). In addition, stakeholders such as consumers, producers and governments are also impacted. The operation and impacts of imposing a price floor are explained in Figure 6.2.10.

Model explanation:

The imposition of a price ceiling $P_{ceiling}$ (P_{max}) below the equilibrium price P_e , results in the quantity demanded expanding to Q_d and the quantity supplied contracting to Q_s . This is consistent with the laws of demand and supply and results in a shortage in the market of $Q_d - Q_s$.

The impact on market efficiency and stakeholders is now dependent on how the government responds to the shortage. The government must implement a non-price rationing mechanism to allocate the available supply Q_s , (examples are explained below). Irrespective of the method the government chooses, the existence of the shortage represents an under-allocation of resources to the production of this product and thus a DWL result.

Model explanation:

Prior to the imposition of a price ceiling $P_{ceiling}$ (P_{max}) the consumer surplus was area $a+b+c$ and the producer surplus was area $d+e+f$. The social surplus of area $a+b+c+d+e+f$ was maximised, and allocative efficiency was attained. The imposition of the price floor results in quantity demanded being Q_d and quantity supplied being Q_s .

Where the government adopts an ineffective non-price rationing mechanism there is a likelihood that a parallel market will form. This is because consumers (buyers) could purchase the available supply Q_s and sell it at the parallel market price P_{pm} . This action will impact end consumers negatively as those who need the product will be forced to buy it at P_m which is higher than the original equilibrium price of P_e . Consumer surplus thus falls to area a , a loss of consumer surplus of area $b+c$. The sellers however gain from the parallel market forming, as the extra revenue, area $b+d$ adds to producer surplus. Producer surplus will now increase despite the loss of area e , to be area $b+d+f$. The overall effect is a loss in social surplus (DWL) of area $c+e$.

However, in situations where parallel markets can be prevented the impact on consumers and producers is distinctly different. Consumers can now buy the product at a lower price P_{max} ; however, they also now get less quantity Q_s , this results in the Consumer surplus becoming $a+b+d$, a loss of area c , but a gain of $b+d$. Producers lose in this situation as they sell a smaller quantity Q_s and at a lower price P_{max} . The producer surplus falls to area f , with area b being gained by the consumer but area e being a loss to society. The overall effect is a loss in social surplus (DWL) of area $c+e$.

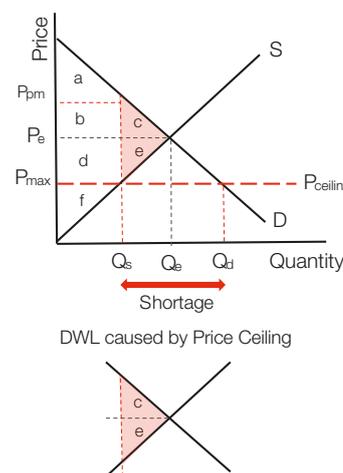


Figure 6.2.12: Impacts of a Price Ceiling on Market efficiency.

Whilst the impact of the ceiling price on efficiency is consistent, a DWL of area $c+e$. The implications for consumers and producers is dependent on the effectiveness of the non-price rationing mechanism imposed by the government. Common non-price allocation strategies used by governments include:

- A first-in-first-served model
- The use of coupons
- A predetermined needs basis (often an income means tested)
- A lottery system
- Waiting lists.

It is important to note that all these options have drawbacks, which is why market systems rely on price as the allocative mechanism. It is likely that the government will introduce a system that combines elements of each of these options as they attempt to ensure that the price ceiling assists in creating access to affordable goods.



Figure 6.2.11: Non-price Rationing Mechanisms.

Table 6.2.3: Summary of Non-Price Rationing Methods.

Stakeholder	Surplus Not Purchased
First in First Served	Products are provided to those buyers who are first to the seller. First in first served models tend to create parallel markets as those who can buy first are able to resell the good at higher prices
Coupons	Coupon systems where buyers need a coupon to purchase the product often create markets for the coupon itself, again allowing people to profit from selling the coupon at a high price
Stockpile	Lottery systems reduce the potential for parallel markets, but they can at times fail to achieve the equity outcome required. They potentially allow high income earners who win the lottery to buy the good at a lower price
Waiting Lists	Waiting lists are also problematic as they can result in consumers waiting considerable lengths of time without the product

Table 6.2.4: Summary of Impacts of Price Ceiling on Stakeholders.

Stakeholder	With Parallel Market	Without Parallel Market
Consumer	<ul style="list-style-type: none"> • Loss of Consumer Surplus • Higher Price • Lower Quantity 	<ul style="list-style-type: none"> • Likely Gain of Consumer Surplus • Lower Price • Lower Quantity
Producer	<ul style="list-style-type: none"> • Likely Gain in Producer Surplus • Higher Price • Lower Quantity Traded 	<ul style="list-style-type: none"> • Loss of Producer Surplus • Lower Price • Lower Quantity Traded
Government	<ul style="list-style-type: none"> • Decision of how to Manage Shortage • Potential Administrative Costs reducing Parallel market 	<ul style="list-style-type: none"> • Decision of how to Manage Shortage • Potential Administrative Costs of non-price allocative mechanism

Real World Considerations: Why Rent Controls are a Zombie Idea (extract)

Richard Holden Jun 14, 2023

Source: Australian Financial Review <https://www.afr.com/property/residential/why-rent-controls-are-a-zombie-idea-20230607-p5dev3#:~:text=In%20rental%20markets%20specifically%2C%20rent,in%20maintenance%20or%20quality%20improvements.>

How do we address a housing affordability crisis that exists in owner occupier and rental markets, well according to Economists its not with a historically bad idea like a price ceiling. Economists are not keen on price ceilings as they distort the market and create inefficiencies, the seller sells less, and buyers demand more. As stated by Richard Holden (AFR 2023) “It’s not just a matter of theory, there are countless examples of the counterproductive effects of price ceilings. From petrol price controls leading to rationing in the 1970s, to food shortages in Venezuela in the early 2000s, to serious distortions in the New York housing market”.

It is in rental markets however that price controls are especially detrimental, put simply they decrease supply, and this makes it even harder to find rental accommodation and in the long-run when the controls are lifted it drives up prices. They also reduce incentives for landlords to maintain or improve the quality of rental accommodation. Price Ceilings essentially create poorer rentals that are harder to find and that will ultimately cost more and that is before we consider the parallel markets that emerge.

Discussion Point

Why are price ceilings in rental markets considered to be an ineffective solution to Rental Affordability?

Taxes

Key Definition:

Indirect Tax a tax that is levied on expenditure but paid by the producer thus impacting the cost of production and supply.

As mentioned in Chapter 3, factors impacting supply, indirect taxes are taxes that are levied on expenditure and whilst paid by the producer, some of the cost is ultimately indirectly borne by the consumer in the form of higher prices. Indirect taxes represent a cost of production to producers, and as such, increases in indirect taxes increase the cost of production and decrease supply. There are two primary reasons for the introduction of an indirect tax:

1. To decrease the quantity traded, particularly in the cases of demerit goods or goods with negative externalities or
2. To raise revenue for the government.



Figure 6.2.14: Excise Tax on fuel and sugar.



Figure 6.2.13: Reasons for Indirect Taxes.

Key Point:

The imposition of an indirect tax on a market which is allocatively efficient will create a DWL.

The imposition of an indirect tax in a competitive market not experiencing a market failure market will impact efficiency and create a dead weight loss (DWL). In addition, stakeholders such as consumers, producers and governments are also impacted. The operation and impacts of imposing an indirect tax are explained in Figure 6.2.15.

Model explanation:

Prior to the imposition of the indirect tax the consumer surplus was area $a+b+c+d$ and the producer surplus was area $e+f+g+h$. The social surplus of area $a+b+c+d+e+f+g+h$ was maximised, and allocative efficiency was attained. The imposition of the tax results in quantity traded decreasing to Q_{e1} and price rising to P_{e1} , therefore creating allocative inefficiency and a DWL.

This imposition of the tax will generate revenue for the government represented by area $b+c+e+f$. This is calculated by multiplying the tax (the vertical distance between the two supply curves) by the quantity traded Q_{e1} . The tax also has the impact of decreasing quantity traded Q_e to Q_{e1} which means less quantity is now traded than in socially optimal at Q_e .

Consumers now buy the product at a higher price P_{+tax} and purchase less of the good Q_{e1} rather than Q_e , this results in the consumer surplus becoming area a , a loss of area $b+c+d$. Producers also lose in this situation as they sell a smaller quantity Q_{e1} and despite receiving P_{e1} from consumers must pay the government the tax resulting in them only receiving P_p on each sale. The lower price and reduced quantity sold results in producer surplus falling to area h , a loss of area $e+f+g$. Whilst consumer surplus falls by area $b+c+d$ and producer surplus falls by area $e+f+g$ the government gains parts of these losses as revenue, area $b+c+e+f$. The overall effect on social surplus is therefore a DWL of area $d+g$.

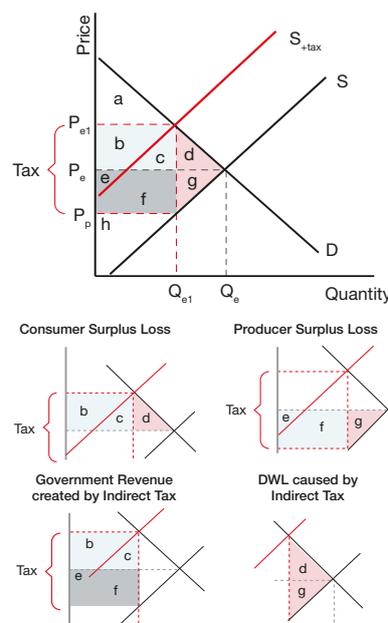


Figure 6.2.15: Impacts of an Indirect Tax on Market efficiency.

Whilst all indirect taxes imposed in allocatively efficient markets create a DWL, the implications for consumers and producers are dependent on the overall PED of the product being taxed.

In Figure 6.2.15, the overall PED is close to unitary, and as such, the price increase is approximately half the value of the tax. Consumers ultimately indirectly bear approximately half of the tax burden (area $b+c$), with the producer bearing the other half (area $e+f$). These respective burdens reflect a loss for the consumer due to a higher price paid P_{e1} , and a loss to the producer who receives a lower final price of P_p .

If, however, the product's PED is relatively inelastic, the consumer will bear a higher incidence, as producers will be able to pass on most of the tax in the form of a higher price. Conversely, for products where the PED is relatively elastic, the majority of incidence will fall on the producer, as they will not be able to raise the price significantly. This is indicated in Figures 6.2.16a and 6.2.16b.

Key Definition:

Tax Burden the final resting place of the tax, often referred to as the incidence of tax.

Key Point:

The same per unit dollar value tax placed on two differing products can raise the price of these products to differing magnitudes.

Model explanation:

When a products PED is relatively inelastic (Figure 6.2.16a) producers can pass most of the tax burden onto consumers in the form of a higher price. ($e+f$ is less than $b+c$). Taxes on products which have price inelastic demand result in large increase in price P_e to P_{e1} . Alternately when the PED is relatively elastic (Figure 6.2.16b) the increase in price P_e to P_{e1} is much smaller. This results in the producer bearing most of the tax burden ($e+f$ is greater than $b+c$).

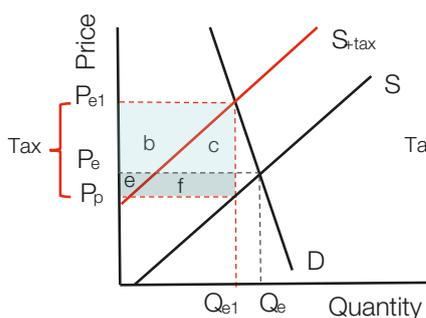


Figure 6.2.16a – Impacts of Tax with Inelastic PED

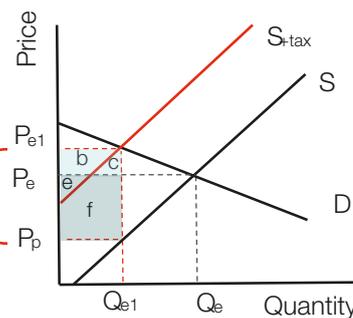


Figure 6.2.16b – Impacts of Tax with Elastic PED

The relative PED of the product also impacts the capacity of the government to achieve the objectives of imposing the tax. For the relatively inelastic PED, the tax has minimal impact on decreasing quantity traded Q_e to Q_{e1} (Figure 6.2.16a). This would make it difficult for the government to use taxes to decrease the consumption of these types of goods. However, taxes on these products do effectively raise revenue, noted by the large area of $b+c+d+e$, this is because the quantity traded does not change by much. In comparison, products where the PED is relatively elastic (Figure 6.2.16b), will see a tax result in a large decrease in quantity traded Q_e to Q_{e1} , and will be effective at decreasing consumption. However minimal revenue will be raised due to the quantity traded falling so much, note the small area of $b+c+d+e$.

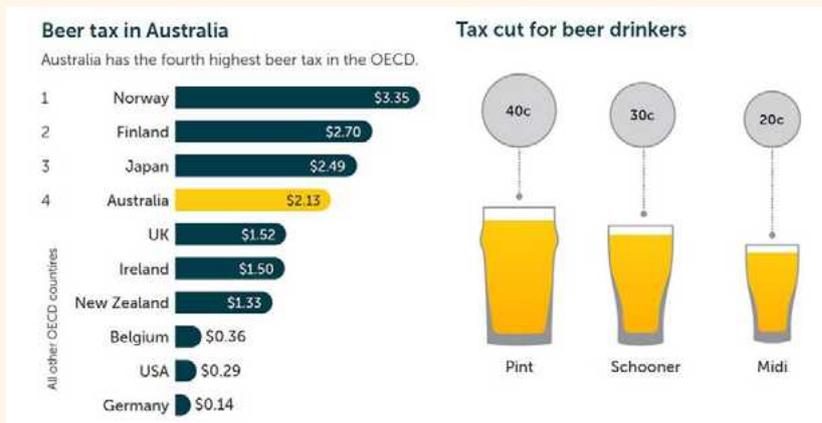
Key Point:

Tax revenue is equal to the Tax multiplied by quantity traded. When products have a relatively elastic PED quantity traded falls more resulting in lower revenue gained by government.

Table 6.2.5: Summary of Impacts of Indirect Taxes on Stakeholders.

Stakeholder	Impact	With Relative Inelastic PED	With Relative Elastic PED
Consumer	<ul style="list-style-type: none"> Loss of Consumer Surplus Higher Price Lower Quantity Traded 	<ul style="list-style-type: none"> Large Increase in price Smaller decrease in quantity traded. Relatively high loss of consumer surplus. 	<ul style="list-style-type: none"> Smaller increase in price Larger decrease in quantity traded. Relatively smaller loss of consumer surplus
Producer	<ul style="list-style-type: none"> Loss of Producer Surplus Lower Price Lower Quantity Traded 	<ul style="list-style-type: none"> Smaller decrease in price. Smaller decrease in quantity traded. Relatively smaller loss of producer surplus. 	<ul style="list-style-type: none"> Smaller decrease in price. Larger decrease in quantity traded. Relatively smaller loss of producer surplus.
Government	<ul style="list-style-type: none"> Gain in Tax Revenue 	<ul style="list-style-type: none"> Smaller decrease in quantity traded. Large gain in tax revenue 	<ul style="list-style-type: none"> Larger decrease in quantity traded. Smaller gain in tax revenue

Real World Considerations: That’s a whole lot of Tax



Source: Brisbanista (2023) <https://brisbanista.com.au/call-for-australian-beer-tax-relief-for-pubs-clubs-and-beer-drinkers/>

Discussion Point

Why is beer taxed so heavily in Australia?

What impact could taxes have on business?

Should taxes be lowered on beer in Australia?

Subsidies

Producer Subsidies

Key Definition:

Producer Subsidy a payment by government to producers that lowers the cost of production and increases supply.

A producer (or production) subsidy is a payment by the government to producers that lowers the cost of production and increases supply. Producer subsidies are most often provided with the aim of encouraging the output of products, especially in industries where the product is deemed essential to the economy or where fluctuations and uncertainty of income exist. Producers subsidies benefit producers with higher prices and greater output, but they also benefit consumers who receive lower prices and increased output. There are two primary reasons for the introduction of a producer subsidy.

1. To increase the quantity produced and guarantee output, especially in the case of essential goods.
2. To protect employment by guaranteeing output and increasing profit.

In addition, producer subsidies can be used for a third reason, centred on assisting consumers.

3. To make the product cheaper for consumers.

Producer subsidies lower the cost of production and thus create an incentive for producers to increase supply (output). This is often used in agriculture where the aim is to guarantee supply of food.

Guarantee Output



Producer subsidies increase output and profits for firms. This ensures these firms continue to demand labour and thus employment is maintained.

Support Employment



As producer subsidies lower the cost of production and increase supply, they should result in lower retail prices for consumers and thus more affordable products.

Lower Prices for Consumers



Figure 6.2.18: Reasons for Producer Subsidies.

There are many historic and current examples of subsidies provided to the producers, markets for agriculture, steel, motor vehicles, medicines, oil have all had subsidies provided to the producer in attempts to lower the cost of production and increase supply.

The imposition of a producer subsidy in a competitive market not experiencing a market failure will create allocative inefficiency and a dead weight loss (DWL). In addition, stakeholders such as consumers, producers and governments are also impacted. The operation and impacts of imposing a producer subsidy are explained in Figure 6.2.20.



Figure 6.2.19: Producer Subsidies for Agriculture in the EU.

6

Model explanation:

Prior to the imposition of the producer subsidy the consumer surplus was area $a+b$ and the producer surplus was area $d+h$. The social surplus of area $a+b+d+h$ was maximised, and allocative efficiency was attained. The imposition of the producer subsidy results in quantity traded increasing to Q_{e1} and price falling to P_{e1} , this increase in output represents an over allocation of resources to this market creating allocative inefficiency and a DWL.

This imposition of the subsidy will generate a direct cost to the government represented by area $b+c+d+e+f+g$. This is calculated by multiplying the subsidy (the vertical distance between the two supply curves) by the quantity traded Q_{e1} .

Consumers now buy the product at a lower price P_{e1} and purchase more of the good Q_{e1} rather than Q_e , this results in the consumer surplus becoming area $a+b+d+e+f$, a gain of area $d+e+f$. Producers also gain in this situation as they sell a larger quantity Q_{e1} and despite receiving P_{e1} from consumers they also receive the subsidy from government resulting in them receiving P_p on each sale. The higher price and increased quantity sold results in producer surplus increasing to area $d+h+b+c$, a gain of area $b+c$. Whilst consumer surplus rises by area $d+e+f$ and producer surplus rises by area $b+c$ they do not represent the entire cost to government, area $b+c+d+e+f+g$ as area g is a cost that does not benefit any stakeholder in the market. The overall effect on social surplus is therefore a DWL of area g .

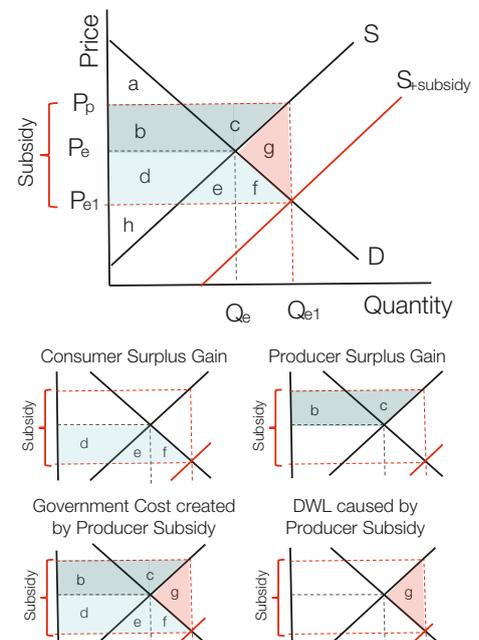


Figure 6.2.20: Impacts of a Producer Subsidy on Market efficiency.

Consumer Subsidies

A consumer subsidy is a payment by the government to consumers that lowers the price they pay for a good, with the aim of increasing demand. Consumer subsidies are most often provided with the aim of encouraging the consumption of products by making them more affordable, especially in markets where the product has positive externalities associated with its consumption. Whilst provided with the aim of supporting consumers, particularly those on low incomes, consumer subsidies also benefit producers who are the recipients of higher prices and increased output as demand increases. There are two primary reasons for the introduction of a consumer subsidy.

Key Definition:

Consumer Subsidy a payment by government to consumers that lowers the price paid and increases demand.

1. To increase the quantity of a good consumed.
2. To make a product more affordable for those on low incomes.

In addition, consumer subsidies can be used for a third reason, centred on assisting producers:

3. To increase sales and, therefore profits.



Figure 6.2.21: Consumer Subsidies for Solar Panels and vaccines.

As consumer subsidies increase demand producers are benefited by higher prices and increased sales volumes resulting in increased profits.

Increased Sales and Profits for Firms

Consumer subsidies lower the price paid for the product and thus act as an incentive for consumers to purchase the good.

Increase Consumption

Consumer subsidies lower prices for essential items, allowing many consumers on low incomes the ability to purchase these goods.

Support Low Income Earners

Figure 6.2.22: Reasons for Consumer Subsidies.

There are many historical and current examples of subsidies provided to the consumer: markets for medicines, particularly for those on welfare, vaccines, electric vehicles, solar panels, natural gas appliances, and childcare have all had subsidies provided to the consumer in attempts to reduce the price and increase the demand.

The imposition of a consumer subsidy in a competitive market not experiencing a market failure will create a dead weight loss (DWL) and allocative inefficiency. In addition, stakeholders such as consumers, producers and governments are also impacted. The operation and impacts of providing a consumer subsidy are explained in Figure 6.2.23.

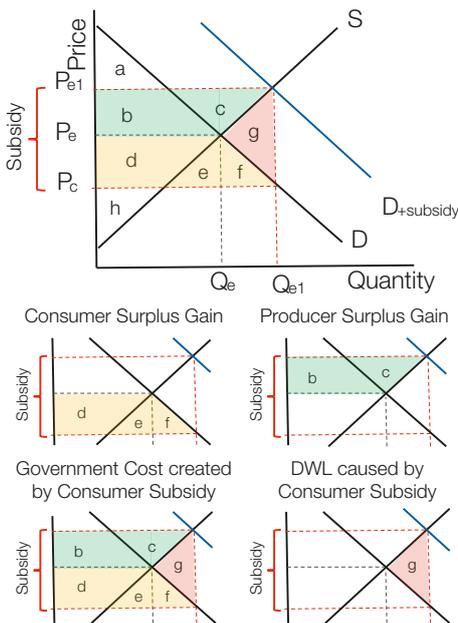


Figure 6.2.23: Impacts of a Consumer Subsidy on Market efficiency.

Model explanation:

Prior to the imposition of the consumer subsidy the consumer surplus was area a+b and the producer surplus was area d+h. The social surplus of area a+b+d+h was maximised, and allocative efficiency was attained. The imposition of the consumer subsidy results in quantity traded increasing to Q_{e1} and price rising to P_{e1} , this increase in output represents an over allocation of resources to this market creating allocative inefficiency and a DWL.

This imposition of the subsidy will generate a direct cost to the government represented by area b+c+d+e+f+g. This is calculated by multiplying the subsidy (the vertical distance between the two demand curves) by the quantity traded Q_{e1} .

Consumers now buy the product at a lower price P_c (P_{e1} less the subsidy) and purchase more of the good Q_{e1} rather than Q_e , this results in the consumer surplus becoming area a+b+d+e+f, a gain of area d+e+f. Producers also gain in this situation as they sell a larger quantity Q_{e1} and at a higher price P_{e1} . The higher price and increased quantity sold results in producer surplus increasing to area d+h+b+c, a gain of area b+c. Whilst consumer surplus rises by area d+e+f and producer surplus rises by area b+c they do not represent the entire cost to government, area b+c+d+e+f+g as area g is a cost that does not benefit any stakeholder in the market. The overall effect on social surplus is therefore a DWL of area g.

Key Point:
The imposition of a subsidy on a market which was allocatively efficient will create a DWL.

Regardless of whether the subsidy is provided to the consumer or producer, the resulting market outcomes and impacts on stakeholders are almost identical. These are summarised in Table 6.2.6

Table 6.2.6: Summary of Impacts of Subsidies on Stakeholders.

Stakeholder	Impact
Consumer	<ul style="list-style-type: none"> Gain of Consumer Surplus Lower Price Increased Quantity Traded 
Producer	<ul style="list-style-type: none"> Gain of Producer Surplus Higher Price Higher Quantity Traded 
Government	<ul style="list-style-type: none"> Cost of Expenditure 

Real World Considerations: Are Agricultural Subsidies a Growing Problem

The EU's common agricultural policy (CAP) has accounted for up to 58 billion euros in a single year. These funds have been provided to various agricultural support programmes including direct payments to farmers, rural development projects and to promote environmental sustainability.

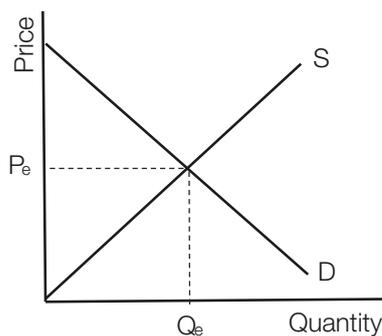
Discussion Point

Should the EU (or any country) provide subsidies to Agricultural production?

Exercise 6 Government Intervention in Markets

6

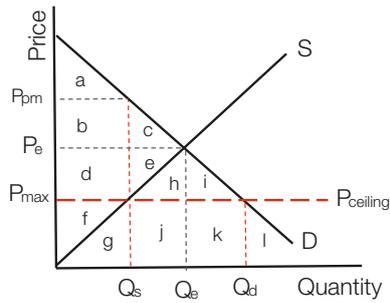
1. The following demand and supply diagram represent the market for rental accommodation in a city in the USA.



- (a) Complete the diagram above by illustrating the impacts of the introduction of a price ceiling below P_e .
 (b) Explain how a parallel market may emerge for rental accommodation in this market.

- (c) Evaluate the effectiveness of a price ceiling in this market.

2. Referring to the model below, answer the following questions.



(a) After the introduction of the price ceiling and assuming no parallel market, identify with reference to the labeled areas each of the following.

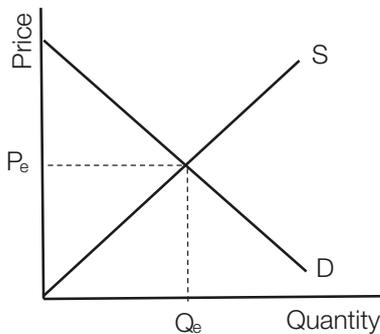
Consumer Surplus	
Producer Surplus	
Dead Weight Loss	

(b) Identify how the emergence of a parallel market at P_{pm} impacts consumer and producer surplus.

Consumer Surplus	
Producer Surplus	

(c) Explain why the introduction of price ceiling creates allocatively efficiency.

3. The following demand and supply diagram represent the market for wool in Australia in the 1980's.



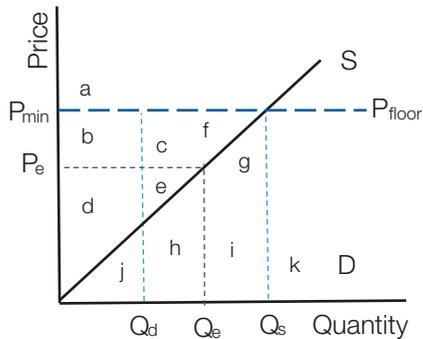
(a) Complete the diagram above by illustrating the impacts of the introduction of a price floor.

(b) Explain why a price floor leads to a disequilibrium in the market.

(c) Outline the government responses to the disequilibrium explained in part b).

- (d) Explain why a government would implement a price floor if it creates a disequilibrium.

4. Referring to the model below, answer the following questions.



- (a) After the introduction of the price floor and assuming no government purchases the surplus, identify with reference to the labelled areas each of the following.

Consumer Surplus	
Producer Surplus	
Dead Weight Loss	

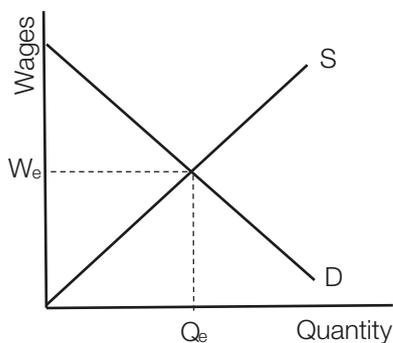
- (b) Analyse what occurs to the dead weight loss if the government does not buy the surplus.

Dead Weight Loss	
------------------	--

- (c) Evaluate whether stockpiling is the most effective response from government in dealing with the surplus created.

6

5. The following demand and supply diagram represents the market for labour.



- (a) Complete the diagram above by illustrating the impacts of the introduction of a minimum wage above W_e .
 (b) Explain why the introduction of a minimum wage is likely to lead to unemployment.

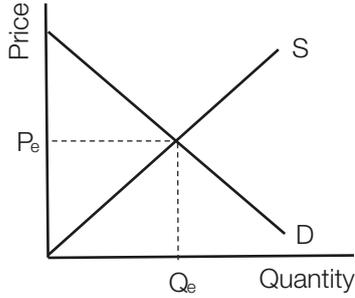
6. Referring to extract below, answer the following questions.

Taxes making Sugar Sourer.

Excessive sugar consumption is being blamed for obesity and diabetes and according to the WHO there is clear evidence that raising prices on sugary drinks by 20% will decrease its consumption by about 20%.

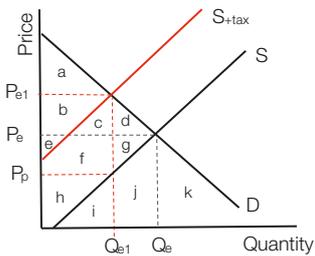
(a) Explain why governments are being encouraged to tax sugary drinks.

(b) Complete the diagram below by illustrating the impacts of the introduction of a tax on the market for sugary drinks.



(c) Evaluate the effectiveness of imposing a tax to achieve the outcome identified in part a).

7. Referring to the model below, answer the following questions.



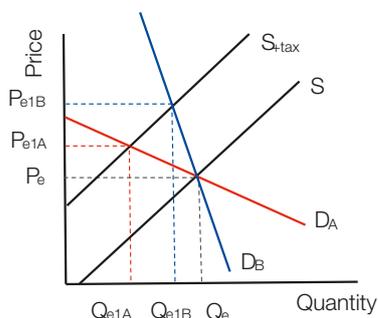
(a) After the introduction of the excise tax and assuming a market with no market failures, identify with reference to the labelled areas each of the following.

Consumer Surplus	
Producer Surplus	
Dead Weight Loss	
Government Revenue	

(b) State the change to each of the following.

Producer Surplus	
Consumer Surplus	

8. The model below shows the impact of an excise tax on the demand for tobacco of two differing consumer groups.



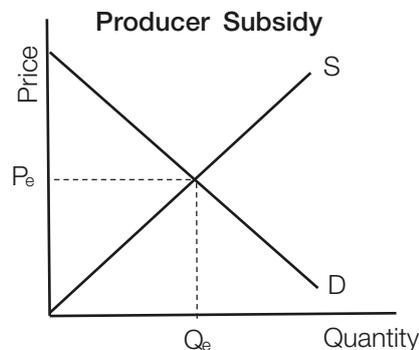
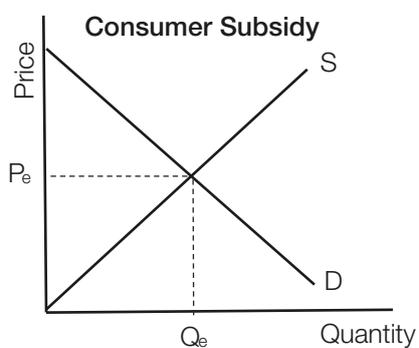
(a) Justify which of the demand curve is most likely to represent long-term smokers.

(b) Outline which consumer group will generate the most revenue for government.

(c) (i) Explain who bears the major burden of the excise tax in relation to long-term smokers

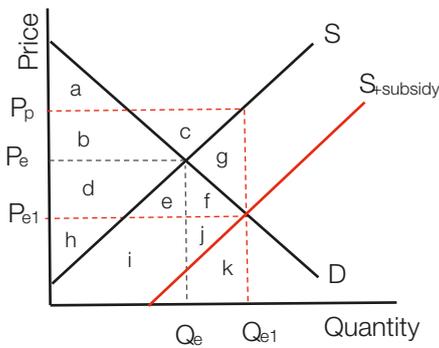
(ii) Explain how the imposition of an excise tax on tobacco may impact equity.

9. (a) Illustrate on the following models the impacts of imposing a consumer subsidy and a producer subsidy.



(b) Compare and contrast the impacts of producer subsidies on the market, consumers, and producers.

10. Referring to the model below, answer the following questions.



(a) After the introduction of the producer subsidy and assuming a market with no market failures, identify with reference to the labelled areas each of the following.

Consumer Surplus	
Producer Surplus	
Dead Weight Loss	
Government Cost	

(b) State the change to each of the following.

Producer Surplus	
Consumer Surplus	

(c) Explain why government are being encouraged to provide subsidies.

11. Complete the table below by justifying an appropriate form of government intervention (subsidy, price controls or taxes) to address the identified issue and listing the potential unintended consequences of this action.

Issue	Appropriate form of Intervention	Unintended Consequences
Vaping Rates Rise		
Cost of living pressures for those on low incomes		
Rental Prices Rise		

Issue	Appropriate form of Intervention	Unintended Consequences
EV sales slow		
Shortages of Essential Foods		

Microeconomics Review Test (41 marks)

Refer to the following information to answer the questions that follow.

The global orange market is the largest of all citrus fruit markets accounting for over 50% of all citrus fruit grown. Many distinct orange varieties have been developed to suit growing regions including Lane Late from Australia and Navelate from Spain. In recent years environmental factors including disease have impacted on production. Additionally, government policies to reduce water subsidies have made it less profitable to grow oranges in some of the largest growing nations. Global production is dominated by Brazil and the EU which account for almost 60% of global production. Brazil's output is expected to rise next year due to improved weather conditions. The recognition of the clear health benefits of Oranges has increased consumption in most nations, but demand is growing most in China and the USA. Oranges are in demand all year round, but there is a notable spike in sales during winter months.

Information sourced from: <https://www.mordorintelligence.com/industry-reports/orange-market>

Question 1

- (a) State the most likely structure of the global orange market.

(1 mark)

- (b) Outline 2 reasons for your answer to part a)

(2 marks)

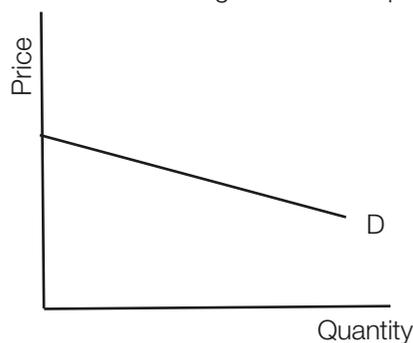
- (c) Assess whether there are advantages for consumers from the market structure of the global orange market.

(3 marks)

- (d) (i) Explain how the development of a distinct variety of orange may impact on the Price Elasticity of demand for producers.

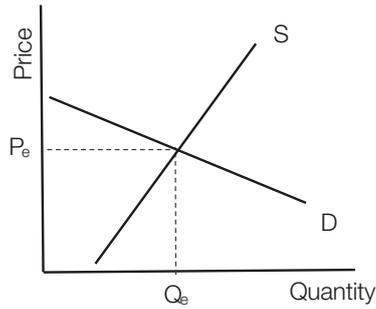
(2 marks)

- (ii) Illustrate the change identified in part (i) on the diagram below.



(1 mark)

- (e) (i) Complete the diagram below to illustrate the change in the global market for oranges over the last few years.

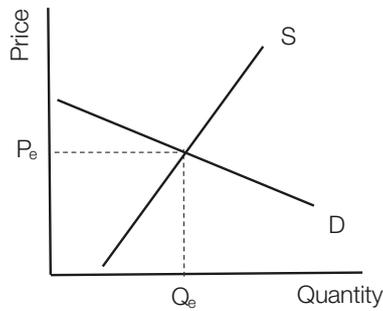


(2 marks)

- (ii) Explain the impact of this change on the price and quantity traded

(2 marks)

- (f) (i) Complete the diagram below to illustrate the expected future change in the market for Oranges bought about improved weather conditions in Brazil.

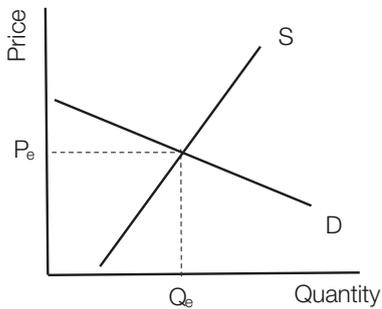


(2 marks)

- (ii) Explain how the market mechanism works to restore equilibrium in part (i).

(2 marks)

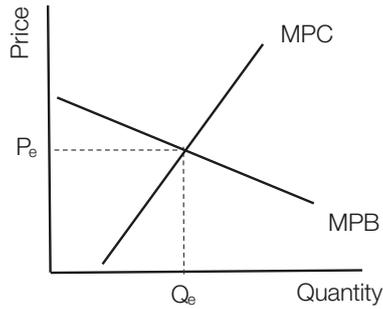
- (g) Complete the diagram below to illustrate the expected change in the market for oranges during winter months.



(2 marks)



- (h) (i) The health benefits of orange consumption are likely to lead to positive externalities. Complete the diagram below to illustrate the positive externalities associated with orange consumption.



(2 marks)

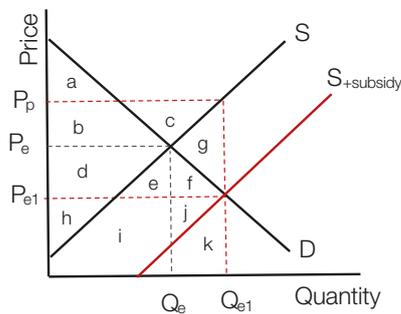
- (ii) Explain why the existence of positive externalities is likely to result in a market failure in the orange market.

(2 marks)

- (iii) Outline one strategy (other than a subsidy) that could be implemented by government to address this market failure.

(2 marks)

- (i) The following model illustrates the water subsidies provided to orange producers.



- (i) With reference to price, quantity, revenue, and producer surplus, explain how Orange Producers benefit from a water subsidy

(4 marks)

- (ii) Justify whether the subsidy is likely to result in allocative inefficiency.

(2 marks)

Question 2

Refer to the following information to answer the questions that follow.

In one country of the world oranges are only sold in supermarkets, and the supermarket industry is dominated by 2 firms. Each firm must decide whether to import a newly developed orange from Brazil. Each firm is seeking to maximise profit and the payoff matrix below shows the expected profits in \$ (000's) if they choose to import the new variety or maintain their current range.

		Supermarket 2	
		Import new Variety	Maintain Range
Supermarket 1	Import new Variety	90 / 90	120 / 70
	Maintain Range	70 / 120	110 / 110

- (a) State the Nash equilibrium in the above market.

(1 mark)

- (b) Explain how the Nash equilibrium demonstrates the concept of mutual interdependence.

(2 marks)

- (c) Explain why the Nash equilibrium is not Pareto Optimum.

(2 marks)

- (d) Explain the likely outcome if the two firms agree to collude.

(1 mark)



(e) Explain the how the introduction of a new variety may result in the market failure of asymmetric information.

(2 marks)

(f) Outline one strategy that the two supermarkets may introduce to address this market failure.

(2 marks)

Topic 8: Macroeconomic Indicators and Models

Learning Outcomes based on the authors interpretation to SACE Economics Subject Outline Core

Students apply their understanding of a range of leading, lagging and coincident indicators to determine the phase of the business cycle for an economy.

Students use the five-sector, circular-flow model to understand the relationship between different sectors of the economy. Students analyse the effect of leakages and injections on the equilibrium level of income and expenditure in an economy.

Macroeconomics

Macroeconomics is the study of whole economies - the part of economics concerned with large-scale or general economic factors and how they interact in economies. The examination of macroeconomics is important because its goals - maximum sustainable employment and stable inflation - are measured and achieved on an economywide level, not on an individual level. Economists in the field of Macroeconomics study questions such as:

- What makes the business cycle fluctuate?
- What makes economic growth go up and down?
- How are prices determined?
- What is the rate of inflation, and what determines it?
- What is productivity growth; and what are the determinants of productivity?

This chapter focuses on the primary ways that Macroeconomics can be modelled and the ways that indicators can be used as measures of assessment, prediction, and adjustment.

Key Definition:

Macroeconomics is the study of whole economies - the part of economics concerned with large-scale or general economic factors and how they interact in economies <https://www.federalreserve.gov/faqs/what-is-macroeconomics.htm>

8.1 Business Cycle

The Business Cycle (Figure 8.1.1), also known as the Economic cycle, is an Economic Model that demonstrates fluctuations in the level of economic activity over a period of time. The cycle is characterised by four main stages: the peak, downturn, trough, and upturn. The stages of the business cycle can be identified with reference to a range of economic indicators. The main indicators of the economic cycle include:

- Economic activity measured by real Gross Domestic Product (RGDP)
- Unemployment, measured by the unemployment rate
- Inflation, measured by changes in the CPI
- Business and consumer confidence
- Stock (or inventory) levels.

Key Definition:

Business Cycle demonstrates the cyclical fluctuations in the level of economic activity over a period of time.

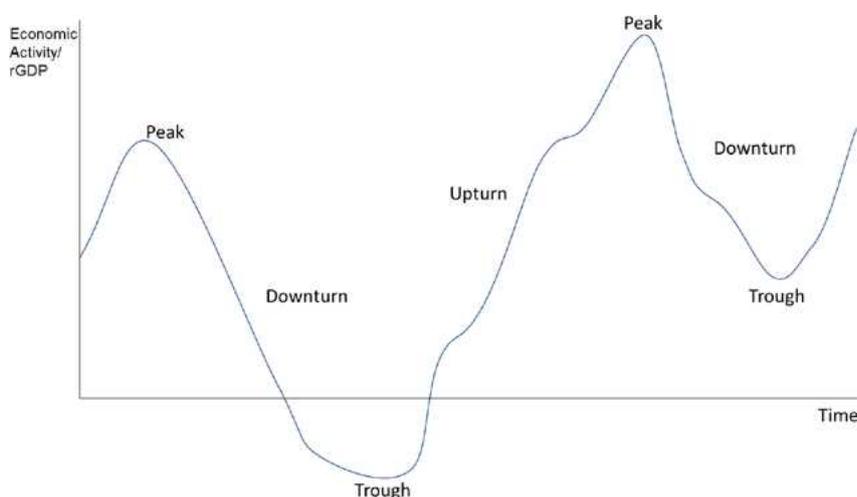


Figure 8.1.1: The Stages of the Business Cycle.

Stages of the Business Cycle

Peak

Key Definition:

Peak is the highest point of economic activity.

The peak stage of the business cycle can also be referred to as a boom. This is the point in the cycle where economic activity is at its highest.

During the peak, an economy will experience:

- High levels of economic growth.
- Consumption levels growing faster than production.
- Income levels rising as firms are willing to pay for the most suitable candidates (labour)
- Labour shortages emerge as the economy is operating beyond its long-run capacity.
- Upward pressure on prices as production cannot keep pace with aggregate demand, leading to demand-pull inflation.
- The level of inflation exceeding the target rate.
- High levels of business and consumer confidence.
- A run down in firms' stock levels as production cannot occur at a rate fast enough to match demand.

The impact of a boom on various sectors of the economy is identified in Table 8.1.1.

Table 8.1.1: Impacts of boom on sectors of the economy.

The Impact on Firms	Impact on Households	Impact on Government	Impact on Overseas
<ul style="list-style-type: none"> • Stock levels decrease • Production is at its highest • Operating at full capacity • Profits peak • Confidence at its highest. 	<ul style="list-style-type: none"> • Rising incomes • High confidence • High levels of expenditure • Real wages may begin to fall as inflation rates exceed wage growth. 	<ul style="list-style-type: none"> • Government spending on welfare reduces • High tax revenues from increased incomes, higher profits and increased expenditure on goods and services • Interest rates likely to be rising. 	<ul style="list-style-type: none"> • High spending on imports.

A boom will be followed by a contractionary phase in the economic cycle. There are differing schools of economic thought as to what triggers the turning point in economic activity. However, one of the most accepted is that rising costs of production will cause falls in output and reductions in confidence and, thus, total expenditure. This economic theory suggests that as inflation rates continue to rise, employees will demand higher wages to maintain their real spending power. Such wage growth will feed through to high production costs for firms that will respond by cutting output. The cut in output will trigger reductions in consumer and business confidence, and thus, total expenditure (Aggregate Demand) will begin to fall, leading to an economic downturn.

Downturn

The downturn can also be referred to as a contraction and is a period of time where economic activity is declining from its highest point.

During a downturn, an economy will experience:

- A decline in economic activity.
- Consumption and investment decreasing as consumer and business confidence fall.
- A decrease in the demand for labour and rising unemployment. Employee income levels decreasing as increased unemployment results in surplus labour and falling wage levels.
- Rising part-time employment and underemployment.
- Falls in inflation rates as demand pull pressures subside.
- A build up in stock levels as production occurs at a rate faster than demand.

The impact of a downturn on various sectors of the economy is identified in Table 8.1.2.

Key Definition:

Downturn demonstrates a decline from the highest point of economic activity.

Table 8.1.2: Impacts of downturn on sectors of the economy.

The Impact on Firms	Impact on Households	Impact on Government	Impact on Overseas
<ul style="list-style-type: none"> • Decreasing investment spending as confidence falls • Decreased production as stock levels rise • Excess capacity and less demand for labour. 	<ul style="list-style-type: none"> • Decreased confidence as uncertainty around employment grows • Falling consumption expenditure and rising savings • Falling incomes as unemployment and underemployment emerge. 	<ul style="list-style-type: none"> • Government spending on welfare increases • Tax revenues fall from lower incomes, lower profits and decreased expenditure on goods and services • Government may elect to increase discretionary spending and lower taxes to encourage consumption and investment spending. • Interest rates are likely to fall as the central bank tries to encourage consumption and investment. 	<ul style="list-style-type: none"> • Decreased spending on imports.

8

An economic downturn may occur across a number of periods and can perpetuate a cycle of economic contraction (Figure 8.1.2), potentially resulting in a recession, a situation where the economy experiences two consecutive periods of negative growth. Not all downturns, however, lead to recession; in fact, recessions are rare. However all downturns will lead to a trough. The changes to the key economic indicators during a downturn are demonstrated in Figure 8.1.13.



Figure 8.1.2: Cycle of economic contraction

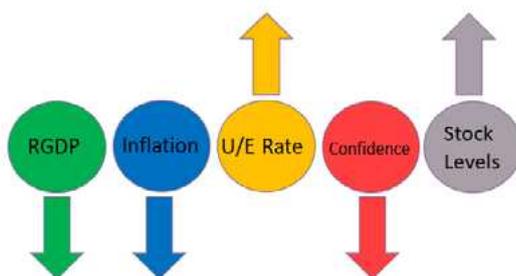


Figure 8.1.13: Changes to key economic indicators during a downturn.

Trough

Key Definition:

Trough is the lowest point of economic activity at a specific period of time.

The trough (sometimes referred to as a recession or depression) is the period of time when economic activity is at its lowest point.

During a trough, an economy will experience:

- Low and perhaps negative levels of economic activity.
- Consumption and investment are at their lowest points as consumer and business confidence are below long-term averages.
- Low levels of demand for labour and high levels of unemployment.
- Employee income levels stagnate or perhaps fall, as increased unemployment results in surplus labour and falling wage levels.
- Higher part-time employment and underemployment.
- Falls in inflation rates and perhaps deflation as the economy operates below its long-run capacity.
- Surplus stock levels as production exceeds total expenditure.

The impact of a downturn on various sectors of the economy is identified in Table 8.1.3.

Table 8.1.3: Impacts of a trough on sectors of the economy.

The Impact on Firms	Impact on Households	Impact on Government	Impact on Overseas
<ul style="list-style-type: none"> • Investment spending is at its lowest point, reflecting low levels of business confidence. • Low production rates as excess stock levels exist. • Excess capacity and lower production results in minimal demand for labour. • Profits are at their lowest levels, resulting in potential business closures. 	<ul style="list-style-type: none"> • Decreased confidence as uncertainty around employment grows. • Falling consumption expenditure and rising savings due to uncertainty. • Falling incomes as unemployment and underemployment peak. 	<ul style="list-style-type: none"> • Government spending on welfare increases. • Tax revenues fall from lower incomes, lower profits and decreased expenditure on goods and services. • The government may elect to increase discretionary spending and lower taxes to encourage consumption and investment spending. • Interest rates are likely to fall as the central bank tries to encourage consumption and investment. 	<ul style="list-style-type: none"> • Low spending on imports.

It is important to note that a trough is not always a recession, as there may still be a level of positive economic activity during a trough. However, a recession will ultimately always be a trough, as the occurrence of negative growth will imply the lowest point in the cycle has been reached. An expansionary phase always follows a trough in the economic cycle, however the explanation of what triggers this movement differs across a range of economic schools of thought. One of the more common perspectives is that inflation rates will continue to fall, resulting in Household real wages rising, and thus, consumption expenditure will begin to increase. Increases in consumption expenditure will lead to employment growth which will further increase consumer confidence and ensure a sustained recovery. Monetarists, however, view the change as triggered by falling costs of production (due to surplus labour), and thus, an increase in output occurs, causing increased profits and rising confidence. The increased confidence will then lead to total expenditure increasing. A third view suggests that government intervention is required to stimulate economic activity and promote confidence in the economy, leading to an upturn.

Upturn

The upturn can also be referred to as a recovery or expansion. This is a period of time when the level of economic activity is increasing.

During an upturn, an economy will experience:

- Rising levels of economic activity.
- Consumption and investment growing as consumer and business confidence begin to rise.
- Increasing levels of demand for labour and falling levels of unemployment.
- Employee income levels rise as increased demand for labour begins to create labour shortages and rising wages.
- Higher full-time employment and lower rates of underemployment also increase income levels.
- Rising inflation rates as the economy approaches or surpasses its long-run capacity.
- Falling stock levels as production rates begin to lag behind rising total expenditure.

The impact of an upturn on various sectors of the economy is identified in Table 8.1.4.

Table 8.1.4: Impacts of an upturn on sectors of the economy.

The Impact on Firms	Impact on Households	Impact on Government	Impact on Overseas
<ul style="list-style-type: none"> • investment spending begins to rise reflecting higher levels of business confidence. • Increased production rates as stock levels decrease. • Less excess capacity and higher production results in increased demand for labour. • Profits begin to increase resulting in potential business expansion. 	<ul style="list-style-type: none"> • Increased confidence as employment opportunities exist and wages rise. • Increased consumption expenditure and falling savings resulting from higher wages. • Higher incomes from unemployment and underemployment are falling, and the demand for labour is increasing. 	<ul style="list-style-type: none"> • Government spending on welfare decreases. • Tax revenues rise from higher incomes, higher profits and increased expenditure on goods and services. • Government may elect to decrease discretionary spending and raise taxes to discourage consumption and investment spending. • Interest rates are likely to rise as the central bank tries to prevent inflationary pressures from building. 	<ul style="list-style-type: none"> • Rising spending on imports.

An economic upturn may occur across a number of periods and can perpetuate a cycle of economic expansion (Figure 8.1.4), potentially resulting in extended periods of continuous growth. The changes to the key economic indicators during a upturn are demonstrated in Figure 8.1.5.

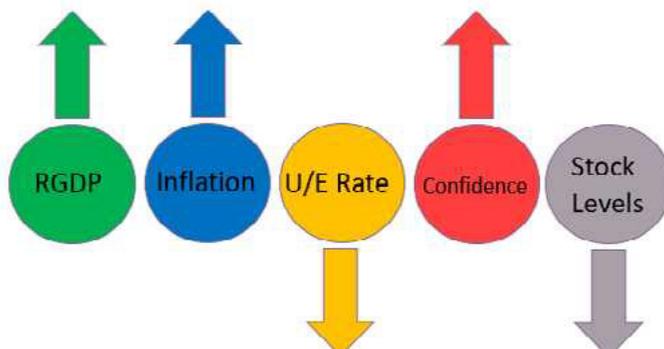


Figure 8.1.5: Changes to key economic indicators during an upturn.

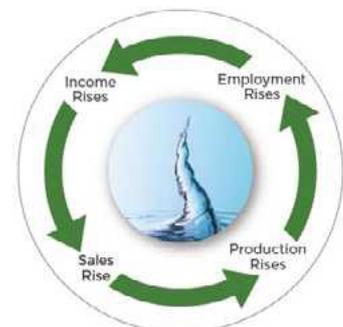


Figure 8.1.4: Cycle of economic expansion.

Whilst some economic theory suggests that there will be a continuous cycle of natural economic fluctuations, there is growing belief amongst mainstream economists that most significant economic fluctuations, particularly contractions, result from singular random events often outside of the control of governments. So, whilst some economists suggest that the economic cycle is tied to the credit cycle, where changes in interest rates can reduce or induce economic activity by making borrowing by households, businesses, and the government more or less expensive. Others have argued that cycles exist because the economy naturally shifts across a range of disequilibrium as producers constantly over or under-invest and over or under-produce as they try to match ever-changing consumer demands. A third perspective linked in part to both of the previous two is that fluctuations in total expenditure are spurred by the inherent instability and volatility of an investment, meaning when, for whatever reason, business confidence decreases and investment slows, a self-perpetuating cycle of economic downturn can result. Mainstream economists, while noting the theoretical and historical significance of the above theories, now suggest that business cycles are essentially random shocks that average out over time. Due to the inherent randomness of these events, recessions or economic downturns can sometimes not occur for decades (Australia 1991 to 2020). This perhaps explains why economists have found it difficult to forecast recessions or determine their likely severity. The most recent of these random events was the COVID-19 pandemic, which resulted in global declines in economic activity.

Real World Considerations: That's a whole lot of Tax

The following graph indicates major events that have led to economic downturns and recessions at a global level up until 2017.



Discussion Points

What are the major random events identified in grey that have resulted in economic downturns?

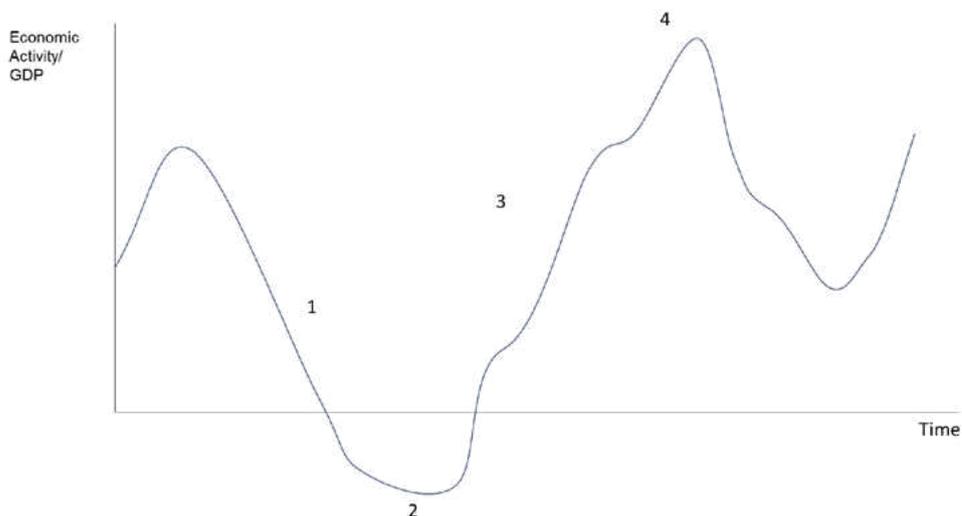
Why did these random events result in the economic troughs identified?

Exercise 8.1: The Business Cycle

1. Identify (by ticking the appropriate box) which stage of the business cycle the following factors impact.

Factor	Peak	Downturn	Trough	Upturn
Low levels of demand for labour				
Consumption levels are growing faster than production				
Consumption and investment falls with declining consumer and business confidence				
Falls in inflation rates – demand pressure subsides				
Rising levels of economic activity				
Falling stock levels as production rates lag rising total expenditure				
Low/negative levels of economic activity				
Labour shortages emerge in the economy				

2. Identify each stage of the business cycle and state what is happening to the key aspects of the cycle



	1	2	3	4
Stage				
Full Employment				
Price Stability				
Economic Growth				
Consumer and Business Sentiment				
Production Levels				

3. Which phase of the business cycle is the economy at in Year 3? Justify your answer.

	Year 1	Year 2	Year 3	Year 4
Unemployment rate	2.4%	3.1%	5.7%	6.9%
Economic growth	1.3%	2.2%	-1.3%	0.7%

8.2 Economic Indicators

Key Definition:

Economic Indicators

variables used to represent a particular aspect of economic performance.

An Economic indicator is a variable, or a combination of variables used to represent a particular aspect of economic performance. These variables are used to:

- Measure what has taken place in an economy
- Map or assess the current economic situation
- Predict likely future economic trends over the short term.

Economic indicators can be used by governments in attempts to determine the direction and magnitude of demand-side economic policies (discussed in later chapters) or by various non-government groups to critique the performance of government or as a basis of individual decision making.

The two broad categories of economic indicators are:

1. Key Indicators
2. Composite Indicators.

Key Definition:

Key Indicators

a singular variable used to assess a particular key aspect of economic performance or business cycle fluctuation.

A Key indicator is a singular variable used to assess a particular key aspect of economic performance or business cycle fluctuation. They measure one aspect of economic activity such as Inflation or Unemployment and policymakers can use a combination of these to predict or realise the course of the business cycle.

Composite indicators are a combination or range of key indicators that are used to create a singular index. This results in a broader measure of economic performance and removes any issues an individual indicator might have in providing a false signal.

Key Definition:

Composite Indicators

are a combination of key indicators.

Key and Composite indicators can be further divided into leading, coincident, and lagging indicators.

Leading Indicator

Key Definition:

Leading Indicators are a measured set of data that assists in predicting the future economic activity.

A leading economic indicator is an economic variable that can assist economists in predicting the next stage of the business cycle. It is variable that predicts a change or movement in another data series, process, trend, or other phenomenon of interest before it occurs. In this course their use is to identify the future movement in economic activity (the business cycle) thus changes in leading indicators occur prior to the change in the factor that impacts economic activity. Key examples of leading indicators are shown in Table 8.2.1.

Table 8.2.1: Examples of Leading Economic Indicators.

Leading Indicator	Impact on future expenditure and economic activity
Consumer Confidence	A change in consumer confidence will occur before changes in consumption spending that impacts the economic cycle.
Business Sentiment	A change in business sentiment occurs before businesses alter investment expenditure.
Business Investment Intentions	This is a composite indicator that projects future business investment expenditure
New Dwelling Approvals	New dwelling approvals predict future building activity
Factory Overtime	Changes to overtime in factories indicate a firm's intention to alter production. Firms will cut or increase variable costs, such as overtime, first before altering fixed costs and sacking or hiring workers.

Key Point:

Leading indicators adjust before the change in economic activity and are used to forecast (predict) economic changes before the rest of the economy begins to move.

Leading indicators vary in terms of their accuracy and precision of forecasting, and whilst the ideal leading indicator would predict changes in economic activity trends accurately, with a narrow range of estimates, and over a major time horizon, this rarely occurs as all leading indicators vary the extent to which they accurately forecast activity. This, therefore, can impact the accuracy of decisions that are based on forecasts or projections using these indicators.

Coincident Indicators

A coincident indicator is a metric that shows the current state of economic activity within a particular area. This means the indicator shows peaks and troughs at the same time as the business cycle.

Coincident indicators are used to identify the position of the business cycle. They confirm the accuracy of the leading indicators and allow the Government or Central Bank to see if policy changes have had the desired effect and whether any policy adjustments are required. Key examples of co-incident indicators are shown in Table 8.2.2.

Key Definition:

Coincident Indicators are a measurable factor which shows a simultaneous change with the levels of economic activity.

Table 8.2.2: Examples of Leading Economic Indicators.

Coincident Indicator	Impact on future expenditure and economic activity
Retail Sales	Retail sales reflect changes in consumer expenditure in almost real time.
New Motor Vehicle Registrations	A new motor vehicle is registered at the point of purchase reflecting an increase in expenditure at the point in time where the expenditure occurs.
Gross Domestic Product	Despite the lag in compiling GDP data the indicator reflects the actual stage of the business cycle at the point it is occurring.

Key Point:

Coincident indicators reflect the current state of the economy and are useful in plotting the business cycle. They assess the timing and magnitude of changes in economic activity.

Lagging Indicator

Lagging indicators are observable or measurable factors that change sometime after the economic, financial, or business variable with which it is correlated changes. In the SACE course, lagging indicators are economic factors that change after the movement in the business cycle.

Lagging indicators are used to confirm the path of the business cycle as well as provide validation of the leading and coincident indicators. Lagging indicators are also used to review the impact of the policies implemented by the Central Bank or Government, as they can confirm long-term trends. Key examples of lagging indicators are shown in Table 8.2.3.

Key Definition:

Lagging Indicators measurable factors that change sometime after the economic, financial, or business variable with which it is correlated changes.

Table 8.2.3: Examples of Lagging Economic Indicators.

Lagging Indicator	Impact on future expenditure and economic activity
Inflation Rate (CPI)	Changes in the inflation rate lag behind changes in economic activity. When an economy moves into an upturn, the spare capacity that exists in the trough allows firms to increase output without creating a significant scarcity of resources. This means that shortages of goods and services do not occur immediately, and thus demand-pull inflationary pressure does not emerge until the increase in economic activity has been prolonged.
Unemployment Rate	Unemployment does not coincide with changes in economic activity. In the case of economic contractions, firms will not cut labour immediately as they have invested significant costs into their development. Instead, firms tend to reduce hours first, only laying staff off if the downturn is extended. This results in unemployment rates rising sometime after the initial downturn in economic activity. Equally, when economic activity expands, firms will not immediately employ more staff. Instead, they increase existing staff hours, meaning that additional employees are not added until after the increase in economic activity causes a firm to reach full capacity.

A visual representation of how each indicator type is related to economic activity (RGDP) and the business cycle is shown in Figure 8.2.1.

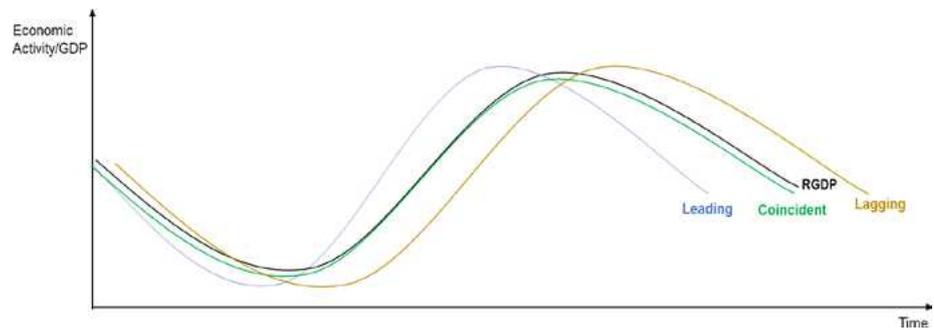


Figure 8.2.1: Relationship between the indicators and the business cycle.

Interpreting indicators

When interpreting indicators, economists are most interested in trends in economic data.

Trends

Key Definition:

Trends long-term direction of an indicator (or economy)

A Trend is the long-term direction of an indicator (or economy) and is suggestive of the stage of the economic cycle. It is important to consider the trends in indicators when making economic decisions, as fluctuations inevitably occur in the short term. When discussing a trend, the terms used are upward, downward or steady.

The following aspects need to be considered and accounted for when interpreting indicators and trends:

1. Seasonal factors
2. Erratic Factors.

Seasonal Factors

Seasonal factors are patterns that may emerge in specific indicators such as retail sales and unemployment figures. Seasonal factors need to be adjusted for so that they do not distort the underlying changes in the economy. Seasonal factors can make indicators misleading, for example, a decrease in unemployment figures in December could be due to the increase in retail sales for Christmas rather than a strengthening trend in the labour market. Equally, January unemployment might increase because Christmas employees are no longer required, and school leavers add to the pool of unemployed.

Erratic factors

As described in the causes of economic downturns, random or erratic factors can influence the value of indicators and, thus, their reflection of economic activity. These events cannot always be planned for, and often, they are short-term in nature with a tendency to be self-correcting. Examples of erratic factors include natural disasters such as droughts, fires, floods, and overseas events, including wars. The impacts of these need to be adjusted for so that trends in the indicators are observable.

Economists are often interested in trends and cycles when using indicators for decision-making.

Key Point:

When interpreting indicators economists consider the following:

- Seasonal factors
- Erratic Factors

Economists check for patterns to help determine and analyse the different phases of the business cycle.

Exercise 8.2: Economic Indicators

1. Identify (by ticking the appropriate box) what type of indicators these are:

Example	Leading	Coincidental	Lagging
Consumer Confidence			
Retail Sales			
New Dwelling Approvals			
Unemployment Rate			
Business Sediment			
Inflation Rate			
Gross Domestic Product			
Business Investment Intentions			
Factory Overtime			
New Vehicle Registrations			

2. The economic indicators in the table below refer to a hypothetical economy.

	Year 1	Year 2	Year 3
Change in real GDP	1.4%	1.6%	2%
Business Sediment	5.5%	7.5%	5.2%
Consumer price index	3.2%	4.2%	2.1%
Unemployment rate	7.7%	5.7%	5.3%
Cash rate	0.5%	0.25%	0.25%

- (a) Identify the phase of the business cycle the economy experienced in Year 2
- (b) Justify with the support of **two** indicators the phase of the business cycle in Year 2.
- (c) Predict the likely change in the level of economic activity in Year 3. Referring to a leading indicator.

3. This question refers to the data in the table below for a hypothetical economy.

Indicator	Year 1	Year 2	Year 3	Year 4	Year 5
Real GDP (% of change)	2.3%	2.5%	2.8%	3.3%	3.1%
Unemployment rate (% of labour force)	6.2%	6.3%	6.0%	5.5%	5.5%
Consumer Price Index (% of change)	2.5%	2.7%	3.2%	3.5%	3.3%
Business investment (% of GDP)	10.0%	15.6%	17.8%	15.2%	7.5%

- (a) Identify the indicator in the table that is lagging.
- (b) Identify the phase of the business cycle the economy experienced in Year 4.
- (c) Justify with the support of **two** indicators the phase of the business cycle in Year 4.

8.3 Circular Flow Model

An economy comprises four primary sectors that interact with each other in three differing markets. The circular flow model helps to show the interaction and interdependence of the different sectors of the economy and the impacts that each sector has on the value of total output in an economy.

The four sectors of an economy include Households, Firms, Government and Overseas (or external). It is important to note that some textbooks or courses refer to a fifth sector known as the financial sector. In our SACE course, we are going to consider this to be a market rather than a sector. These sectors interact within three markets: Product markets, where goods and services are traded; resource markets, where land, labour capital and enterprise are traded; and financial markets, where money is traded. These sectors and markets are illustrated in Figure 8.3.1.

Key Definition:

Circular Flow Model an economic model allowing analysis of economic output changes, where the economic process is seen as a flow system of exchanges between 4 sectors within 3 differing markets.

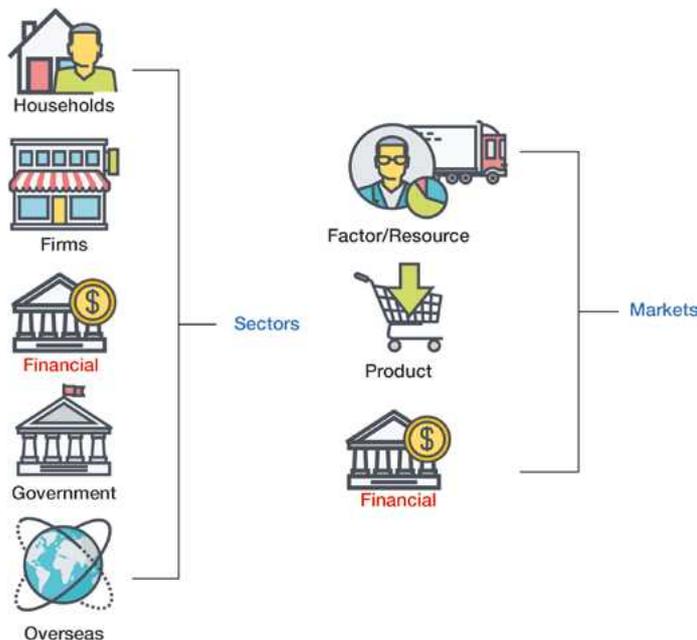


Figure 8.3.1 Sectors and Markets in the Circular Flow Model.

The model is based on the following assumptions:

- Households own all economic resources (land, labour, capital and enterprise).
- Firms purchase (buy) resources from households.
- Households receive an income for the resources sold to firms (rent, wages, interest, profit).
- Firms use resources to produce Goods and Services.

Key Point:

Each resource generates an income for households when supplied to firms.

- Land (N) - Rent (r)
- Labour (L) - Wages (w)
- Capital (K) - interest (i)
- Enterprise/Entrepreneurship (E) - profit (Π)

Two-Sector Circular Flow Model (without leakages and injections)

The two-sector circular flow model (Figure 8.3.1) is a simplified theoretical economic model that demonstrates how income, resources and goods and services flow through an economy where only households and firms exist. Two flows can be identified in the model: real flows, which represent the resources and goods and services, and money flows, which trace income and expenditure flows (money).

Model Explanation

In the two-sector circular flow model there is interdependence between households and firms. Households' own resources that they sell to firms who use these resources to produce goods and services. This represents the real flows highlighted in blue.

In return for the resources firms provide households with income (Y) which is then spent on goods and services, this expenditure is known as consumption (C).

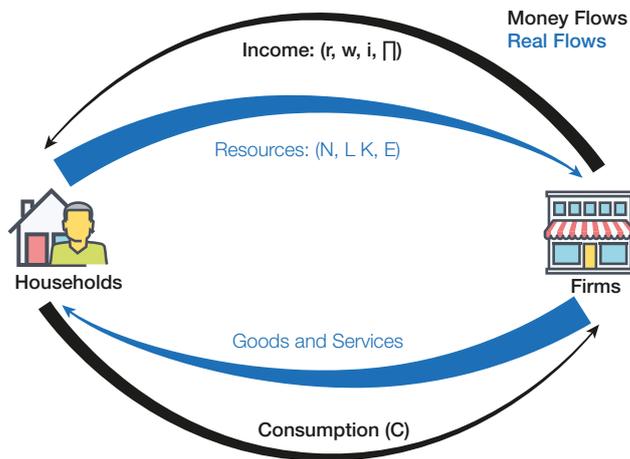


Figure 8.3.2: 2 Sector circular flow model.

The model highlights the interaction between Households and firms in two markets:

- Factor/Resource Market
- Product Market.

In the resource or factor market, households are sellers of resources, and firms are buyers of resources. The price of the resource represents the income paid by firms to households. This market is shown in Figure 8.3.3.

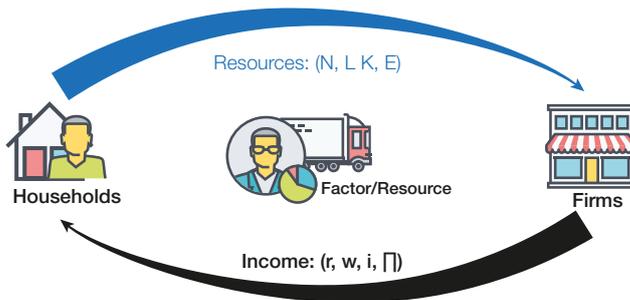


Figure 8.3.3: Household and Firm interactions in Resource or Factor Market.

Key Definition:

Consumption spending by households on goods and services that satisfy immediate wants.

In the product market, households are buyers of goods and services, and firms are sellers of goods and services. The expenditure by households on goods and services is known as consumption (C). This market is shown in Figure 8.3.4

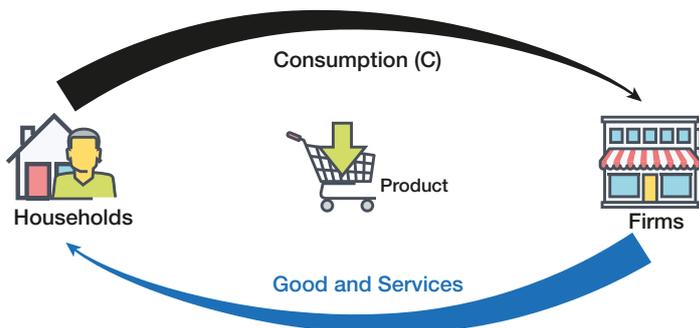


Figure 8.3.4: Households and Firms interactions in the Product Market.

Each of these markets has both a money flow and real flow occurring. Real Flows are the flow of physical items, such as the economic resources and goods and services within the economy. Money Flows are the flow of money between the sectors. Between households and firms this is either the income received for providing resources or the payment for goods and services produced by firms.

This model is clearly over-simplified as it ignores the reality that households do not use all their income on consumption. Instead, households can save, are taxed or spend on imports.

Full Circular Flow of Income Model

The addition of government and overseas sectors as well as financial markets allows for a more realistic assessment of and determination of total output. The circular flow model (Figure 8.3.5) allows for the analysis of the flow of income from households to multiple sectors and markets. Household income (Y) can now be spent on Goods and services as consumption, can be saved in the financial markets to seek higher returns (interest), can go to the government as taxation or can be spent on imports, goods and services that originate in overseas (international) markets. Equally government, firms and the overseas sector can engage within the product market via government spending on capital and consumer goods, firms' investment spending and via spending by overseas consumers on exports.

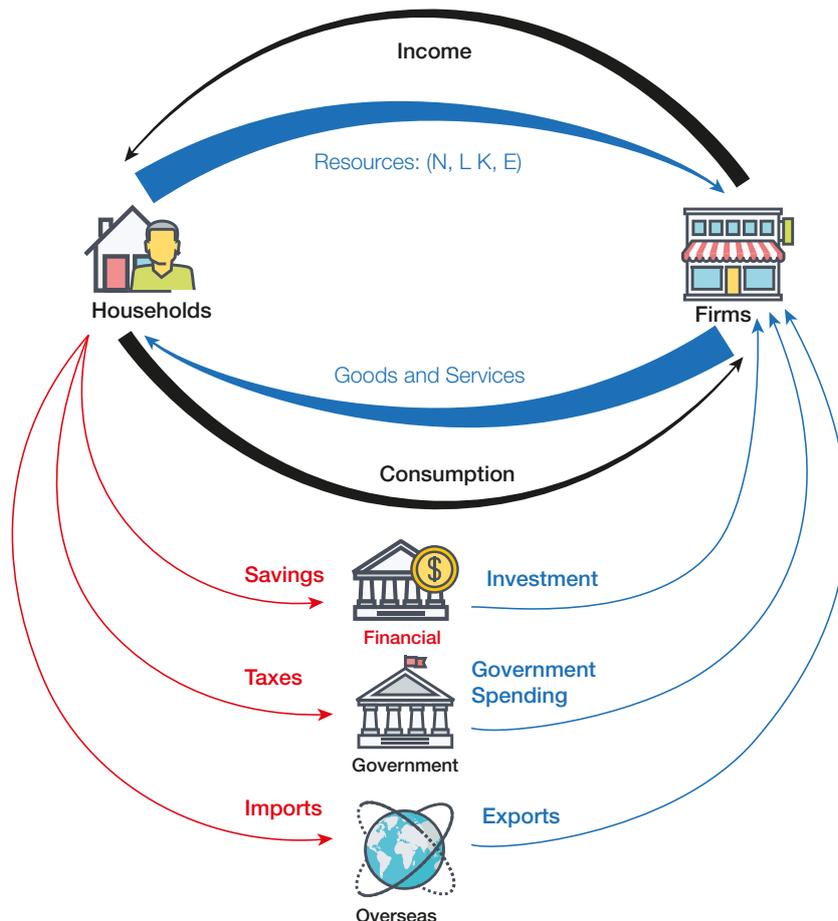


Figure 8.3.5: Circular Flow of Income Model.

From this model, it can be ascertained that total income must be equal to the sum of consumption, savings, taxes, and imports. This is represented by the following formula $Y=C+S+T+M$. A more detailed explanation of how output is influenced by each sector is found in the next section.

Impact of Financial Markets

The Financial Sector allows households and firms to save and invest.

To an economist, savings (S) are an ability to defer consumption; it represents the portion of after-tax disposable income that is not consumed. This means that savings are a leakage from the circular flow model, which will reduce economic activity. Savings can be in the form of bank accounts, share portfolios or the purchasing of other financial assets. Because Households face a consumption opportunity cost when they save, they must consider the relative merits of present consumption versus future consumption.

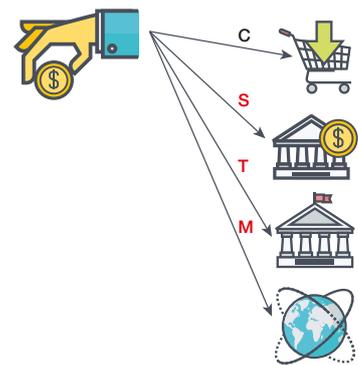


Figure 8.3.6: 4 Flows of Household Income.

Model Explanation

In the full circular flow of income model there is interdependence between households, firms, government, and overseas sectors. These sectors now engage in three markets factor markets, product markets and financial markets. Households' income that has been generated by the sale of resources to firms in the factor market can now be used for 4 purposes Consumption (C), Savings (S), Taxes (T) and Imports (M). Firms can now borrow from the financial sector to spend on capital goods (Investment) and government can use tax revenue to fund expenditure on goods and services. The overseas sector can also engage in the domestic product market by demanding exports.

Key Definition:

Savings the portion of after-tax disposable income that is not spent on consumption.

Factors that affect whether money is saved or consumed include (Table 8.3.1):

Table 8.3.1: Factors influencing consumption expenditure and savings.

Factor	Explanation
Income levels	Households will consider their current income and perceived income levels.
Levels of Consumer Confidence	The lower the level of consumer confidence in the economy the more likely that households will increase their savings.
Price Levels	Households consider both current and perceived future prices.
Interest Rates	If interest rates are low, households are more likely to borrow money, whilst if interest rates are higher, households would prefer to save/lend.
Expectations of future job prospects	If people are unsure of future job prospects, they increase savings. If people have a job or know that job prospects are good, they may be willing to increase consumption.
Age and Income Distribution in the Economy	Consumption and savings levels vary for people at different stages of life.

Key Point:

If all income is consumed or saved it is represented by the following equation: $Y = C + S$

Key Definition:

Investment spending by firms on capital goods that aid future production.

Investment spending (I) is also encouraged through the functioning of the financial market, as it allows firms to use the savings from households as a source of funds for investment spending. In economics, investment relates to the creation of capital and additions to stocks. Investment is spending by firms on capital goods that aid future production. This spending affects a firm's ability to increase production and/or the supply of products to the market in the future and is driven by a profit incentive. Investment spending is an injection into the circular flow of income so will increase economic activity.

Factors that affect investment expenditure include (Table 8.3.2):

Table 8.3.2: Factors influencing investment expenditure.

Factor	Explanation
Business confidence and future sales and profits	If business confidence is low, firms are unlikely to further invest in capital and infrastructure. When business confidence is high firms are more likely to invest due to the increased possibility of future sales and profits.
Government Spending and Taxation decisions	Government spending and taxation decisions can affect the profitability of the investment for a firm. When taxes increase it discourages investment, whereas higher government spending such as subsidies may encourage investment spending.
Interest Rates	Firms are more likely to invest in capital and infrastructure if the interest rates are lower than when interest rates are high.
Cost of resources, in particular, labour	Firms need to consider their costs when they make investment decisions. Labour is one of the biggest costs to firms. When a firm makes an investment decision it needs to consider the cost of the resources being used. Firms may see a fluctuation in the prices of resources due to uncertainty in the global economy, through impacts in transportation and shortages of supplies. Depending on the firms' position they may wait for more certain economic circumstances or may invest to alter production techniques to decrease costs in other areas.
Technological Changes	As technology changes most firms are likely to need to update their practices to align with others in their fields. Firms may need to do this when this is less economically desirable, but to stay in touch with their competitors they need to invest in the new technologies.

Impact of the Government Sector

The Government Sector includes all levels of Government. In Australia, it includes the Local, State/Territory and Federal Levels, but the number of levels of government will differ across countries. The government sector influences the flow of income in the model through taxes on households and via expenditure in the product market. Taxation (T) is a compulsory payment from households to government and represents a leakage from the circular flow of income. Increases in taxes will reduce economic activity as they reduce the portion of income that is returned to firms as consumption spending. Government spending is expenditure made by all levels of government on goods and services, governments can use taxes collected from households to fund this expenditure. Government spending represents an inflow into the circular flow model and will therefore increase economic activity.

One function of the government is to satisfy the wants of the community by providing the provision of collective goods and services, such as roads, railways, education, healthcare, law and order and defence. To be able to satisfy the communities' needs governments need to spend money to pay for the services. This is known as Government Spending (G). Government spending is an injection into the circular flow of income.

Governments need to consider ways of raising funds to pay for these services. They do this by imposing taxes in various forms within the economy. Examples of taxation include income tax, company tax and excise taxes. If the funds are not sufficient to meet the needs of their spending commitments the government may need to go to other sectors to borrow funds. Taxation is a leakage from the circular flow of income.

Factors impacting Government spending and taxation (Table 8.3.3):

Figure 8.3.3: Factors impacting government spending and taxation.

Factor	Explanation
Government priorities relating to macroeconomic and other objectives.	If the priority is economic growth and or employment then governments will be inclined to increase spending and lower taxes, conversely if the aim is to reduce inflation governments will likely cut spending and raise taxes.
The stage in the election cycle and election promises	The closer a government is to the end of its elected term the more inclined it will be to increase government spending or lower taxes in attempts to increase their chances of re-election.
The stage of the Business Cycle	Where there is an economic contraction, governments are forced to spend on welfare and may elect to spend on stimulating the economy. During these downturns taxes may be lowered to stimulate activity, but they will also decrease as incomes fall. The reverse of this occurs during expansions and booms.
Desire/need for collective goods and services.	Where an economy needs collective goods the value of government spending will rise.
Policies relating to equity in the economy.	Attempts to attain a more equitable distribution in income may see government provide transfers to low-income earners or raise taxes on high income earners.

Impact of the Overseas Sector

Also commonly referred to as the International or External Sector, the Overseas sector influences economic activity via Export expenditure (X) and Import expenditure (M). Most countries are dependent on international trade for the provision of goods and services or resources that are not accessible domestically. Exports (X) represent spending by overseas buyers on goods produced in the domestic economy and thus are an injection into the economy stimulating economic activity. Imports (M) represent spending by domestic buyers on goods produced in other countries and are thus a leakage which result in a decrease in economic activity.

Key Definition:

Taxation a compulsory payment from households to government.



Figure 8.3.7: Government Expenditure represents an injection into the economy.

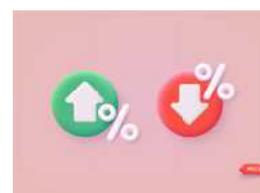


Figure 8.3.8: Taxes represent a leakage from the model. Rising or falling taxes impact economic activity.

Factors impacting Export and Import Expenditure (Table 8.3.4):

Table 8.3.4: Circular Flow of Income Model.

Factor	Explanation
Growth rates in domestic and foreign economies	Rising incomes caused by higher rates of economic growth will see an increase in expenditure on Imports. Where overseas incomes grow this will reflect increased spending on the domestic country's exports and where the domestic countries income grows it will result in more import expenditure.
Relative inflation rates	Where inflation rates are higher domestically than overseas, spending on imports will rise as these are relatively cheaper, and spending on exports will fall as these are not relatively more expensive.
Erratic factors such as war, global pandemics	Erratic factors can disrupt supply chains and reduce the ability to trade with other countries.
Exchange rate	This is expanded on in Chapter 11, but a higher exchange rate will reduce exports and increase imports. A lower exchange rate will increase exports and reduce imports.
Domestic availability of resources	Where resources are not able to be accessed domestically, they need to be imported this often relates to land resources such as minerals or oil which may not be present in the domestic country.
Trade Policies	Government changes to trade policies such as signing free trade agreements or imposing protectionist policies can influence the ability of exports and imports to reach their intended markets.



Figure 8.3.9: Export and Import Expenditures impact on the circular flow of income.

The Role of Leakages and Injections

As has been explained earlier, money flows into and out of each sector of the economy and the financial market. The inflows of money are referred to as injections. This is the money that indirectly enters the flow of income through expenditure in the product market. These injections could come from increased investments (I) by firms, government spending (G) or exports expenditure from overseas (X).

Outflows of money are referred to as leakages. Leakages occur when money is withdrawn from the model and not returned to firms through expenditure by households in the domestic product market. These leakages could be in the form of savings (S), taxation (T) or imports (M).

Key Definition:
Injections represent expenditure by sectors other than households in the domestic product market. Investment, Government Spending and Exports are injections.

Key Definition:
Leakages represent those portions of income that do not return to firms through Consumption spending in the product market. Savings, Taxation, and Imports are leakages.

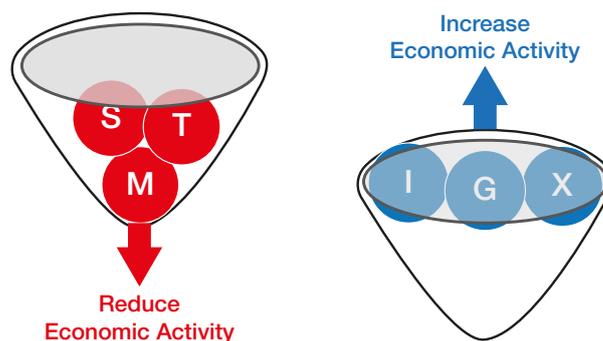


Figure 8.3.10: Impact of Leakages and Injections on Economic Activity.

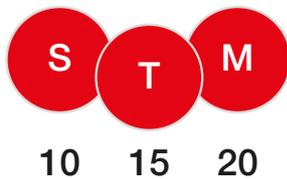
When leakages and injections are equal, the economy is in balance or in a short-run equilibrium. If leakages and injections are not equal, it causes an economy to be in a short-run disequilibrium and will result in a change in the level of economic activity.

Table 8.3.5: The impacts of leakages and injections on short-run equilibrium.

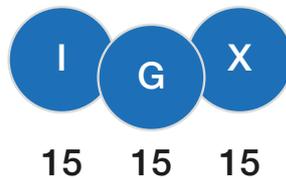
Equation	Balanced or Unbalanced Economy
$S + T + M = I + G + X$	Balanced Economy is in equilibrium Economic Activity remains unchanged.
$S + T + M < I + G + X$	Unbalanced Economy is in disequilibrium Economic Activity increases.
$S + T + M > I + G + X$	Unbalanced Economy is in disequilibrium Economic Activity decreases.

A numerical explanation of injections and leakages appears in the following three examples.

Example 1 - Balanced Economy



Total Leakages 45

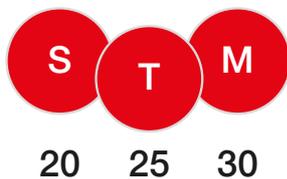


Total Injections 45

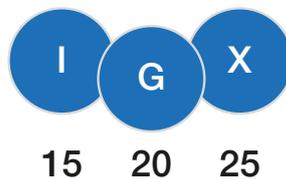
Model explanation

Total Leakages equal Total injections so the model is in equilibrium and there is no change to economic activity.

Example 2 - Unbalanced Economy (Leakages < Injections)



Total Leakages 75

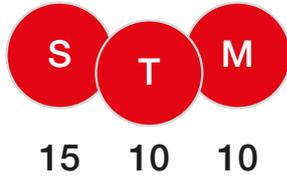


Total Injections 60

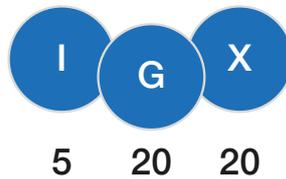
Model explanation

Total Leakages are greater than Total Injections so the model is in a disequilibrium and there will be a fall in economic activity.

Example 3 - Unbalanced Economy (Leakages > Injections)



Total Leakages 35



Total Injections 45

Model explanation

Total Leakages are less than Total Injections so the model is in a disequilibrium and there will be an increase in economic activity.

The circular flow model can also be used to model and explain another important concept relating to changes in economic activity, the expenditure multiplier. The expenditure multiplier notes that any autonomous change in expenditure results in the total change in economic activity being larger than the initial change due to secondary rounds of consumption spending. The concept demonstrates the impact of a change in autonomous spending on the total spending (aggregate demand) within the economy. Simply put, it refers to how much further total expenditure changes from the initial injection of expenditure (C, I, G, or NX).

Key Definition:

Expenditure multiplier demonstrates the impact of a change in autonomous spending on the total spending (aggregate demand) within the economy.

The basis of this model is that the initial injection in the economy becomes the income of a second person, who then spends the income on consumption, resulting in income for a third person. If households were to spend all their income this would result in a continuous loop of spending creating income creating spending. However, we have already learnt that Household income can go to four areas: Consumption, Savings, Taxation, and Imports. This means that the income for person 1 (which resulted from the initial injection) will not be all consumed, and thus, the income to the second person will be reduced. This will mean that every additional round of income will be less than the previous one. Consider the table below, where Households consume 50% of their income.

Model explanation

The initial autonomous injection of \$100000 results in income for person 1 of \$100000 who consumes 50% of this, \$50000. This results in income for person 2 of \$50000 and the process continues for 23 rounds with each additional person receiving 50% of the previous persons income. Eventually the total leakages are equal to the initial injection and there are no additional rounds of consumption spending. The key part of this is that total expenditure is equal to the initial injection plus all the secondary rounds of consumption, this results in total expenditure of \$200000 which is greater than the initial injection by \$100000.

Table 8.3.6: The Expenditure Multiplier.

Person	Income	Expenditure Initial Injection \$100,000	Leakages
1	\$100,000	\$50,000	\$50,000
2	\$50,000	\$25,000	\$25,000
3	\$25,000	\$12,500	\$12,500
4	\$12,500	\$6,250	\$6,250
5	\$6,250	\$3,125	\$3,125
6	\$3,125	\$1,562	\$1,562
7	\$1,562	\$781	\$781
8	\$781	\$390	\$390
9	\$390	\$195	\$195
10	\$195	\$97	\$97
11	\$97	\$48	\$48
12	\$48	\$24	\$24
13	\$24	\$12	\$12
14	\$12	\$6	\$6
15	\$6	\$3	\$3
16	\$3	\$1.50	\$1.50
17	\$1.50	\$0.75	\$0.75
18	\$0.75	\$0.37	\$0.37
19	\$0.37	\$0.18	\$0.18
20	\$0.18	\$0.09	\$0.09
21	\$0.09	\$0.04	\$0.04
22	\$0.04	\$0.02	\$0.02
23	\$0.02	\$0.01	\$0.01
Totals		\$200,000	\$100,000

Key Definition:

Marginal Propensity to Consume (mpc) the portion of every dollar of income that is spent on consumption economy.

The multiplier continues to create additional rounds of consumption expenditure, but each of these rounds becomes incrementally smaller. The size of the multiplier is determined by how much of household income is returned to the economy as Consumption spending. This is known as the marginal propensity to consume (mpc) and is defined as the portion of every dollar of income that is spent on consumption. As $Y = C + S + T + M$ the marginal propensities of each of these four functions must total to 1. The marginal propensities of S, T and M represent the portion of every dollar of income that is a leakage from the circular flow model and their sum is known as the marginal propensity of leakages (mpl).

The higher the mpc, the greater the multiplier will be, as every additional round of income generated results in higher consumption and thus higher income for the next person. Economists have created a formula that saves us having to create tables such as Table 8.3.7 to determine the size of the multiplier and its impacts on total expenditure. Whilst you won't need to calculate the expenditure multiplier in this course, understanding the formula allows for you to better explain the concept via the circular flow model. The multiplier is represented by the letter k and is calculated by the formula:

$$k = \frac{1}{1 - mpc}$$

If the mpc was 0.5 consumers would consume 50% of every dollar earned (as per Table 8.3.6) and the multiplier k would equal ($k = \frac{1}{1-0.50}$) which equals 2. When you multiply the initial injection by k you get the total change in economic activity, in the case (as per from Table 8.3.7) $\$100000 \times 2 = \200000 . The following table highlights how a change in the mpc impacts the size of the expenditure multiplier and thus the total change in economic activity that occurs from an initial autonomous injection of \$100000.

Key Point:

$mpc + mps + mpt + mpm = 1$
or $mpc + mpl = 1$

Table 8.3.7: The Impact of mpc on the Expenditure Multiplier.

mpc	Multiplier $k = \frac{1}{1 - mpc}$	Value of Multiplier k	Total Expenditure	Total secondary rounds of consumption expenditure
1	$k = \frac{1}{1 - 1}$	undefined	Infinite	Infinite
0.75	$k = \frac{1}{1 - 0.75}$	4	\$400000	\$300000
0.50	$k = \frac{1}{1 - 0.50}$	2	\$200000	\$100000
0.25	$k = \frac{1}{1 - 0.25}$	1.33	\$133333	\$33333
0	$k = \frac{1}{1 - 0}$	1	\$100000	\$0

What is illustrated by the above table is that when the mpc is larger, the size of the multiplier increases, as does the total change in expenditure. Understanding of this concept is critical for later topics on demand-side policy, as the size of the multiplier will impact government decisions regarding the magnitude of policy adjustments. It is also important to remember that the multiplier can work in reverse, where decreasing the injections of expenditure can lead to the total decrease in economic activity being larger than the initial expenditure fall. This is especially relevant to declines in exports, which lead to less income in the domestic economy. The multiplier working in reverse results in the level of total expenditure decreasing by more than the initial export fall due to losses in secondary rounds of consumption spending.

Real World Considerations: Extract from Multiplier effect of empowering rural women can propel national growth

Women from indigenous and grassroots communities are frequently considered custodians of tradition. It is essential to mention that simultaneously they are notable contributors to the economy as informal workers, wage earners, farmers, and micro-entrepreneurs. In addition to this, they oversee the needs of their family members and play the role of caregivers without remuneration. While India has made significant strides in gender equity and equality; this hasn't yet spread deep into the rural segment, thereby causing sectoral imbalance within our own socio-economic framework.

...

Empowerment in the true sense is when the skill learnt by a person (be it academic, livelihood and/or life skills), has a positive impact on the individual, the family and allows for inter-generational transformation. Empowering our girls and women will have a cross-sectional benefit towards their access to healthcare, education & livelihood prospects; supplemented with the necessary resources, tools, and knowledge to overcome the cycle of poverty. This will enhance their socio-economic status thus unleashing the multiplier effect.

Source: The Times of India - Shaifalika Panda (April 2023) – **Multiplier effect of empowering rural women can propel national growth.**

(Extract sourced 10/12/2023)

Discussion Points

How does the multiplier effect relate to this scenario?

Why might governments consider the investment in education and healthcare rather than other infrastructure, such as roads and other capital investments?

Why might education and healthcare improve the national economy?

How might the improvement in education and healthcare of women assist in improving the living standards of the community?

Would this work in other economies? Why or Why not?

Does a government need to consider both traditions and progression of communities?

Exercise 8.3: The Circular Flow Model

1. The table shows hypothetical data for an economy.

G	M	T	I	X	S
25	60	30	20	70	35

- (a) State whether this economy is a balanced/unbalanced economy.
- (b) Explain why your answer in a)
- (c) Discuss whether the Government is in a budget or surplus. (Consider Taxation and Government Spending.
2. Outline how each of the following events affects the size of income flows in the circular flow model:
- (a) The government increases the goods and services tax.
- (b) Interest rates in an economy decrease.
- (c) The currency depreciates making imports more expensive and increasing the revenues earned from exports.
- (d) Income support payments such as the pension and unemployment benefits are increased.
- (e) There is a major economic recession in a country's major export market.
- (f) The government increases spending on health and education.

- (g) Consumer confidence increases.
- (h) Foreign imports become more price competitive within domestic markets.
- (i) Retirement saving is made mandatory at 5% of income.
3. Identify and briefly describe the three sectors in the five-sector circular flow model that generate injections into the circular flow of income. Describe the injection in each case.
4. The following data relates to annual expenditures for Year 1 in a fictional economy.

	\$m
Investments	78 000
Imports	24 000
Household Consumption	195 000
Savings	28 000
Exports	42 000
Government Expenditure	56 000
Taxation Receipts	23 000

- (a) Calculate the value of GDP for this economy for Year 1.
- (b) Use your knowledge of the circular flow of income to explain why the level of production can be measured by both expenditure and income.

Topic 9: Macroeconomic Objectives

Learning Outcomes based on the SACE Economics Teaching and Learning Framework

Students develop an understanding of macroeconomic objectives and their measurement, and learn to identify and interpret recent trends in data. The macroeconomic objectives are:

- full employment — unemployment rate and labour force participation rate
- price stability — the percentage change in the consumer price index
- economic growth — the percentage change in real gross domestic product (GDP).

Macroeconomic Objectives

Macroeconomists study the role of government in determining the pace of growth, the long-run rate of potential output in an economy, and the inflation rate. Macroeconomic Objectives are the primary goals of economic policy, with the overarching goal being to have sustained improvement in living standards via increases in economic growth. This overarching goal is supported by five commonly referred to macroeconomic objectives: Economic Growth, Full Employment, Price stability, *Equity in Income Distribution* and *External Balance*

Whilst there are 5 commonly recognised macroeconomic objectives, this course focuses on only 3:

- **Economic Growth**
- **Full Employment**
- **Price Stability**

The remaining portion of this chapter will define the meaning of each objective, identify how each objective is measured and note the consequences of not attaining these objectives on individual stakeholders and the economy.

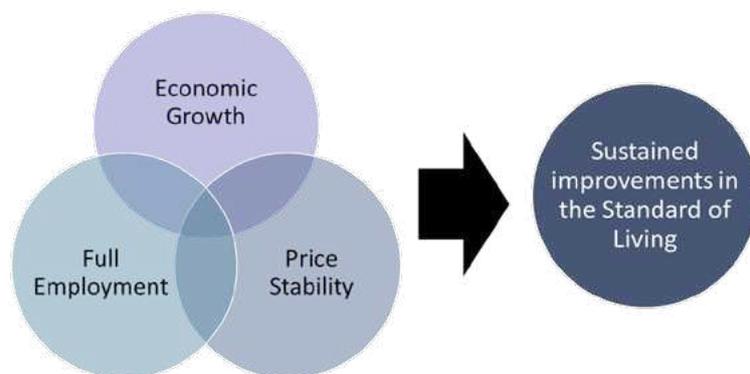


Figure 9.0: The Three Macroeconomic Objectives.

9.1 Full Employment

Key Point:

Full Employment cannot be 0% unemployment as three types of unemployment will always exist in an economy:

- Structural
- Frictional
- Seasonal

Full employment is an economic situation in which all available labour resources are being used in the most efficient way possible. Full Employment occurs when all available labour resources are being employed in the most appropriate way that increases efficiency and productivity in an economy. When used in economics it does not mean zero percent unemployment.

The idea that full employment can be 0% unemployment is a theoretical ideal, but in reality, Full employment does not coincide with 0% unemployment, as some unemployment is considered to be inevitable or unavoidable. Economists accept that there will always be some level of unemployment because there are always people who are:

- entering and/or exiting the workforce or changing jobs,
- lacking required skills
- reliant on jobs that are seasonal in nature.

These types of unemployment are referred to as frictional, structural, and seasonal.

Structural Unemployment

Structural unemployment occurs because of changes in demand for particular types of labour skills, changes in the geographical location of industries and, therefore, jobs, and labour market rigidities. Structural unemployment occurs when there is a change in demand for resources used to complete tasks or the labour market has impediments that inhibit it from returning to equilibrium. These changes alter the requirements of labour in an industry and cause a mismatch between the skills required and the skills held. Such change is unavoidable, and as such, structural unemployment will always exist.

Frictional Unemployment

Frictional unemployment occurs when a person is going between jobs or entering into and out of the labour force. This type of unemployment is short-term in nature, meaning it is normally less than 4 to 6 months and no more than 12 months. There are many reasons why people are between jobs. These can include new entrants to the labour market, people who have left a job and are waiting to start another, or people who have left a job in search of another. These scenarios are constants in the labour market, and as such, there will always be people who are frictionally unemployed.

Seasonal Unemployment

Seasonal unemployment occurs when certain jobs are dependent on seasonal factors. Jobs that are classified as seasonal include ski/snowboard instructors, fruit pickers, harvest workers or even during school/Christmas holidays employees. Due to the seasonal nature of these jobs, some people will become unemployed in the off-season. As seasonal jobs will always exist, there will also be workers who are unemployed in 'off-seasons.'

Cyclical Unemployment

Cyclical unemployment, also known as Demand Deficient Unemployment, occurs with changes in the level of economic activity. It occurs during the downturns of the business cycle, when the economy is in a recessionary gap and the decline in total expenditure forces firms to decrease output, leading to a decreased demand for labour.

Because some unemployment types are unavoidable, unemployment can never be zero. Instead, Full Employment is referred to as a situation where the only unemployment remaining in the economy is structural, frictional or seasonal in nature. It is a target rate or a level of unemployment that is consistent with maintaining low and stable rates of inflation. It is known as the natural rate of unemployment or the non-accelerating inflation rate of unemployment (NAIRU). In Australia, this rate at the time of publication is considered to be 4.5%. The rate varies across time as changes in structural unemployment can occur in the longer term; the rate also varies across countries. What is common is that when an economy is at full employment there is zero cyclical unemployment occurring. These characteristics are summarised in Table 9.1.1.

Table 9.1.1: Characteristics of Full employment.

Full Employment Characteristics	Individual Factor/s
Does Not Equal 0%	Some Unemployment is unavoidable – structural, frictional, and seasonal, so some unemployment will always exist at any point in time.
Is a target rate	Known as the NAIRU, it is a level of unemployment that does not result in accelerating rates of inflation.
Cyclical Unemployment is equal to 0%	Unemployment caused by declining economic activity does not exist.
Only Structural, Frictional and Seasonal Unemployment exist	This is known as the natural rate and whilst it varies across time and countries it corresponds to a level of output in the long-run where all markets (product and factor markets) are in equilibrium.



Figure 9.1.1: Types of Unavoidable Unemployment.



Figure 9.1.2: Unemployment queues during the Great Depression.

Key Definition:

Full Employment is a target rate or a level of unemployment that is consistent with maintaining low and stable rates of inflation. It is known as the natural rate of unemployment or the non-accelerating inflation rate of unemployment (NAIRU).

Exercise 9.1.1 Types of Unemployment

1. Identify the type of unemployment present in each of the following situations.

Situation	Unemployment Classification
A recent university or high school graduate has not yet found the right job.	
A snow ski instructor in the off-season.	
A factory worker loses their job because the firm has started automating its production process.	
A hospitality worker loses their job as the economy has low economic growth.	
A fruit picker is in between fruit seasons.	
A retail worker is able to secure a job as there is growth in the Economy.	
A coal miner loses their job due to the shutdown of the mine site as the economy moves towards renewable energy.	

2. Differentiate between structural and cyclical unemployment.

3. Explain why both cyclical and structural unemployment occur during a recession.

Measuring Full Employment

The primary measure of Full employment is the unemployment rate. An understanding of the measure requires an understanding of three important concepts:

- Meaning of the Working Age Population
- Meaning of Unemployment
- Meaning of the Labour Force.

Working Age Population (WAP)

The definition of the working age population (WAP) (Figure 9.1.3) varies across countries, but one of the more common definitions and the one used in this text is that it is representative of all people in a country's population who are 15 years and older. The reason this definition varies across countries is that different countries have different age limits on when someone can work. The working age population leads to three classifications of people who are of working age: employed, unemployed or not in the labour force (LF).



Figure 9.1.3: The WAP.

Unemployed

Unemployment refers to the state of being out of work, actively seeking work, but unable to get work (Figure 9.1.4). This definition means that for a person to be considered unemployed, they must display three important characteristics:



Figure 9.1.4: Characteristics of Unemployed.

1. Be of working age
2. Not be employed
3. Be actively seeking employment.

Two important parts of this definition limit its effectiveness as a measure of unemployment.

Underemployment

Using the International Labour Organisation (ILO) definition, a person is considered employed if they work for one hour or more of paid employment in the week where the measurement occurs (Table 9.1.2). This means an employed person can be full-time, part-time or casually employed.

Table 9.1.2: Classifications of Employment Status.

Classification	Definition
Full time	Full-time employees usually work an average of 38 hours each week. They're usually employed permanently or on a fixed-term contract
Part-time	Part-time employees work less than 38 hours per week and their hours are usually regular each week. They're usually employed permanently or on a fixed-term contract.
Casual	A person is a casual employee if they accept an offer for a job from an employer knowing that there is no firm advance commitment to ongoing work with an agreed pattern of work.

Both part-time and casual employees who work less hours than desired may result in the true value of unemployment being understated. These workers would take additional hours if offered and are known as underemployed workers.

Actively Seeking Employment

Actively seeking implies that a person is looking for and willing and able to start work immediately. This can include, among other things, submitting job applications and registering with an employment agency. There will be several people of working age who have stopped looking for work as they believe they cannot get a job. These people would take a job should one be offered to them, but are not considered unemployed as they are not actively seeking. These people are known as discouraged workers.

The labour force is made up of persons of working age who are employed or unemployed so does not take into consideration those who are inactive in the labour force. These concepts are summarised in Figure 9.1.5.

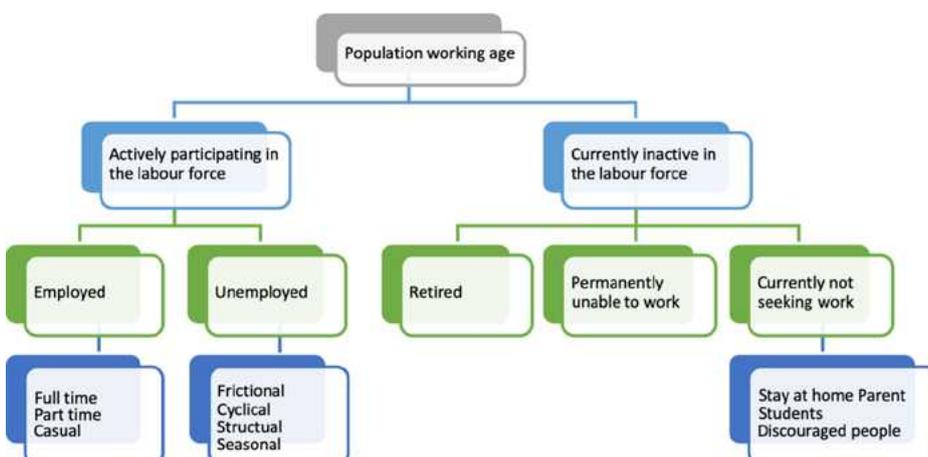


Figure 9.1.5: Summary of the Working Age Population

Key Definition:

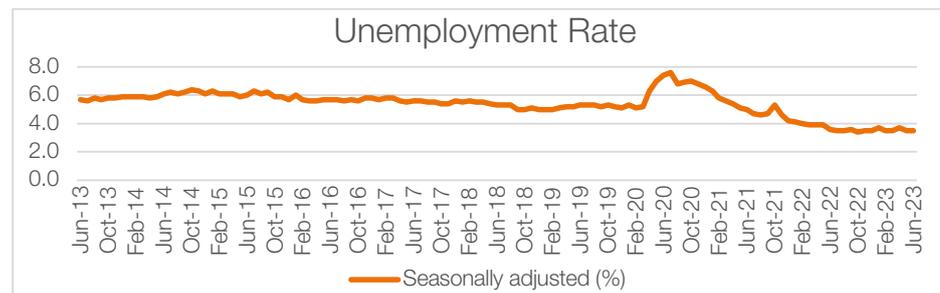
Unemployment Rate the number of unemployed people expressed as a percentage of the Labour Force.

The Unemployment Rate

Having now gained an understanding of the important aspects and definitions related to the measure of unemployment, we can look more closely at the measure of the unemployment rate. The unemployment rate is defined as the number of unemployed people, expressed as a percentage of the Labour Force and is represented by the following formula:

$$\frac{\text{Unemployed}}{\text{Labour Force}} \times 100$$

Whilst you don't have to calculate the unemployment rate, a knowledge of the formula provides a better understanding of some of the limitations of this measure. The unemployment rate will vary across genders, age groups, cultural and ethnic groups and will also fluctuate across time periods. Figure 9.1.8 reflects the variations in Australia's unemployment rate across time periods.



Source: Australian Bureau of Statistics, Labour Force, Australia June 2023

Figure 9.1.6: Fluctuations in Australia's Unemployment Rate over time.

Labour Force Participation Rate (LFPR)

Fluctuations in unemployment rates are important to view in the context of the Labour Force Participation Rate (LFPR). The LFPR represents the Labour Force expressed as a percentage of the Working Age Population and is calculated using the following formula:

$$\frac{\text{Labour Force}}{\text{Working Age Population}} \times 100$$

Fluctuations in the LFPR can influence the unemployment rate, as it may represent a change in the size of the Labour Force resulting from changes in people's status of actively seeking. This can be viewed through the following examples in Table 9.1.3.

Key Definition:

The labour force participation rate the percentage of the working age population who are in the labour force.

Table 9.1.3: Impacts of LFPR changes on the Unemployment Rate.

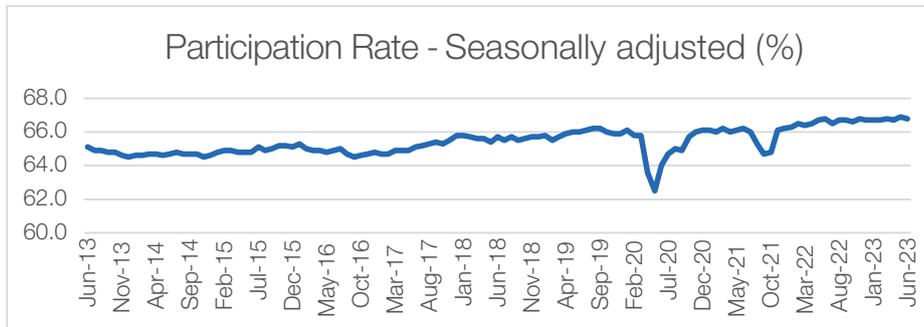
Employed	Unemployed	Labour Force	Working Age Population	LFPR	Unemployment Rate
1,000,000	70,000	1,070,000	2,500,000	42.8%	6.5%
1,055,000	70,000	1,125,000	2,500,000	45%	6.2%
1,000,000	125,000	1,125,000	2,500,000	45%	11.0%
955,000	70,000	1,025,000	2,500,000	41%	6.8%
1,000,000	25,000	1,025,000	2,500,000	41%	2.4%

Explanation of Table 9.1.3.

The initial Labour market data is highlighted in blue, with a LFPR of 42.8% and an unemployment rate of 6.5%. When the LFPR increases to 45% the LF increase by 55,000 people. If these additional people were to become immediately employed the unemployment rate would fall to 6.2%. However, if no additional jobs were created, then the number of unemployed would increase to 125,000 people and the unemployment rate would increase to 11%.

Alternately a fall in the LFPR to 41% would see the LF decrease by 45,000 to 1,025,000 people. If all these 45,000 people were previously employed, then the unemployment rate would rise to 6.8%. However, if all these people were previously unemployed the number of unemployed would fall to 25,000 and the unemployment rate would fall to 2.4%.

What is evident from the data in Figure 9.1.7 is that a rise in the LFPR can cause an increase in the unemployment rate if it results in those who were not actively seeking work now taking steps to find employment due to increased confidence in finding a job. Alternately, a fall in the participation rate can cause the unemployment rate to fall, as those who were unemployed stop actively seeking employment. When analysing changes in the unemployment rate, it is important also to view the changes in the LFPR.



Source: Australian Bureau of Statistics, Labour Force, Australia June 2023

Figure 9.1.7: Fluctuations in Australia's LFPR over time.

Exercise 9.1.2 Measurement of Unemployment

- Calculate the unemployment rate in each of the following situations.

Situation	Unemployment Calculation
Employed 1,000,000 Unemployed 40,000 Labour Force 1,040,000 Working Age Population 2,380,000	
Employed 205,500 Unemployed 12,400 Labour Force 217,900 Working Age Population 370,000	
Employed 1,365,000 Unemployed 675,000 Labour Force 2,040,000 Working Age Population 3,750,000	
Employed 2,755,000 Unemployed 575,000 Labour Force 3,330,000 Working Age Population 4,000,000	

2. Calculate the Labour Force Participation Rate for the following situations.

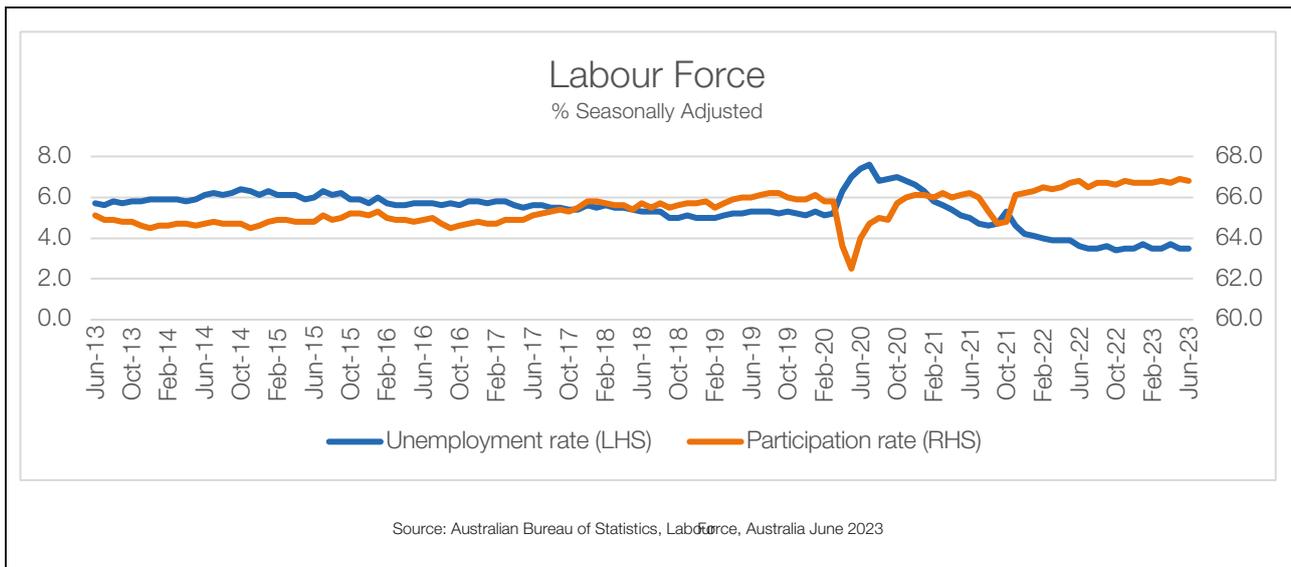
Situation	Labour Force Participation Rate Calculation
Employed 1,000,000 Unemployed 40,000 Labour Force 1,040,000 Working Age Population 2,380,000	
Employed 205,500 Unemployed 12,400 Labour Force 217,900 Working Age Population 370,000	
Employed 1,365,000 Unemployed 675,000 Labour Force 2,040,000 Working Age Population 3,750,000	
Employed 2,755,000 Unemployed 575,000 Labour Force 3,330,000 Working Age Population 4,000,000	

3. How does full employment contribute to a stable economy?

4. What are some potential challenges in achieving and maintaining full employment?

5. How does the government's role in addressing unemployment differ during economic recessions compared to periods of economic growth?

6. Referring to the stimulus – Labour Force Graph answer the following questions.



(a) Explain the 'general' relationship that exists between the Labour Force Participation Rate and the Unemployment Rate in the above graph and explain why this relationship exists.

(b) Referring to the graph, when did the unemployment rate peak and what was the rate at this time

- Period/ Year
- Rate

(c) Why might some economists suggest that the unemployment rate understates the true extent of unemployment?

Problems Associated with Measuring Unemployment

The measurement of unemployment is determined by a survey, and it can therefore be subject to error. Small sample sizes, the extent to which the sample is representative of the population, and whether participants respond accurately all impact on the accuracy of the measure. The unemployment rate also does not consider the extent of discouraged workers and underemployed workers. These were defined previously, but it is important to re-emphasise that they are not included in the official measure. Whilst changes in the participation rate may reflect changes in discouraged workers, it is not an accurate measure, as participation rates can also change from retirees or stay at home parents changing status. Underemployment, however, can be measured and in many countries is officially reported upon. If unemployment rates remain on hold, but underemployment rates grow this can reflect a weakening labour market and a fall in household living standards as people generate less income from working fewer hours.

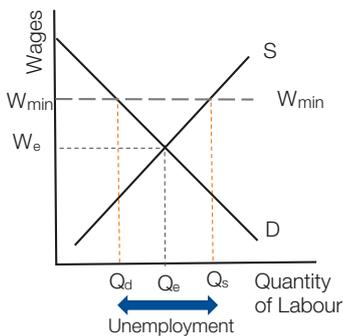


Figure 9.1.8: Minimum Wage can create Structured Unemployment.

Causes of Unemployment

The causes of unemployment are reflected by the differing types of unemployment, as defined earlier. The 3 main types of unemployment are:

- Structural Unemployment
- Frictional Unemployment
- Cyclical Unemployment

Structural Unemployment

Structural unemployment occurs because of decreased demand for particular labour skills, changes in geographical locations of industries or rigidities in the labour market. These are summarised in Table 9.1.4.

Table 9.1.4: Causes of Structural Unemployment.

Structural Unemployment Cause	Explanation
Decreased Demand for a particular Labour Skill	Declines in the demand for a particular labour skill are often caused by technological change. It can also result from structural change in the economy (sectorial change) leading to growing and declining industries.
Change in Geographical Location of Industries.	When a large firm (or even an industry) moves its physical location from one region to another, there is a resulting fall in demand for labour in one region and an increase in the region where it relocates. If people cannot (or will not) move to the economically expanding regions, they may become structurally unemployed.
Labour Market Rigidities	When factors prevent the forces of supply and demand from operating freely in the labour market, labour surpluses can emerge as wages are above the allocatively optimal level. Disincentives for demanding or supplying labour will also prevent the efficient functioning of the labour market. Primary examples include: <ul style="list-style-type: none"> • Minimum wage legislation: which leads to higher than equilibrium wages causing unemployment (Figure 9.1.8). • Labour union activities and wage bargaining with employers: which results in higher than equilibrium wages causing unemployment. • Employment protection laws: which make it costly for firms to fire workers (because they must pay compensation), thus making firms more cautious about hiring) • Generous unemployment benefits: which increase the attractiveness of remaining unemployed and reduce the incentives to work.

Frictional Unemployment

As defined previously Frictional unemployment occurs when a person is going between jobs or entering into and the labour force. The main causes of unemployment include entering/reentering the labour force or between jobs (Table 9.1.5).

Table 9.1.5: Causes of Frictional Unemployment.

Frictional Unemployment Cause	Reason
Entering or Re-entering the Labour Force	Education leavers who are entering the labour market for the first time and are yet to gain a job are considered to be frictionally unemployed. Those who were stay at home parents who are re-entering the labour market having reduced parenting obligations are also frictionally unemployed.
Between Jobs	Workers may leave jobs for a number of reasons, they have been fired, they are searching for a better job or they are waiting to start a new job. During these periods these people are considered to be frictionally unemployed. It is important to note that frictional unemployment tends to rise during economic upturns, as more workers seek new jobs in search of higher incomes.

Cyclical Unemployment

Cyclical Unemployment or Demand Deficient Unemployment occurs due to insufficient total expenditure resulting in decreases in total output and thus the demand for labour. This can be modelled using an Aggregate Demand and Supply of Labour model (Figure 9.1.9) and the PPC (Figure 9.1.10).

Explanation of Figure 9.1.9:

The Aggregate Demand and Aggregate Supply of Labour model represents the total supply of labour and total demand for labour in the economy. When the AS_{labour} equals the AD_{labour} the economy is at its natural rate (NAIRU) Q_e and cyclical unemployment is equal to zero. It is also at this point where only structural frictional and seasonal unemployment exists. However, if there is a decrease in economic activity that results in a decrease in the demand for labour to $AD_{labour1}$ then cyclical unemployment emerges as at W_e the AS_{labour} remains at Q_e but the AD_{labour} is now at Q_D this represents a surplus of labour and cyclical unemployment.

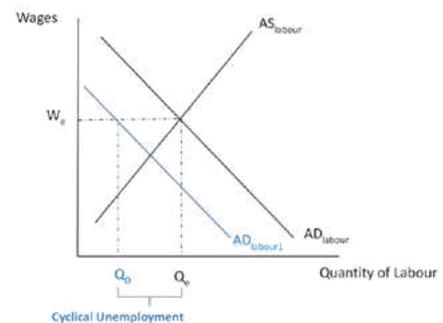


Figure 9.1.9: Cyclical Unemployment Explained.

Trends in Employment

Part-Time and Casual Employment Growth

Trends in Labour Markets vary across countries, but in many developed nations such as Australia, there has been a clear movement towards Casualisation and Part-Time Employment. These countries have undertaken labour market reforms that have led to increased flexibility of employment for both employers and employees. Employees have gained from an increased work-life balance associated with part-time and casual employment, whilst employers have been better able to match hours of work to high peak demand times for their business. This has improved both productivity and profits.

Female Participation Rate Growth

In countries like Australia, there has been growth in the participation of females in the Labour market. Whilst their participation rates remain below those of males, these rates have grown. Some of the factors contributing to this growth are said to include equal opportunity legislation, a growing need for dual-income families, changes in social attitudes towards women and employment, and technological advancements in labour-saving devices which have reduced the time required for home duties. It is also suggested that the growth of service industry jobs, which tend to be heavily female-dominated, particularly in retail, has also contributed to this participation rate rise.

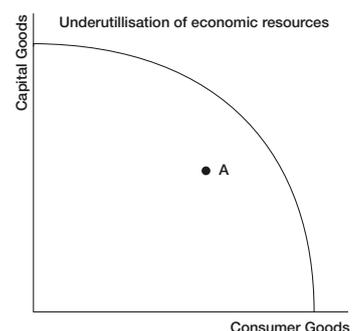


Figure 9.1.10: Cyclical Unemployment is associated with an economy operating inside its PPC.

Capital Replacing Labour

Technology has also changed the face of manufacturing, and many other industries have moved towards capital-intensive methods of production as capital resources tend to be cheaper than labour resources. Capital resources are also usually more efficient and productive, and this has reduced labour demand across several industries. Mining and agriculture in developed countries tend to employ fewer workers than in previous decades, despite the growing output from these sectors.

Consequences of Unemployment

Unemployment can cause economic, social, and personal consequences for society (Figure 9.1.10). For the economy it results in a loss of real output (GDP), loss of household income, loss of tax revenue for the government, higher unemployment benefit payments, costs to government of dealing with social problems, rising inequality, and a loss of skill sets for labour. Each of these consequences tends to have a financial consequence for governments and thus society, either directly through payments or indirectly through the opportunity costs that are incurred.

At a personal level unemployment can lead to a loss of income, increased indebtedness, lower self-esteem, depression, suicide, family breakdown, addictions, and health issues. Those who become unemployed suffer more significantly from financial stresses which are reflected in the impacts identified.

At a social level, unemployment is associated with crime and violence, drug use and homelessness, all of which tend to create economic costs for the government but can also impact those in society who are not unemployed.

Table 9.1.10: Consequences of Unemployment.

Economic Costs	Personal Costs	Social Costs
<p>Loss of real output (GDP) and household income Not only does unemployment represent resources that are not being utilised in production but the declines in income associated with unemployment will directly decrease consumption and thus economic growth.</p>	<p>Loss of income Becoming unemployed sees people's incomes decrease as they lose the wage or salary they previously enjoyed. These people may receive welfare, but this will still represent a smaller portion of income than previously.</p>	<p>Crime and violence Higher unemployment rates tend to increase the number of individuals who resort to crime to gain money. Such criminal activity can also lead to violence. Crime can also increase through boredom of being unemployed, and vandalism is often higher when unemployment increases.</p>
<p>Loss of tax revenue for the government Higher rates of unemployment result in lower income levels and thus less income tax revenue for the government. Firms during these times also have lower profits, resulting in less corporate tax revenue for the government.</p>	<p>Increased indebtedness Reductions in income mean that servicing debt becomes more difficult as there is less income to pay for the existing debt. Those who are made unemployed and have high mortgage costs may find it difficult to service these and may end up defaulting on these loans.</p>	<p>Homelessness As people's incomes fall more people are forced out of rental properties or their own homes as they cannot afford to pay rents or debt repayments. This increases the number of homeless. Family breakdown during this time can also result in increased homelessness.</p>
<p>Higher unemployment benefit In many countries, the unemployed may be eligible for social benefits. The more people that are unemployed the larger the cost of providing benefits.</p>	<p>Lower self-esteem, depression, suicide Mental Health issues are commonly associated with those who are unemployed, and research shows a strong correlation between employment status and suicide.</p>	
<p>Loss of skill sets for labour Long-term unemployment can lead to a decline in job specific skills, work willingness and work ethics.</p>	<p>Family breakdown Financial pressures are one of the main causes of divorce and in some cases this financial pressure results from the loss of employment.</p>	

Economic Costs	Personal Costs	Social Costs
<p>Rising inequality A greater divide in society may occur due to those who are unemployed earning a lower income than others. It is possible that this may cause a decrease in social cohesion and a loss of opportunity for many. It could also cause an increase in the growth of an 'under class'.</p>	<p>Addictions Those who are unemployed have been found to resort to addictions as a mechanism of escape. These addictions can be in many forms, but commonly include alcohol, drugs, and gambling.</p>	
<p>Costs to government of dealing with social problems Most of the social problems identified incur funding costs to address. For example, more policing to deal with crime, more health expenditure to deal with drug use and more social expenditure on housing to address homelessness.</p>	<p>Health issues Health issues emerge because those who are unemployed lack the income to access health services and tend also to have poorer diets which results in an increase in health-related issues.</p>	

9.2 Price Stability

Price stability is defined as the maintenance of low and stable rates of inflation (average or general price levels), resulting in the avoidance of long periods of inflation or deflation and maintaining the value of money. This definition contains two important terms: Inflation and Deflation. Inflation is defined as a sustained increase in average or general price levels, whereas deflation is a sustained decrease in average price levels.

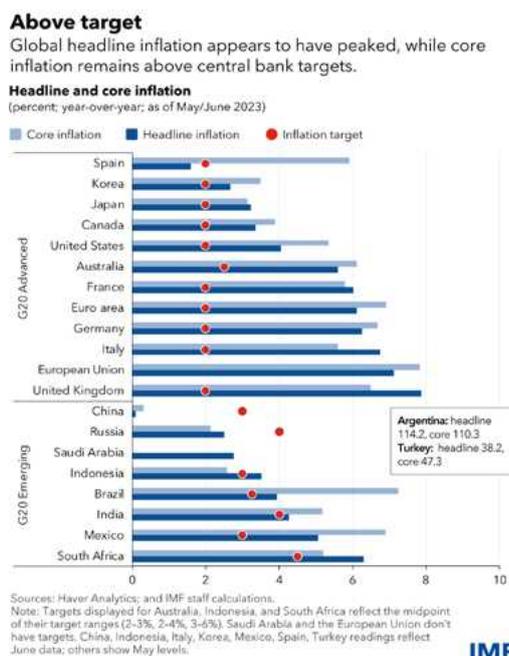
This implies that a government is not aiming to attain decreasing average price levels, and nor does it wish to have accelerated average price levels. Instead, it aims for a rate of inflation that is consistent with the maintenance of full employment and medium to long-term economic growth targets. In Australia this rate is stated as 2 to 3% over the course of the business cycle, other countries around the world will have different target rates.

Key Definition:
Price Stability the maintenance of low and stable rates of inflation (average or general price levels), resulting in the avoidance of long periods of inflation or deflation and sustaining the value of money).

Key Definition:
Inflation a sustained increase in average or general price levels

Key Definition:
Deflation a sustained decrease in average or general price levels

Key Definition:
Disinflation a slowing rate of inflation



Model Explanation:
 Figure 9.2.1 shows relative inflation rates for various countries across the world. Target rates vary from 2% to 4.5%, and in most circumstances countries are not attaining their price stability objectives with inflation rates exceeding these target rates.

Figure 9.2.1: Inflation Targets from Selected Countries and Regions.

Key Definition:

Core Rate (underlying rate) of Inflation the rate of change of average prices without the effects of highly volatile items such as food and energy levels

Inflation has a series of measurements, including the Core rate (or Underlying rate), and Headline rate. The Headline rate is the rate of inflation measured by the entire CPI basket of goods, whereas the Core rate of inflation is the persistent component of inflation that removes volatile items from its calculation. It is the rate of change of average prices without the effects of highly volatile items such as food and energy and is an important measure of inflation for policymakers because it reflects longer-term trends in Inflation rather than transitional price movements.

Measuring Inflation

Inflation is commonly measured by the percentage change in a price index. “A Price index is a normalised average of prices for a given class of goods or services in a given region, during a given period of time. It is a statistic designed to help compare how these prices, taken as a whole, differ between time periods or geographical locations.” (Wikipedia). Common Price indices include the Producer Price Index (PPI) and the Consumer Price Index (CPI), which is possibly the most commonly used measure and the measure of inflation used in this course.

Consumer Price Index

Key Definition:

CPI measures the percentage change in the value of a basket of goods and services which are commonly consumed by average, wage-earning households.

The CPI is an index of retail prices that provides a quarterly measure of variations in prices of consumer goods and services representing the expenditure of the typical household. The CPI is calculated by collecting prices for a sample of goods and services called a regimen and then multiplying these prices by a weighting for each good. The weighting reflects the relative importance of each good or service to household spending. The Price multiplied by the weighting provides an expenditure value and changes to these expenditure values relative to a base year are used to create an index number (the CPI).



Figure 9.2.2: Reserve Bank of Australia's Groups in the CPI Basket.

The CPI regimen includes thousands of items that are sorted by both category and major grouping. Australia's groupings as of 2023 are identified in Figure 9.2.2. Indices are created for all major groupings allowing for changes in specific types of goods and services to be identified and their contributions to inflation tracked.

The rate of inflation is calculated by working out the percentage change in the CPI from one period to the next. In addition to being a measure of inflation changes in the CPI are also used as a measure of cost-of-living changes for the average household.

Limitations of Using the CPI

Even though the Consumer Price Index is the most common indicator used to measure inflation, it does have limitations in terms of measuring changes in average price levels. The primary limitations occur because:

- The CPI is only a sample of goods
- The weightings and regimen do not always truly reflect all spending patterns
- Quality changes in goods are not accounted for.

These are outlined in more detail in Table 9.2.1.

Table 9.2.1: Limitations of the CPI as a measure of Inflation.

Limitation	Explanation
Different Rates for different income earners	The CPI is a basket of goods and services representing the average household; however, consumers have differing patterns of consumption dependent on their income levels. This means households with different income levels will have different rates of inflation, but this is not recognised by the CPI.
Different rates of inflation depending on regional or cultural factors	Like households with differing income levels, households in different regions of the same country will have different consumption patterns and thus inflation rates. Again, the CPI does not distinguish between these regions, in fact in Australia the CPI is specific to metropolitan households as thus does not reflect rural or regional areas at all. Equally the expenditure patterns of households from differing cultures may vary considerably but this will also be unaccounted for by the CPI.
Consumer consumption patterns change when relative prices change	All the weights of the CPI are fixed, but consumption patterns will change as consumers substitute cheaper goods for more expensive ones. Because the weights do not adjust for this the CPI tends to overstate inflation.
Changes in consumption patterns with sales and discount stores and sales	The prices collected for the CPI are taken at a particular point in time whereas consumers may purchase goods only on specials, or from discount stores only, meaning they buy at prices lower than those used in the CPI.
New product introduction changes consumption patterns	The introduction of new products will change consumption patterns, but these goods will not appear in the regimen. Equally outdated products that are no longer consumed may still be part of the basket and thus contribute to inflation
Quality changes in products not accounted for.	The CPI only looks at the cost of the items and does not consider the changes in the quality of the item. For example, new technology tends to cost more when it first comes out, influencing the CPI, however, the CPI calculation does not take into consideration the improvements that comes with new technology.

9.2.1 Focus Questions: Measuring Inflation

1. What role does the Consumer Price Index (CPI) play in measuring inflation?
2. Discuss some limitations of using the CPI to measure inflation.



Figure 9.2.4: Inflation has two primary causes.

Causes of Inflation

Most economists identify two primary causes (or types) of inflation:

- Demand-Pull Inflation
- Cost-Push Inflation.

Demand-Pull Inflation

Demand-pull inflation results from an excess of total expenditure over aggregate output. It occurs because increases in total expenditure happen at a rate faster than total output can increase, resulting in economy-wide shortages of goods and services and, thus, rising average price levels. Total expenditure is equal to $C+I+G+NX$, any change in one of these components can result in demand-pull inflation. Some of the more common factors include:

- An increase in consumer optimism about the future
- An increase in business confidence
- An increase in income
- Lower interest rates, encouraging borrowing
- An increase in exports
- Increased wealth fuelling increased consumption.

Historically, demand-pull inflation has also occurred as a result of governments printing money at a rate faster than production can increase. This has resulted in too much money chasing too few goods and services, and, thus, average price levels rising at extraordinary rates. This results in what is known as Hyperinflation, where inflation rates rise rapidly and are beyond the control of the government. Table 9.2.2 reflects some of the countries that have experienced Hyperinflation.

Table 9.2.2: Historical Examples of Hyperinflation.

Highest Monthly Inflation Rates in History

Country	Month with highest Inflation rate	Highest monthly Inflation rate	Equivalent daily Inflation rate	Time required for prices to double
Hungary	July 1946	$1.30 \times 10^{16}\%$	195%	15.6 hours
Zimbabwe	Mid-November 2008 (latest measurable)	79,600,000,000%	98.0%	24.7 hours
Yugoslavia	January 1994	313,000,000%	64.6%	1.4 days
Germany	October 1923	29,500%	20.9%	3.7 days
Greece	November 1944	11,300%	17.1%	4.5 days
China	May 1949	4,210%	13.4%	5.6 days

Source: Prof. Steve H. Hanke, February 5, 2009.

Key Definition:

Cost-push Inflation

Cost-push inflation occurs when the total supply of goods and services in the economy (aggregate supply) falls. A fall in aggregate supply is often caused by an increase in the cost of production. If aggregate supply falls but aggregate demand remains unchanged, there is upward pressure on prices and inflation – that is inflation is pushed higher.

<https://www.rba.gov.au/education/resources/explainers/causes-of-inflation.html>

Cost-Push Inflation

The second cause of inflation results from the supply side of the economy and is known as Cost-push inflation. This is caused by increases in the cost of production or supply-side shocks which force firms across the economy to raise prices to maintain profit margins. Common causes of increased costs of production include:

- An increase in wages paid to employees
- An increase in interest rates and thus interest costs
- An increase in government taxes
- An increase in fuel costs, including oil and gas prices
- An increase in prices for utilities (such as electricity, gas and water services)
- An increase in the cost of raw materials
- An increase in insurance costs
- An increase in rental costs.

Because countries are now globally integrated, many of these cost increases may find their origins in overseas countries. Increases in these costs can filter through to the domestic economy as higher resource costs or intermediate good prices, which add to domestic costs of production. This is often referred to as Imported inflation and one of the critical elements of this is that it is difficult for Domestic governments to control as its cause is beyond its domestic borders.

Equally, supply chain disruptions and disasters can cause the cost of production to increase and result in output declines that force average price levels up. Wars, pandemics, droughts, floods and earthquakes have all had impacts on inflation in recent decades.

9.2.2 Focus Questions: Causes of Inflation

1. What are some possible consequences of demand-pull inflation for people?
2. Explain how demand-pull inflation affects the prices of goods and services.
3. Discuss possible effects of demand-pull inflation on businesses.
4. What are some possible consequences of cost-push inflation for companies?
5. Explain how inflation affects the competitiveness of businesses.
6. Describe the impact of inflation on a firm's competitiveness internationally.

Consequences of Inflation and Deflation

Inflation and deflation have both redistributive effects and consequences for the broader economy.

Inflation

If the level of inflation is too high, the purchasing ability of certain groups is reduced. This is bought about by the value of money buying less goods than it did before inflation. This is illustrated in the following simplified example. If a person spends \$10,000 on a quantity of goods at the beginning of year 1 and the rate of inflation is 5%, those same goods at the beginning of year 2 will cost \$10,500. If the person's income does not rise at the same rate as inflation, they will not be able to buy the same number of goods in year 2 as they did in year 1. This loss of purchasing power tends to result in a redistributive effect away from certain groups. The groups who tend to lose during times of unanticipated inflation include:

- Fixed Income Earners
- Wage Earners whose wages increase at a rate less than inflation.
- Holders of Cash
- Savers
- Lenders (creditors).

However, with redistributive effects, there are also those who gain. The groups who tend to benefit during times of unanticipated inflation include:

- Borrowers (debtors)
- Payers of fixed incomes or wages
- Payers of wages to slow wage increase earners.

A summary of these groups is in Table 9.2.3 which emphasises that those groups whose income does not rise at a rate equal to inflation are worse off, whilst those who have assets that rise at rate higher than inflation are better off.

Table 9.2.3: *Winners and Losers from Unanticipated Inflation.*

Position worsens with inflation	Position improves with inflation
<p>People who receive fixed wages</p> <p>1) Employees with fixed wages 2) Pensioners receiving fixed pensions 3) Landlords receiving fixed rental income 4) individuals receiving fixed welfare payments</p> <p>These groups' income does not increase when the cost of living increases.</p> <p>People who receive wages or incomes that increase less promptly than the rate of inflation These people will see a decrease in real wages.</p> <p>People holding on to their cash Purchasing power falls on the cash that is held.</p> <p>People saving their money (Savers) The real value of savings falls if the interest rate is less than the leave of inflation.</p> <p>Lenders (Creditors) Lenders are worse off if those borrowing money have a fixed interest rate. The lenders, therefore, see a decrease in the real return.</p>	<p>Borrowers If money is borrowed at a rate lower than the inflation rate, they are paying less than the real rate.</p> <p>Payers of fixed incomes or wages If any form of income is fixed below the level of inflation the real value of payments is lower than that of inflation. Renters are an example of this group.</p> <p>Payers of fixed incomes or wages increasing slower than the rate of inflation Even if the wages are increasing but not at the level of inflation, the payers of these wages are paying less than the real value of their payments.</p>

Inflation also comes with other costs particularly for the economy more broadly. One critical aspect of inflation is that it can create higher rates of anticipated inflation which can fuel demands for higher wages and perpetuate a cycle known as a wage price spiral. This occurs when higher rates of inflation cause wages to rise, which causes inflation to increase.

Inflation will also cause total expenditure and, therefore, economic growth to decrease. Inflation creates uncertainty, particularly for firms that are unable to anticipate returns on capital expenditure (Investment). This can discourage Investment spending. Equally, exports become less internationally competitive as domestic inflation forces the price of exports higher. Exports, therefore, fall. At the same time, imports are cheaper for domestic buyers, and so household expenditure switches to imports, resulting in a leakage from the domestic economy and further reductions in total expenditure and economic growth. High inflation rates also encourage investment into non-productive assets as individuals attempt to maintain their real value of wealth. Gold will see an increase in price when inflation rates rise, as this is an example of a non-productive asset. These flows also slow future economic growth by preventing the growth of capital goods.

As growth in the economy decreases, it is likely that cyclical unemployment grows. This will probably be reinforced by policies introduced by government that attempt to slow inflation by decreasing total expenditure.

Inflation also reduces the effectiveness of the price mechanism to act as a rationing mechanism and creates additional costs for consumers who must spend more time seeking lower prices referred to as shoe shuffle costs and for firms whose costs of production increases through what are referred to as Menu costs or the administrative/printing costs associated with updating prices.

The consequences of Inflation are summarised in Figure 9.2.5.

Consequences of Inflation

Reduced Purchasing Power of Money.

Redistributive Effects – creating winners and losers.

Reduced Investment spending because of uncertainty.

Reduced International Competitiveness – creating a decrease in net exports.

Lower rates of Economic Growth resulting from decreased I and NX.

Increased Unemployment – lower exports, investment and government policies reduce total expenditure and the demand for labour.

Higher costs for Producers and consumers.

Reduced efficiency of the price mechanism.

Figure 9.2.5: Consequences of Inflation.

Deflation

Whilst high rates of inflation are detrimental to individuals and the economy, deflation is also undesirable. Like inflation, deflation also has redistributive effects, only they are the opposite of those for inflation. Deflation also creates uncertainty for firms that, again, will delay or cancel investment spending. Firms also suffer from Menu costs as they incur costs for adjusting prices.

Deflation also creates a problem of a deflationary spiral emerging where consumers delay spending as they anticipate prices falling, and along with firms, they do not borrow. This results in total expenditure falling further and causes cyclical unemployment to rise. Deflation results in the real value of debt rising. If this occurs alongside falling profits from less sales, firms are likely to be forced to close. The same is true for households who will see their real debt levels rise if their incomes fall, they are likely to default on loans such as mortgages. If bankruptcies become widespread, deflation has the potential to create a major financial crisis as banks and other financial institutions are impacted by loan cancellations.

Key Definition

Menu Costs are a type of transaction cost incurred by firms when they change their prices. That is, menu costs are the costs incurred by a business when it changes the prices it offers to customers.

<https://www.investopedia.com/terms/m/menu-costs.asp>



Figure 9.2.6: Consequences of Deflation.

Real World Consideration Inflation retreated in May to 5.6% easing fears RBA will again raise interest rates:

Australia's monthly inflation rate retreated in May, easing fears the Reserve Bank will hoist its key interest rate again at next Tuesday's board meeting.

The headline consumer price index increase last month was 5.6%, the lowest since April 2022, the Australian Bureau of Statistics said on Wednesday. Economists had expected the measure to drop from April's 6.8% level to 6.1%.

The underlying rate that strips out more volatile price movements came in at 6.4% compared with 6.5% in April.

"While prices have kept rising for most goods and services, many increases were smaller than we have seen in recent months," the ABS's head of prices statistics, Michelle Marquardt, said.

Housing costs were among the biggest contributors to the monthly CPI numbers, rising 8.4%, down from 8.9% in April. Rents were up 6.3% in May from a year earlier, compared with 6.1% in April.

Food and non-alcoholic beverages also rose 7.9%, with bread and cereals up 12.8% and dairy products rising 15.1% with both groups' prices accelerating from April.

Automotive fuel was 8% lower than for May 2022 and 6.7% cheaper than in April, leading the price falls.

At the time Australia has had a persistent level of inflation above 6%

Source: Hannam P, 2023, Inflation retreated in May to 5.6% easing fears RBA will again raise interest rates, The Guardian, **accessed 18th June 2023**

Discussion Points

1. Why is inflation a key indicator of price stability?
2. What is the connection between price stability and the economy?
3. How does inflation impact consumers?
4. Why are certain items in the inflation 'basket of goods'?

9.2.3 Focus Questions: Consequences of Inflation and Deflation

1. Explain the negative consequences of both high inflation and deflation on the economy.
2. Suggest potential consequences of high inflation on individuals' purchasing power.
3. What impact does deflation have on firms and employment?

9.3 Economic Growth

Key Definition:

Economic Growth refers to an increase in the size of a country's economy over a period of time.

<https://www.rba.gov.au/education/resources/explainers/economic-growth.html>

Key Point:

Real GDP is nominal GDP adjusted for inflation.

Economic growth is defined as a sustained increase in the level of total output (or expenditure) over time. This implies that there is an increase in the size of economic activity in an economy for a given period. In many countries, economic growth is measured quarterly and yearly. The most commonly used measure of economic growth is the annual rate of growth in real Gross Domestic Product (rGDP).

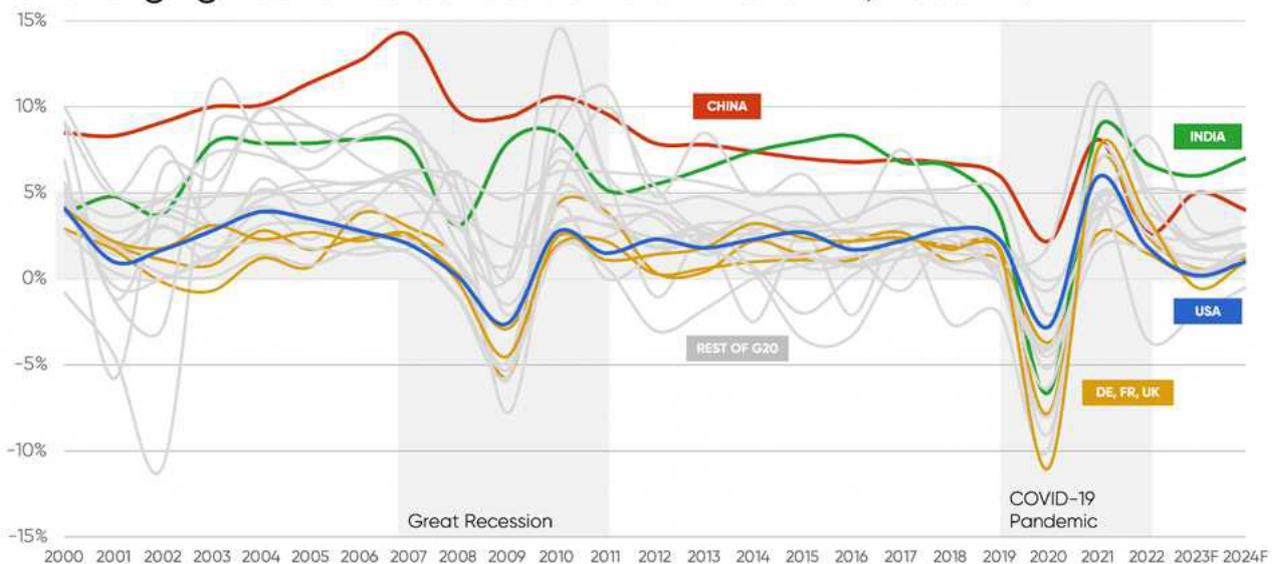
Economic growth is essential for the attainment of improved living standards of the population, as increased economic activity will allow individuals to satisfy more wants. Whilst higher rates are desirable, economic growth is interdependently linked with Price stability and full employment. As noted in previous sections, higher growth will lead to a reduction in cyclical unemployment, but excessive growth will result in demand-pull inflation. For this reason, most governments target growth rates that are compatible with the maintenance of full employment and the NAIRU. In Australia, this target (as of 2023) is considered to be between 3 to 4%.

Economic growth is not always positive, as output can decrease from one period to the next. In cases where economic activity declines, we refer to it as negative growth and 2 consecutive periods (quarters) of negative growth are referred to as a recession. The following graph (Figure 9.3.1) shows the GDP growth rates of some of the world's largest economies.

HOLONIQ. GLOBAL IMPACT INTELLIGENCE

Holon IQ

Challenging Economic Outlook. G20 GDP Growth, 2000-2024F



Source: HolonIQ forecasts as at Mar 3, 2023. IMF and World Bank historical GDP growth figures.

Figure 9.3.1: GDP Growth of the world's largest economies.

Whilst clearly showing various economic cycles and two periods of global recession, Figure 9.3.1 also identifies different growth rates across various countries and the reality that for the 2 decades shown, most countries have experienced large periods of positive rates of economic growth.

Focus Questions 9.3 Economic Growth

1. Why is economic growth important?
2. Give an example of using resources more efficiently to promote economic growth.
3. Explain why economic growth is important for improving people's lives and living conditions.

Sources of Economic Growth

It is important to distinguish between actual economic growth and potential economic growth. Actual growth (increased rGDP) is an increase in actual output, whilst potential growth expands the capacity for future actual growth. Actual economic growth comes from increases in total expenditure, defined as spending on goods and services by all sectors of the economy.

The sources of actual growth, come from the expenditure from each sector of an economy: Consumption, Investment, Government Spending and Net Exports. Expenditure by each sector is impacted upon by arrange of factors which are identified in the following table. (Figure 9.3.2) These factors will be expanded on in the chapter on the Aggregate Demand and Aggregate Supply model.

Sector	Influences on Expenditure by Sector
 Households	Changes in consumer spending: (Consumption C) consumer confidence, interest rates (monetary policy), wealth, personal income thus income taxes (fiscal policy), level of household debt
 Firms	Changes in investment spending: (Investment I) business confidence, interest rates (monetary policy), changes (improvement) in technology, business profits thus taxes (fiscal policy), level of business debt, legal/institutional changes
 Government	Changes in government spending: (Government Spending G) political priorities, economic priorities: (discretionary fiscal policy)
 Overseas	Changes in foreigners' spending: (Net Exports NX or X-M) changes in national income abroad and domestically, changes in exchange rates, changes in the level of trade protection

Figure 9.3.2: Sources of Actual Economic Growth (Total Expenditure).

In Australia Consumption represents approximately 60% of GDP

The main contributor to economic growth tends to be Consumption, which also tends to be a positive contributor towards total expenditure. Investment spending can be volatile and is highly dependent on economic conditions. In times of economic downturn, firms are likely to decrease investment, and the reverse is likely when an economy is expanding. The levels of exports and imports can also be volatile, as they rely on the certainty of global circumstances. These circumstances can change rapidly and unexpectedly. The points noted about contributions towards growth are highlighted in the following graph (Figure 9.3.3), which represents the economy of the USA across 3 years (12 quarters). During these three years, large fluctuations occur in Investment and Net Exports (Trade) expenditure, whilst Consumption remains a positive contributor across all quarters.

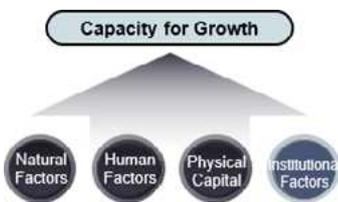
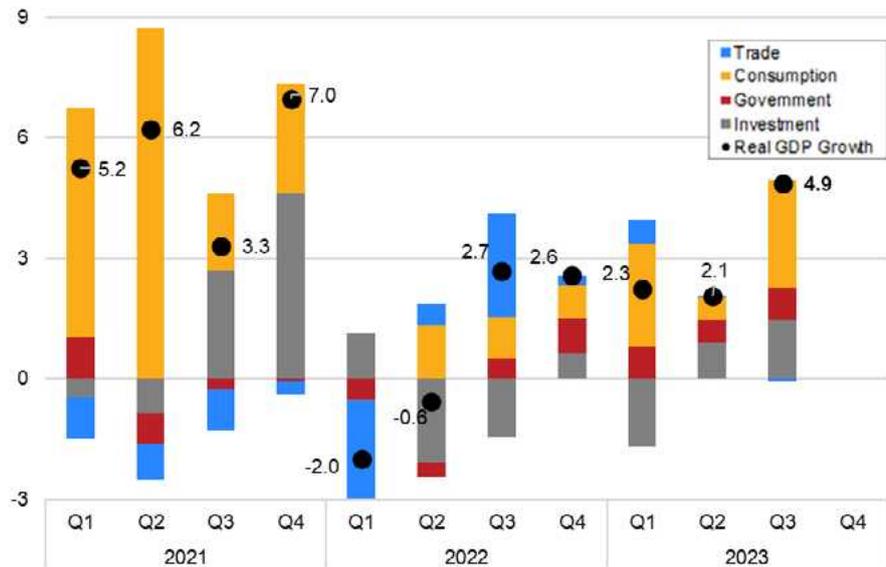


Figure 9.3.4: Sources of Potential Economic Growth.



Source: <https://www.conference-board.org/brief/global-economy/GDP-Q3-2023>

Figure 9.3.3: Contributions to Economic Growth (Total Expenditure).

Potential Growth sources include those that are responsible for shifting the PPC outwards to the right (Figure 9.3.5). From the 'Thinking Like an Economist' section, you should recall these factors to be changes in the quality and or quantity of resources, productivity, and technology improvements. It can also be caused by Institutional changes that lead to more efficient institutional frameworks and markets.

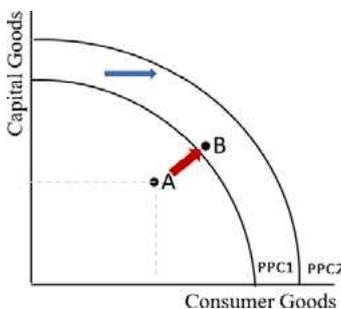


Figure 9.3.5: Actual and Potential Economic Growth Modelled.

Model explanation:
 A shift of the PPC outward to the right as a result of an increase in the quantity or quality of resources represents potential growth. This could be immigration of skilled labour, advancements in education and training, new technology improvements, or infrastructure development. Increases in total output from point A to point B represents actual growth with an increase in total production of both consumer and capital goods. This could have been the result of increases in C, I, G or NX.

Focus Questions 9.3 Economic Growth

1. Discuss some sources of actual economic growth.
2. Explain how household debt impacts consumer spending.
3. Define the role that consumption plays in economic growth.
4. Explain how changes in consumption patterns affect the overall economy.
5. Explain how changes in government spending impact the overall health of the economy.
6. Discuss how improvements in firms contribute to potential economic growth.
7. Discuss how technological improvements contribute to potential economic growth.
8. Demonstrate with a diagram how actual growth can be represented on the production possibilities curve (PPC).

Measuring Economic Growth

Key Definition:

Real GDP nominal GDP adjusted for the effects of inflation.

GDP represents the total market value of final goods and services produced by a country over a period of time. This is known as nominal GDP and is output measured at current dollar values. This measure is not effective for making comparisons between time periods, as the impacts of inflation can distort values. Economists therefore adjust nominal GDP to remove the effects/impacts of any inflation and create what is known as Real GDP (rGDP). rGDP measures the total economic output of the economy at a constant dollar value, allowing for comparisons between time periods to be made more accurately.

GDP is usually calculated by one of three methods (or, in some cases, an average of the three methods):

- Expenditure method
- Production, Output or Value-added method.
- Income method.

These three methods are best explained by referring to the circular flow of income model (explained in Chapter 8), shown in Figure 9.3.6.

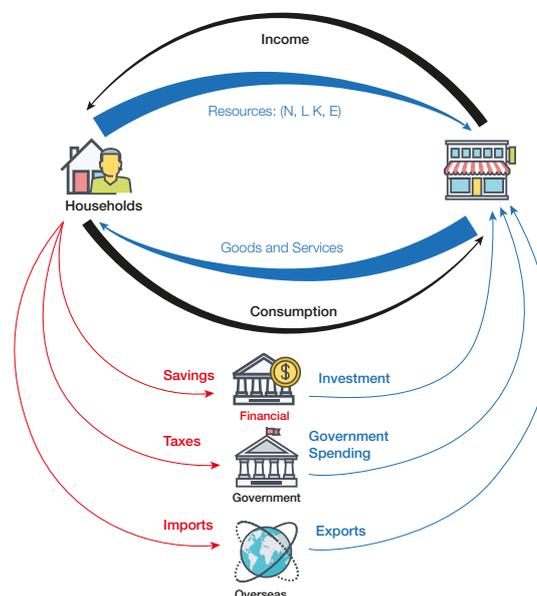


Figure 9.3.6: Circular Flow Model and Measures of GDP.

Expenditure Method (GDP_e)

The expenditure method sums the total spending on final goods and services produced within a country over a time period by all sectors. This represents Household Consumption Spending (C), Firms Investment Spending (I), Government Spending (G) and Net Export Spending (NX) from the Overseas sector. Net Exports are calculated by deducting the value of imports from the value of exports. This creates the following formula for measuring Total Expenditure and therefore, GDP:

$$GDP_e = C + I + G + (X - M)$$

Production, Output or Value Added Method (GDP_p)

The production method, also known as the output and value add methods, is determined by calculating the value of all final goods and services produced in an economy over a specified time. The existence of intermediate goods can make this difficult to measure and avoid the problem of counting production values twice. It can alternatively be measured by adding the value added at each stage of a product's production. This essentially measures the difference between the economic inputs (intermediate goods) to create output and the output's value in the economy. This is determined by estimating the total economic output and deducting the cost of the intermediate goods that are consumed in the process.

$$\mathbf{GDP_p = Sales Receipts - Intermediate Goods Costs + increase in stock values.}$$

Income Method (GDP_Y or GDP_I)

The income method sums all income earned by the provision of factors of production to produce goods and services within an economy for a specified period. This is determined by the sum of income that comes from Labour, Land, Capital, and Enterprise provision during a period. It is, therefore, equal to Wages (W) + Rent (R) + Interest (i) + Profits (π).

$$\mathbf{GDP_Y = W + R + i + \pi}$$

In theory, all three methods should provide the same value. The **value of output** produced in an economy for a period, (Goods and Services in Figure 9.3.5) will be equal to the **total income** provided to households in that period. Every dollar of production generates a dollar's worth of income (remember that resource costs also include the cost of enterprise, which is profit). Total income will be equal to the **expenditure** made by all sectors, as every dollar of income must have been used to purchase a dollar's worth of final output.

Consider the following simplistic representation (Table 9.3.1) of the fictional country Familkerland. In this country, the Farmer sells all their output to the Miller, who sells all their output to the Baker, whose production represents a final good.

Table 9.3.1: Three Methods of Calculating GDP.

Producer	Sales	Material Costs	Wages	Profit
FARMER	10,000	0	6,000	4,000
MILLER	18,000	10,000	3,000	5,000
BAKER	30,000	18,000	6,000	6,000

In this simplified example, we can calculate the value of GDP using the three methods. If we start with the production or value add method (Sales – Material Costs), we sum the value added at each stage of production:

- VA of Farmer = \$10,000
- VA of Miller = \$8,000
- VA of Baker = \$12,000

The sum of these is \$30,000 so $GDP_p = \$30,000$

If we use the income method, we sum $W+R+i+\pi$. In our simplified country, there are only two forms of income, Wages and Profit, so when summing these at each stage of production, we get:

- Income of Farming = \$6,000 + \$4,000 = \$10,000
- Income of Milling = \$3,000 + \$5,000 = \$8,000
- Income of Baking = \$6,000 + \$6,000 = \$12,000

The sum of these is \$30,000 so $GDP_Y = \$30,000$

Using the expenditure method, we add $C+I+G+(X-M)$, however, as there are only households spending on final goods (from the baker) in Familkerland total expenditure is equal to Household Consumption.

- Consumption Expenditure = \$30,000

The sum of these is \$30,000 so $GDP_e = \$30,000$

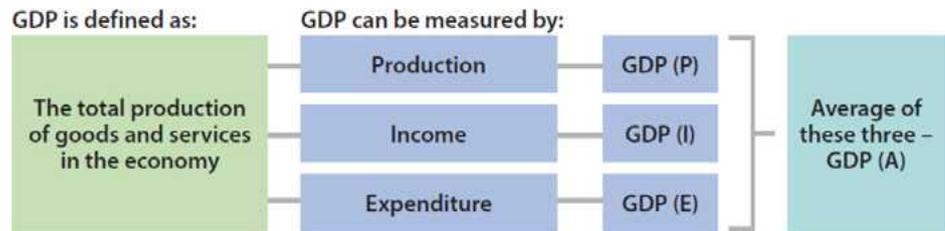
As is represented in the example of Familkerland, in theory, all three methods will produce the same result. However, in reality there are errors, estimations and omissions in the collection of data, so statistical discrepancies in the three measures will exist. An averaging method, GDP_A may therefore be used.

Averaging Method

This method is simply the average of the other three methods (Expenditure, Production, and Income Methods).

$$GDP_A = (GDP_e + GDP_p + GDP_y)/3$$

A summary of the measurements of GDP is highlighted below in figure 9.3.7.



Source: <https://www.rba.gov.au/education/resources/explainers/economic-growth.html>

Figure 9.3.7: Summary of Methods of Measuring GDP.

Limits in Measuring Growth

GDP has several limitations as a measure of economic growth. These limitations can result in the true value of economic activity being over or understated. The most common limitations of GDP as a measure of output include that it:



Figure 9.3.8: GDP does not count the cash economy or parallel markets..

- Does not include non-marketed output
- Does not include output sold in parallel markets (Underground Economy)
- Does not take into account quality improvements
- Fails to account for negative externalities
- Fails to account for Resource depletion.

In addition, GDP must be adjusted for

- Inflation (real GDP)
- Population Change (Real GDP per capita).

These limitations are explained in more detail in the table (Table 9.3.1) Those highlighted in blue can be addressed by alternative measures, whilst those in grey may be considered more of a problem associated with GDP as a measure of living standards.

Table 9.3.2: Limitations of GDP as a measure of Economic Growth.

Limitation	Explanation
Does not include non-marketed output.	GDP does not take into consideration any non-marketed transactions non-marketed activities include resource usage in production which does not generate an income. This includes home production activities. For example, growing vegetables at home does not add to GDP, but the same type of vegetables grown by a farmer add to GDP. Equally looking after your own children does not add to GDP but putting them in Childcare where someone else looks after them does. Where households are highly self sufficient non-marketed production can be of a significant value, this is especially the case in developing countries where people are forced to be more self-sufficient.
Does not include output sold in parallel markets (Underground Economy)	GDP does not include activity that takes place in parallel markets (outside of the formal regulated market). This includes the cash economy where people are paid cash to do activities (often in an attempt to avoid paying taxes). Equally production of illegal products such as drugs are not included in the official measure. In some countries this can be a significant value.
Some goods are not Provided at Market Value	Some collective goods for example, libraries, parks, have a limited market value. And may be omitted from the GDP figures or given an estimated value. Equally, goods provided by government are often provided and valued at cost price (or at the labour cost price) resulting in an underestimate of GDP.
Inflation (real GDP)	Nominal GDP must be adjusted for the effects of inflation in order for it to be comparable across period. This is addressed through the calculation and use of real GDP.

Limitation	Explanation
Population Change (Real GDP per capita)	Population increases should result in GDP growth through both additional resource availability and also increased consumption expenditure. GDP is a does not reflect population changes however this is addressed by economist who use rGDP per capita as a mechanism of comparing regions or times with different population sizes. rGDP per capita is simply rGDP/population.
Fails to account for quality improvements.	GDP does not consider quality changes in products. Often improvements technology allows for improved quality products being sold at lower prices. GDP calculations do not reflect this.
Fails to account for negative externalities.	GDP growth often creates externalities and the impacts of these are not calculated as part of the measure of GDP. In part this is because externalities do not have a marketed price accounted for by the consumer or producer.
Fails to account for Resource depletion.	GDP growth often results in resource depletion, like externalities these are not considered in the final value of expenditure as they don't have a cost that is incorporated into marketed prices.

Limits in Measuring Living Standards

GDP is also limited as a measure of living standards, as there are limits to the extent to which increased output adds to living standards. Some of the common reasons that GDP may not reflect improvements in living standards include:

- It does not distinguish between the composition of output.
- It does not reflect other improvements such as health, education, and life expectancy.
- It does not indicate whether the distribution of output is equal.
- It does not account for leisure time changes.
- It does not measure other quality-of-life factors.

These limitations are explained in more detail in the table (Table 9.3.3)

Table 9.3.3: Limitations of GDP as a measure of Economic Growth.

Limitation	Explanation
Does not distinguish between composition of output.	GDP is simply a quantifiable measure and does not distinguish between the goods that are contributing to its value. Expenditure on weapons is considered no different to expenditure on education. It is likely that some goods will contribute more to living standards than others, but GDP makes no distinction between any expenditure. Related closely to this is spending on 'Regrettables' where households spend on goods to restore living standards rather than improve them. Spending to repair a car after an accident or on medical expenses associated with a broken leg add to GDP but simply restore living standards rather than add to them.
Does not reflect other improvements such as health, education, life expectancy.	Health and education are two elements that contribute to standards of living significantly and it is possible that countries can have higher values of these despite lower GDP than other countries.
Does not indicate whether distribution of output is equal.	How equally or unequal the distribution of output is not reflected in GDP figures. Even GDP per capita is simply an average and does not reflect the level of output that goes to differing quantiles. Where wealth and income are highly concentrated the benefits of growth may not improve the living standards of the majority of the population.
Does not account for leisure time changes.	GDP does not show the number of work hours that have occurred in the generation of it. There is an opportunity cost associated with working which is leisure time. If GDP increases because of an increase in the number of hours worked this would come at the expense of leisure time. This has the potential to reduce living standards.
Does not measure other quality of life factors.	Living standards are dependent on a number of non-economic factors, including things like crime rates, freedoms, stress levels and a sense of security. GDP does not reflect changes in any of these factors.

Focus Questions 9.3.2 Measuring of Economic Growth

1. State the three methods used to calculate GDP and the corresponding equation.

2. Calculate GDP in the following situations.

GDP Method	Situation	Calculation
Expenditure	Consumption 100,000 Investment 15,000 Government Spending 40,000 Net Exports (20,000)	
Production	Sales Receipts 210,000 Intermediate Goods Costs 120,000 Increase in Stock Values 45,000	
Income	Rent 10,000 Wages 75,000 Interest 20,000 Profit 30,000	
Averaging	Using the above three answers	
Expenditure	Consumption 536,000 Investment 120,000 Government Spending 60,000 Net Exports 34,000	
Production	Sales Receipts 1,255,000 Intermediate Goods Costs 530,000 Increase in Stock Values 25,000	
Income	Rent 80,000 Wages 450,000 Interest 130,000 Profit 90,000	
Averaging	Using the above three answers	

3. Explain some limitations of using GDP as a measure of economic growth.

4. Examine the purpose of adjusting nominal GDP to calculate rGDP.

5. State some alternative measures that can be used to address the limitations of using GDP as a measure of living standards.

Consequences of Economic Growth

Economic growth is generally correlated with an improvement in living standards resulting from higher incomes and greater output. Economic growth also has positive consequences for unemployment as high rates of growth increase the demand for labour and reduce cyclical unemployment. However, not all outcomes of growth are positive; there are several undesirable consequences that may arise from the growth in output of a nation over time. These include:

- **Externalities:** Economic growth often comes at the expense of the environment. If growth is fuelled by resource depletion, it may be unsustainable and may result in harmful effects on human and environmental health.
- **Inflation:** In economies experiencing rapid growth, high inflation often accompanies it. This means that if household incomes do not keep up with inflation, higher incomes may not actually improve standards of living over time.
- **Structural unemployment:** A common effect of growth in the era of globalisation is large numbers of people becoming structurally unemployed, as certain skills are no longer demanded in rapidly growing economies.
- **Inequality:** Economic growth can contribute to the widening of inequality. Increases in growth are often associated with increased asset prices, including housing and shares. This leads to more wealth and income for those who own these assets.



Figure 9.3.9: Economic Growth can lead to environmental damage.

The costs and benefits of economic growth are summarised in Table 9.3.4.

Table 9.3.4: Benefits and Costs of Economic Growth.

Benefits	Costs
Job growth.	Can contribute to demand pull inflation.
Increase standard of living.	Can create net trade deficits as import spending rises.
Income multiplier effect.	Growth may be unsustainable.
Employment opportunities.	Can contribute to externalities.
	Can create environmental problems.

Focus Questions 9.3.2 Measuring of Economic Growth

1. Explain why governments might make changes in government spending to affect economic growth.
2. Explain the potential consequences of prioritising economic growth over other macroeconomic objectives.
3. Describe some limitations of using GDP as a measure of living standards.
4. Discuss some potential negative effects of economic growth on the environment.

9.4 Macroeconomic Objectives Overview

A summary of the macroeconomic objectives is shown in the table below, with target rates reflecting Australia. Please note that the modelling of the objectives will occur in the chapter on the Aggregate Demand and Aggregate Supply Model.

Objective	Definition	Indicator	Target	Cause	Modelled	Consequences
Full Employment	A level of unemployment that is consistent with the attainment of low and stable rates of inflation (Price stability). This is not zero percent unemployment but rather a Non-Accelerating Inflation Rate of Unemployment (NAURU) or Natural Rate where there is zero cyclical unemployment present in an economy.	Unemployment Rate LFPR	4-5%	Cyclical Structural Frictional Seasonal	Decreased Demand for Labour bought about by a decrease in AD — Deflationary Gap	<p>Personal</p> <p>loss of income, increased indebtedness, lower self esteem, depression, suicide, family breakdown, addictions, health issues</p> <p>Social</p> <p>crime and violence, drug use homelessness</p> <p>Economic</p> <p>loss of real output (GDP), loss of household income, loss of tax revenue for the government, higher unemployment benefit payments, costs to government of dealing with social problems, rising inequality, loss of skill sets</p>
Price Stability	Low and stable rates of inflation (average or general price levels), resulting in the avoidance of long periods of inflation or deflation and sustaining the value of money over time	CPI Inflation Rate	2-3%	Demand Pull Cost-Push Money Supply Expansion Expectations	Increase in AD — Inflationary Gap Decrease in SRAS	<p>Redistribution Effects Uncertainty</p> <p>Menu Costs</p> <p>Money Illusion</p> <p>International Competitiveness</p>
Economic Growth	Sustained increases in the level of total expenditure or output (real GDP) over time	RGDP RGDP per capital	3-4%		Increase AD Increase LRAS	<p>Increased living standards - HIGHER INCOMES and GREATER OUTPUT.</p> <p>Undesirable Consequences:</p> <p>Externalities: Negative environmental impacts. Depletion, degradation, eco-system destruction</p> <p>Inflation: Decreased real income</p> <p>Structural unemployment: Capital replacing labour</p> <p>Inequality</p>

Topic 10: The Aggregate Demand and Aggregate Supply Model

Learning Outcomes based on the SACE Economics Teaching and Learning Framework

- Students analyse the Monetarist AD–AS model (including both short-run and long-run aggregate supply curves) to identify equilibrium in the model and determine output and price level.
- Students analyse the potential cause and effect of changes in aggregate demand (AD) and long run and short run aggregate supply (LRAS, SRAS) in the AD–AS model. They evaluate the impact of these changes against the macroeconomic objectives

10.1 Aggregate Demand and Aggregate Supply Model

The Aggregate Demand (AD) Aggregate Supply (AS) model is a model that shows the impacts that changes in aggregate expenditure (demand) and aggregate output (supply) have on economic growth and average price levels in an economy. It can also be used to indirectly determine impacts on unemployment. In this SACE course, the AS-AS model is represented from a monetarist perspective. Whilst we do not investigate the monetarist theory, an overview is provided in Table 10.1.1 to allow some perspective as we investigate the model in more depth.

Key Definition:

AD-AS Model a model that shows the impacts that changes in aggregate expenditure (demand) and aggregate output (supply) have on economic growth and average price levels in an economy.

Table 10.1.1: Overview of Monetarist Theory.

Aspect	Monetarist Beliefs
Control of Economy	Money in circulation should be regulated by the central bank
Inflation	Controlling the money supply by increasing or decreasing it, should be used to control inflation
Priority	Emphasis should be placed on reducing inflation more than keeping unemployment low
Wages	Wages are likely to adjust naturally to prevent real wage unemployment

One of the critical elements to understand about the AD-AS model is the macroeconomic distinction between the short-run and long-run time periods. The distinction between these will be important as we develop our understanding of the model. The short-run is a period of time in which prices of factors of production are fixed or inflexible and do not respond to price changes in product markets. In the long-run factor prices become flexible and are able to adjust to price level changes for goods and services.

Overview of the Monetarist AD-AS Model

The AD-AS Model, as defined above, focuses on the impacts that changes in economy aggregates have on Output (rGDP) and Average Price Levels (APL). Figure 10.1.1 demonstrates these two variables; Output as measured by rGDP on the horizontal axis and inflation as measured by APL on the vertical axis.

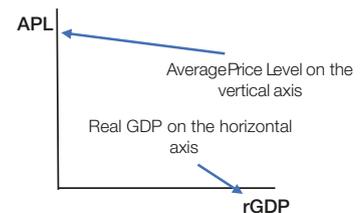


Figure 10.1.1: The axes of the AD/AS Model

The model demonstrates the aggregate activities that are occurring in an economy. An aggregate is simply defined as a whole, which is formed by combining several separate elements. This model demonstrates the interaction between Aggregate demand (AD), which is downward sloping to the right, Short-run aggregate supply (SRAS), which slopes upwards to the right and Long-run aggregate supply (LRAS), which is vertical. These elements will be explained in more detail later in this chapter, but they are illustrated in Figure 10.1.2 as a mechanism of providing a holistic perspective of the model first.

Model explanation:

The intersection of AD and SRAS is known as the short-run equilibrium position and is represented by Y_e and PI_e . Y_e is the level of output currently existing in the economy and PI_e represents average price levels at the same point. The LRAS curve is vertical and represents a level of output that coincides with the NAIRU, this output level is known as Y_p the long-run potential level of output or full employment level of output. In this model the long-run and short-run equilibrium positions are equal ($AD=SRAS=LRAS$) however, this is not always the case.

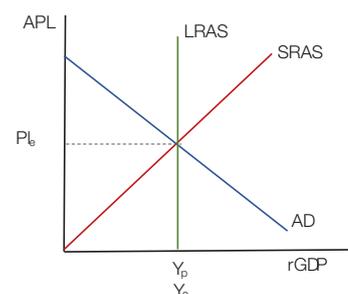


Figure 10.1.2: The AD/AS Model.

Key Point:

When labelling equilibrium points on each axis we use PI_e to represent the average price level point and Y_e to represent the level of output in the short-run, and Y_p to represent output in the long-run.

Note that Y is the letter that represents income, which you will remember from the objectives chapter is one of the three methods of measuring GDP, this is why it is used for labelling points on the horizontal axis. A summary of acronyms used in the AD/AS model appears in the table below (Table 10.1.2).

Table 10.1.2: Meanings of acronyms used in the AD/AS model.

Acronym	Meaning
APL	Average Price Level – Reflecting inflation
rGDP	Real Gross Domestic Product – Reflecting total output
AD	Aggregate Demand – Reflecting aggregate expenditure
SRAS	Short-Run Aggregate Supply – Reflecting aggregate output in short run
LRAS	Long-Run Aggregate Supply – Reflecting long run output equilibrium
PI_e	Average Price Level Equilibrium – Current level of average price
Y_e	Short-Run Income (output) Equilibrium – Current level of total income or output
Y_p	Long-Run equilibrium level of income (output) – Reflecting the output occurring at the natural rate of unemployment or the NAIRU

Positions of an Economy illustrated using an AD-AS Model

Key Definition:

Full Employment level of Output an equilibrium where $Y_e = Y_p$ and the economy is operating at an output level consistent with its natural rate of unemployment.

In the short-run, the equilibrium position of the economy is determined by the point where AD is equal to SRAS. There are three basic positions an economy can be situated in (in the short-run), and these positions are relative to the level of long-run potential output Y_p :

- At full employment
- In an inflationary gap
- In a deflationary gap.



Full Employment

At full employment, the economy's short run equilibrium position Y_e is equal to the long-run equilibrium position Y_p . This long-run equilibrium position is argued by monetarists to be the position the economy naturally tends towards in the long-run and would represent a position where the government is potentially (likely) to be attaining all three domestic macroeconomic objectives simultaneously (Figure 10.1.3).

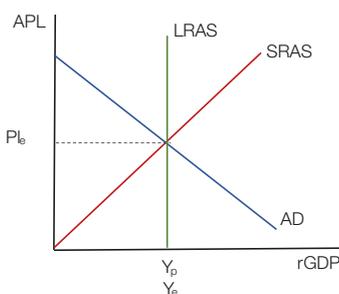


Figure 10.1.3: The Long run equilibrium position $Y_e = Y_p$.

Model explanation:

In this model the economy is at its long run equilibrium position. $AD=SRAS$ at the LRAS level of output and the long-run (Y_p) and short-run equilibrium positions (Y_e) are equal. $AD=SRAS=LRAS$ and the economy is at the full employment level of output with a level of unemployment equal to the natural rate or NAIRU.

Inflationary Gap

Key Definition:

Inflationary Gap an equilibrium where $Y_e > Y_p$ and the economy is operating beyond the economies long run capacity.

When an economy is in an inflationary gap, the short-run equilibrium position (Y_e) is operating beyond the economy's long-run capacity (Y_p) (Figure 10.1.4). It is likely that unemployment rates would be below the natural rate and inflation rates would exceed the medium to long-term target.

Model explanation:

In this model the economy is in a inflationary gap where the short-run equilibrium position ($AD=SRAS$) occurs to the right of the long run potential level of output (LRAS). The level of output in the economy Y_e exceeds the long run capacity Y_p .

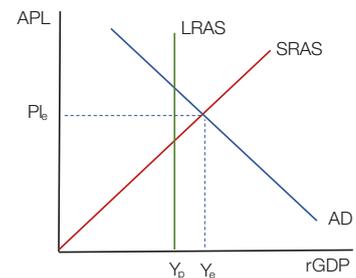
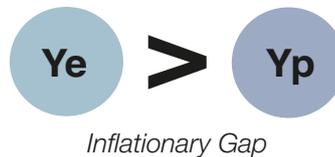


Figure 10.1.4: Inflationary Gap $Y_e > Y_p$.

Deflationary Gap (Recessionary Gap)

Key Definition:

Deflationary Gap an equilibrium where $Y_e < Y_p$ and the economy is operating below the economies long run capacity.

When an economy is in a deflationary gap (or recessionary gap) the short-run equilibrium position (Y_e) is operating below the economies long-run capacity (Y_p) (Figure 10.1.5). It is likely that unemployment rates would be higher than the natural rate and inflation rates would be below the medium to long term target.

Model explanation:

In this model the economy is in a deflationary gap where the short-run equilibrium position ($AD=SRAS$) occurs to the left of the long run potential level of output (LRAS). The level of output in the economy Y_e is below the long run capacity Y_p .

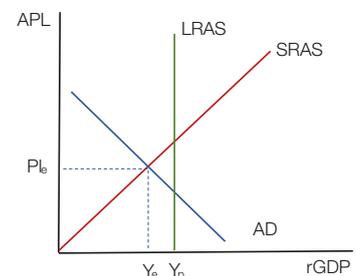


Figure 10.1.5: Deflationary Gap $Y_e < Y_p$.

Key Elements of the AD-AS Model

The AD – AS model is a reflection of three key elements:

- Aggregate Demand (AD)
- Short run Aggregate Supply (SRAS)
- Long run Aggregate Supply (LRAS)

These elements are explained in the following sections including definitions, determinants, and the impacts of changes in these elements on the Economy.

10.2 Aggregate Demand (AD)

Aggregate Demand (AD) is defined as the total planned expenditure of all sectors of the economy, households, firms, the government and overseas at a given price level and period of time. AD is, therefore, represented by the equation $AD = C + I + G + (X - M)$. It can also be defined as the total demand from all consumers, domestic and foreign, for the output of a nation at a range of price levels in a particular period of time. Both these definitions refer to the fact that AD reflects a relationship between total expenditure and average price levels. The AD curve slopes downwards to the right, and this relationship is caused by three primary effects:

- The wealth effect
- The interest rate effect
- The international trade effect.

$$AD = C + I + G + (X - M)$$

These effects and, thus, the inverse relationship between AD and APL are explained in Table 10.2.1. It is important to remember in the explanations that follow is that they are explaining why, at higher average price levels, AD is lower and why, as average price levels fall, AD rises. They describe the relationship between APL and AD at singular point (or period) in time and explain movements along the aggregate demand curve.

Key Definition:

Aggregate Demand is the total planned expenditure of all sectors of the economy, households, firms, the government and overseas at a given price level and period of time

Table 10.2.1: Explaining the relationship between AD and APL.

Effect	Explained
<p>The Wealth Effect A change in average price levels impacts the real value of people's wealth and thus consumption and AD.</p>	<p>Wealth is value of assets that people have accumulated rather than their income. If average price levels fall, the real value of wealth increases, leading to an increased level of purchasing power, thus people spending more money in the economy. The reverse is also true if the price levels increase the real value of the assets falls, decreasing the purchasing power.</p>
<p>The Interest Rate Effect As the average price level changes this changes the demand for money and thus interest rates. Changes in interest rates impact consumption and investment and, therefore, AD.</p>	<p>If there is an increase in average price levels, households and firms may need more money to complete their purchases and transactions, this leads to an increase in the demand for money (an increase in the amount of money that consumers and firms need to borrow). Due to this increase in demand for money, interest rates are likely to be increased, leading to an increase in the cost of borrowing. Increases in the cost of borrowing lead to a decrease in household expenditure - Consumption and expenditure by Firms investment. If the economy was experiencing a fall in average price levels, decreased demand for money would lower interest rates, and an increase in the quantity of expenditure would occur.</p>
<p>The International Substitution Effect As average price levels change, domestic and foreign consumers' patterns of expenditure are likely to alter. This will impact net exports and, therefore, AD.</p>	<p>If prices in the domestic economy increase, households and firms will consider using alternative, cheaper overseas markets to purchase their goods and services. This increases the number of imports into the economy. The cost of the domestic economy's exports will also become more expensive to foreign buyers leading to fewer exports. These two impacts will result in lower net exports and, therefore, AD. The reverse occurs when prices in the domestic economy decrease, seeing net exports improve and appear as a downward movement along the aggregate demand curve.</p>

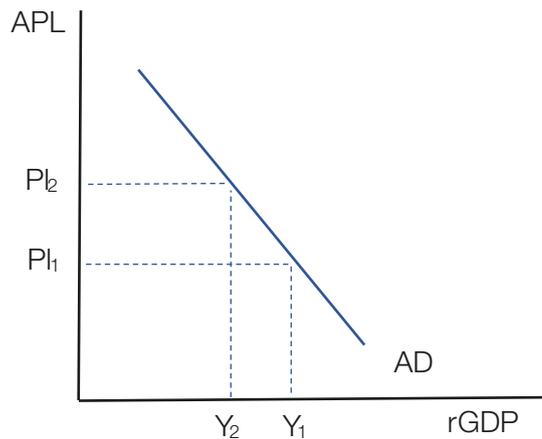


Figure 10.2.1: The downward sloping AD curve.



Figure 10.2.3: Savings Levels impact Consumption

Determinants of Aggregate Demand

Changes in any of the components of AD cause an increase or decrease in AD and, thus, a shift of the entire AD curve to the left or right. The 4 components of AD are Consumption, Investment, Government Spending and Net Exports. There are multiple factors that can influence the 4 components of AD, and these are explained in the following section.

Factors Influencing Consumption

Consumption spending is spending by households on goods and services that satisfy wants. Common factors that cause changes in consumption spending include:

- Consumer confidence
- Interest rates (monetary policy)
- Wealth
- Personal income thus income taxes (fiscal policy)
- Level of household debt.

Key Definition:

Consumption is spending by households on goods and services that satisfy wants

Key Point:

Because Income $Y = C + S + T + M$ changes in S, T and M will impact the extent of consumption.

Table 10.2.2: Influences on Consumption.

Factor	Influence
Consumer confidence <i>Higher confidence higher consumption</i>	Consumer confidence is a measure of household optimism about future income and the economy. If households expect future incomes to rise or are optimistic about the economy and thus job security, they are likely to buy more goods and services now. This represents an increase in consumption spending. Alternatively, if optimism falls due to concerns about future unemployment or falls in wages households will decrease current expenditure and increase savings.
Interest rates (monetary policy) <i>Higher interest rates lower consumption</i>	Interest rates reflect the cost of borrowing and the price paid on savings. As some household expenditure is financed by borrowing it will be influenced by changes in interest rates. Increases in interest rates will encourage savings and will make it more expensive to borrow funds, equally those with existing borrowings now pay more to service these loans. All these factors will cause consumption to decrease. The reverse is also true where decreases in interest rates reduce savings, increase borrowing, and decrease the cost of servicing existing loans all of which result in consumption increasing.
Wealth <i>Higher wealth higher consumption</i>	Wealth, which was defined previously as an increase in the value of assets owned by individuals, impacts the ability of households to borrow, as well as incentivising consumption. When wealth increases, households feel more inclined to spend, and it also increases their equity position, allowing greater borrowings. These two influences result in consumption increasing.
Personal income thus income taxes and savings (fiscal policy) <i>Higher income higher consumption.</i> <i>Higher Taxes lower consumption</i> <i>Higher Savings lower consumption</i>	Personal income taxes influence the portion of income available for consumption, known as disposable income. Increases in income taxes reduce disposable income and, therefore, decrease consumption spending. Decreases in income taxes cause disposable income to rise and, therefore, increase consumption. Savings also impact consumption levels, as savings increase there is less income available for consumption
Level of household debt <i>Higher debt lower consumption</i>	Indebtedness refers to the value of money owed by people from taking out loans in the past. If household debt (credit cards, mortgages, personal loans) is high, servicing these loans will require cuts in consumption expenditure. It will also reduce the potential of borrowing more as high debt levels will discourage financial institutions from lending to these households. The reverse of this is that low debt levels will encourage consumption spending by allowing greater borrowing as well as providing more income available for consumption.

Factors Influencing Investment

Investment spending is spending by firms on capital goods that aid future production. Common factors that cause changes in Investment spending include:

- Business confidence
- Interest rates (monetary policy)
- Changes (improvement) in technology
- Business profits, thus taxes (fiscal policy)
- Level of business debt.

Key Definition:

Investment spending by firms on capital goods that aid future production.



Figure 10.2.3: Company Taxes reduce Investment Spending.

Table 10.2.3: Influences on Investment.

Factor	Influence
Business confidence <i>Higher confidence higher investment</i>	Business confidence is a measure of firms' optimism about future sales and economic activity. If firms expect future sales to rise or are optimistic about the economy and thus future profits, they are likely to buy more capital goods now to expand their production capacity in the future. This represents an increase in investment spending. Alternatively, if optimism falls (firms become pessimistic) due to concerns about future profits or falls in sales firms will decrease current investment.
Interest rates (monetary policy) <i>Higher interest rates lower investment</i>	Interest rates reflect the cost of borrowing and the price paid on savings. As some investment expenditure is financed by borrowing, it will be influenced by changes in interest rates. Increases in interest rates will make it more expensive to borrow funds and those firms with existing borrowings now pay more to service these loans decreasing profits. These factors will cause investment to decrease. The reverse is also true where decreases in interest rates, increase borrowing and decrease the cost of servicing existing loans which result in investment spending increasing.
Changes in technology <i>Increased technology adoption increased investment</i>	As technology improves it will stimulate investment spending as firms are required to update technologies to remain competitive.
Business Profits, thus corporate taxes (fiscal policy) <i>Higher Profits higher investment</i> <i>Higher Taxes lower investment</i>	Corporate taxes influence the portion of profit available for investment. Increases in corporate taxes reduce profits and therefore decrease investment spending. If, however, corporate taxes decrease investment spending will increase as after-tax profits rise.
Level of business debt <i>Higher debt lower investment</i>	Corporate indebtedness refers to the value of money owed by firms from taking out loans in the past. If firm debt is high, servicing these loans will require cuts in investment expenditure. It will also reduce the potential of borrowing funds as high debt levels will discourage financial institutions from lending to these firms. The reverse of this is that low debt levels will encourage investment spending by allowing greater borrowing, as well as providing more profits available for investment.

Key Definition:

Government Spending
 spending by all levels of government on goods and services.

Factors Influencing Government Spending

Government spending is spending by all levels of government on goods and services. Changes in government spending are influenced by the following factors:

- political priorities,
- economic priorities: (discretionary fiscal policy).

Table 10.2.4: Influences on Government Spending.

Factor	Influence
Political priorities	Governments provide many merit and public goods that require government expenditure, they also fund transfer payments (welfare), provide subsidies to firms and consumers, and pay wages to its employees. Spending on any or all of these priorities will increase government spending. Likewise, a decrease in spending on these priorities results in government spending falling. These priorities often change, particularly in terms of where a government is in the election cycle. In many cases, government spending increase near elections in attempts to convince voters to vote for government re-election.
Economic priorities	Government can also choose to spend as part of a deliberate attempt to alter AD. Discretionary spending may be changed to influence growth, unemployment, or inflation.

Factors Influencing Net Exports (Exports – Imports)

Net exports represent spending by overseas buyers on goods produced in the domestic economy less spending by domestic buyers on goods produced in other countries. Common factors that cause changes in net exports include:

- Changes in national income abroad and domestically
- Changes in exchange rates,
- Changes in the level of trade protection.

Key Definition:

Net Exports spending by overseas buyers on goods produced in the domestic economy less spending by domestic buyers on goods produced in other countries.

Table 10.2.5: Influences on Net Exports.

Factor	Influence
Changes in national income abroad and domestically <i>Higher overseas income higher exports</i> <i>Higher domestic income higher imports</i>	As incomes rise overseas their spending on imports increases which will reflect increased exports from their trading partners. Exports rise as incomes in overseas countries increase. This will increase net exports.
Exchange rates <i>Higher exchange rates higher imports</i> <i>lower exports, lower net exports</i>	Exchange rates change the relative prices of exports and imports. Where an exchange rate increases exports become more expensive and imports become relatively cheaper this causes exports to decrease and imports to increase leading to a decrease in net exports. Where the exchange rate falls exports become cheaper and imports more expensive, so Net exports increase from falling imports and rising exports.
Trade Protection <i>Higher protection less imports</i>	Trade protection represents a restriction on the flow of international trade. If Country A imposes higher trade protection imports will decrease. Higher levels of trade protection by trading partners of Country A will decrease Country A's exports.

An overview of the factors influencing the components of AD is given in Table 10.2.6.

Table 10.2.6: Determinants of Aggregate Demand.

Consumer Spending Consumption (C)	Investment Spending Investment (I)	Government Spending (G)	Foreigners Spending Net Exports (X-M)
<ul style="list-style-type: none"> • Consumer confidence • Levels of Income (Y) • Wealth level • Interest rates • Indebtedness 	<ul style="list-style-type: none"> • Business confidence • Technology change • Indebtedness • Interest rates 	<ul style="list-style-type: none"> • Government economic priorities • The election cycle • Emergencies – for example natural disasters • Political priorities 	<ul style="list-style-type: none"> • National income levels • Commodity prices • Relative inflation prices • Trade protection • Exchange rate variations

Aggregate Demand Increases

If there is an increase in consumption, investment, government spending or net exports it results in an increase in aggregate demand and a shift of the AD curve to the right. This is illustrated in the following AD-AS model (Figure 10.2.4a).

Model explanation:

In this model (Figure 10.2.4a) the economy is initially at the full employment level of output or long run equilibrium position ($Y_e = Y_p$). The movement of AD to the right, AD to AD₁ represents an increase in AD (caused by an increase in one or more of C, I, G or NX). As AD increases it creates increased output in the economy Y_e to Y_{e1} and increases in APL, P_e to P_{e1} . It will also result in a reduction in unemployment as more labour is required to increase output. In this instance it results in the economy shifting into an Inflationary Gap position. However, increases in AD do not always cause an inflationary gap to emerge. The new short run equilibrium position depends on both the size of the change in AD and the initial short run equilibrium position. This can be seen in Figure 10.2.4b where the economy returns to full employment having started in a deflationary gap position ($Y_e < Y_p$) and in Figure 10.2.4c the economy remains in a deflationary gap despite the increase in AD.

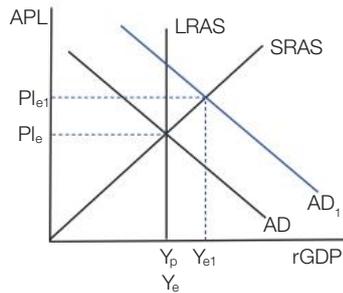


Figure 10.2.4a: Effects of an Increase in AD.

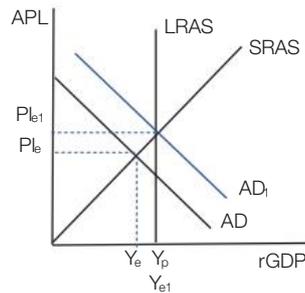


Figure 10.2.4b: Effects of an Increase in AD.

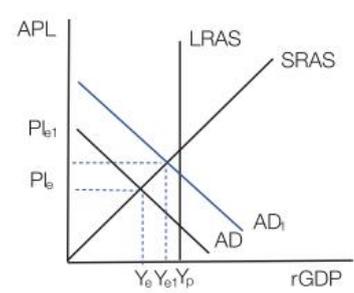


Figure 10.2.4c: Effects of an Increase in AD.

The key takeaway from the above monetarist AD-AS models is that an increase in AD will always result in an increase in rGDP, an increase in APL and a reduction in unemployment.

Aggregate Demand Decreases

If there is a decrease in one or more of consumption, investment, government spending or net exports it results in a decrease in aggregate demand and a shift of the AD curve to the left. This is illustrated in the following AD-AS model (Figure 10.2.5a).

Model explanation:

In this model (Figure 10.2.5a) the economy is initially at the full employment level of output or long run equilibrium position ($Y_e = Y_p$). The movement of AD to the left, AD to AD₁ represents a decrease in AD (caused by a decrease in one or more of C, I, G or NX). As AD decreases it creates decreased output in the economy Y_e to Y_{e1} and decreases in APL, P_e to P_{e1} . It will also result in an increase in unemployment as less labour is required due to lower output. In this instance it results in the economy shifting into a deflationary Gap position. However, decreases in AD do not always cause a deflationary gap to emerge. The new short run equilibrium position depends on both the size of the change in AD and the initial short run equilibrium position. This can be seen in Figure 10.2.5b where the economy returns to full employment having started in an inflationary gap position ($Y_e > Y_p$) and in Figure 10.2.5c the economy remains in an inflationary gap despite the decrease in AD.

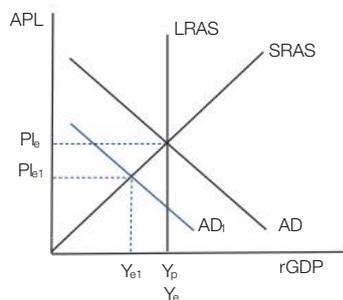


Figure 10.2.5a: Effects of a decrease in AD.

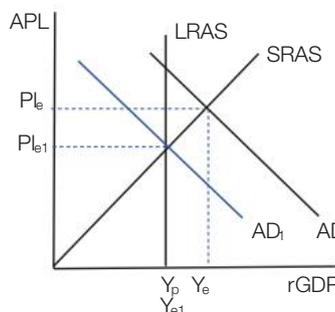


Figure 10.2.5b: Effects of a decrease in AD.

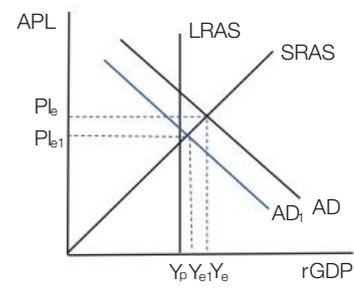


Figure 10.2.5c: Effects of a decrease in AD.

The key takeaway from the above monetarist AD-AS models is that a decrease in AD will always result in a decrease in rGDP, a decrease in APL and an increase in unemployment.

10.3 Aggregate Supply

Aggregate supply is the sum of the quantities of all final goods and services (GDP) that firms produce in an economy. Aggregate supply is distinguished by a long-run and short-run perspective. These two timeframes were outlined at the beginning of this chapter, and their existence means there are two distinct Aggregate Supply curves:

- Short-Run Aggregate Supply (SRAS) curve
- Long-Run Aggregate Supply (LRAS) curve.

These curves focus on the production of goods and services in the economy, unlike the Aggregate demand curve, which focuses on consumption, investment, government spending and net exports.

Short-Run Aggregate Supply

The Short-Run Aggregate Supply (SRAS) curve illustrates the relationship between average price levels and a nation's output produced in the fixed resource price period. It shows the actual levels of production in the economy, and its upward-sloping nature reflects that firms can make higher profits at higher APLs; thus, SRAS is higher at higher APLs. The SRAS curve shows the willingness of producers to change production when there is an increase or change in the general price level. The direct relationship between APL and SRAS is emphasised in Figure 10.3.1.

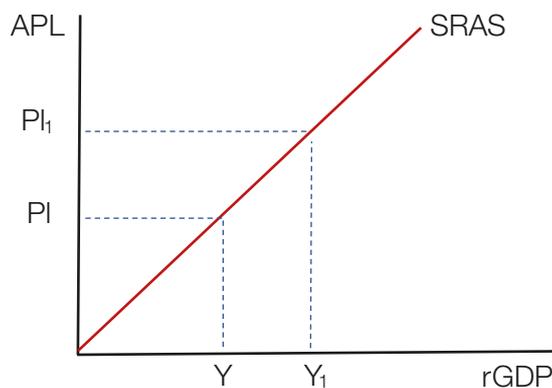


Figure 10.3.1: Upward Sloping SRAS curve.

What needs to be emphasised is that in the short-run, product prices may change (APL increases or decreases), but because factor prices are inflexible (they don't change), the margin between what goods are being sold for and the cost of producing them changes. This changes the profit margin for firms and, consequently, the incentive to produce output. For example, as APL increase, the profit margin increases and incentivises higher production due to higher profits. Conversely, lower APL reduces the profit margin, so it disincentivises production. Figure 10.3.2 shows this in a simplified manner. The differences in profit made at differing APLs explain the movement along the SRAS curve.

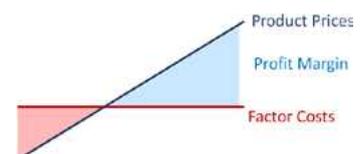


Figure 10.3.2: Changing profit margin in short-run.

10

Determinants of Short Run Aggregate Supply

There are several factors that cause a shift in the SRAS curve; however, the more important factors include changes in production costs and supply shocks. These are expanded on in the following list:

- Wages
- Non-labour resource prices: price of oil, equipment, capital goods, land inputs,
- Business taxes
- Subsidies offered to businesses
- Supply shocks – natural disasters, human-made disasters.

When costs increase, the SRAS decreases and shifts to the left; alternatively, a decrease in costs leads to an increase in SRAS and a movement to the right. The factors causing a shift in the SRAS are outlined in Table 10.3.1.

Key Definition:

Aggregate Supply the sum of the quantities of all final goods and services (rGDP) which as firms produce in an economy.

Key Definition:

Short-Run Aggregate Supply the relationship between average price levels and a nation's output produced in the fixed resource price period.

Table 10.3.1: Determinants of SRAS.

Factor	Influence
Wages	Wages are the cost of labour resources and can change because of government legislation such as minimum wages, changes in the bargaining power of employee associations or from labour shortages in the market for labour. If wages increase, the cost of production for firms increases and SRAS decreases. Alternatively, a decrease in wages will lower the cost of production and cause an increase in SRAS.
Non-labour resource prices	An increase in the cost of a land resource or capital resource impacts SRAS in the same way as wages rising. Common causes of non-labour resource costs changing include, energy costs, rent, capital costs, oil, insurance, cost of leased equipment, current borrowing costs (loans and mortgages), and the impact of exchange rates on inputs in production.
Business Taxes	Business taxes are taxes levied on business and they impact business profits. They are a cost of production, so when indirect taxes or company profit taxes increase, they add to a firm's cost of production and decrease SRAS.
Subsidies to Firms	Subsidies lower the cost of production to firms, as they are a payment to firms by government. Therefore, increases or the introduction of a subsidy will result in the SRAS increasing.
Supply Shocks	Supply shocks are events that have a sudden impact in the economy. Examples include natural and human made disasters such as, floods, earthquakes, cyclones, and wars. These cause disruptions to the ability to produce and result in lower production levels being possible. Destruction of capital or natural resources impacts in the short-run the capacity of firms to maintain output leading to a decrease in the SRAS curve.

Short-Run Aggregate Supply Increases

If there is a fall in the cost of production or a positive supply-side shock, the SRAS curve increases and shifts to the right. This is illustrated in Figure 10.3.3.

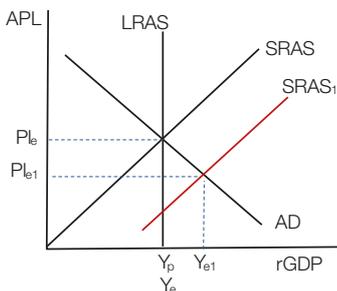


Figure 10.3.3: Effects of an increase in SRAS.

Model explanation:

In this model, the economy is initially at the full employment level of output or long run equilibrium position ($Y_e = Y_p$). The movement of SRAS to the right, SRAS to SRAS1 represents an increase in SRAS (caused by a decrease in the cost of production or a positive supply side shock). As SRAS increases it creates an increase in output Y_e to Y_{e1} and a decrease in APL, P_{le} to P_{le1} . The falling average price levels result from firms being able to lower prices but continue to maintain profit margins. The increase in SRAS creates an inflationary gap situation in that $Y_e > Y_p$ but it also results in decreasing APL. This situation results in an economy experiencing falling APL, as well as rising levels of output and increases in employment.

Short-Run Aggregate Supply Decreases

If there is an increase in the cost of production or a negative supply-side shock, SRAS decreases, and the curve shifts to the left. This is illustrated in Figure 10.3.4.

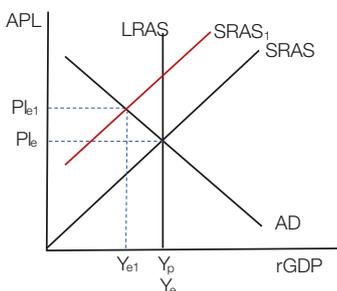


Figure 10.3.4: Effects of a decrease in SRAS.

Model explanation:

In this model the economy is initially at the full employment level of output or long run equilibrium position ($Y_e = Y_p$). The movement of SRAS to the left, SRAS to SRAS1 represents a decrease in SRAS (caused by an increase in the cost of production or a supply side shock). As SRAS decreases it creates a decrease in output Y_e to Y_{e1} and an increase in APL P_{le} to P_{le1} . The rising average price levels result from firms increasing prices to maintain profit margins. The decrease in SRAS creates a deflationary gap situation in that $Y_e < Y_p$ but it also results in increasing APL. This situation is often referred to as stagflation, a situation where an economy experiences rising APL, as well as falling levels of output and rising unemployment.

Key Point:

Changes in SRAS have an inverse relationship to changes in APL but a direct relationship to changes in output (rGDP).

Long-Run Aggregate Supply

The Long-Run Aggregate Supply (LRAS) curve is vertical and thus shows that there is no relationship between APL and AS in the long-run. In the long-run factor prices adjust to disturbances in product markets such that factor markets return to equilibrium, resulting in any short-run differential between product prices and factor prices reducing to the original value. This movement means there is no change in profit margins and, hence, no incentive in the long-run to alter output as AD and APL change.

Figure 10.3.5 illustrates the relationship between average price levels and a nation's output produced in the variable resource price period (long-run). It shows the actual levels of production in the economy are independent of APL.

What needs to be emphasised is that in the long-run whatever the level of AD the economy will operate at its full employment level of output. If AD were to increase, then in the short-run, APL rise, but factor prices remain constant, resulting in a shift up and along the SRAS curve. However, in the long-run, higher average prices will force factor costs to increase, and these rising costs of production will lead firms to decrease SRAS back to the LR equilibrium position. There is no incentive for firms in the long run to increase output as APL increases.

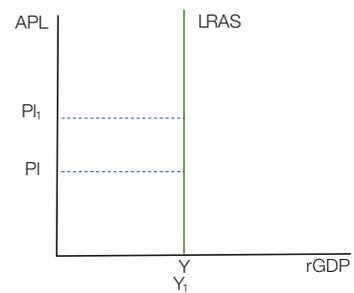


Figure 10.3.5: Vertical LRAS curve.

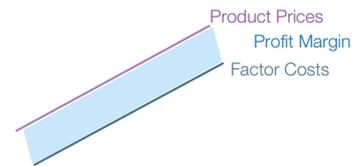


Figure 10.3.6: No profit margin change in the Long run.

Determinants of Long-Run Aggregate Supply

There are several factors that cause a shift in the LRAS curve; these are consistent with the factors that increase the productive capacity of an economy and shift the PPC. At the most simplistic level, they relate to changes in the quantity and or quality of resources and productivity changes. These are listed below:

- Increase in the quantity of resources.
- Improvements in the quality of resources.
- Improvements in technology.
- Increases in productivity and productive efficiency.
- Institutional changes – extent of privatisation, changes in competition, quality, and extent of regulation.



Figure 10.3.7: Productivity increase allows more output per unit of input, so increase LRAS

When the productive capacity of the economy increases, it shifts the LRAS to the right. These changes also result in lower costs of production, so any change in LRAS must also be accompanied by a change in the SRAS. Whilst LRAS can decrease many of the factors identified above, it results in an increase in the LRAS. This is illustrated in Figure 10.3.8.

Model explanation:
An increase in the quantity or quality of resources or productivity expands the productive capacity of the economy. That is, it allows more to be produced due to an increase in resources or alternatively an increase in output from the same quantity of resources. This shifts the LRAS to the right, LRAS to LRAS1. (the SRAS also shifts to the right as these factors result in a decrease in the cost of production). In this model the resulting impact is an increase in output Y_e to Y_{e1} and a fall in average price levels P_{le} to P_{le1} . The economy has increased output, decreased APL and remained at full employment.

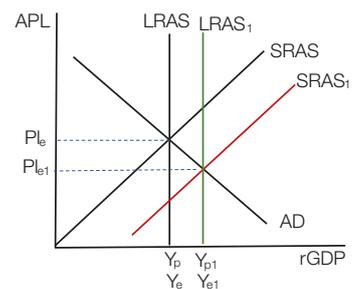


Figure 10.3.8: Effects of an increase in LRAS.

Increases in LRAS do not however always result in a return of the economy to the long run equilibrium position in some instances it can result in a deflationary gap emerging in an economy.

Model explanation:
In this instance despite starting at the long-run equilibrium position ($Y_e = Y_p$) the increase in the LRAS (and SRAS) results in the economy operating in a deflationary gap where $Y_{e1} < Y_{p1}$.
The final position of the economy is dependent on the relative changes in SRAS and LRAS. However, despite the deflationary gap position there has still been an increase in output Y_e to Y_{e1} a fall in APL P_{le} to P_{le1} and an increase in employment.

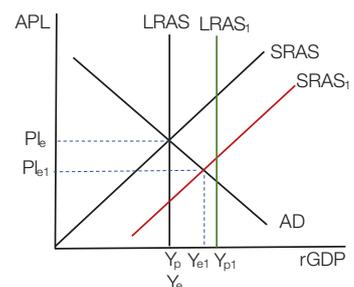


Figure 10.3.9: Increases in LRAS and a Deflationary Gap.

Key Point:

Increases in LRAS result in increased output, lower APL and an increase in employment.

It is important to note that changes in LRAS occur over the long run and as such it is unlikely that AD would remain constant during this period. Whilst it is possible for a decrease in LRAS to occur this would need to result from a long run decrease in resources, which would be rare therefore has not been emphasised. The impacts of a decrease in LRAS are the opposite of those of an increase in LRAS.

10.4 The AD-AS Model in the Long-run with no Government Intervention

Building on the explanation of the vertical nature of LRAS, it is important to understand that in a monetarist model without government intervention, an economy will always gravitate to the LRAS output level (Y_p). This requires two explanations, what occurs to remove an inflationary gap position and what occurs to remove a deflationary gap position. This understanding will be important further on in this chapter as we illustrate the business cycle using the AD-AS model.

Long-run change from an Inflationary Gap

In the short-run when an economy is in an inflationary gap position $Y_e > Y_p$, firms increase output to match higher levels of AD. However, households will experience higher APL, and thus, the value of their real income will fall. The response is that they bid up wages, and the existence of labour shortages ensures that firms pay higher wages in an attempt to maintain labour and output levels. As wages rise the cost of production increases and a decrease in SRAS returns the economy to the long run equilibrium position, although at a higher APL.

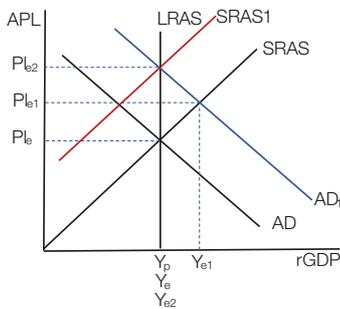


Figure 10.4.1: Long run Effects of an Inflationary Gap.

Model explanation:

An increase in AD, AD to AD1 shifts the economy into an inflationary gap. Y_{e1} is to the right of Y_p and APL begins to rise. In the long-run households will seek higher wages to maintain their purchasing power. The increase in wages will increase the cost of production for firms and decrease SRAS, SRAS to SRAS1. This results in output falling back to Y_{e2} which is equal to Y_p , and APL rising further to P_{le2} .

Long-run change from a Deflationary Gap

When an economy is in a deflationary gap position, $Y_e < Y_p$ firms decrease output to match lower levels of AD. However, in the long-run, wages and other resource prices will fall as there will be less demand, and surpluses will exist in these factor markets. Lower costs of production will increase the SRAS curve, returning the economy back to the long run level of output of Y_p although at a lower APL.

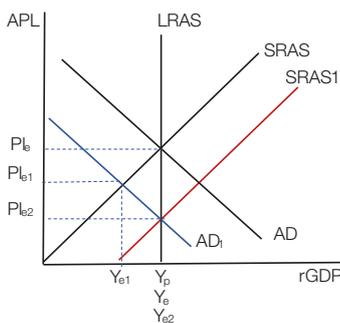


Figure 10.4.2: Long run Effects of a Deflationary Gap.

Model explanation:

A decrease in AD, AD to AD1 shifts the economy into a deflationary gap, Y_{e1} is to the left of Y_p and APL begins to fall. In the long-run resource prices (including wages) fall. The decrease in resource prices will decrease the cost of production for firms and increase SRAS, SRAS to SRAS1. This results in output rising to Y_{e2} which is equal to Y_p , and APL falling further to P_{le2} .

10.5 Applications of the AD-AS Model

The AD-AS Model and The macroeconomic Objectives.

Price Stability

As mentioned in Chapter 9, there are two primary causes of inflation:

- Demand-Pull
- Cost Push.

Demand-Pull Inflation

Demand-Pull Inflation results from an excess of total expenditure over aggregate output. It occurs because increases in AD happen at a rate faster than SRAS can increase (Figure 10.5.2), resulting in economy-wide shortages of goods and services and, thus, raising average price levels.

Model explanation:
An increase in AD, AD to AD₁ causes a widespread shortage of goods and services as output cannot increase at the same pace. The consequence is an increase in APL's, P_e to P_{e1}. This is demand-pull inflation.

Cost-Push Inflation

Cost-push inflation is caused by increases in the cost of production or supply-side shocks, which force firms across the economy to raise prices to maintain profit margins. The rising costs of production cause SRAS to decrease (Figure 10.5.3).

Model explanation:
A decrease in SRAS, SRAS to SRAS₁ occurs because of higher costs of production or a supply side shock. The decrease in SRAS results in APL increasing P_e to P_{e1} which represents cost-push inflation.

The situation depicted above is reflective of stagflation. This is a stagnant or falling level of economic activity accompanied by higher APLs. In this situation it is unlikely that the government is attaining either price stability or economic growth.

Key Definition:
Stagflation This is a stagnant or falling level of economic activity accompanied with higher APL's.

Economic Growth

As mentioned in Chapter 9, there are two types of economic growth:

- Actual Growth
- Potential Growth.

Actual Growth

Actual growth (increased rGDP) is an increase in actual output and results from increases in AD (Figure 10.5.5).

Model explanation:
An increase in AD, AD to AD₁ causes rGDP to increase from Y_e to Y_{e1}. This increase in output reflects actual economic growth.



Figure 10.5.1: Higher rates on inflation cause the same basket of goods to cost more.

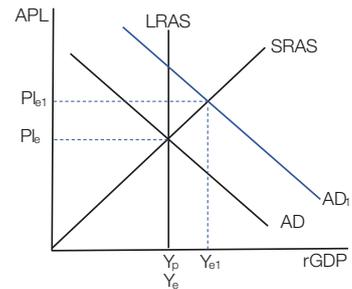


Figure 10.5.2: Demand-Pull Inflation.

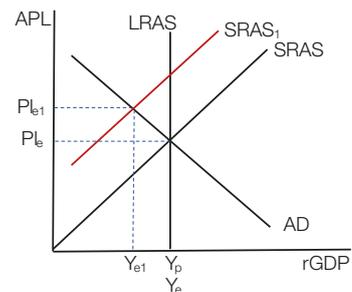


Figure 10.5.3: Cost-Push Inflation.



Figure 10.5.4: Cost-Push Inflation can lead to the creation of Stagflation.



Figure 10.5.6: Increases in rGDP represents Economic Growth.

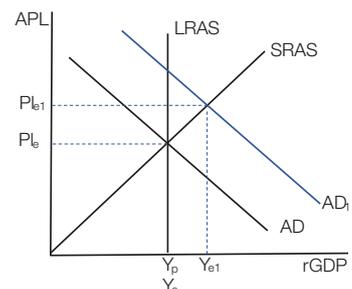


Figure 10.5.5: Actual Economic Growth.

Potential Growth

Potential growth occurs when there is an increase in the capacity for future actual growth. This occurs when there is an increase in the quality and or quantity of resources or productivity changes. These changes lead to the LRAS shifting to the right (Figure 10.5.7).

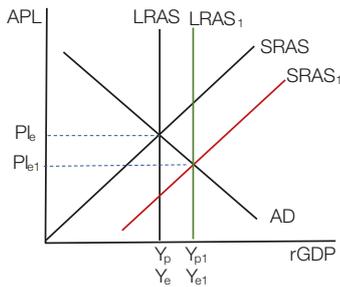


Figure 10.5.7: Potential Economic Growth.

Model explanation:

An increase in LRAS to LRAS1 increases the long run potential output level in the economy from Y_p to Y_{p1} , this is a reflection of an increase in the potential economic growth.

Full employment

As mentioned in Chapter 9, full employment occurs when cyclical unemployment is equal to zero. Increases in AD will stimulate demand for labour and decrease cyclical unemployment, whilst decreases in AD will reduce the demand for labour and increase cyclical unemployment (Figure 10.5.8). Whilst the AD-AS model does not directly reference unemployment the position of Y_e relative to Y_p can be used to infer the presence of cyclical unemployment.

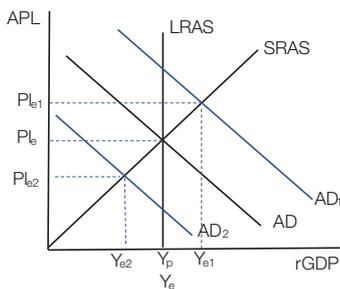


Figure 10.5.8: Cyclical Unemployment.

Model explanation:

When output is at Y_e the economy operates at its NAIRU or natural rate. This is the equivalent of full employment and so cyclical unemployment is equal to zero. However, when the economy is at Y_e2 there is insufficient output to stimulate demand for labour and cyclical unemployment exists. When the economy operates at $AD1$ the level of output Y_{e1} exceeds Y_p and thus unemployment is below the natural rate. This would imply that firms are employing labour beyond its long run capacity which would be unsustainable in the long run.

The AD-AS model and The Business Cycle

As defined previously, the business cycle represents the cyclical fluctuations in the level of GDP over time. It is characterised by four phases: Boom, Downturn, Trough, and Upturn, and these can be modelled using an AD-AS model.



Figure 10.5.9: The Business Cycle can be modelled using the AD-AS Model.

Upturn to Boom

In an upturn, the economy experiences rising levels of output, reflecting increases in AD (Figure 10.5.10).

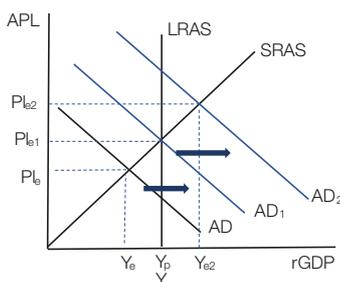


Figure 10.5.10: Upturn to Boom.

Model explanation:

The increase in AD from AD to AD1 then to AD2 results in increases in output Y_e to Y_{e2} and reflects an upturn in the economy. When Output reaches its highest point in this model at Y_{e2} the economy is at the boom stage of the economic cycle. In this model this occurs in an inflationary gap position ($Y_e > Y_p$) this does not have to be the case as a boom is simply the highest point of economic activity. Whilst not common this may occur with the economy in a deflationary gap position with $Y_e < Y_p$.

Boom to Downturn

In the boom stage of the economic cycle, high APLs will result in a fall in real wages. Households will seek higher wages which will increase costs of production and result in falling output. As confidence begins to fall, AD will decrease leading to an economic downturn (Figure 10.5.11).

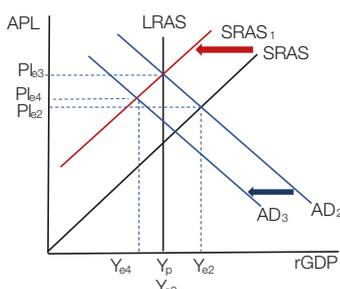


Figure 10.5.11: Boom to Downturn.

Model explanation:

With the economy at a boom and in an inflationary gap at $AD2$ it is likely wages will begin to rise which increases in the cost of production, this will decrease the SRAS shifting the economy to Y_{e3} . This fall in output and rising rates of unemployment is likely to result in falling business and consumer confidence and thus AD begins to decrease to $AD3$. This is the beginning of the economic downturn as output (rGDP) begins to fall to Y_{e4} . The trigger for a downturn may not be caused by higher wages resulting in higher costs and lower confidence. Regardless of the cause a decrease in AD from the boom levels is an indication of the economic downturn.

Downturn to Trough

In the downturn business and consumer confidence decrease resulting in falls in consumption and investment spending. The decreases in C and I will lead to AD decreasing further (Figure 10.5.12).

Model explanation:

In the downturn falling AD, AD₃ to AD₄ results from a cycle of falling output leading to rising unemployment leading to decreased consumer confidence and further decreases in AD, to AD₅. This process continues until the economy reaches the lowest level of rGDP Y_{e6}, the economy has now reached its trough. In this case the economy is deep in a deflationary gap and is likely to have very low rates of inflation, perhaps even deflation. Unemployment is now well above the target rate with high levels of cyclical unemployment and growth could potentially be negative.

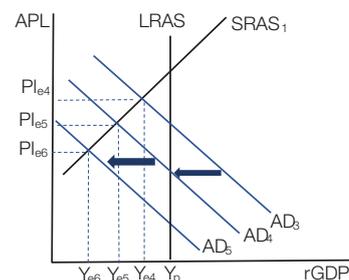


Figure 10.5.12: Downturn to Trough.

Trough to Upturn

In the trough stage of the economic cycle, low demand for labour will result in low wages and lower costs of production. Lower costs will increase output, and confidence begins to rise. AD will increase leading to an economic upturn. (Figure 10.5.13).

Model explanation:

With the economy in a trough, theory suggests that wage costs will fall due to surpluses of labour, and this will result in the SRAS shifting to the right SRAS₂. The output increase that result from this (to Y_{e7}) should begin to increase confidence levels and thus AD will increase to AD₆, and the economy will enter the Upturn. Other economic theories suggest that the movement from trough to upturn will need to be stimulated by government action, either from government spending, lowering taxes or from lowering interest rates to encourage expenditure, shifting the economy to AD₆.

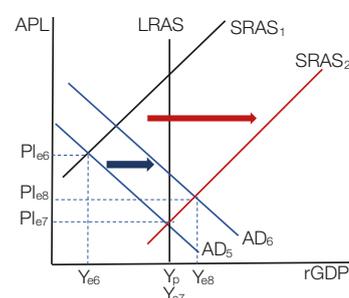


Figure 10.5.13: Trough to Upturn.

The AD-AS Model and Common Economic Events

The AD-AS model is used to illustrate the impacts of changes in economic events on the macroeconomic economy of a country. Some of the more common situations that need to be modelled include:

- Investment Spending
- Infrastructure Spending by Government
- Rising Wage Costs.

These are illustrated and explained below.

Investment Spending

Investment spending is spending by firms on capital goods that aid future production. This Investment spending is a component of AD, so it will result in AD increasing. Investment also increases capital resources and thus results in an increase in the LRAS and SRAS curves (Figure 10.5.14).

Model explanation:

Investment spending is a component of AD, so as investment spending increases AD will increase and shift to the right, AD to AD₁. The spending by firms on Capital goods adds to the capital resources of an economy, resulting in both the LRAS and SRAS curves increasing and shifting to the right to LRAS₁ and SRAS₁.

The resulting impact of investment spending is an increase in output from Y_e to Y_{e1} which will increase the demand for labour and increase employment. APL's do not change in this situation as the increase in potential output allows increases in output to match increases in AD, without creating inflationary pressure.

The outcomes could be different dependent on the relative changes in AS and AD. This is especially the case for APL and unemployment. In this situation the economy has shifted into an inflationary gap removing cyclical unemployment, however if the capacity of the economy (LRAS) grew at a faster rate than AD a deflationary gap could emerge, and cyclical unemployment may emerge and APL's fall.

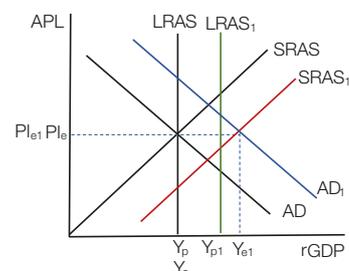


Figure 10.5.14: Impacts of Investment Spending.



Figure 10.5.15: Increased infrastructure increases the LRAS and SRAS and AD.

Infrastructural Spending by Government

Infrastructure is a system of physical capital (facilities and systems) that aid production across industries. Examples include power, transport, and communication networks. Infrastructure improves productivity and lowers production costs for firms and represents a form of investment spending often conducted by government. As spending on infrastructure is a form of investment (spending on capital goods), the impact on the economy is demonstrated in Figure 10.5.16.

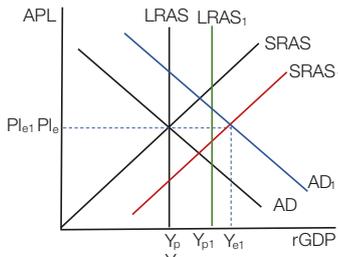


Figure 10.5.16: Impacts of Infrastructure Spending.

Model explanation:

Government spending on Infrastructure increases a component of AD. So as infrastructure spending increases AD will increase and shift to the right, AD to AD1. The spending by Government on capital goods adds to the capital resources of an economy and improves productivity of industries across the country. This results in both the LRAS and SRAS curves increasing and shifting to the right to LRAS1 and SRAS1.

The resulting impact of spending on infrastructure is an increase in output from Y_e to Y_{e1} . This will increase the demand for labour and increase employment (particularly in the construction phase). APLs do not change in this situation, as the increase in potential output allows increases in output to match increases in AD, without creating inflationary pressure.

The outcomes could be different, dependent on the relative changes in AS and AD. This is especially the case for APL and unemployment. In this situation the economy has shifted into an inflationary gap removing cyclical unemployment, however if the capacity of the economy (LRAS) grew at a faster rate than AD a deflationary gap could emerge, and cyclical unemployment may emerge and APLs fall.

Higher Wage Costs

Wages represent a cost of production, so increases in wages will result in higher production costs and a decrease in the SRAS (Figure 10.5.8). Higher wages may have resulted from a shortage of labour or alternatively from the government increasing minimum wages.



Figure 10.5.17: Minimum wage increases can impact on both SRAS and AD.

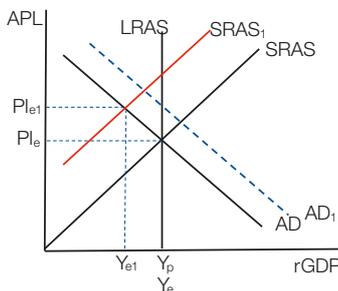


Figure 10.5.18: Higher Wage Costs.

Model explanation:

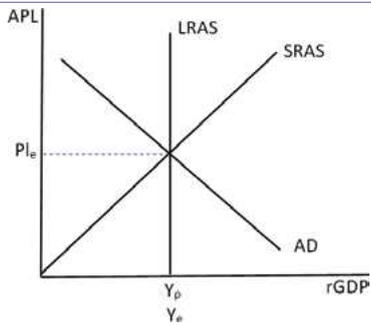
An increase in wages increases the cost of production for firms and this causes the SRAS to decrease, SRAS to SRAS1. This causes APL to increase (cost push inflation) P_{le} to P_{le1} and causes output in the economy to fall Y_e to Y_{e1} . As the economy is now in a deflationary gap, cyclical unemployment is likely to rise as firms look to cut overall costs by reducing labour.

Higher wage costs also reflect an increase in household incomes, so AD may also be expected to increase. Whilst this is likely, the key element of the above, it is a focus on the increased costs to firms of higher wages. This scenario also has the potential to create a wage-price spiral where higher wages increase APL, which fuels further wage increases and higher APLs.

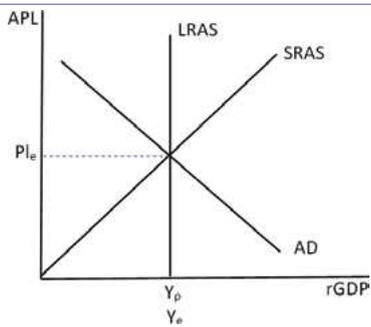
Focus Questions: Aggregate Demand and Aggregate Supply

1. The following scenarios relate to the economy of the USA. Complete the AD-AS model to assist in explaining the impact on the economy.

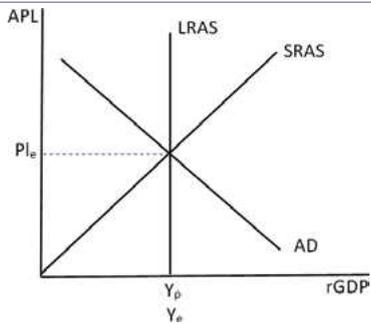
(a) Increases in house prices make households feel wealthier.



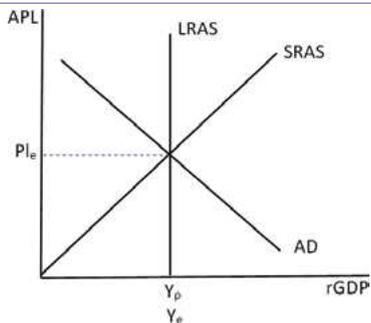
(b) A new trade deal with Canada increases exports.



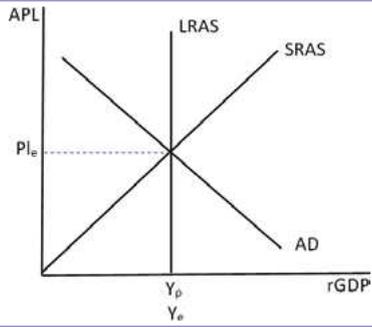
(c) The government raises minimum wages.



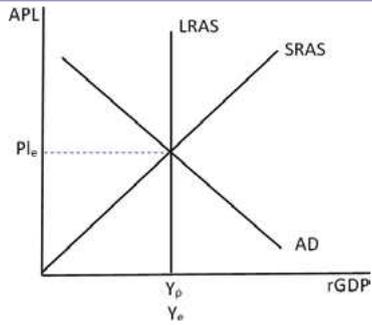
(d) Falling Share prices decrease consumer confidence.



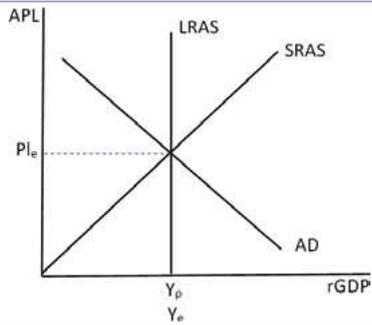
(e) Higher interest rates make borrowing by households and firms less attractive.



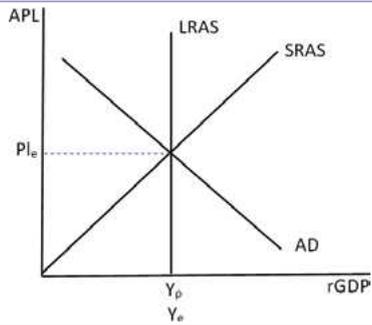
(f) A depreciation of the US dollar.



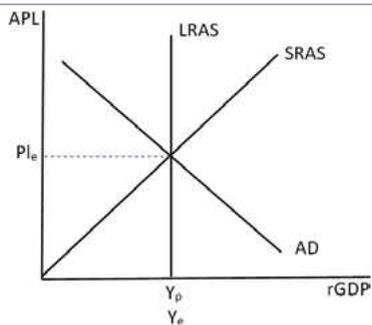
(g) An appreciation of the US dollar.



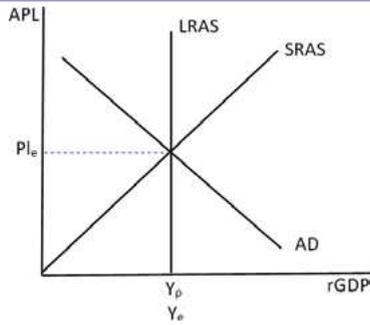
(h) An increase in investment spending by firms.



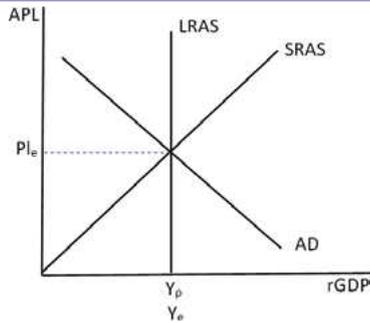
(i) Spending by Government on building new airports.



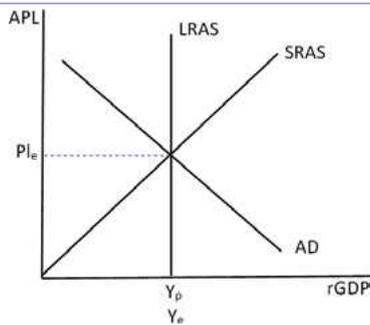
- (j) Looser immigration laws lead to higher amounts of skilled labour entering the economy.



- (k) Falling rGDP in the economy of Mexico a major trading partner.



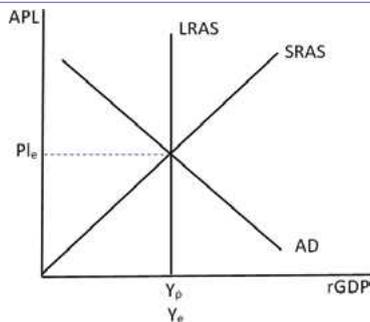
- (l) Cyclone destroys crops.



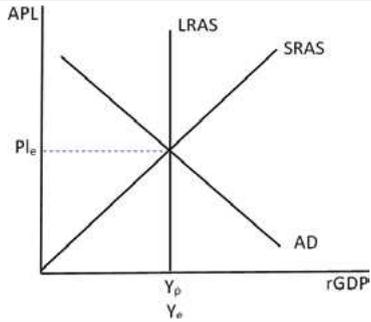
2. Refer to the extract to answer the questions that follow.

In Country E, inflation exceeds the target rates of the government being forced up by a series of supply shocks the most noticeable being higher oil prices being imported into the country from areas affected by War. Inflationary pressures are feeding through to higher inflationary expectations and higher wage demands from households. Unemployment is also increasing as firms attempt to cut costs.

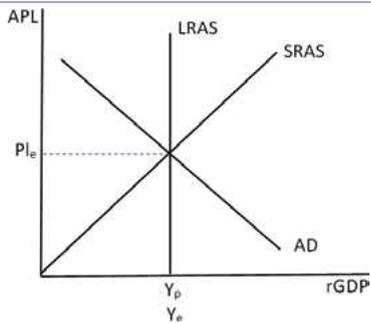
- (a) Use the following AD-AS model to explain the cause of inflation in country E.



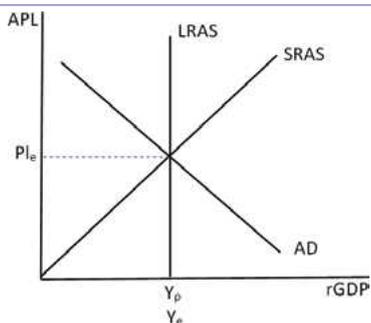
(b) Explain how inflationary expectations from households in country E will impact on the AD-AS model in future periods.



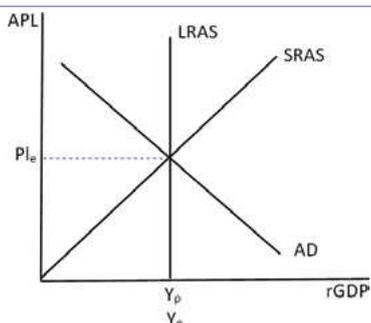
(c) Explain how inflationary expectations from households will impact on the AD-AS model.



(d) Illustrate an economy experiencing higher rates of cyclical unemployment.

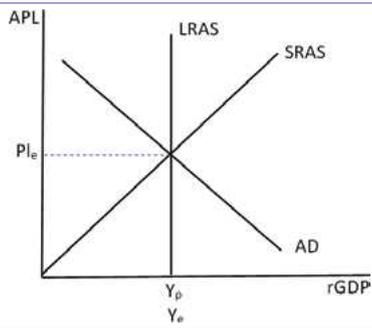


3. Explain using an AD-AS model to assist, how an economy experiencing an Inflationary gap would return to the long run equilibrium position without government intervention.

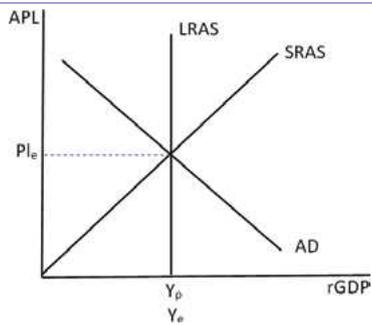


4. Use the AD-AS models below to assist in explaining the characteristics of an economy going through an:

(a) Upturn.



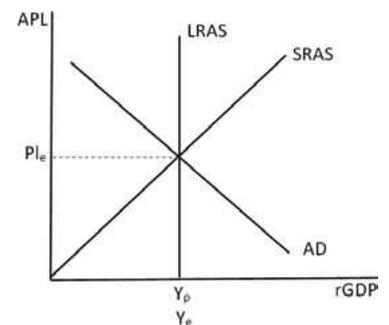
(b) Downturn.



5. Use the following extract to answer the questions that follow.

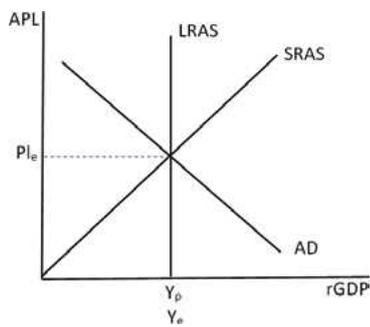
Country A's government has spent \$1bn over the last year on a major infrastructure project. The inland Rail system will connect cities on the counties east and west coasts improving transport connectivity and boosting productivity.

(a) Illustrate and explain how the spending by government on the inland rail system will impact the economy of country A.



- (b) Explain how the impact on the economy would have differed if the same amount of spending by government had been on welfare payments.

6. Explain using an AD-AS model to assist, why Oil prices have a significant impact on the economy.



7. Explain with the aid of an AD-AS model what is meant by the equilibrium level of output.

8. Outline and illustrate the effects of an increase in planned investment and consumption expenditure on the price level, output, and employment when the economy is at the 'full employment' rate of output.

Topic 11: Macroeconomics – Exchange Rates

Learning Outcomes based on the SACE Economics Teaching and Learning Framework

Students analyse the causes of and impact of changes in the exchange rate on the macroeconomic objectives and on demand and supply management policies.

11.1 Exchange Rate

Individual countries often have their own unique currencies, and therefore, to transact with another country, a relative conversion value is necessary. This is known as an exchange rate. An exchange rate is necessary because each country in any global transaction requires payment in its own country's currency. This currency must be purchased by the other country using their own currency, thus requiring a price. Exchange rates are, therefore, defined as the value of one country's currency expressed in terms of another. In a simplistic sense, a country's currency is treated like anything else that can be bought or sold, and the exchange rate is its price (valued in another country's currency). It is common for a country's exchange rate to be stated in US\$, reflecting the world's most traded currency; however, it can be stated in any other foreign currency.

A country's exchange rate is expressed in terms of what 1 unit of the domestic currency will buy in terms of the foreign currency. For example, Figure 11.1.1 shows the value of one US dollar in terms of a range of foreign currencies (at a given moment in time). This figure also shows the exchange rate for the foreign currency expressed in US\$ terms. This value is the reciprocal of the US\$ value and is calculated by dividing 1 US\$ by the exchange rate value. For example, 1 divided by 0.952 = 1.051 which is the number of US\$ that 1 Euro will buy.



1 USD	Euro	British Pound	Indian Rupee	Australian \$	Canadian \$	South African rand	New Zealand \$	Japanese Yen	Chinese Yuan
1 US \$ =	0.952	0.819	77.6	1.453	1.302	16.218	1.602	129.66	6.764
1 Foreign Currency =	1.051	1.22	0.0129	0.688	0.768	0.062	0.624	0.0077	0.148

Figure 11.1.1: Foreign Currency Exchange rates in US\$.

The exchange rate of a country will differ against various foreign currencies and can both rise and fall against these currencies over time. Whilst tending to move in the same direction against most currencies at a given moment, it is possible for a country's exchange rate to rise against one currency but fall against another at the same time. The consequence is that countries often measure their currency's exchange rate in terms of a 'basket' of currencies. For example, the Australian dollar is often measured by the Trade Weighted Index (TWI), an index measuring the relative exchange rate change of the Australian Dollar against the country's 26 largest trading partners.

11.2 The FOREX Market and Floating Exchange Rate Systems

Countries use multiple exchange rate systems to manage a currency, including fixed, pegged, floating and managed systems. Regardless of the system used to manage a currency, its exchange rate reflects the currency's trade in the foreign exchange market (FOREX market). This means that all exchange rates are influenced by the demand for and supply of a currency in the FOREX market (Figure 11.2.1). This course focuses on Floating Exchange rate systems, where the value of the currency is determined solely by the forces of demand and supply in the FOREX market, without government or central bank intervention.

Key Definition:

Exchange rates the value of one country's currency expressed in terms of another.

There are 180 different kinds of official currencies in the world.

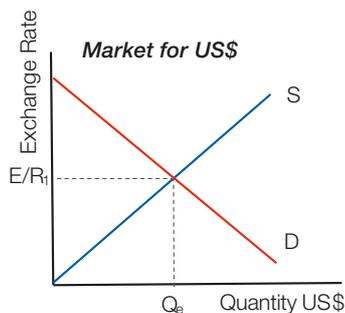


Figure 11.2.1: FOREX market.

Model explanation:

This model reflects the market for US\$ (within the FOREX market). The price (or exchange rate) for the US\$ is determined by the demand for and supply of the currency and the resulting equilibrium that emerges at E/R_1 . Note: The vertical axis could also have been expressed as P of US\$ in AUD (or any other currency).

Appreciations and Depreciations

Key Definition:

Appreciation the increase in the value of a country's currency in terms of another currency in a floating exchange rate system

Key Definition:

Depreciation a decrease in the value of a country's currency in terms of another currency in a floating exchange rate system

The operation of the market for a currency is like all other markets, its exchange rate (price) will adjust to changes in demand and supply to remove shortages or surpluses that emerged at the original equilibrium exchange rate (price). In a floating exchange rate system, an increase in the price of a country's currency is known as an appreciation, whilst a decrease in the currency's price is known as a depreciation. Appreciations occur when there is an increase in the demand for the currency (Figure 11.2.2a) or, alternately, a decrease in the supply of the currency (Figure 11.2.2b). Conversely, Depreciation results from a decrease in demand for the currency (Figure 11.2.3a) or an increase in the supply of the currency (Figure 11.2.3b). It is important to note that the terms devaluation and revaluation of a currency apply to fixed exchange rate systems and are not interchangeable with depreciation and appreciation.

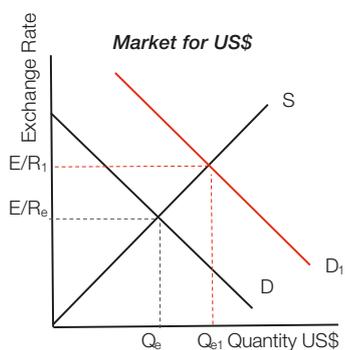


Figure 11.2.2a: Appreciation from an Increase in Demand.

Model explanation:

An increase in the demand for a country's currency results in the demand curve shifting to the right. At the original equilibrium exchange rate (E/R_0) there is now a shortage of the currency as Q_d exceeds Q_s . As a result, the exchange rate appreciates (rises) resulting in Q_s expanding and the Q_d contracting until a new exchange rate equilibrium is reached at E/R_1 .

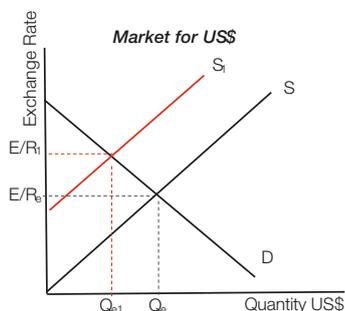


Figure 11.2.2b: Appreciation from a Decrease in Supply.

Model explanation:

A decrease in the supply of a country's currency results in the supply curve shifting to the left. At the original equilibrium exchange rate (E/R_0) there is now a shortage of the currency as Q_s is less than Q_d . As a result, the exchange rate appreciates (rises) resulting in the Q_s expanding and the Q_d contracting until a new exchange rate equilibrium is reached at E/R_1 .

Model explanation:

A decrease in the demand for a country's currency results in the demand curve shifting to the left. At the original equilibrium exchange rate (E/R_e) there is now a surplus of the currency as Q_d is less than Q_s . As a result, the exchange rate depreciates (falls) resulting in the Q_d expanding and the Q_s contracting until a new exchange rate equilibrium is reached at E/R_1 .

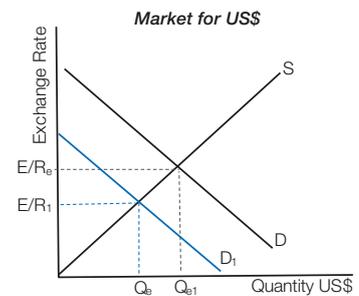


Figure 11.2.3a: Depreciation from a Decrease in Demand.

Model explanation:

An increase in the supply of a country's currency results in the supply curve shifting to the right. At the original equilibrium exchange rate (E/R_e) there is now a surplus of the currency as Q_s exceeds Q_d . As a result, the exchange rate depreciates (falls) resulting in the Q_s contracting and the Q_d expanding until a new exchange rate equilibrium is reached at E/R_1 .

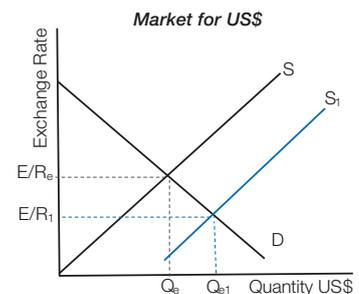


Figure 11.2.3b: Depreciation from an Increase in Supply.

Factors Influencing the Demand and Supply of Currency

Having stated that an exchange rate is determined by the demand for and supply of the currency in the FOREX market (Figure 11.2.4), it is important to note the individual factors that cause these changes. The demand for a country's currency comes from individuals in foreign countries who wish to transact with the domestic country. Anytime there is an inflow of foreign currency into the domestic country, it needs to be converted to the domestic currency, thus impacting demand (Figure 11.2.5). Alternately the supply of the currency comes from individuals in the domestic country who wish to transact with a foreign country. This requires the purchase of foreign exchange, which is done with domestic currency, thus impacting the supply of the domestic currency. Therefore, anytime there is an outflow of currency to foreign markets, there is an impact on the supply of that currency (Figure 11.2.6).



Figure 11.2.4: Impact of inflows and outflows of funds on demand and supply of country's currency.

Influences on the Demand for a Currency

As stated previously, the demand for a country's currency occurs because foreign countries wish to transact with the domestic country, resulting in monetary inflows into the domestic country. These monetary inflows come from four broad sources: Export demand, Foreign Investment both Portfolio (financial) and Direct (FDI), Remittances and Loan Repayments. These three broad sources are influenced by a large range of individual factors, the main ones of which are summarised in Table 11.2.1.

Key Point:

Foreign Investment flows can be either Portfolio or Direct in nature. Portfolio investment is investment into the financial assets of another country whereas Direct investment is investment into the productive activities of another country.

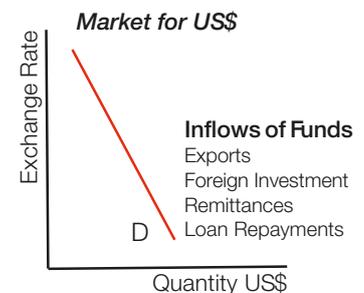


Figure 11.2.5: Factors impacting demand for a country's currency.

Table 11.2.1: Summary of Factors Influencing the Demand for Domestic Currency.

Factor	Individual Influences	Explanation
Export Demand	<ul style="list-style-type: none"> • Relative Inflation Rates • Foreign Country Growth Rates • Foreign Trade Policies 	<p>Where the demand for exports increase, overseas buyers will need to pay in the currency of the exporting country thus increasing the demand for this currency. Equally a fall in the demand for exports will result in a decrease in the demand for the exporting countries currency.</p> <p>The demand for exports reflects overseas consumer expenditure and this expenditure is influenced largely by the income levels of these buyers. When overseas countries' economies grow, incomes increase, increasing the demand for exports. Alternately, when economic growth rates slow in overseas countries so too does income growth which will reduce export demand.</p> <p>Relative inflation rates will also impact export demand as high domestic inflation will make exports more expensive relative to the foreign countries own products thus decreasing the demand for exports. Equally low domestic inflation rates make the exports more internationally competitive and increase export demand.</p> <p>Trade policies can also impact on export demand with free trade policies opening up the opportunity for export growth and protectionist policies, such as increased tariffs likely to limit export demand.</p>
Foreign Investment Inflows	<ul style="list-style-type: none"> • Relative Interest Rates • Profit Potential • Financial Risk 	<p>Foreign Investment Inflows are investments of funds by foreign individuals, businesses, or governments into the assets of the domestic economy. When this investment is into financial assets it is known as Portfolio investment, whereas investment into the productive assets of a country it is known as Direct investment (often referred to as FDI). FDI is defined specifically as investment into the productive activities of another country with control of at least 10% of the firm in the host country. When firms engage in Direct investment they are referred to as Multinationals and their investment decisions are determined primarily on the profit returns they are likely to deliver. Both Portfolio and Direct investment inflows require foreign investors to purchase the domestic currency thus impacting the demand for the domestic currency</p> <p>One major contributing factor impacting investment flows is the relative return on the investment (compared to overseas alternatives). Interest rates therefore impact significantly on portfolio investment inflows. Where interest rates are relatively higher, returns on investments increase, increasing the demand for the currency as financial inflows increase. The reverse is true, as lower interest rates relative to other countries will decrease portfolio investment inflows and therefore the demand for the currency.</p> <p>In much the same way investments into a company's shares or physical assets are based on expected profit levels. Higher profits attract inflows and thus increase the demand for the currency, whilst lower profits discourage inflows and therefore decrease the demand for the currency. For FDI, profit expectations are influenced by both cost factors, such as wage rates, tax rates, subsidies and access to materials or resources and demand factors such as market size and proximity to buyers.</p> <p>Equally, if there are risks whether they be political, social or economic that impact on the potential to receive the return on the investment, inflows are discouraged and thus the demand for the currency falls.</p>
Remittances and Loan Repayments	<ul style="list-style-type: none"> • Foreign Financial Aid • Income Repatriation • Pensions 	<p>Remittances are sums of money flowing from one party to another as a non-commercial transaction, often as a gift. Three common forms include, Foreign Aid, Income repatriation and pensions. In all instances where remittances into the country increase the demand for the domestic currency increases.</p> <p>In developing countries, income repatriation can be quite high as workers working in foreign countries send income back to support their families in the domestic country. Equally interest payments received on loans provided to foreign countries can impact the demand for the currency. Foreign Aid is also a significant contributor to demand for currencies as inflows of foreign financial aid must be converted into the domestic currency before it can be used.</p>

Influences on the Supply of a Currency

As stated previously, the supply of a country's currency occurs because the domestic country wishes to transact with a foreign country, resulting in monetary outflows from the domestic country. These monetary outflows come from three broad sources: Import demand, Foreign Portfolio (financial) Investment, Remittances and Loan Repayments. These three broad sources are influenced by a large range of Individual factors, the main ones of which are summarised in Table 11.2.2.

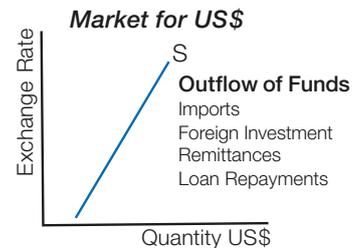


Figure 11.2.6: Factors impacting Supply of a country's currency.

Table 11.2.2: Summary of Factors Influencing the Supply of the Domestic Currency.

Factor	Individual Influences	Explanation
Import Demand	<ul style="list-style-type: none"> Relative Inflation Rates Domestic Growth Rates Domestic Trade Policies 	<p>Where the demand for imports increase, domestic buyers will need to pay in the currency of the foreign importing country. This requires the purchase of foreign currency, with the domestic currency increasing the supply of the currency. Equally, a fall in the demand for imports will result in a decrease in the supply of the domestic countries currency as less foreign currency needs to be purchased.</p> <p>The demand for imports reflects domestic consumer expenditure on overseas goods. One significant factor influencing this will be the income levels of domestic consumers. When the domestic economy grows, incomes increase, increasing the demand for imports. Alternately, when economic growth rates slow in the domestic economy so too does income growth, which will reduce import demand.</p> <p>Relative inflation rates will also impact import demand as high domestic inflation will make imports cheaper relative to the countries own products thus increasing the demand for imports. Equally, low domestic inflation rates make the imports less competitive and decrease demand for these as consumers switch to local products.</p> <p>Trade policies can also impact on import demand with free trade policies opening up the opportunity for import growth and protectionist policies, such as increased tariffs likely to limit import demand.</p>
Foreign Investment Outflows	<ul style="list-style-type: none"> Relative Interest Rates Profit Potential Financial Risk 	<p>Foreign Investment Outflows are investments of funds by domestic individuals, businesses, or governments into the assets of a foreign economy. When this investment is into financial assets, it is known as Portfolio investment abroad whereas investment into the productive assets of a country it is known as Direct investment abroad. Both Portfolio and Direct investment outflows require domestic investors to purchase the foreign currency thus impacting the supply of the domestic currency</p> <p>One major contributing factor impacting these flows is the relative return on the investment (compared to domestic alternatives). Interest rates therefore impact significantly on portfolio investment outflows. Where foreign interest rates are relatively higher, returns on investments increase, which in turn increases the supply the domestic currency as financial outflows increase. The reverse is true as lower foreign interest rates will decrease portfolio investment outflows and therefore the supply of the currency.</p> <p>In much the same way, investments into a foreign company's shares or physical assets are based on expected profit levels. Higher profits encourage FDI abroad and thus increase the supply of the currency, whilst lower profits discourage FDI outflows and therefore decrease the supply of the currency.</p> <p>Equally if there are risks, whether they be political, social or economic, that impact on the potential to receive the return on the investment outflows are discouraged and thus the supply of the currency falls.</p>
Remittances and Loan Repayments	<ul style="list-style-type: none"> Foreign Financial Aid Income Repatriation Pensions 	<p>Where remittances out of the country increase, the supply of the domestic currency increases. Many developed countries employ foreign workers who send income back to support their families in their country of origin, this increases the supply of the currency in the forex market. Equally interest payments on foreign debt must be paid in the foreign country's currency requiring the domestic currency supply to increase. Foreign Aid sent overseas also requires the domestic currency to be converted into foreign currency increasing the supply of the domestic currency.</p>

Other Influences on the Demand and Supply of a Currency

Key Definition:

Currency Speculation the buying and selling of a foreign currency in the hope of gaining due to fluctuations in the exchange rate.

One of the major influences on a currency’s value in a floating exchange rate system is currency speculation. Currency speculation occurs whenever an individual buys or sells a foreign currency in the hope of making a gain on the purchase or sale. This means the transaction in the FOREX market is for a purpose that is not associated with trade, foreign investment, or remittances. The individual is buying or selling currencies of countries to take advantage of fluctuating exchange rates, with the intention of buying a currency at a low exchange rate and selling it at a higher exchange rate to make a gain. Speculation of currency movements can impact both the demand for a currency and the supply of the currency. This is outlined in Table 11.2.3.

Table 11.2.3: Speculation of currency movements.

Speculation of an Appreciation	Where an appreciation of a currency is expected in the future, speculators will buy the currency now, with the intention of selling it as the currency appreciates and thus make a gain. This type of speculation will increase the demand for the currency and therefore results in the currency appreciating.
Speculation of a Depreciation	Where a depreciation of a currency is expected in the future, speculators will sell the currency now, with the intention of buying an alternative currency that is likely to appreciate. This sale is also done to avoid losses that could arise when a currency depreciates. This type of speculation will increase the supply of the currency and therefore results in the currency depreciating.

Large speculative flows can impact a currency’s value significantly; as noted in Table 11.2.3, the expectation of an appreciation likely results in an appreciation due to the increased demand for the currency and likewise, expectations of a depreciation can cause a depreciation, as the supply of the currency increases from speculators selling the currency. Due to the size of speculation in the FOREX market (there is approximately 7.5 trillion dollars’ worth of trade in the FOREX market daily as of 2023), speculation can easily destabilise a currency’s value.

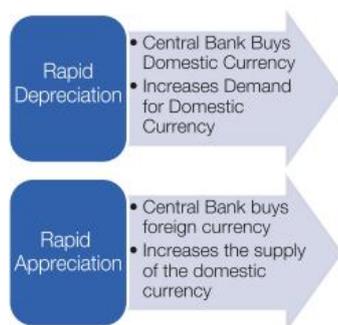


Figure 11.2.8: Central Bank Intervention in the FOREX Market.

A country’s Central Bank can also influence both the demand and supply of the currency in the FOREX market (Table 11.2.3). Whilst intervention by a country’s Central Bank implies that the system is no longer a purely floating exchange rate, it is common for Central Banks to intervene in currency markets of floating exchange rate systems to stabilise the currency of their country, particularly against speculative movements. Where a country’s currency is depreciating rapidly, the Central Bank is likely to intervene and buy the domestic currency with Foreign Exchange reserves (foreign currencies). This will increase the demand for the domestic currency and stabilise the currency by working to prevent further falls. Equally, if the country’s currency is appreciating rapidly, the Central Bank is likely to intervene and sell domestic currency to buy foreign currency. This will increase the supply of the domestic currency in the FOREX market and stabilise the currency by working to prevent further increases.

Key Point:

The value of a country’s currency reflects the demand for and supply of the currency in the FOREX market. Inflows of funds from overseas will increase the demand for the currency whereas outflows of funds to foreign countries will increase the supply of the currency.

11.3 Impacts of a Change in a Countries Exchange Rate

Exchange Rate

Changes in the value of a country's exchange rate will impact at a microeconomic level on individual stakeholders such as consumers, local producers, and exporters, and at a macroeconomic level in terms of inflation, unemployment, and economic growth.

When there is a change in the exchange rate of a country, it will influence the prices of exports and imports and, therefore, the quantities of these; this, in turn, impacts aggregate demand. Changes to the relative price of imports also alter the cost of imported materials and capital goods, impacting the Short-run Aggregate Supply Curve.

Impacts of an Appreciation

An appreciation reflects an increase in the value of a country's currency in terms of another. It results in more foreign currency being required to acquire the same volume of the domestic currency. This impacts the domestic country's exports, making them more expensive to foreign buyers.

Explanation:

If the exchange rate were $1\text{AUD} = 1\text{USD}$ then \$1000 worth of Australian exports would cost US buyers \$1000 US. If the Australian Dollar were to appreciate to $1\text{AUD} = 1.20\text{USD}$, then the same \$1000 worth of Australian exports would now cost US buyers \$1200 US. If US buyers only had \$1000 US to buy exports, they would now demand fewer exports from Australia. Australia's exports have become more expensive in foreign currency terms due to the appreciation.

Equally, less domestic currency is now required to buy the same volume of foreign currency as before. This makes the price of imports relatively cheaper to domestic buyers.

Explanation:

If the exchange rate were $1\text{AUD} = 1\text{USD}$, then a \$1000 worth of US imports into Australia would cost Australian buyers 1000AUD. If the Australian Dollar were to appreciate to $1\text{AUD} = 1.20\text{USD}$, then the same \$1000 worth of US imports would now cost Australian buyers 833 AUD. Australian buyers can now purchase more US imports with the same 1000 AUD they had previously; they would now demand more imports from the US. Australia's imports have become cheaper in AUD terms due to the appreciation.

With exports becoming more expensive and falling and imports becoming cheaper and rising, there is a direct impact on aggregate demand, resulting in AD decreasing and shifting to the left. In addition, as the price of imports falls, imported intermediate goods (materials) and resources used in production, as well as capital goods used for production, become cheaper. This lowers the cost of production for firms and results in the Short Run Aggregate Supply curve (SRAS) shifting to the right.

Model explanation:

The decrease in net exports (resulting from exports falling and imports rising) decreases AD to AD_1 . In addition, the cheaper imports lower production costs and causes the SRAS to increase to $SRAS_1$. The consequence of these changes is that inflation falls PI_e to PI_{e1} . The impact on output is more difficult to determine as the relative change in AD and SRAS needs to be considered. In this instance the decrease in AD is larger resulting in output falling to Y_{e1} .

Inflation falls or is reduced when an appreciation occurs because the decrease in AD lowers demand pull inflationary pressure, and lowers production costs from cheaper imports, allowing firms to sell their products cheaper but still maintain profit margins. There is no overarching guide as to what will happen to output as magnitude changes to AD and SRAS will vary in all circumstances as they are context-dependent. It is, however, likely that Unemployment will rise, as export



**PRICE INCREASES
QUANTITY TRADED FALLS**

Figure 11.3.1: Impacts of an Appreciation on Exports



**PRICE DECREASES
QUANTITY TRADED RISES**

Figure 11.3.2: Impacts of an Appreciation on Imports.

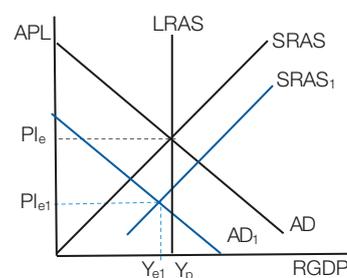


Figure 11.3.3: Impacts of an Appreciation on the AD/AS Model.

industries reduce employment in response to lower demand for their products and firms competing with cheaper imports also reduce output and, therefore, labour demand. Some of this unemployment may be offset by job creation in firms that use imports in production and have lower costs and more output. A summary of the impacts of appreciation displayed in Figure 11.3.4, while the impact on the different stakeholders is demonstrated in Figure 11.3.5.

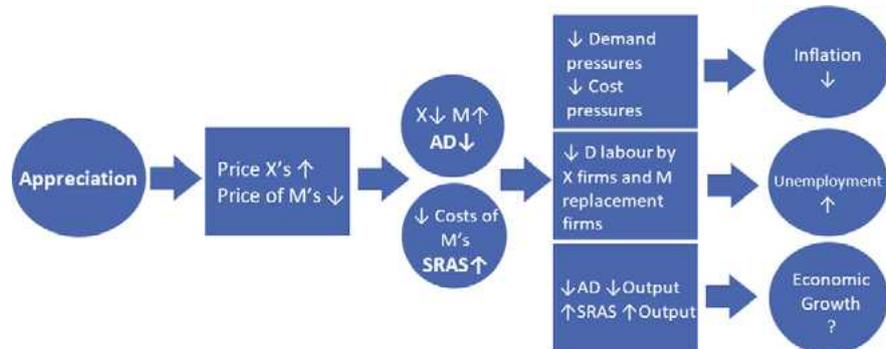


Figure 11.3.4: Summary of Impacts of an Appreciation.

Table 11.3.1: Summary of impacts a of appreciation on stakeholders.

Stakeholder	Impact of Appreciation
Exporters	Increased price of exports will see the quantity of exports sold decrease. Exporters will lose market share and their profits will decline due to decreased revenues. It is likely exporters will cut output and demand less labour leading to higher unemployment in export industries.
Import Competing Firms	Firms competing with Imports will see a loss of market share, revenue and profit as cheaper imports become a more desirable substitutes for consumers. These local firms will cut back on output and like exporters will demand less labour leading to higher unemployment in these industries.
Firms Using Imports in Production	Cheaper import prices will reduce the cost of production for local firms using imported materials or capital. These firms will be able to sell at more competitive prices leading to increased market share, more revenue, and high profits. As these firms increase output, they will demand more labour creating employment opportunities in these industries.
Importers	Importers gain as their products are now more competitive in terms of price with domestically produced goods. Their market share in the domestic market rises as does their revenue and thus profit.
Domestic Consumers	Domestic consumers will gain as there are now cheaper imports to be purchased and some domestically produced goods will also be cheaper, due to lower costs of production and through domestic firms lowering prices to compete with imports. However, some consumers are likely to be impacted by job losses in some industries and the falling income may make these individuals worse off.
Government	Government will see improvements with its price stability objective but will also likely see rising unemployment and the potential for lower rates of economic growth.

Real World Considerations: Japan’s government likely to intervene as multiple factors weaken the Yen.

A widening gap between Japanese and U.S. interest rates has been a main cause of the depreciation of the yen, although the weakening of the yen has been accelerated by surging imported fuel costs after global conflicts. With the Bank of Japan unable to increase the official interest rate to stabilise the yen, due to the devastating influence it would have on the Japanese economy struggling with low growth, the Japanese government has overcome its historical reluctance to intervene in the foreign exchange market, purchasing yen for the first time in 24 years to prevent any further depreciation.

Source: The Diplomat - Daisuke Akimoto (June 2022) Japan’s Historic Yen Depreciation (Modified 26/10/23)

Discussion Points

- Why do interest rate differentials cause depreciations?
- How would higher import costs cause a depreciation?
- Why could raising interest rates have devastating impacts on an economy?
- How would a governments purchase of its own currency prevent a further depreciation?

Impacts of a Depreciation

A depreciation reflects a decrease in the value of a country's currency in terms of another and results in less foreign currency being required to acquire the same volume of the domestic currency than before the depreciation. This impacts the price of the domestic country's exports, making them cheaper for foreign buyers.

Explanation:

If the exchange rate were $1AUD = 1US\$$, then \$1000 worth of Australian exports would cost US buyers \$1000 US. If the Australian Dollar were to depreciate to $1AUD = 0.80US\$$, then the same \$1000 worth of Australian exports would now cost US buyers \$800 US. If US buyers had \$1000 US to buy exports, they would now demand more exports from Australia. Australia's exports have become cheaper in foreign currency terms due to the depreciation.

Equally, more domestic currency is now required to buy the same volume of foreign currency than before. This makes the price of imports relatively more expensive to domestic buyers (Figure 11.3.6).

Explanation:

If the exchange rate were $1AUD = 1US\$$, then \$1000 worth of US imports into Australia would cost Australian buyers 1000AUD. If the Australian Dollar were to depreciate to $1AUD = 0.80US\$$, then the same \$1000 worth of US imports would now cost Australian buyers 1250 AUD. Australian buyers can now purchase fewer US imports with the same 1000 AUD they had previously; they would now demand fewer imports from the US. Australia's imports have become more expensive in AUD due to the depreciation.

With exports becoming cheaper and rising and imports becoming more expensive and falling, there is a direct impact on aggregate demand, resulting in AD increasing and shifting to the right. In addition, as the price of imports increases, imported intermediate goods (materials) and resources used in production, as well as capital goods used for production become more expensive. This increases the cost of production for firms and results in the Short Run Aggregate Supply curve (SRAS) shifting to the left (Figure 11.3.7).

Model explanation:

The increase in net exports (resulting from exports rising and imports falling) increases AD to AD_1 . In addition, the more expensive imports increase production costs and causes the SRAS to decrease to $SRAS_1$. The consequence of these changes is that Inflation rises PI_e to PI_{e1} . The impact on output is more difficult to determine as the relative change in AD and SRAS needs to be considered. In this instance the increase in AD is larger resulting in output rising to Y_{e1} .

Inflation rises when a depreciation occurs because the increase in AD increases demand pull inflationary pressure, and higher production costs from more expensive imports force firms to sell their products at a higher price to maintain profit margins. There is no overarching guide as to what will happen to output as magnitude changes to AD and SRAS will vary in all circumstances, as they are context dependent. It is, however, likely that unemployment will fall, as export industries demand more labour in response to higher demand for their products and firms competing with more expensive imports also increase output and, therefore, labour demand. Some of this reduction in unemployment may be offset by job losses in firms that use imports in production and now have higher costs and lower output.

A summary of the impacts of depreciation displayed in Figure 11.3.8, while the impact on the different stakeholders is demonstrated in Table 11.3.2.

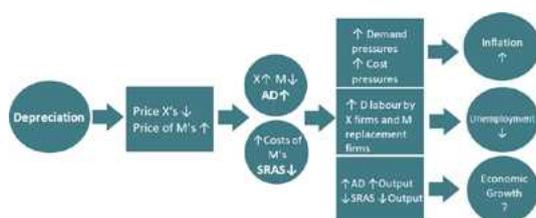


Figure 11.3.8: Summary of Impacts of a Depreciation.



**PRICE DECREASES
QUANTITY TRADED RISES**

Figure 11.3.5: Impacts of a Depreciation on Exports



**PRICE INCREASES
QUANTITY TRADED FALLS**

Figure 11.3.6: Impacts of a Depreciation on Imports.

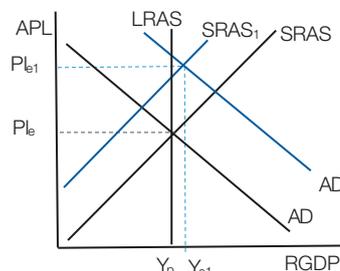


Figure 11.3.7: Impacts of an Appreciation on the AD/AS Model.

Table 11.3.2: Summary of Impacts of a Depreciation on Stakeholders.

Stakeholder	Impact of Appreciation
Exporters	Decreased price of exports will see the quantity of exports sold increase. Exporters will increase market share and their profits will rise due to increased revenues. It is likely exporters will increase output and therefore demand more labour leading to lower unemployment in export industries.
Import Competing Firms	Firms competing with imports will see a gain in market share as more expensive imports become less-desirable substitutes for consumers. Profits will rise due to high revenue. These local firms will likely increase output and demand more labour leading to lower unemployment in these industries.
Firms Using Imports in Production	Higher import prices will increase the cost of production for local firms using imported materials or capital. These firms will now sell products at less competitive prices leading to a decrease in market share. Less revenue will result in decrease profits. As these firms decrease output, they will demand less labour creating unemployment in these industries.
Importers	Importers lose as their products are now less competitive, in terms of price with domestically produced goods. Importers market share of the domestic market falls and lower revenue results in a decrease in profit.
Domestic Consumers	Domestic consumers will lose as there are now more expensive imports and some domestically produced goods will also be more expensive due to higher costs of production. Additionally, some domestic firms are able to raise price because of less price competition from imports. Some consumers are however likely to be impacted by job opportunities in some industries and the rising income may make these individuals better off.
Government	Government will see a deterioration in its price stability objective but will also likely see rising employment and the potential for higher rates of economic growth.

Real World Considerations: Japan's Currency Depreciation is Providing Both Benefits and Costs

Throughout much of the last 3 years, the yen has depreciated. This has provided a significant boost to Japan's export-oriented industries, notably the automotive and electronics sectors. However, the flip side has been increased import costs, contributing to inflationary pressures, and affecting consumer purchasing power. With the depreciation occurring during an economic downturn and with interest rate differentials already impacting the Yen, it has limited the ability for the Japanese Government to use Monetary Policy as a demand side tool. Managing these dynamics to achieve a macroeconomic equilibrium has proven challenging. The yen's depreciation is serving as a potent reminder of the intricate interplay between currency values, trade dynamics, policy setting and overall economic well-being.

Source: ChatGPT (Modified 26/10/23)

Discussion Points

- Why does a depreciation boost export orientated industries?
- Why does a depreciation contribute to inflationary pressures?
- What is the impact of a depreciation on domestic consumers?
- Why could a depreciation limit the ability to use monetary policy?
- How are currency values linked to trade dynamics and overall well-being?

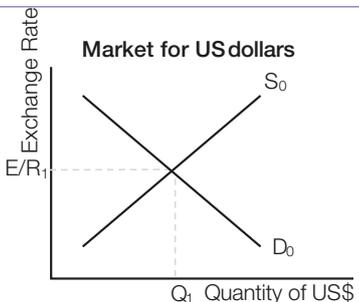
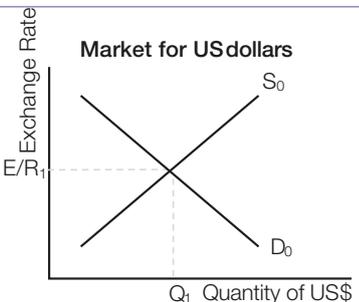
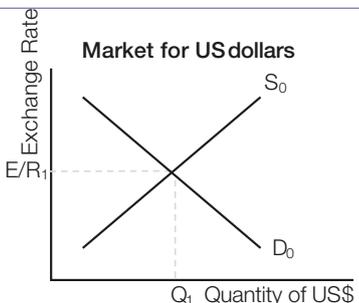
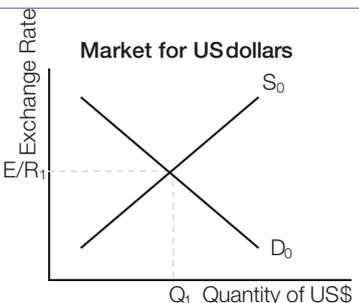
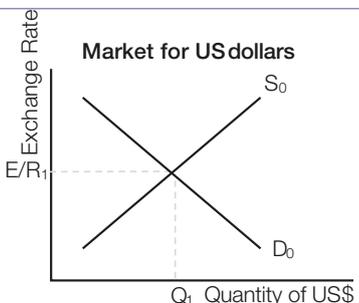
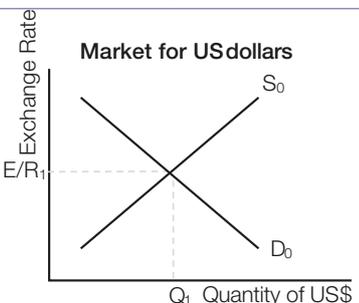
Exercise 11.1 Determination of Exchange Rates

1. Identify (by ticking the appropriate box) whether the following factors influence the demand for a currency, the supply of a currency or both the demand for and supply of a currency in the FOREX market.

Factor	Demand For	Supply of	Both
Decrease in Official Interest rates			
Trade Deficit caused by rising imports			
Speculation of a depreciation			
Repayment of foreign debt			
Profits from Multinationals in the country are returned overseas.			

2. The following questions relate to the market for US dollars (US\$) in the FOREX market.

(a) Complete each demand and supply model to show the impact of the event on the US exchange rate.

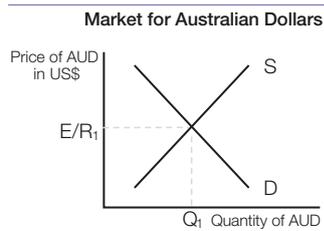
<p>(i) US central bank (The Fed) raises interest rates.</p>  <p>The graph shows the market for US dollars with an upward-sloping supply curve S_0 and a downward-sloping demand curve D_0. The equilibrium exchange rate is E/R_1 and the equilibrium quantity is Q_1.</p>	<p>(ii) Higher rates of inflation in the US economy</p>  <p>The graph shows the market for US dollars with an upward-sloping supply curve S_0 and a downward-sloping demand curve D_0. The equilibrium exchange rate is E/R_1 and the equilibrium quantity is Q_1.</p>
<p>(iii) Major world sporting event attracts overseas fans into the US.</p>  <p>The graph shows the market for US dollars with an upward-sloping supply curve S_0 and a downward-sloping demand curve D_0. The equilibrium exchange rate is E/R_1 and the equilibrium quantity is Q_1.</p>	<p>(iv) China a major export destination for US products goes into recession.</p>  <p>The graph shows the market for US dollars with an upward-sloping supply curve S_0 and a downward-sloping demand curve D_0. The equilibrium exchange rate is E/R_1 and the equilibrium quantity is Q_1.</p>
<p>(v) Speculation of an appreciation in the US\$</p>  <p>The graph shows the market for US dollars with an upward-sloping supply curve S_0 and a downward-sloping demand curve D_0. The equilibrium exchange rate is E/R_1 and the equilibrium quantity is Q_1.</p>	<p>(vi) Natural Disaster in a neighbouring country prompts the US government to provide financial Aid.</p>  <p>The graph shows the market for US dollars with an upward-sloping supply curve S_0 and a downward-sloping demand curve D_0. The equilibrium exchange rate is E/R_1 and the equilibrium quantity is Q_1.</p>

(b) Explain the reasoning for your answers to part a).

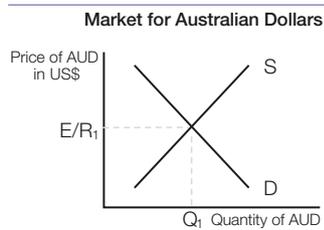
(i)	(ii)
(iii)	(iv)
(v)	(vi)

3. Explain and illustrate the like impact on the Australian Dollar (AUD) of the data indicated in each question.

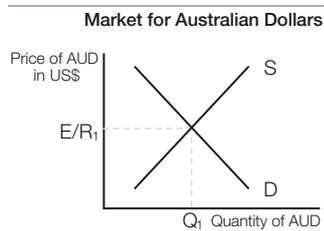
(i) Official Interest rates: Australia 4.1%, USA 5.3%



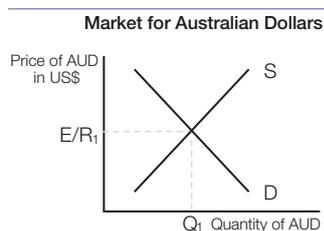
(ii) Inflation rates: Australia 6.8%, USA 7.9%



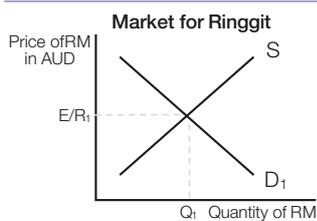
(iii) Australian Trade with the USA: Exports \$14bn, Imports \$27bn



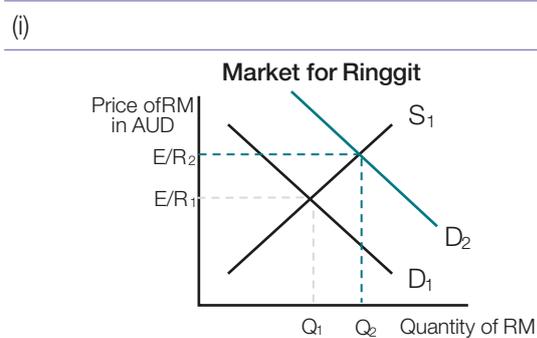
(iv) Foreign Investment – Australia: From UK- \$720bn, To UK - \$540bn.



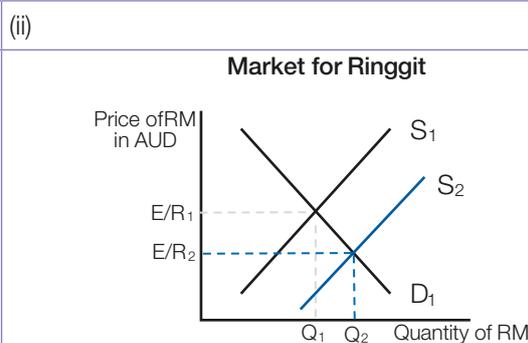
4. Explain and illustrate why speculation of a depreciation in the Malaysian Ringgit (RM) may cause a depreciation.



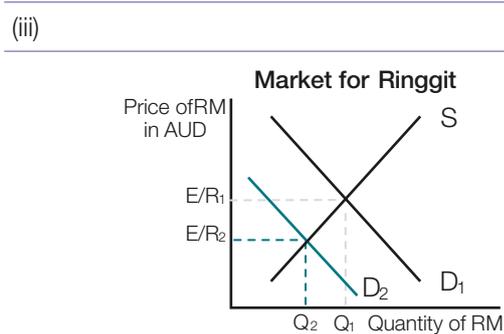
5. The following demand and supply diagrams represent the market for the Malaysian Ringgit (RM). Briefly describe a viable explanation of what may have caused the change in each of the scenarios illustrated.



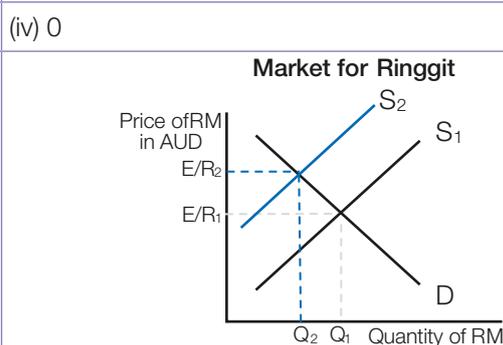
Explanation:



Explanation:



Explanation:



Explanation:

Exercise 11.2 Impacts of Exchange Rate Changes

6. Explain the impact of a depreciation of the US\$ on the following stakeholders.

US Consumers

US Exporters

US Importers

7. Complete the table to assist in examining whether a depreciation will always benefit a country's economy and individuals.

Positive Impacts on Individuals and the Economy	Negative Impacts on Individuals and the Economy

8. Refer to the extract below to answer the following questions.

The Mexican peso continues to appreciate, with the US\$ currently trading below 17 pesos per dollar, the first time this has occurred in over 8 years. Increases in remittances from the U.S. and foreign investment from countries relocating from Asia, along with higher relative yields on Mexican financial assets are contributing to the peso's rise. The currency has also been further strengthened by growth in tourism in Mexico after years of decline.

The Mexican economy has however largely not benefited from the stronger currency. Oil revenues, exports, and remittances are all valued (denoted) in US\$, this is placing pressure on both the Mexican governments and Mexican family's finances. The appreciation of the peso has especially impacted those Mexican families who receive and rely on remittances from relatives in the U.S. (it may even explain why remittances have grown). Mexicans in the U.S. are having to send more US\$ to their relatives in Mexico, so that they don't lose purchasing power. Sending \$1,000 when the dollar is at 20 pesos is different from sending \$1,000 when it is at 17 pesos."

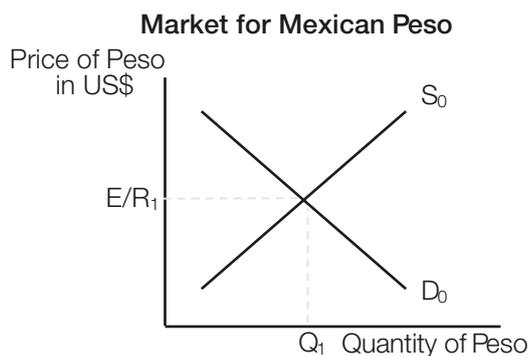
Adapted from: ELPais. ISABELLA COTA JUL 06, 2023 *The Mexican peso breaks through the 17-unit-per-dollar barrier and reaches its highest appreciation in eight years.* Accessed online at <https://english.elpais.com/economy-and-business/2023-07-06/the-mexican-peso-breaks-through-the-17-unit-per-dollar-barrier-and-reaches-its-highest-appreciation-in-eight-years.html>

- (a) (i) Define what is meant by an appreciation of the Peso.

- (ii) Identify the 4 major factors that have contributed to the appreciation of the Peso.

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-
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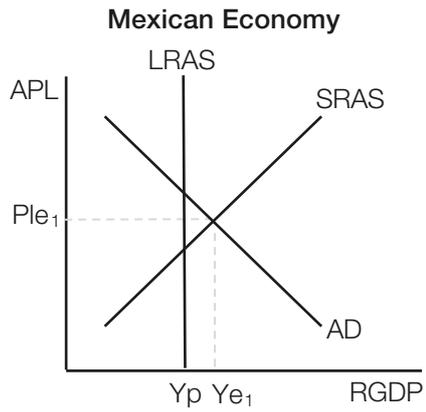
- (iii) Illustrate and explain how the factors identified in (ii) have led to the appreciation of the Peso.



- (b) (i) Outline why Mexicans who rely on remittances from relatives in the US, are now feeling financial pressure because of the appreciation.

- (ii) Outline how the appreciation of the Peso is likely to impact the Tourism sector of Mexico.

- (iii) Using the AD/AS model below to assist, illustrate and explain the likely impact of the peso's appreciation on the Mexican Economy.



Topic 12: Demand-Side Economic Policies

SACE Subject Outline – Teaching and Learning Framework

Students explore the demand and supply management policies that governments and central banks use to meet macroeconomic objectives in different phases of the business cycle. They evaluate the intended and unintended consequences of these policies against macroeconomic objectives and the business cycle. Students evaluate which demand and supply management policies are most effective in managing the economy.

Demand-Side Policy

Demand-side policies are Government or Central Bank policies designed to influence the level of economic activity of an economy through direct or indirect influences on one or more of the components of aggregate demand. There are two forms of demand-side policies:

- Monetary policy
- Fiscal policy.

12.1 Monetary Policy

Monetary policy is a demand-side policy often implemented by a nation's central bank, whereby adjustments are made to the official interest rate (cash rate), influencing commercial interest rates and, thus, consumption, investment, and net exports.

Central banks are generally independent of government and meet regularly to determine the direction of monetary policy. Monetary policy impacts the whole economy and cannot target specific groups.

Whilst not the only mechanism for implementing Monetary Policy, the primary and traditional way is through altering the country's official interest rate. The central bank of Australia, The Reserve Bank of Australia (RBA), uses monetary policy by altering its cash rate (its official interest rate) to achieve three main objectives:

- Stability of the currency
- Full employment
- Economic prosperity and welfare.

In many countries (including Australia), the primary aim of monetary policy is to maintain price stability by meeting an agreed medium-term inflation target. Since 1993, Australia's inflation target has been 2 to 3% inflation over the course of the business cycle. However, other countries have differing targets as shown in Figure 9.2.1 on page 159.

The key instrument of monetary policy is the cash rate. Changes in the cash rate have an influence on other interest rates and, hence, economic activity.

Figure 12.1.2 shows movements in Australia's cash rate since 1990.

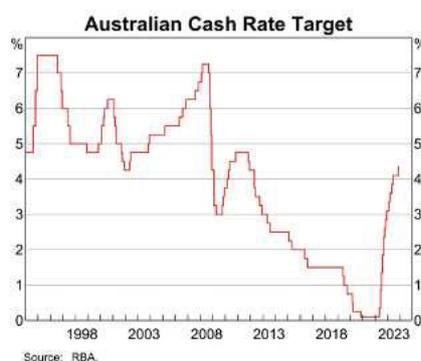


Figure 12.1.2: Australian Cash Rate (Source: RBA Chart Pack: <https://www.rba.gov.au/chart-pack/interest-rates.html>)

Key Definition:

Demand Side Policy

policies designed to influence the level of economic activity of an economy through direct or indirect influences on one or more of the components of aggregate demand.

Key Definition:

Monetary Policy

involves influencing interest rates to affect aggregate demand, employment and inflation in the economy.

<https://www.rba.gov.au/education/resources/explainers/what-is-monetary-policy.html#fn1>



Figure 12.1.1: Objectives of Monetary Policy.

Key Point

While the cash rate acts as a benchmark for interest rates in the economy, it is not the only determinant. Other factors, such as conditions in financial markets, changes in competition, and the risk associated with different types of loans, can also impact interest rates. As a result, the spread (or difference) between the cash rate and other interest rates varies over time.

Central Banks across the world alter their official interest rate depending on the economic conditions. This is demonstrated over a period of 5 years for a number of countries in Table 12.1.1.

Table 12.1.1: Cash Rates across 8 Central Banks around the world
(Source: <https://tradingeconomics.com/>)

	Australia	Malaysia	China	Vietnam	Euro Zone	United Kingdom	New Zealand	United States
July 2023	4.10%	3.00%	3.65%	4.5%	3.75%	5.00%	5.5%	5.25%
July 2021	0.25%	1.75%	3.85%	4.0%	0.0%	0.1%	0.25%	0.25%
July 2019	1.00%	3.25%	4.305%	6.25%	0.0%	0.75%	1.5%	2.5%



Figure 12.1.4: RBA Interest rate Corridor.

The cash rate is the market interest rate for overnight loans between financial institutions, and it has a strong influence over other interest rates, such as deposit and lending rates for households and businesses. When the central bank announces a decision to alter the official interest rate, it announces an intention to buy or sell cash to financial institutions (Banks). The result is the cost of borrowing in the overnight market, and the cost of lending in the overnight market adjusts.

Many countries, including Australia, run a corridor system for the official interest rate, where they lend at 0.25 points above the official rate and pay 0.25 below the official rate of deposits. The mechanism for altering interest rates is more complex than what is indicated here, but the process through which the official interest rate is changed is not part of this course.

The central bank has two options for monetary policy:

- Expansionary or Easy Monetary Policy
- Contractionary or Tight Monetary Policy.

Expansionary policy involves a lowering of interest rates, whilst Contractionary involves an increase in interest rates. Before addressing these in detail, it is important to focus on how changes in interest rates impact the levels of AD.

Monetary Policy – Transmission Mechanism

Monetary policy influences economic activity through 4 transmission channels:

1. Savings and Investment Channel
2. Cash flow Channel
3. Asset Price and Wealth Channel
4. Exchange Rate Channel.

These channels are explained in Table 12.1.2 and visually represented in Figure 12.1.5.

Key Definition:

Overnight money market

where banks lend and borrow funds from each other overnight. The price in this market is the interest rate on these loans. In Australia, this interest rate is called the cash rate.

Table 12.1.1: Monetary Policy Transmission Channels.

Savings and Investment Channel	<p>This channel typically affects consumption, housing investment and business investment.</p> <p>Interest rate changes:</p> <ul style="list-style-type: none"> Alter the incentive for households to save their money and thus the incentive for households to spend on consumption. Encourage or discourage households borrowing as they face changes in repayments and bank lending restrictions. These changes influence the demand and thus price for housing assets. Impact lending rates which can alter investment spending by businesses (on capital goods like new equipment or buildings). This is because the returns on these projects now differ due to the cost of borrowing.
Cash flow Channel	<p>Interest rates influence the decisions of households and businesses by changing the amount of cash they have available to spend on goods and services.</p> <p>Lending rates changes impact on:</p> <ul style="list-style-type: none"> Interest repayments on debt, altering disposable income. The amount of income that households and businesses get from deposits.
Asset Price and Wealth Channel	<p>Asset prices and people's wealth influence how much they can borrow and how much they spend in the economy. The asset prices and wealth channel typically affect consumption and investment.</p> <ul style="list-style-type: none"> Interest rates changes alter demand for assets and thus asset prices. Asset price changes alter the equity (collateral) of an asset that is available for banks to lend against. This can impact the ease for households and businesses to borrow. Asset prices change impact people's wealth which generally has a direct relationship with consumption.
Exchange Rate Channel	<p>Changes in interest rates in a Country influence the relative rate of return when compared with the rest of the world.</p> <ul style="list-style-type: none"> Interest rate changes alter the returns investors earn from assets in Australia (relative to other countries). This will influence the demand for these assets and thus the demand for the Australian currency. Interest rates changes (compared with the rest of the world) typically results in change in the exchange rate in the same direction. This appreciation or depreciation will alter the price of foreign goods and services compared with those produced in Australia. This leads to a change in exports and imports and thus domestic activity.

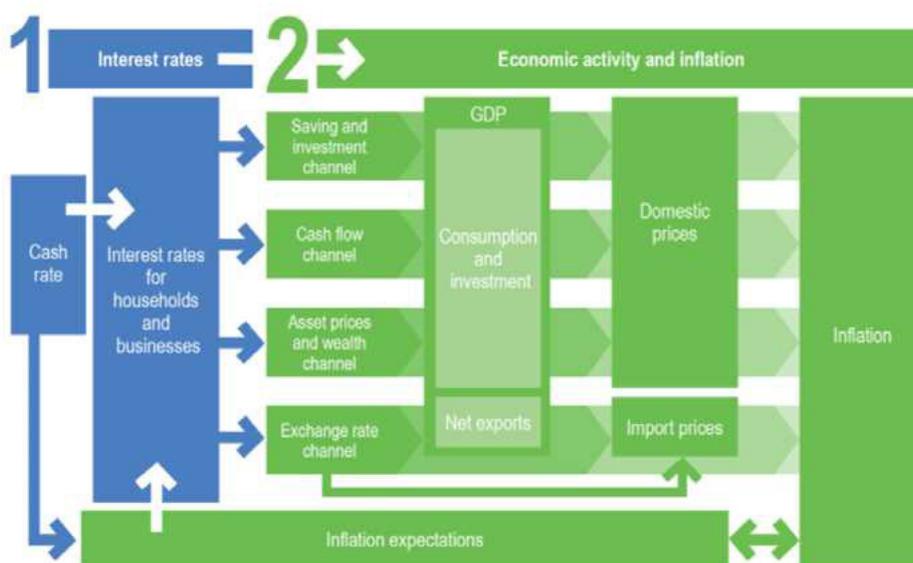


Figure 12.1.4: Monetary Policy Transmission. Source: RBA Australia



Key Definition:

Expansionary Monetary Policy

A central bank decreases the official interest rate to stimulate economic activity by increasing C, I and NX.

Expansionary Monetary Policy

Expansionary monetary policy, also known as easy monetary policy, occurs when the central bank decreases the official interest rate to stimulate economic activity. This decrease tends to decrease other interest rates in the economy, including borrowing and deposit rates. Lower interest rates flow through the economy through the transmission channels outlined above. They discourage savings, incentivise borrowing by households and firms, and increase asset values and thus wealth, which all increase Consumption and Investment spending. Lower interest rates also depreciate the exchange rate, increasing import prices and lowering export prices; this results in exports increasing and imports falling. The increases in C, I and NX increase aggregate demand. Expansionary monetary policy (Figure 12.1.5) is shown on the AD-AS model by shifting AD to the right.

Model explanation:

In this model there has been a decrease in the official interest rate which stimulates an increase in consumption and investment and net exports. The AD curve shifts to the right (AD to AD₁). This leads to an increase in economic growth (Y_e to Y_{e1}), which reduce unemployment, but causes an increase the level of inflation (PL_e to PL_{e1}).

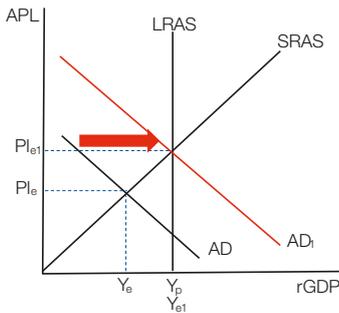


Figure 12.1.5: Expansionary Monetary Policy.

It is also possible that due to the exchange rate changes and higher import prices the SRAS curve will decrease from higher costs of production. A summary of the impacts on the macroeconomic objectives is indicated in Figure 12.1.6a.



Figure 12.1.6a: Expansionary Monetary Policy.

A summary of the impacts of expansionary Monetary policy are shown in Figure 12.1.6b.

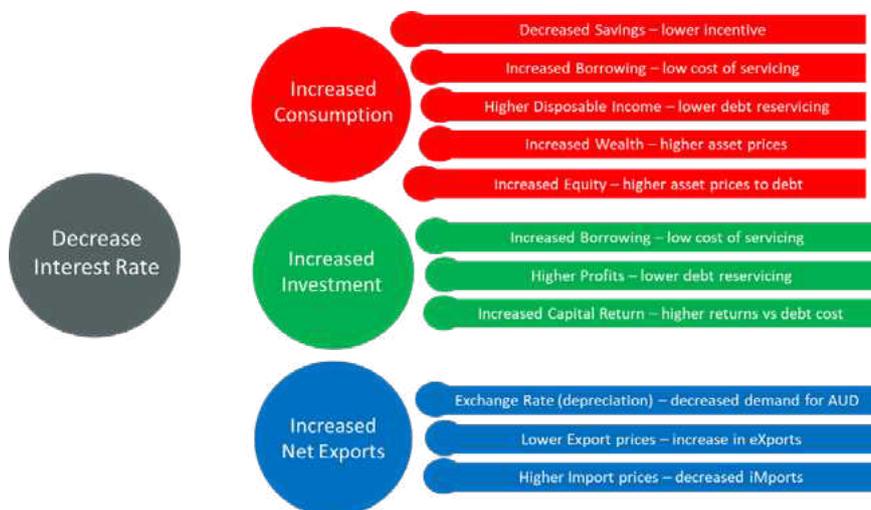
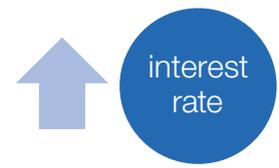


Figure 12.1.6b: Expansionary Monetary Policy.

Contractionary Monetary Policy

Contractionary monetary policy, also referred to as tight monetary policy, occurs when the central bank increases the official interest rate. This increase in the official rate tends to increase other interest rates in the economy. Higher interest rates encourage savings, disincentivise borrowing by households and firms, and decrease asset values and thus wealth, which all result in a decrease in Consumption and Investment spending. Higher interest rates also appreciate the exchange rate, decreasing import prices and increasing export prices; this results in exports decreasing and imports rising. The decreases in C, I and NX result in a decrease in aggregate demand. Higher interest rates mean that it is more expensive to borrow money and to pay back loans. The decreases in C, I and NX result in a decrease in aggregate demand. Contractionary monetary policy (Figure 12.1.8) is shown on the AD-AS model by shifting AD to the left and would generally occur when an economy is in an inflationary gap position or approaching this position.



Key Definition:

Contractionary Monetary Policy

A central bank increases the official interest rate to contract economic activity by decreasing C, I and NX.

Model explanation:

An increase in the cash rate leads to a decrease in consumption and investment the AD curve shifts to the left (AD to AD₁). This leads to a decrease in economic growth (Y_t to Y_e) which increases unemployment, and can cause a decrease in the level of inflation (P_{L_e} to P_{L₁}).

It is also possible that due to the exchange rate appreciation and lower import prices that the SRAS curve will increase from lower costs of production. A summary of the impacts on the macroeconomic objectives is indicated in Figure 12.1.9a.

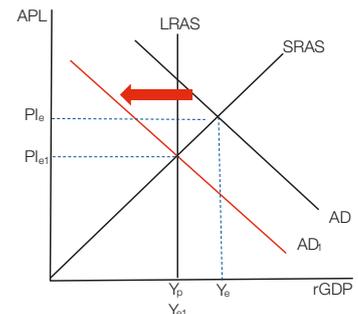


Figure 12.1.7: Contractionary Monetary Policy.



Figure 12.1.8a: Contractionary Monetary Policy.

A summary of the impacts of contractionary Monetary policy are shown in Figure 12.1.9b.

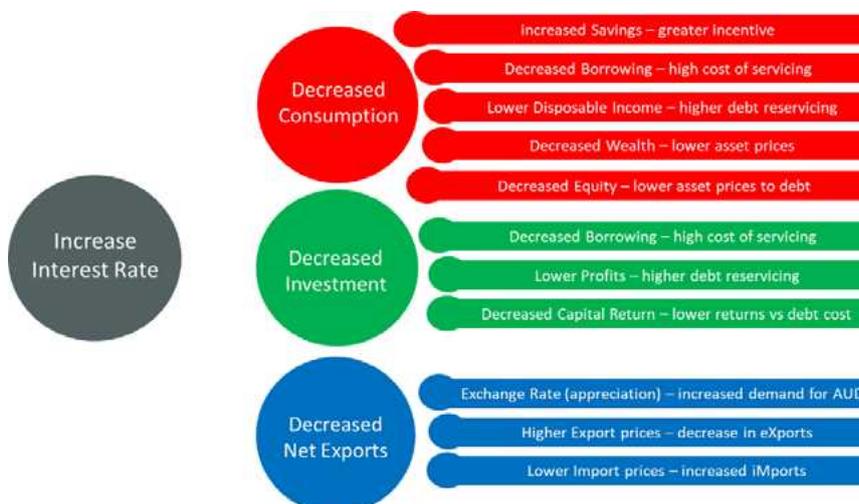


Figure 12.1.8b: Contractionary Monetary Policy.

Summary of the impact of a change in the interest rates

Table 12.1.2

	Increased interest rates	Decreased interest rates
Economic Growth	Decrease → higher mortgage rates and repayments, higher credit card repayments, reduce C and I	Increase → disposable income increased, households and businesses are encouraged to spend, increasing C and I.
Unemployment	Increase → AD is lower	Decrease → AD is higher
Inflation	Decrease → AD is lower	Increase → AD is higher
Exchange Rate	Increased demand for currency as international investment has a higher return could lead to an appreciation	Decreased demand for currency as international investment has a lower return could lead to a depreciation
Net Exports	Could decrease due to appreciation	Could increase due to depreciation

Summary of Advantages and Disadvantages of Monetary Policy

The effectiveness of monetary policy is influenced by its ability to alter the level of economic activity and thus inflation and unemployment. The following table summarises the key advantages and disadvantages associated with monetary policy.

Table 12.1.3: Advantages and disadvantages of Monetary Policy.

Advantages of Monetary Policy	Disadvantages of Monetary Policy
<ul style="list-style-type: none"> • Short Implementation Lag Central banks meet regularly to analyse changes in the economy and to decide the direction of monetary policy. Central banks have considerable flexibility in the management of the economy. In contrast, fiscal policy is, in most circumstances, proposed via an annual budget. • The cash rate is used as a benchmark for other interest-earning assets. This allows transmission to flow relatively quickly and can occur on the same day. • Contractionary Monetary Policy is generally more effective in contracting or slowing down the economy, than expansionary Monetary policy is in expanding the economy. • Consumers and businesses generally have a sound understanding of what the Central Bank is trying to achieve when the cash rate changes and tend to change their behaviour in light of this. • Monetary policy is independent from political decisions. • Monetary policy can also be done incrementally which makes it more effective at fine tuning the economy. • Monetary policy can also be reversed and altered multiple times. 	<ul style="list-style-type: none"> • Long impact lag Monetary policy affects spending and investment of businesses and households with a lag. The changes in spending also take time to have a full effect on prices and wages. These lags are variable and can change over time. In Australia the lag can be anything from 12 to 24 months. • Monetary Policy is known as a blunt instrument. It is a broad approach and impacts any group in the economy that has borrowed funds (Loans), users of credit, and savers. Low interest rates, impact those trying to save or live on savings. This may include self-funded retirees or those saving for a home deposit. Self-funded retirees have a lower level of income, which impacts their ability to consume goods and services. Monetary policy cannot be directed to solve a specific problem or boost a specific industry or region. It can't be targeted. • Effectiveness is dependent upon expectations and confidence levels. A decrease in interest rates may not increase spending if confidence levels are low. • Limitations as interest rates can only be lowered nominally to 0%. Monetary policy is limited when interest rates are low. • Difficulties dealing with supply-side causes of inflation. • Easy monetary policy may be inflationary if the magnitude is incorrect.

12.1 Monetary Policy Questions

1. Discuss how expansionary monetary policy stimulates economic growth.
2. If an economy is in boom, evaluate the potential risks associated with contractionary monetary policy, relating to investment.
3. Discuss the impact of expansionary monetary policy on Self-funded retirees and Business Owners.
4. Explain the impact of contractionary monetary policy on the exchange rate.
5. Discuss some of the possible risks of relying solely on monetary policy to manage the economy.

6. Using an AD-AS Model, explain the role of contractionary monetary policy in controlling inflation.

12.2 Fiscal Policy

Fiscal Policy is a demand-side policy involving deliberate actions by the government to alter the value and or direction of government spending and or taxation. Fiscal policy is implemented by the government and is announced once a year through the government's annual budget.

A government budget is a forecast of the expected receipts of revenue and expenditures for the coming year. Sources of government revenue include taxes which are the primary source of government revenue, the sale of goods and services from government businesses enterprises, and the sale of government-owned assets. Government expenditure includes current expenditure (day to day recurring items such as wages and salaries) Capital expenditure (public investments or infrastructure) and Transfer payments (payments to vulnerable groups).

Whilst Government spending has a direct impact on aggregate demand, Fiscal policy can also indirectly impact Consumption and Investment spending via changes in taxation. The variety of different ways in which fiscal policy can impact aggregate demand include:

Table 12.2.1

Government Spending	Taxation
<ul style="list-style-type: none"> • Education and training- all levels • Healthcare • Infrastructure • Environmental Programs and Policies • Industrial Relations • Legal system • Regulations 	<ul style="list-style-type: none"> • Goods and Services Tax • Income Tax • Excise Tax • Company Tax • Import Tax • Fringe Benefits Tax • Capital Gains Tax

Changing the level of taxation in particular income tax changes disposable income and hence consumption. For example, a decrease in income tax levels increases disposable income leading to an increase in consumption. If the level of taxation increases the reverse occurs, household disposable incomes decrease, and consumption is likely to decrease as well.

If the Government increases payments to welfare recipients, this increases their level of disposable income and consumption is likely to increase. Low income earners are likely to spend a greater proportion of an increase in income than average or higher income earners.

Like monetary policy, there are two types of fiscal policies, expansionary and contractionary. Expansionary fiscal policy is designed to **increase AD** either directly through **increased discretionary government spending** or indirectly through increasing consumption and or investment spending by **lowering taxation rates**. Contractionary fiscal policy is designed to **decrease AD** either directly through **decreased discretionary government spending** or indirectly through decreasing consumption and or investment spending by **increasing taxation rates**. These are outlined and modelled later in this chapter.

Budget Position

Both expansionary and contractionary fiscal policy are implemented through the budget. The budget in most countries is a piece of government legislation meaning it must be enacted by a country's parliament and passed as law. There are three possible budget positions;

- Balanced
- Deficit
- Surplus.

Table 12.2.2: Financial positions of a budget.

Balanced	Deficit	Surplus
$G=T$	$G > T$	$G < T$
Government Spending and Taxation Revenue are equal.	Government Spending is greater than Taxation Revenue	Government Spending less than Taxation Revenue



Figure 12.2.1: Governments need to determine how much tax they receive and what to spend it on.

Key Definition:

Fiscal Policy

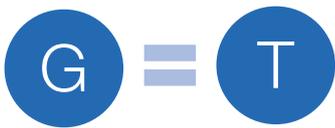
Is the use of government spending and taxation to influence the economy.

<https://www.imf.org/en/Publications/fandd/issues/Series/Back-to-Basics/Fiscal-Policy>

Key Definition:

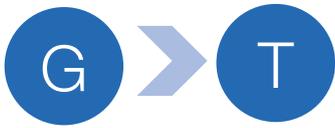
Discretionary Spending

The portion of government spending that is controlled by government.



Balanced Budget

In the case of a balanced budget, the government spends the same amount of money that it receives in revenue (tax).



Deficit Budget

A deficit occurs when the government plans to spend more than they receive in revenue (tax). Deficit budgets tend to be expansionary and are often used if an economy is in a downturn, trough or at the early stages of an upturn. The Government can use a budget deficit to boost consumption and investment and government spending.

One problem with government deficits is that they need to be financed. Governments have three primary options. These are:

- To sell government bonds
- Borrow from overseas
- Borrow from the Central Bank.



Surplus Budget

A budget is in surplus when government revenue (tax) is greater than the amount that the government is spending. Surplus budgets tend to be contractionary and are often used if an economy is in a boom or at the late stages of an upturn. The Government can use a budget surplus to reduce consumption, investment and government spending.



Expansionary Fiscal Policy

Expansionary fiscal policy is usually associated with an increase in government spending and/or a decrease in taxation. The Government budget is likely to be in deficit. The government would tend to implement expansionary fiscal policy when the economy is in the downturn, trough or early stages of an upturn. This policy aims to encourage an increase in spending in other sectors of the economy and to increase overall aggregate demand. This improves economic growth and employment but can lead to an increase in the level of inflation. It is important to note that in order to be expansionary, the budget must show a net increase in expenditure from the previous period. In other words, a larger deficit or a smaller surplus from the last period would have an overall expansionary impact. Expansionary fiscal policy is illustrated by the AD-AS model in Figure 12.2.3.

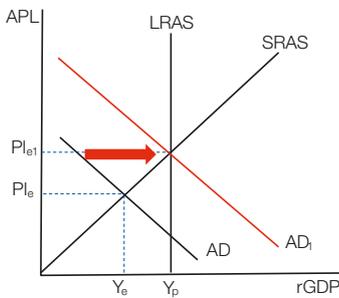


Figure 12.2.2: Expansionary Fiscal Policy.

Model explanation:

An increase in government spending and/or a decrease in taxation, which stimulates an increase in consumption and investment, cause the AD curve shifts to the right (AD to AD₁). This leads to an increase economic growth (Y_e to Y_p) a possible reduction in unemployment but can cause an increase the level of inflation (PL_e to PL_{e1}).



Contractionary Fiscal policy

Contractionary fiscal policy is usually associated with a decrease in government spending and/or an increase in taxation. The Government budget is likely to be in surplus. However, as mentioned with expansionary policy, in order to be contractionary, the budget must result in a net decrease in expenditure from the last period. This means that a larger surplus or smaller deficit would be contractionary in nature.

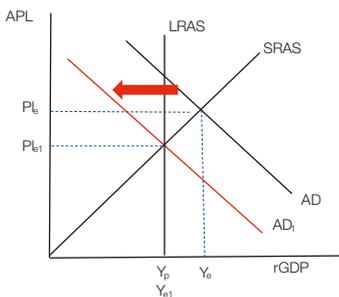


Figure 12.2.3: Contractionary Fiscal Policy.

Model explanation:

A decrease in Government Spending and/or increase in Taxation which stimulates a decrease in consumption and investment causes the AD curve shifts to the left (AD to AD₁). This leads to a decrease in economic growth (Y_p to Y_{e1}), a possible increase in unemployment and can cause a decrease in the level of inflation (PL_e to PL_{e1}).

Summary of Advantages and Disadvantages of Fiscal Policy

The effectiveness of fiscal policy is influenced by its ability to alter the level of economic activity and, thus, inflation and unemployment. The following table summarises the key advantages and disadvantages associated with fiscal policy.

Table 12.2.1: Advantages and disadvantages of Fiscal Policy.

Advantages of Fiscal Policy	Disadvantages of Fiscal Policy
<ul style="list-style-type: none"> • Short impact lag The effects of fiscal policy tools can be seen much quicker than the effects of monetary policy. For example, if income taxes are changed, workers' disposable income and consumption usually change quickly. Similarly, if welfare spending is increased. • Can direct spending to specific purposes Unlike monetary policy tools, which are general in nature, a government can direct spending toward specific projects, sectors, or regions to stimulate the economy where it is seen to be needed most. An advantage of fiscal policy is that it can help keep businesses afloat when household spending declines. Spending on military projects or infrastructure can also produce positive benefits besides economic growth. • Increased aggregate supply and productivity Capital expenditure such as spending on infrastructure increases government spending and AD, and once completed increases potential output and productivity (PPC shifts outward). • Taxation can be used to reduce negative externalities Taxing polluters or those that overuse limited resources can help remove the negative effects they cause while generating government revenue. Fiscal incentives can increase the consumption of merit goods. • Highly effective in a recession Fiscal policy can be highly effective in restoring confidence in an economy during a deep recession. • Income redistribution Spending and taxation decisions can redistribute income. 	<ul style="list-style-type: none"> • Long implementation/decision lag Fiscal policy usually occurs once a year through the government budget. Budget measures usually need to be debated in parliament. This can often take a long time, and there is a risk that budgetary measures could be rejected or modified, which can severely impact budget estimates. However, in some exceptional circumstances e.g. Global Financial Crisis, Covid, SARS etc, bipartisan support can result in quick fiscal policy implementation. In these situations, fiscal policy has a distinct advantage because it can be Timely, Targeted, and Temporary. • May be politically motivated Fiscal spending can be used as a political tool to gain votes. Fiscal spending could be influenced and directed to marginal or safe seats rather than areas of need. The government often uses fiscal spending as a political tool during elections, increasing government expenditure to attract votes. Additionally, there may be a reluctance to raise taxes in certain situations and at different phases of the election cycle. • Tax Incentives may be spent on imports The effect of fiscal stimulus is muted when the money put into the economy through tax savings or government spending is spent on imports, sending that money abroad instead of keeping it in the local economy. • Can Create Budget Deficits Government budget deficits may require borrowing or the issue of government bonds which can result in high-interest repayments to maintain public debt. There is an opportunity cost because this money that could have been invested in health, education or infrastructure. • Limits in Flexibility While governments can easily increase expenditure, there are some difficulties decreasing government expenditure during periods of high economic growth. This can be due to: <ul style="list-style-type: none"> ○ Investment projects being already bound by contracts ○ Pressure by public service unions when expenditure to government sectors decreases ○ Difficulties in decreasing expenditure on essential government services such as education, health or defence. • Side effects of public spending Reduced government spending to decrease inflationary pressure could adversely affect public services such as public transport and education causing market failure and social inefficiency. • Other components of AD The effectiveness of fiscal policy will also depend upon the other components of AD, for example, if consumer confidence is very low, reducing taxes may not lead to an increase in consumer spending. • Crowding Out In the long term, fiscal spending could displace private spending. Persistent government budget deficits can lead to higher market interest rates and lower private investment

Key Point

Most economists believe that due to the advantages of **monetary policy**: *incremental, reversible, flexible, free of political constraints and shorter implementation lags*, that it **is more appropriate for influencing aggregate demand**. However **Fiscal policy** plays an important role especially **when an economy is in deep recession** where monetary policy is likely to be ineffective.

12.2 Fiscal Policy Questions

1. State two (2) factors that should be considered when implementing fiscal policy.
2. Explain some of the potential risks and challenges associated with fiscal stimulus.
3. Describe the potential long-term effects of expansionary fiscal policy on the economy.
4. Evaluate the potential consequences of a contractionary fiscal policy during an economic downturn.
5. Explain why contractionary fiscal policy may have a limited effect on economic activity.

6. Explain what might happen to the level of inflation if a government decides to move from a budget surplus to a budget deficit, if the economy is in a boom.

7. “The lower the level of government spending, the better.” Evaluate this view.

4. Evaluate the use of expansionary demand-side policies may lead to conflicts between the macroeconomic objectives, with the aid of an AD-AS Model.

Real World Application: Demand -Side Policies, Macroeconomic Objectives, Business Cycle and Indicators

Australia's Domestic Position 2nd Quarter 2023, adapted from KPMG Economic Outlook¹

The slowing of aggregate demand is now leading to forecasts that Australia is likely to demonstrate lower economic activity for the remainder of 2023 and into the first quarter of 2024.

After entering 2023 in a relatively strong economic position the impact of the higher cash rate and inflation has started to slow the growth of output. The March 2023 quarter saw GDP grow 0.2%, household consumption increased by 0.2%, investment grew by 0.4%, while net exports were -0.2%.

The June 2023 Global Economic Prospects by the World Bank states its concerns of a fragile global economy throughout 2023 and 2024, suggesting a higher risk of a further downturn if financial market instability continues and if the global economy continues to aggressive contractionary monetary policy to help control inflation. The expected Global growth throughout 2023 to 2025 is low to mid 2% range up to around 3% respectively.

The implementation of expansionary fiscal policy will counteract the inflationary pressures that the contractionary monetary policy is trying to resolve. Due to the government support provided during COVID-19 governments fiscal reserves have become exhausted.

Adapted from KPMG, 2023, **Australia's Domestic Position 2nd Quarter 2023, adapted from KPMG Economic Outlook**, <https://kpmg.com/au/en/home/insights/2023/07/economic-outlook-australia-q2-2023.html>

Using the information provided answer the following questions:

1. State **two** macroeconomic objectives referred to or implied in the article.
2. Define the **two** macroeconomic objectives you listed in Q1. Include a discussion of target rates in your answer.
3. Explain **two** reasons why the government aims to achieve **each** of the macroeconomic objectives you have selected.

7. Discuss an appropriate demand side policy that is appropriate for the situation stated in the case study, use an AD-AS Model to support your explanation.

Topic 13: Supply-Side Policy

SACE Subject Outline – Teaching and Learning Framework

Students explore the demand and supply management policies that governments and central banks use to meet macroeconomic objectives in different phases of the business cycle. They evaluate the intended and unintended consequences of these policies against macroeconomic objectives and the business cycle. Students evaluate which demand and supply management policies are most effective in managing the economy.

13.1 Supply-Side Policy

Supply-side policy or microeconomic reform aims to boost productivity growth by creating an environment in which resources are allocated to their most productive uses and firms use the most efficient methods of production.

Supply-side policies are a combination of government-led and free-market policies with the aim of increasing a country's productive capacity. The two broad categories are also referred to as Market-based and Interventionist Policies. Table 13.1.1 summarises the different types of policies investigated in this chapter.

Table 13.1 Summary of Supply-Side Policies.

Supply-Side Policies	
Free-market Orientated (Market Based)	Interventionist
<p>Policies that encourage competition</p> <ul style="list-style-type: none"> • Deregulation • Competition Policy • Privatisation • Trade Liberalisation including Tariff Reform – changes to trade barriers, free trade agreements. <p>Labour Market Reform – incorporating changes to employee benefits and leave entitlements.</p> <p>Incentive Related policies – including Income Tax Cuts</p> <p>Removal of Government Regulations -including supervisory bodies</p> <p>Changes to Government Benefits</p>	<p>Investment in Infrastructure</p> <p>Investment in Human Capital</p> <ul style="list-style-type: none"> • Spending on education • Spending on Healthcare • Vocational Training <p>Spending on Healthcare</p> <p>Investment in new Technology</p> <p>Industrial Policies</p>

Key Point:

All types of supply-side policies have the same impact on the AD-AS Model.

Both the SRAS and LRAS curves shift to the right.

Key Definition:

Market Based Policies aim to reduce the role of the state/government and let markets work as freely as possible.

Key Definition:

Interventionist Policies Policies that assume that market forces will not achieve desired results so government intervention in markets is necessary to promote improvements in the long run growth capacity of the economy.

13.2 Market-Based Supply-Side Policies

Market-based supply-side policies are intended to reduce government intervention, causing free markets to increase efficiency and improve incentives.

The three broad market-based supply-side policies include:

- Policies to encourage competition
- Incentive related policies
- Labour market reforms.

All these policies aim to increase output from the available economic resources. Reforms can include structural change, improvements in production techniques or processes and the use of international best practices by business and industry leaders. The aim of all these reforms is to improve productivity, increase the profits of firms/businesses and increase the aggregate supply of the economy.

The long-term impact of both market-based and interventionist policies is an increase in both the short-run (SRAS) and long-run aggregate supply (LRAS), shifting both curves to the right (Figure 13.2.1). The intended outcome of these policies is an increase in economic growth, a decrease in unemployment or an increase in employment and lower inflation.

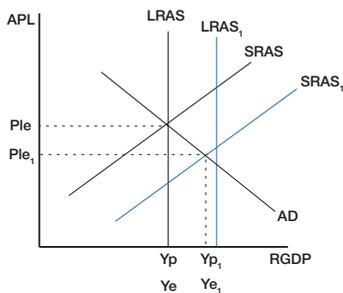


Figure 13.2.1: Market-Based Supply-Side Policy.

Model explanation:

With the implementation of supply-side policies both the LRAS and SRAS curves on the AD-AS Model shift to the right. That is:

- LRAS to LRAS₁
- SRAS to SRAS₁

This promotes economic growth (Ye to Ye₁), with possible improvement in levels of employment. The economy will also see a decrease in the level of inflation.

A summary of the impacts on the macroeconomic objectives from Market-Based incentives is indicated in Figure 13.2.2.

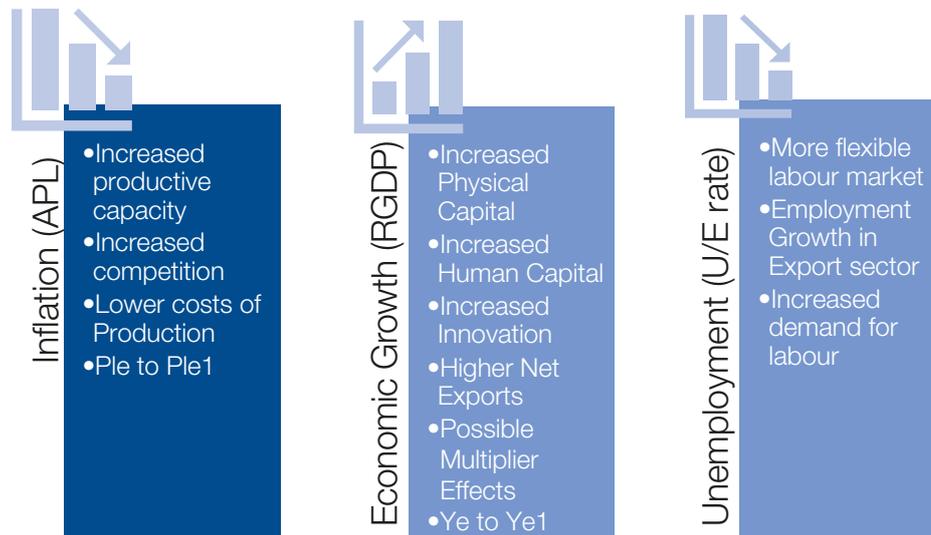


Figure 13.2.2: Market-Based Supply-Side Policy impact on macroeconomic objectives.

However, supply-side policies can have detrimental impacts on the economy in the short run. An increase in productivity should lead to a decrease in unemployment in the long run, but it can increase unemployment in the short run. In the short run, workers could lose jobs, increasing unemployment before the positive effects of increased productivity flow through to costs, demand and profits.

Policies that Encourage Competition

This group of policies aims to increase competition in the market. The philosophy behind this is that greater competition encourages harder work, promotes increased levels of innovation, and leads to lower prices and better quality goods and services as firms attempt to remain competitive.

Deregulation

This is the process of removing government “red tape”, for example, removing bureaucratic barriers such as regulations to enter a particular market. Simplifying, reducing, or removing barriers that interfere with the operation of market forces aims to increase competition in the economy.

Industries are deregulated to encourage participation, increase competition, and increase efficiency.

Deregulation aims to increase competition and create a freer market by removing:

- restrictions to competition
- Improving the allocation of resource
- Limiting monopolies
- Reducing barriers to entry.

Deregulation has at times been criticised in situations when regulations were put in place as a protection against a negative externality of production. This could relate to product quality and safety, the safety of workers or policies preventing pollution from production.

Key Definition:

Deregulation is the reduction or elimination of government regulation in a particular industry. This aims to create more competition within the industry.

Source: <https://www.investopedia.com/terms/d/deregulate.asp>

Competition Policy

Competition policy is used to encourage new firms to enter a market by reducing barriers to entry. Without competition policy, current producers (sometimes a monopoly/duopoly/oligopoly) can restrict output and increase prices. As the number of producers increases it is an expectation that the productivity of existing firms improves, and scarce resources are used more efficiently.

Competition policy is also used to reduce anti-competitive behaviour among firms. Tougher competition policy regime includes policies designed to curb anti-competitive practices such as “price-fixing cartels” and other abuses of a dominant market position – in other words – intervention to curb some of the market failure that can come from abuse of market power. This allows more choice and lower prices for consumers.

Privatisation

Privatisation is the process of state-owned monopolies being broken up and sold to private owners to create more competition. This changes the ownership for public to private ownership, with private ownership. Private ownership leads to a greater focus on making a profit and on productivity and sustainability. Examples of industries impacted by privatisation are telecommunications and transportation.

Trade Liberalisation

Trade liberalisation occurs when there is a reduction of protectionist barriers, such as tariffs, quotas and subsidies, allowing for freer trade. Freer trade leads to increased competition and more efficient use of resources and encourages domestic firms to improve their production techniques and ensure that resources are being utilised efficiently.

Labour Market Reforms

Governments at times endeavour to manage and regulate labour relations if they believe that there are inefficiencies. The objective of these policies is to reduce the Natural Rate of Unemployment. Market Reforms are intended to improve the responsiveness of both labour supply and demand and to create better flexibility and efficiency in the labour market.

Examples of market reforms include:

- Union amalgamation can reduce inefficiency and costs for firms having to deal with multiple smaller unions.
- Retraining of workers
- Casualisation and greater workplace flexibility
- Reduction or removal of minimum wages
- Reduction in unfair dismissal laws.
- Reducing Unemployment Benefits (welfare).

Incentive-related Policies - Taxation

Economists have suggested that personal income taxes can discourage workers from working more hours and reduce their productivity as they reduce disposable income. Similarly, business taxes reduce company profits and could discourage improvements in productivity and the expansion of businesses.

Reducing personal income taxes for individuals, particularly for those earning a lower level of income helps to create an incentive for people to seek employment. This assists in reducing the level of unemployment in the economy and as a result, more people are employed and total output of the economy increases shifting the LRAS curve to the right. Supply-side policies assist in the achievement of macroeconomic objectives.

Cuts to business taxes provide an incentive for businesses to invest in innovation and new technology, rather than having the financial risk of paying tax. Increased investment can increase productivity and output.

Key Definition:

Competition Policy public policy aimed at ensuring that competition is not restricted or undermined in ways that are detrimental to the economy and society.

Source: <https://www.britannica.com/topic/competition-policy>

Key Definition:

Privatisation occurs when a government-owned business, operation, or property becomes owned by a private, non-government party.

Source: <https://www.investopedia.com/terms/p/privatization.asp>

Key Definition:

Trade Liberalisation is the removal or reduction of restrictions or barriers on the free exchange of goods between nations.

Source: <https://www.investopedia.com/terms/t/trade-liberalization.asp>



Figure 13.2.3: Retraining workers can allow for increased flexibility and better efficiency in the workplace.

Key Definition:

Incentive based policies are policies that aim to encourage improvements and efficiency, through encouraging research and development and/or lowering of taxes on business profits.

Source: <https://www.ibeconomics.com/ib-economics-supply-side-policies>

13.3 Interventionist Supply-Side Policies

Key Definition:

Interventionist supply-side policies involve government intervention to overcome market failure.

Source: <https://www.economicshelp.org/macroeconomics/economic-growth/supply-side-policies/>

The reasoning behind interventionist supply-side policies is that the free-market economy can't achieve the desired objectives by itself without any **government intervention**. These policies emphasise government expenditure to address market failures which result in inefficiencies. These policies presuppose that the free-market economy cannot alone achieve the desired result of increasing potential output. From this point of view, interventionist policies are necessary to increase the total output of the economy. Supply-side policies try to improve the productive capacity (maximum possible output) of all factors of production. Interventionist supply-side policies are deliberate attempts by a government to work through market inefficiencies in the economy.

Interventionist policies include investment in:

- Human Capital
- Infrastructure
- Technology.

Interventionist policies improve aggregate demand in the short run, and in the long run, increase an economy's aggregate supply (Figure 13.3.1).

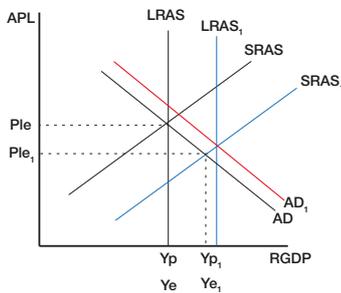


Figure 13.3.1: Interventionist Supply-side policy.

Model explanation:

With the implementation of both a supply-side policy and an expansionary demand-side policy all curves on the AD-AS Model shift to the right. That is:

- (AD to AD_1)
- (LRAS to $LRAS_1$)
- (SRAS to $SRAS_1$)

This promotes economic growth (Y_e to Y_{e_1}), with possible improvement in levels of employment, depending on the change caused by the policies the level of inflation may remain unchanged.

A summary of the impacts on the macroeconomic objectives from interventionist Supply-side policies is indicated in Figure 13.3.2.

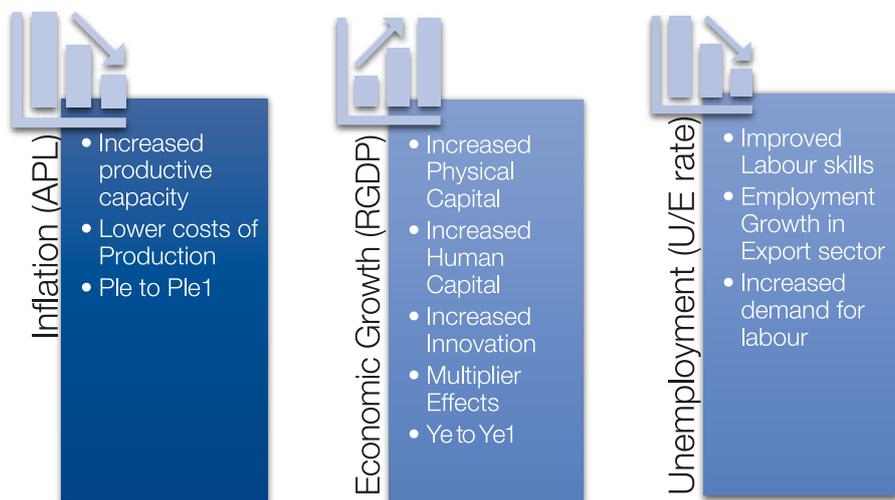


Figure 13.3.2: Interventionist Supply Side-Policy impact on macroeconomic objectives.

Key Definition:

Human Capital refers to the knowledge, expertise and experiences that exist in the workforce. It is both the quantity and quality of labour resources.

Investment in Human Capital

Human capital refers to the knowledge, expertise and experiences that exist in the workforce. There are two ways that the government can invest in human capital.

Education and training

A key form of investment to improve human capital is to spend money on education and training. Education and Training help improve the skills, productivity, and mobility in the labour force. Labour mobility can help fill gaps in the labour market. With this additional flexibility, improvements should be seen in the demand and supply of labour.

When the government invests in human capital through education and training national income increases as this expenditure increases aggregate demand in the short run. The long run outcome of investment in human capital is the improvement in the productive capacity of the economy, demonstrated by an increase in an economy's LRAS (shift to right of the LRAS curve).

Another way that investment in human capital can promote productivity and output is by improving communication in the job market. This could assist in reducing frictional employment.

Investment in human capital encourages economic growth due to the increase in aggregate demand and the greater productivity capacity in the long run.



Figure 13.3.3: With education and training the labour force gains new knowledge and develops new skills.



Figure 13.3.4: With improved healthcare the labour force is likely to be fitter and healthier leading to improved productivity.

Investing in Improved Healthcare

Investment in Healthcare Services can also improve human capital. Poor healthcare can increase the level of absenteeism in schools, training centres and workplaces. If a government improves healthcare services labour productivity can be improved because there is less illness in the economy.

Investments across education, training and healthcare services through building and staffing new institutions can create an increase in AD. In the long run, the LRAS will be pushed outwards as the workforce is more educated and healthier and likely to work for longer.

Investment in New Technology

Government policies that encourage investment in new technology have a positive effect on aggregate demand, as the expenditure is part of aggregate demand (AD) (shift to the right of AD). These policies include:

- Tax rebates for investment
- Lower interest rates



Figure 13.3.5: Updating obsolete technology or investing in new technology can lead to improved productive capacity and productivity.

Grants for research and development.

In the long run, investment in new technology can improve the productive capacity and productivity of the economy. It could make production processes quicker, less costly, and more efficient. This increases the total productivity, output, and efficiency in the economy and shifts the LRAS curve to the right.

Research and Development also encourages firms to improve work processes and discover new ways to complete tasks, leading to an improvement in the workforce. The improvement in technology can also see improvements in other industries, such as safer or cleaner technologies, improved techniques in agricultural production and life-enhancing drugs. Research and Development can be accomplished by public/private partnerships or through tax incentives.

Investment in Infrastructure

Infrastructure projects are large-scale projects that a government undertakes. These can include motorways, highways, hospitals, schools, utility networks and ports. This kind of spending increases the AD curve in the short run; however, it improves the capital base of a country in the long run, increasing the LRAS (shifting LRAS to the right).



Figure 13.3.6: Improved infrastructure by the government improves the capital for the whole country.

Industrial Policies

Industrial policies include government policies that aim to encourage growth and production in a certain industry. These can include:

- Providing support to small businesses.
- Providing support to emerging industries.

The government can target certain industries and businesses by providing subsidies, grants, or decreasing taxation to encourage entrepreneurship, boost production and employment, and, therefore, economic growth and output. Protecting infant industries, through protective tariffs or quotas while the industry is setting up is another example of an industrial policy.

13.4 Advantages and Disadvantages of Supply-Side Policy

The effectiveness of supply-side policies is that it can impact both economic activity and inflation in a positive way, however the time it takes to implement is longer than demand side policies. The following table (Table 13.4.1) summarises the key advantages and disadvantages associated with supply-side policies.

Table 13.4.1: Summary of Advantages and Disadvantages of Supply-side policies.

Advantages of Supply-Side Policy	Disadvantages of Supply-Side Policies
<p>Reduction of inflationary pressure – In the long- run supply-side policies can improve levels of productivity and efficiency in both the product and labour markets.</p> <p>Improved Resource Allocation – Market-based supply-side policies tend to focus on creating efficiencies in the market forces of supply and demand, resulting in increased efficiency in resource allocation.</p> <p>Creation of jobs and sustainable growth – Increased labour productivity and competitiveness improve LRAS and the potential productivity and efficiency in the economy.</p> <p>Direct support for specific sectors – Interventionist policies can provide direct support to industries that assist in creating economic growth, such as education, training, healthcare, and infrastructure.</p> <p>Less reliance on Government Funding – A number of the supply-side policies are based on private initiatives rather than government-funded initiatives meaning less government spending (excluding tax, subsidies and grants).</p> <p>Less conflict between the macroeconomic objectives – Supply-side policies cause less conflict between the main macroeconomic objectives of price stability, economic growth and employment.</p>	<p>Implementation and impact Lag – Supply-side policies take time to be both implemented and work throughout the economy.</p> <p>Cost of Supply-side policy – It can be very expensive to implement a supply-side policy. This can have a negative effect on the government budget.</p> <p>Demand-deficient unemployment – Unemployment caused by the fall in aggregate demand is not reduced by supply-side policies. However, the long-term non-acceleratory inflationary rate of unemployment (NAIRU) will be reduced.</p> <p>Distribution of Income – Most supply-side policies have a negative effect on the distribution of income and equity in the economy, particularly in the short run. Some supply-side policies widen the gap between the rich and the poor. For example, some tax benefits assist business owners and not employees.</p> <p>Potential for influence by pressure groups– The government may be influenced by groups that have a vested interest.</p> <p>Potential Environmental Costs – The creation of activities via competition that can create negative externalities.</p>

Key Point

Most economist believe that supply-side policies are largely responsible for the sustained rates of economic growth throughout the 1990s and 2000s. The ability to expand the productive capacity of the economy allows for **improved output and employment growth without creating inflationary pressure**.

However, **concerns over impacts of market-based policies on equity**, through business collapses, unemployment from restructuring and reduced worker power continue to exist.

13.1 Supply-Side Policies Questions

1. Discuss two potential problems when implementing supply-side policies.
2. Explain the role of competition policy in promoting economic efficiency.
3. Analyse one/two advantages and disadvantages of implementing supply-side policies.
4. Explain the short-run and long-run impacts of deregulation.
5. Evaluate the use of supply-side policies to reduce unemployment.
6. Explain, with reference to one example, the potential impacts on income distribution of the implementation of supply-side policies.

13.5 Comparison of Demand-Side Policies and Supply-Side Policy

Demand and Supply-side policies both have their place in an economy, however, when making a decision about which policy should be considered it is importance to consider the impact that they will have on an economy. The differences between the types of policies are demonstrated in Table 13.5.1.

Table 13.5.1: Comparison of Demand and Supply Side policies.

Demand-Side Policies	Supply-Side Policy
<p>Demand-side policies try to influence the level of aggregate demand in an economy.</p> <p>Two demand side policies:</p> <p>Monetary Policy – determined by the change in cash rate/official interest rates by a country's Central Bank.</p> <p>Fiscal Policy – influenced by Government Spending and/or changes in Taxation.</p> <p>Both Monetary and Fiscal policies can be used to expand or contract an economy.</p>	<p>Supply-side policies aim to increase the productive output of the economy impacting the level of aggregate supply. (Both SRAS and LRAS)</p> <p>The two broad categories of policies include:</p> <p>Market-Based Policies aim to reduce the role of the state/ government and let markets work as freely as possible.</p> <p>Interventionist Policies involve the investment in infrastructure, human capital, new technologies or through industry support.</p>
Impact on AD-AS Model	
<p>Expansionary Policies shift AD curve to the right.</p> <p>Contractionary Policies shift AD curve to the left.</p>	<p>All forms of Supply-side policies shift the LRAS and SRAS curve to the right.</p> <p>Interventionist Policies also shift the AD curve as they represent forms of government spending.</p>

13.6 Conflicts of Macroeconomic Objectives

At times, we see conflicts between the macroeconomic objectives. When a government is trying to improve one economic objective it can cause a conflict with another one. The most common conflicts are:

- Inflation and unemployment
- Inflation and economic growth
- Economic growth and Environmental Sustainability.

Inflation and Unemployment:

If an economy is trying to decrease the number of people unemployed, the government could introduce policies to increase Aggregate Demand. This requires expansionary demand-side policies. When a government implements expansionary policies, the likely outcome is that the level of economic growth and employment will improve but worsen inflation.

Falling unemployment can cause an increase in demand, which might lead to demand-pull inflation. If firms/industries face increased costs (e.g. the cost for the increased number of employees (labour resources), this could lead to cost-push inflation.

When a government or central bank tries to reduce the level of inflation, the policy options include contractionary demand-side policies. The implementation of contractionary policies is likely to see a decrease or slowdown of the rate of inflation; however, at the same time, the level of unemployment would increase and economic growth would reduce.

If an economy faces deflation (negative inflation), this may lead to an increase in the unemployment level. Deflation may be due to a decrease in consumption and investment, so firms need fewer people working for them, decreasing spending in the economy.

Inflation and Economic Growth

Maintaining strong economic growth and a steady level of inflation can prove to be difficult. A government may want to prioritise economic growth as this may lead to further employment and reduce welfare benefit payments.

If economic growth is too high this can increase inflation. There is the possibility that either cost-push or demand-pull inflation will occur.

Higher rates of inflation can have negative effects on international trade performance, business profits and employment and, ultimately economic growth. This has the potential to further increase cost-push inflation due to increased costs of imports used in production.

If the central bank attempts to control the level of inflation by increasing the cash rate, this may lead to the exchange rate appreciating. This could negatively impact export industries as the goods and services they sell are more expensive for overseas buyers. Import-competing industries will face more price competition as the price of imports becomes cheaper.

Economic Growth and Environmental Sustainability

As economies grow, they tend to use more non-renewable resources. This can lead to the destruction of the environment and habitat for fauna and flora. Higher economic growth can cause negative externalities such as pollution.

Rapid economic growth and development puts extra pressure on scarce environmental resources threatening the sustainability of living standards for future generations.

13.7 Resolving Conflicts between the Macroeconomic Objectives

A combination of both demand and supply policies can be used to help reduce conflicts between the macroeconomic objectives (Figure 13.7.1).

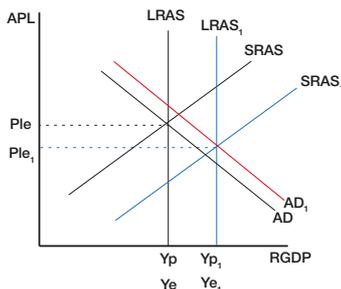


Figure 13.7.1:
Implementation of both demand and supply-side policies.

Model explanation:

With the implementation of both a supply-side policy and an expansionary demand-side policy all curves on the AD-AS Model shift to the right. That is:

- (AD to AD₁)
- (LRAS to LRAS₁)
- (SRAS to SRAS₁)

This promotes economic growth (Y_e to Y_{e_1}), with possible improvement in levels of employment, depending on the change caused by the policies the level of inflation may remain unchanged.

13.2 Combining Demand-side and Supply-side Policies

1. Explain why a government might find it difficult to maintain a low rate of inflation as the economy approaches full employment, without the aid of supply-side policy.

Macroeconomics Review Test (39 marks)

Question 1

Source A

The following table includes economic data for Country F over 3 years.

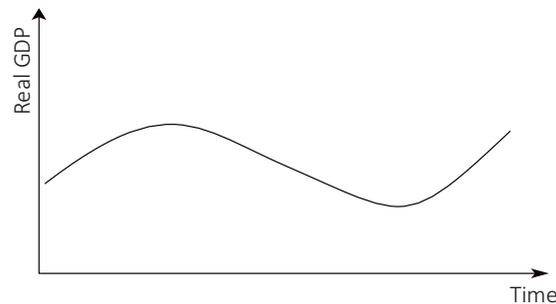
Country F has experienced an increase in infrastructure projects, including education and technology, by the government throughout the 3 years; this has led to an increase in retail sales and consumption.

Country F's macroeconomic targets include:

- Unemployment of 5%
- Inflation of 2-3%
- GDP Growth 3%.

	Year 1	Year 2	Year 3
GDP Growth (%)	1.2	1.4	2.2
Government Revenue (% of GDP)	16.0	17.0	18.0
Government expenditure (% of GDP)	20.0	24.0	30.0
Inflation Rate (%)	3	4	4.5
Unemployment rate (%)	7.5	5.5	5.1
Official Interest Rate	0.5	0.25	0.25

- (a) On the diagram below, identify the phase of the business cycle the economy in Country E experienced in Year 2. Justify your answer.



(2 marks)

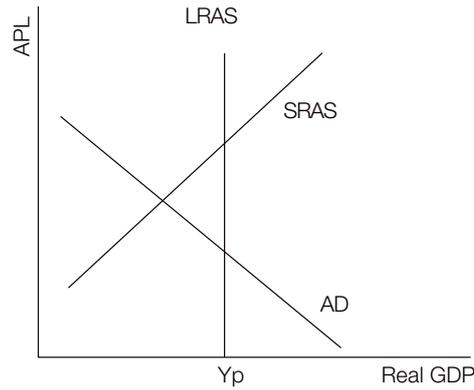
- (b) The following indicators can be used to determine the phase of the business of an economy. State one limitation for each indicator. (2 marks)

(i) Retail Sales

(ii) Inflation Rate

(2 marks)

- (c) (i) On the aggregate demand-aggregate supply model below, indicate the change in economic conditions in Country F from Years 1 and 2. (2 marks)



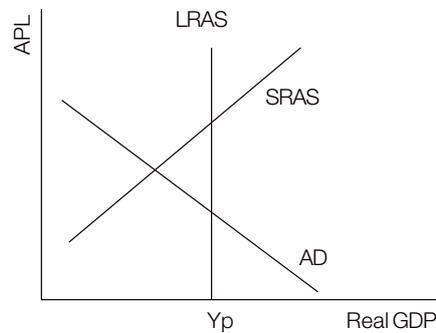
- (d) (i) Define the macroeconomic objective of ‘full employment of labour.’

(1 mark)

- (ii) Explain one reason why the official unemployment rate may underestimate the real level of unemployment in Country E.

(2 marks)

- (e) Assess the effectiveness of the government’s economic management policies in Country E in Year 3. Fully label and complete the AD-AS diagram below to support your answer.



(6 marks)

Additional information has been provided. Country E's Central Bank intends to raise the interest rate in Year 4 to 0.75%.

- (f) With reference to the current economic conditions in Country E, evaluate this decision.

(5 marks)

- (g) Describe how one group or individual might be impacted by the monetary policy position in Year 4.

(2 marks)

Source B

Country E's Households (Consumers) have been watching the exchange rate with concern the exchange rate for Country E has depreciated against the US\$ from Year 1 to Year 3.

	Year 1	Year 2	Year 3
Country E \$	0.85	0.81	0.69

Country E's government discusses their concerns leading into Year 4 with many consumer groups. Households are concerned with the speculation about interest rate changes and the concern that if the dollar continues to depreciate, the cost of goods and services will increase, increasing the cost of living. After these discussions, the government saw that it was evident that consumer confidence was worsening.

- (h) (i) Define the term leading indicator.

(1 mark)

- (ii) Using the information from Source C, predict the stage of the business cycle in Year 4.

(1 mark)

- (i) State the likely impact on Net Exports.

(1 mark)

- (j) Explain the likely intended and unintended consequences of Country E's dollar depreciating.

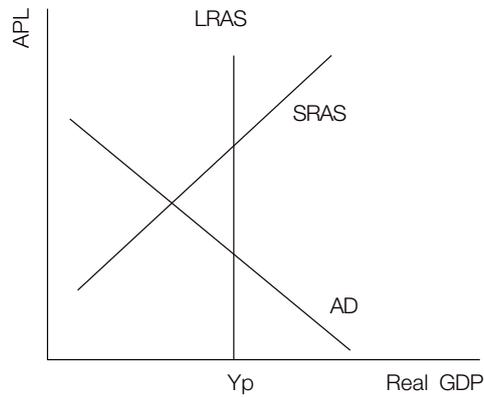
(4 marks)

(k) (i) State the type of inflation that is likely to occur in Year 3 and possibly Year 4.

(1 mark)

(ii) Explain the likely impact of your answer in j i) for Country E.

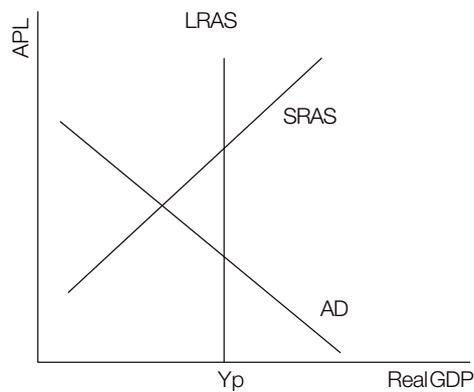
Fully label and complete the AD-AS diagram below to support your answer.



(3 marks)

Question 2.

Discuss the likely consequences if the Central Bank in Country E should increase the cash rate to 0.75% in light of the information in Source B. Fully label and complete the AD-AS diagram below to support your answer.



(6 marks)

Answer Guides

It should be noted that these answers are a guide and should not be relied upon as the most appropriate format for answering examination questions.

Exercise 1.1 The Fundamental Economic Questions

Identify which fundamental question each of the following newspaper headlines is most associated with.

Newspaper Headline	Fundamental Economic Question
"Economists Weigh in on the Benefits and Challenges of Diversifying Production in a Global Market"	WHAT
"Infrastructure Improvements: A Catalyst for Economic Expansion"	HOW
"Experts Debate Best Strategies for Allocating Resources in an Ever-Changing Economy"	HOW
"Ensuring Access to Essential Goods and Services for All"	FOR WHOM
"Innovations in Technology and Manufacturing Driving Economic Growth"	HOW
"Empowering Women in the Workforce: A Path to Economic Equity"	HOW or FOR WHOM

Exercise 1.2 How differing systems impact What, How and For Whom

1. Complete the table below by identifying and justifying which economic system (market capitalism or planned socialism) more effectively attains the outcome listed?

Outcome	System that most effectively attains it	Justification
Productive Efficiency	Market Capitalism	Profit Motive ensures minimized resource wastage
Allocative Efficiency	Market Capitalism	Resources allocated on \$ votes, consumer sovereignty so will be allocated to areas of most need
Economic Growth	Market Capitalism/ Planned Socialism	Planned socialism may allocate more resources to capital goods promoting long term growth
Full Employment	Planned Socialism	Jobs and wages controlled by government
Price Stability	Planned Socialism	Prices set by government preventing fluctuations.
Equality	Planned Socialism	Restrictions on resources ownership means the main variation in income will be via wages, these are controlled by government.

2. The following questions relate to the market for healthcare?

- (i) Explain how resources would be allocated to goods and services within the healthcare market in a market capitalist system.

Based on consumer sovereignty, allocated to areas where there is the most demand. This could be on elective surgeries rather than emergency areas.

- (ii) Explain how a Planned Socialist system would allocate resources within the healthcare market.

Based on government decision making on what is most needed by society. Likely to allocate to areas of need rather than luxuries or non-essentials.

- (iii) Outline the Economic System that the country in which you live uses to allocate resources within the healthcare market.

Likely to be a mixed system, where there is a combination of government allocation such as Medicare and emergency departments and consumer sovereignty such as private hospitals and elective surgeries.

3. Evaluate whether governments should intervene in markets to answer the, what, how or for whom questions

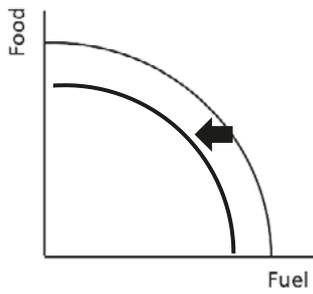
The question is largely about the failures of markets to produce desirable products, public goods, and a tendency to produce undesirable goods. In addition, there are other market failures that may require government intervention to address. Governments may also need to intervene in the for whom question to ensure an equitable distribution. In a pure market system only those with income will be able to buy goods and as such some groups may be forced to go without. The other side of this is that markets are argued to be more efficient and thus minimise resources wastage.

Exercise 1.3 Using PPC's to model Economic Concepts and Change

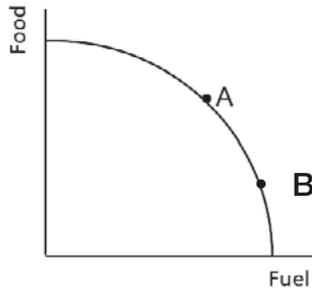
1. Complete the table below by using the PPC model to illustrate and assist in explaining the identified concept.

Concept	Illustrated on PPC	Explanation
Opportunity Cost		<p>Movement from A to B increases the production of consumer goods but results in a loss of capital good production. The opportunity cost is a to b Capital goods.</p>
Scarcity		<p>Point B is unattainable due to scarcity of resources. Production is limited to the PPC due to the scarcity of resources.</p>
Productivity Increase		<p>Productivity is output per unit of input. An increase in productivity thus expands the potential capacity of production shifting the PPC outwards to the right. It is assumed here that productivity relates to the production of both goods, if it was particular to one good type then the PPC would only shift for that good.</p>
Economic Growth		<p>A movement from point A to point B signifies an increase in the production of goods and services and thus actual economic growth. The movement of the PPC outwards to the right signifies an increase in potential capacity and thus potential growth</p>
Economic Efficiency		<p>Economic efficiency refers to minimising wastage of resources. Thus a movement from A to B which reduces the number of unemployed resources also indicates improved economic efficiency.</p>

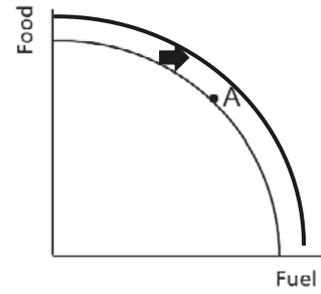
2. The PPC's below represent Country A which can produce only food or fuel. Illustrate on the PPC's the impact of the individual identified change in Country A.



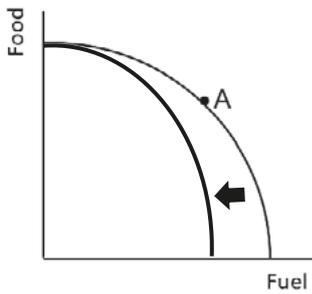
Canola crops destroyed by cyclone, impacts both industries



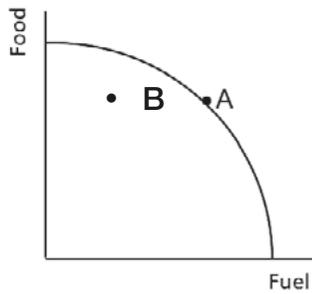
Consumer demand for Food rises significantly



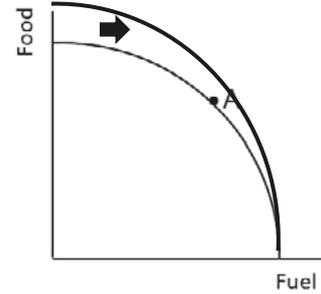
Net migration into Country A



Infrastructure essential for fuel production is destroyed by fire



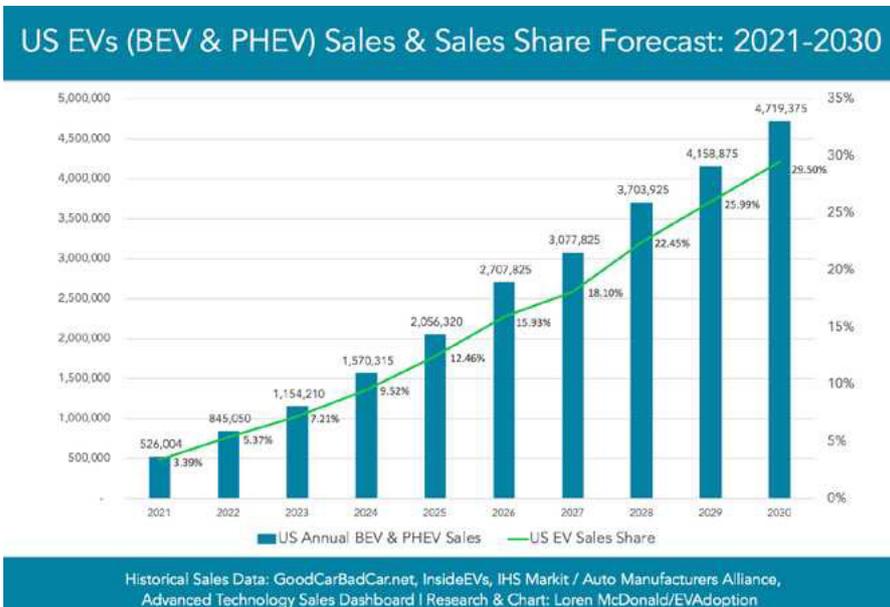
Increasing unemployment in the fuel industry



Excellent growing conditions increase food yields.

Exercise 2.1 Mean, Median and Trends in Data

1. The following graph indicates the actual and projected trends in Electrical Vehicle (EV) Sales in the USA



- (a) Describe what the above data suggests about the Vehicle market in the USA.

Suggests that there is a growing number of EV sales each year and that this is projected to increase. Also shows that EV's as a percentage of all vehicles on the road has risen likely to exceed 30% by 2030.

- (b) Outline how the trend in the above data could be used by car manufacturers in the USA.

Would suggest that manufacturers should switch production to EVs away from petrol vehicles as EV sales are rising and based on these trends will be the dominant vehicle on the road.

- (c) Identify how the trend in the above data would impact two other businesses.

Business that could be impacted include Service Stations, Mechanics, Retailers of Cars, Electricity providers, charging station providers, roadside assistance services, insurance firms, oil companies.

- (d) State how future consumers of vehicles may react to the trend in the above data.

Those with current petrol cars may delay purchase for a period to wait for prices of EVs to fall, others may consider buying an EV for their next vehicle. Those purchasing right now may still buy petrol vehicles on the basis that they will have 10+ years before electrical vehicles dominate the market.

2. The following graph indicates the portion of households (%) that have solar panels connected to their homes by Australian State.



- (a) Estimate the mean and median portion of household across Australia that used solar electricity.

Mean 13.25% Median 10.25%

- (b) Outline which of these measures is a better reflection of solar electricity use by Australian households.

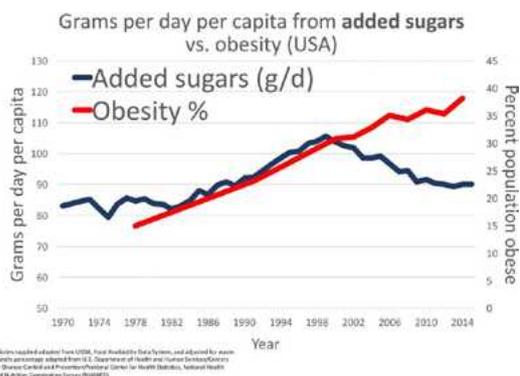
Given the right skew in the data (with 5 values below the mean) it would be better to use the median as this reduces the impacts of the outliers particularly SA and Qld.

- (c) Outline how Australia's Federal government may use the information to encourage solar panel installation in homes.

The government can target areas with policies for example advertising could be more prevalent in states with low uptake, whilst subsidies could also be targeted at these areas. For infrastructure development the government could prioritise areas like SA who have the higher uptake first.

Exercise 2.2 Correlation and Causation

1. The following graph indicates the relationship between added sugars and obesity in the USA.



- (a) State the relationship (correlation) that exists between added sugar and obesity in the USA up until 1999.

Direct or positive

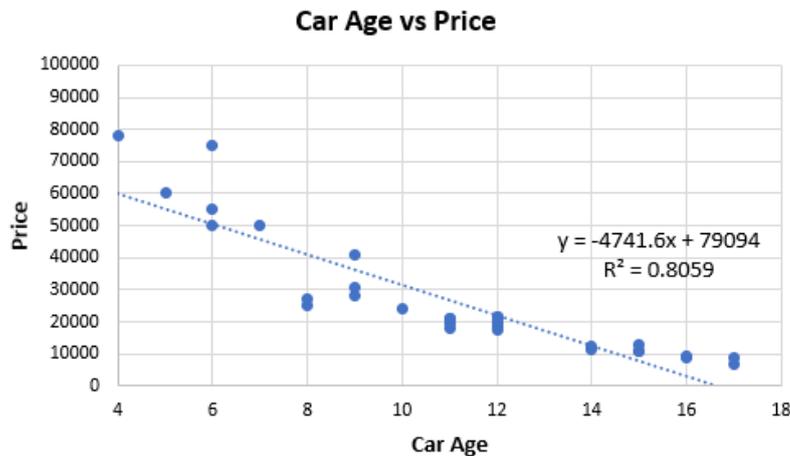
- (b) State the relationship (correlation) that exists between added sugar and obesity in the USA after 1999.

Inverse or indirect

- (c) Use this data to explain why using correlations to formulate social policy is problematic.

Correlation is not the same as causation and what this data suggests is that there is a strong positive correlation up to 1999 suggesting perhaps that obesity rates are related to added sugar. Formulating policy to reduce sugar in take would therefore seem appropriate. However, after 1999 the relationship becomes negative implying despite lower sugar intake obesity rose. This may suggest that there is no cause and effect present or that other factors are more influential in the cause of obesity than sugar intake. Government policy should therefore not target sugar intake but what is actually the primary cause of obesity.

2. The following graph indicates the relationship between Car age and Resale prices.



- (a) State the relationship (correlation) that exists between Price and Car Age

Inverse or indirect

- (b) Explain the meaning of the R^2 value.

An R^2 value of 0.8059 indicates that 80.6% of the variance of price is explained by the variation in the age of the vehicle.

- (c) Explain whether the R^2 value would differ if the data set only included values up to seven years.

It is likely that there would be a weaker relationship a lower R^2 value, this is shown as this data appears to be more dispersed

- (d) Evaluate the statement “based on the data a seller of this model of car should only sell after holding the vehicle for more than 14 years”.

It does appear that the data suggests that after 14 years the value of the car does not fall as quickly, there are cars at 17 years of age that have the same price as 14-year-old cars. However, cars up to 6 years of age seem to maintain value well perhaps suggesting that sales should occur within this time frame. There is however quite a variance in these values as 6-year-old cars range from \$75000 to \$50000. It is evident that between 8 and 12 years the prices are much closer together showing less variation this would suggest that around 12 years of age would be the better time to sell before prices fall again. There are arguments for selling before year 4 close to year 12 and again at 16 years tending to not support the statement.

- (e) (i) Identify two outliers to the data set

Year 6 \$75000 and Year 8 \$25000

- (ii) Outline one reason that could account for the outlier identified in part (i).

Correlation is not causation and whilst generally vehicles will travel more kilometers or miles as they age the consistency of usage will vary across owners. Distance travelled and price may be a better measure. Perhaps the 6-year-old car had travelled very few kilometers so was the equivalent of a 4-year-old car in distance travelled. Alternately the 8-year-old car may have travelled more kilometers than the 9- and 10-year-old cars reducing its price.

Exercise 3.1 Changes in Demand and Supply and Consumer and Producer Surplus

1. Use the demand and supply schedules in the table below to answer the following questions.

Mens Hair Cuts		
Price \$	Quantity Demanded (per day)	Quantity Supplied (per day)
110	20	320
90	70	270
70	120	220
50	170	170
30	220	120
10	270	70

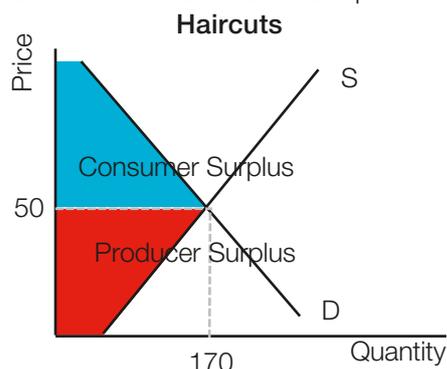
- (a) State the equilibrium price.

\$50

- (b) State the quantity that will be traded at this price.

170

- (c) Sketch a demand and supply diagram that indicates the equilibrium position (identified in parts a and b) and shade the consumer and producer surplus on this diagram.



- (d) Outline the market outcome if prices were set at \$70.

Quantity demanded 120 quantity supplied 220 therefore a surplus of 120

- (e) Outline the impacts to consumer surplus and producer surplus if price is at \$70.

Consumer surplus will decrease as there is a higher price and less quantity traded. Producer surplus will rise from the higher price but will also fall due to the lower quantity. Visually it would appear that the gain would be higher than the loss resulting in producer surplus rising. (This could be mathematically calculated but is not in the course)

- (f) Explain how the price mechanism works to return the market to equilibrium if price was currently at \$70.

Due to the surplus producers would be encouraged to lower price to remove excess as price begins to fall it signals consumers and producers to alter their behaviour. The falling price also creates an incentive for both consumers and producers to alter behaviour. As price falls consumer demand will expand as there is more utility at lower prices, supply will contract as there is less profit this will continue until equilibrium is achieved.

- (g) Outline the market outcome if prices were set at \$10.

Quantity demanded 10, quantity supplied 310 therefore a shortage of 300

- (h) Outline the impacts to consumer surplus and producer surplus if price is at \$10.

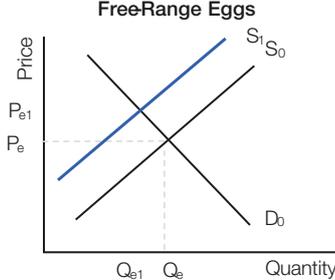
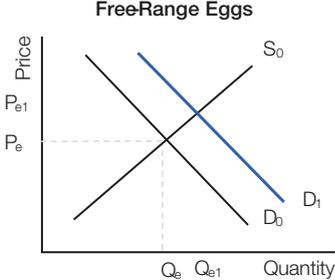
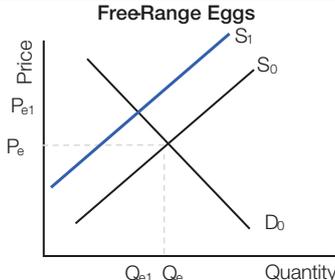
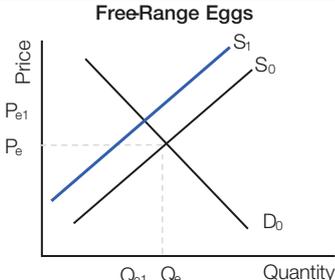
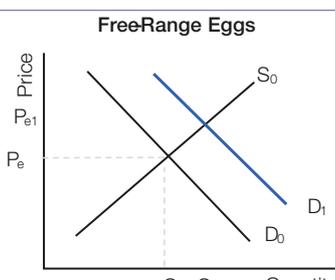
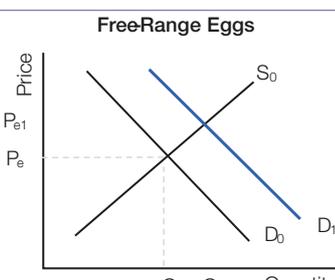
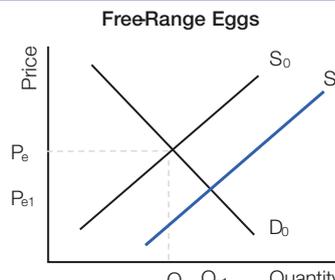
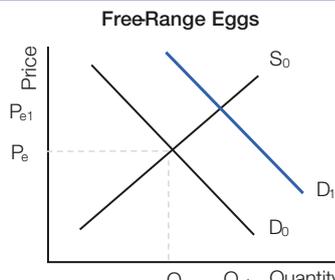
Producer surplus will decrease as there is a lower price and less quantity traded. Consumer surplus will rise from the lower price but will also fall due to the lower quantity. Visually it would appear that the gain would be less than the loss resulting in consumer surplus falling. (This could be mathematically calculated but is not in the course)

(i) Explain how the price mechanism works to return the market to equilibrium if price was currently at \$10.

Due to the shortage consumers would be encouraged to pay more to secure the product, as price begins to rise it signals consumers and producers to alter their behaviour. The rising price also creates an incentive for both consumers and producers to alter behaviour. As price rises consumer demand will contract as there is less utility at higher prices, supply will expand as there is more profit at higher prices, this will continue until equilibrium is achieved.

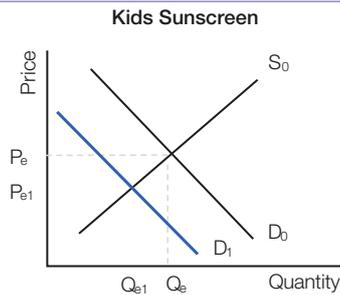
2. The following questions relate to the market for free-range eggs.

(a) Complete the following demand and supply models to show the impact of the event on the market.

<p>(i) Price of Transport rises due to diesel fuel price rise.</p> 	<p>(ii) Many Bakeries reopen after closing for COVID19.</p> 
<p>(iii) Avian Flu outbreak causes culling of Chickens.</p> 	<p>(iv) Feed prices for chickens rise by 70%</p> 
<p>(v) Other sources of protein have seen significant relative cost increases.</p> 	<p>(vi) Government Ban on cage farmed eggs.</p> 
<p>(vii) Government to Subsidise Free Range Chicken Farmers.</p> 	<p>(viii) Reports from CSIRO show egg consumption has minimal to no impact on cholesterol levels.</p> 

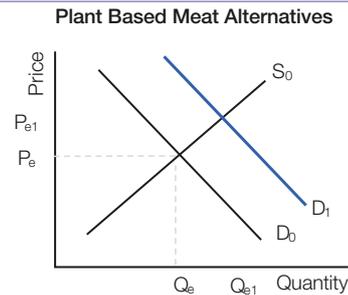
3. Given the news headline, illustrate and explain the likely change in the market for the identified product.

(i) Recall Issued for Popular kids Sunscreen.



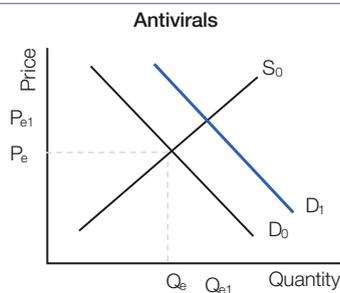
This will scare consumers who will change tastes and preferences away from kids' sunscreen. This causes a decrease in demand D to D_1 and therefore a fall in price and decrease in quantity traded.

(ii) Population turning Vegan.



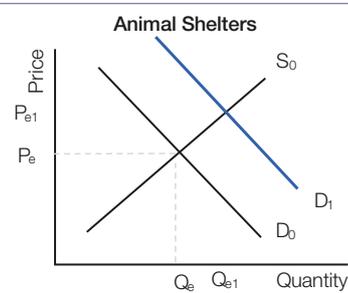
This will increase the number of consumers changing tastes and preferences towards plant-based alternatives. This causes an increase in demand D to D_1 and therefore an increase in price and an increase in quantity traded.

(iii) As Flu surges Pharmacies run out of Antivirals



This will increase the number of consumers wanting anti-virals. This causes an increase in demand D to D_1 and therefore an increase in price and an increase in quantity traded.

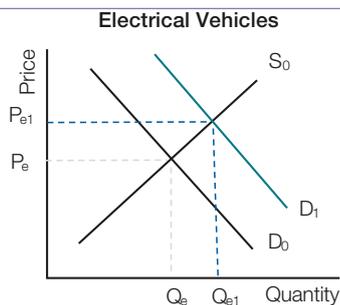
(iv) Animal Shelters see influx as tight rental markets force owners to give up pets.



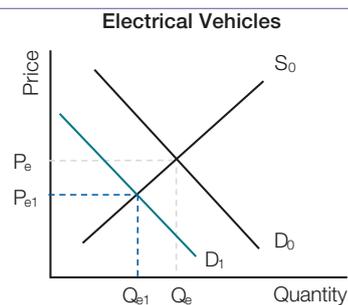
This will increase the number of consumers who need animal shelters. This causes an increase in demand D to D_1 and therefore an increase in price and an increase in quantity traded. (*Note theoretical Animal shelters often don't charge*)

4. The following demand and supply diagrams represent the market for Electric Vehicles. Briefly describe what may have caused the change in each of the scenarios illustrated. Part (i) has been done for you.

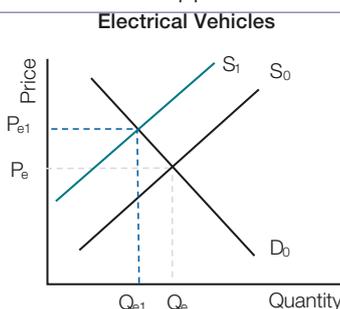
(i) Government Increases Petrol Taxes.



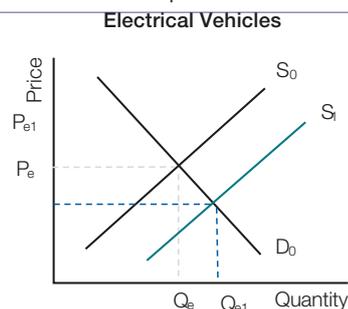
(ii) Consumer subsidies are removed.



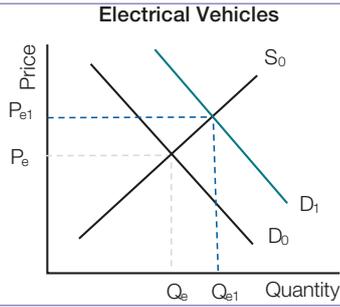
(iii) Disruption in material supplies.



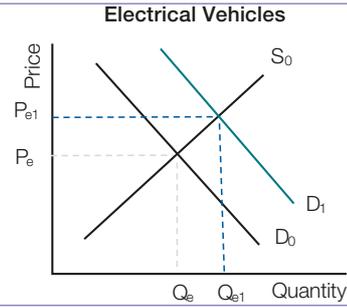
(iv) New manufacturers open



(v) Government bans petrol vehicles.



(vi) Electricity prices fall.



5. The following information relates to the market for Flu Vaccinations. Illustrate and explain the impact of each event on the market.

Event	Illustrated	Explanation
Flu Season Begins Early	<p>Flu Vaccinations</p> <p>The graph shows a supply curve S and two demand curves, D and D_1. D_1 is to the right of D, indicating an increase in demand. The initial equilibrium is at the intersection of S and D, with price P_e and quantity Q_e. The new equilibrium is at the intersection of S and D_1, with a higher price P_{e1} and a higher quantity Q_{e1}.</p>	To avoid getting sick consumers begin to get vaccinated increasing demand and causing prices to rise and quantity traded to increase
Several deaths related to the Flu are heavily publicised in the media.	<p>Flu Vaccinations</p> <p>The graph shows a supply curve S and two demand curves, D and D_1. D_1 is to the right of D, indicating an increase in demand. The initial equilibrium is at the intersection of S and D, with price P_e and quantity Q_e. The new equilibrium is at the intersection of S and D_1, with a higher price P_{e1} and a higher quantity Q_{e1}.</p>	Increased fear of dying causes consumers to get vaccinated increasing demand and causing prices to rise and quantity traded to increase
Government Regulations change to allow Flu vaccines to be administered at Pharmacies.	<p>Flu Vaccinations</p> <p>The graph shows two supply curves, S and S_1, and a demand curve D. S_1 is to the right of S, indicating an increase in supply. The initial equilibrium is at the intersection of S and D, with price P_e and quantity Q_e. The new equilibrium is at the intersection of S_1 and D, with a lower price P_{e1} and a higher quantity Q_{e1}.</p>	Increase in availability increases the number of vaccines that can be administered. This increases supply and causes prices to fall, and quantity traded to increase.
Adverse reactions to other vaccines cause concerns for consumers.	<p>Flu Vaccinations</p> <p>The graph shows a supply curve S and two demand curves, D and D_1. D_1 is to the left of D, indicating a decrease in demand. The initial equilibrium is at the intersection of S and D, with price P_e and quantity Q_e. The new equilibrium is at the intersection of S and D_1, with a lower price P_{e1} and a lower quantity Q_{e1}.</p>	Increased fear of side effects discourages consumers from getting vaccinated decreasing demand and causing prices to fall and quantity traded to decrease
Shortage of hens' eggs impacts vaccine production.	<p>Flu Vaccinations</p> <p>The graph shows two supply curves, S and S_1, and a demand curve D. S_1 is to the left of S, indicating a decrease in supply. The initial equilibrium is at the intersection of S and D, with price P_e and quantity Q_e. The new equilibrium is at the intersection of S_1 and D, with a higher price P_{e1} and a lower quantity Q_{e1}.</p>	Decreased availability of resources causes a decrease in supply and results in prices rising and quantity traded decreasing.

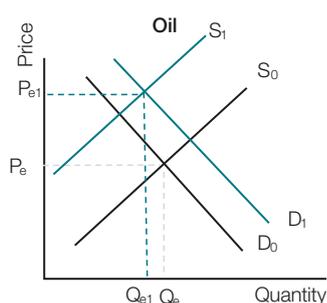
6. Outline how price adjusts to return a market to equilibrium if there is a shortage.

Due to the shortage consumers would be encouraged to pay more to secure the product, as price begins to rise it signals consumers and producers to alter their behaviour. The rising price also creates an incentive for both consumers and producers to alter behaviour. As price rises consumer demand will contract as there is less utility at higher prices, supply will expand as there is more profit at higher prices, this will continue until equilibrium is achieved.

7. Refer to the extract to answer the following questions.

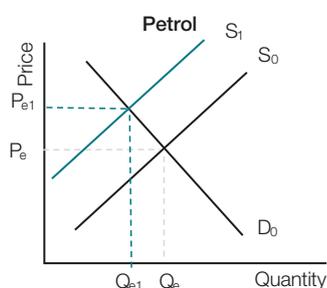
Global oil prices have surged due to a multitude of factors in the global economic landscape. Whilst energy consumption from major economies where oil is a contributor to energy generation, has begun to increase, supply disruptions have played a much more significant role in the market. Global conflict, production cuts, and natural disasters have all impacted oil extraction and transportation.

- (a) Use a demand and supply model to illustrate and assist in explaining the impact of the events identified in the extract on the market for Oil.



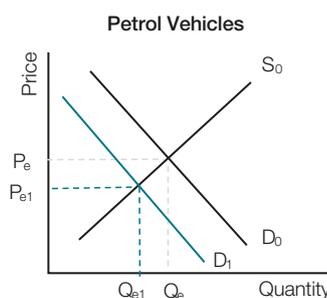
There have been significant decreases in supply caused by a variety of factors shifting S to S_1 . There has also been an increase in demand as consumption rises D to D_1 . As both a decrease in supply and an increase in demand result in a price rise there is a large increase in price to P_{e1} . However, the decrease in supply results in quantity traded falling whilst the increase in demand results in quantity traded rising, because the supply decrease is larger the net effect is a decrease in quantity traded to Q_{e1} .

- (b) Explain and illustrate the impact identified in part (a) on the market for Petrol. (Note: Oil is used in Petrol production).



Oil is a cost of production for petrol, as it rises supply of petrol will decrease S to S_1 . As a decrease in supply causes a shortage at the original equilibrium price P_e it results in a price rise to P_{e1} . The decrease in supply also results in quantity traded falling to Q_{e1} .

- (c) Explain and illustrate the impact of a change in Petrol Prices identified in part (b) on the market for Petrol Vehicles.

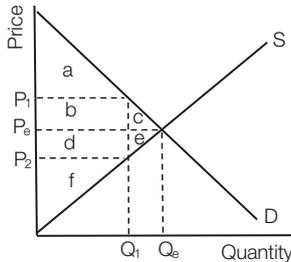


As petrol and vehicles are complementary goods an increase in the price of petrol will result in a decrease in the demand for vehicles to D_1 . The decrease in demand results in a surplus at the original equilibrium price P_e so prices fall to P_{e1} , and quantity traded also decreases to Q_{e1} .

8. Refer to the following diagram to answer the questions that follow.
 (a) Identify the consumer and producer surplus at each price level.

Price Level	Consumer Surplus	Producer Surplus
P_1	a	b+d+f
P_e	a+b+c	d+e+f
P_2	a+b+d	f

- (b) Using the information from part (a) to assist, explain at which price level allocative efficiency is attained.



Allocative efficiency is attained when social surplus (the sum of consumer and producer surplus) is maximised. This occurs at equilibrium as $a+b+c+d+e+f$ is larger than at any other price level.

Exercise 3.2 Price Elasticity of Demand

1. Complete the table below by stating the likely Price Elasticity of Demand (PED) for the identified product and outline the main factor/s that determines the PED.

Product	PED	Factor/s Determining
Legal Services	Less than 1 - inelastic	Extent of necessity
Coffee	Less than 1 - inelastic	Habitual and addictive
Haircuts	Greater than 1 - elastic	Time frame of purchase can be extended.
Restaurant Meals	Greater than 1 - elastic	Availability of substitutes
Insulin	Less than 1 – highly inelastic	Extent of necessity (absolute necessity for diabetics) Lack of substitutes
Overseas Holiday	Greater than 1 - elastic	Relative cost is high and availability of substitutes.
Sugar	Less than 1 - inelastic	Habitual and addictive
Toothpicks	Less than 1 – highly inelastic	Low relative cost

2. Refer to the estimates of the PED of petrol in the Short-run and Long-run when answering the following questions.

PED Petrol in Short run	0.11
PED Petrol Long-run	0.18

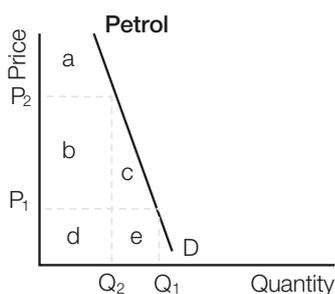
- (a) Compare and contrast the PED of petrol in the short run and long run.

As the PED coefficient is less than 1 in both time frames the PED for petrol is inelastic. Both values are close to zero signifying highly inelastic demand in the case of the short run a 1% increase in price leads to only a 0.11% fall in demand for petrol. In the long run the PED increases becoming slightly less inelastic at 0.18.

- (b) Outline the determinants of PED that impact most significantly on Petrol.

Petrol has very few substitutes and is a complementary good to vehicles which are more expensive creating an extent of necessity.

- (c) Use the diagram below to assist in explaining the impact on total revenue of petrol prices rising from P_1 to P_2 .



As demand is relatively price inelastic an increase in price will increase total revenue. At P_1 revenue is $d+e$ when price rises to P_2 revenue becomes $b+d$, whilst area a is lost due to the fall in quantity traded area b is gained as price rises. Area b is larger than area e resulting total revenue rising.

3. Refer to the demand schedule below to answer the following questions.

Price (\$)	Quantity Demanded
10	1800
20	1600
30	1400
40	1200
50	1000
60	800
70	600
80	400

- (a) Use the total revenue method to justify the price elasticity of demand from \$30 to \$40.

At \$30 total revenue is (30×1400) \$42000 at \$40 total revenue is (40×1200) \$48000. As total revenue increases as price rises it means the increase in price (adding to total revenue) must be larger than the decrease in quantity (which causes revenue to fall), thus demand must be price inelastic between \$30 and \$40.

- (b) Use the total revenue method to justify the price range where the PED is unitary.

Price (\$)	Quantity Demanded	Total Revenue
30	1400	42000
40	1200	48000
50	1000	50000
60	800	48000

Revenue is maximised when PED equals 1. This would appear to occur at a price of \$50 and a revenue of \$50000.

- (c) Explain why the PED is not constant along the length of this demand curve.

PED is not constant as there is an inverse relationship between price and quantity demanded. The % change in Price and the % change in quantity demanded will therefore increase and decrease along the length of a demand curve resulting in differing PED's at different price levels.

4. The following table shows the estimated PED of Food for 3 countries.

Year	PES
USA	0.17
Spain	0.39
Tanzania	0.78

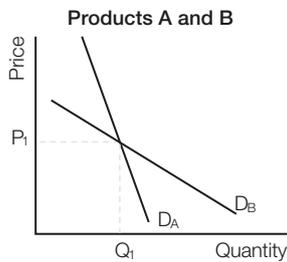
- (a) Compare and contrast the PED coefficients for food for each of the three countries.

As the PED coefficient is less than 1 in all countries the PED for food is inelastic. However, in the USA the PED is highly inelastic whereas it becomes less inelastic in Spain (0.39) and less inelastic again in Tanzania (0.78).

- (b) Referring to the characteristics that determine PED justify why the PED for food varies across the three countries.

Food is a necessity hence the PED is less than 1 in all three countries. However relative cost impacts PED and as the relative cost rises (price as a portion of Income) the PED becomes more elastic. The USA would have the highest income levels of the three countries followed by Spain and then Tanzania. This would mean food prices would be a higher portion of income (relative cost) in Tanzania resulting in a less inelastic PED.

5. The following model illustrates the demand curves for a branded product and a generic product in the same market.



- (a) Justify which of these two demand curves represents the branded product.

Demand curve D_A would be the branded product as branding reduces the closeness of substitutes it decreases the PED makes it more inelastic.

- (b) Explain referring to the concepts of PED and total revenue which of these two products will be sold at a price above P_1 .

As demand is relatively price inelastic for D_A an increase in price will increase total revenue therefore it will likely be sold at a price above P_1 .

6. The following table represents fictional PED's related to cars.

Product	PED
Cars	0.39
SUVs	0.75
Subaru SUVs	1.93

- (a) State the meaning of the PED coefficients for Cars and Subaru SUV's.

The PED for cars is inelastic and a 1% increase in price will lead to a 0.39% fall in quantity demanded. For Subaru SUV's the PED is elastic and a 1% increase in price would lead to a 1.93% fall in quantity demanded.

- (b) Explain why the PED coefficients for SUVs and Subaru SUVs vary.

The PED for SUV's is inelastic whereas for Subaru SUVs it is elastic. This would be because the number of substitutes rises as we narrow the market down. There are more substitutes for Subaru SUV's (all other brand SUV's) than there are for SUV's as a category.

Exercise 3.3 Price Elasticity of Supply

1. Complete the table below by stating the likely Price Elasticity of Supply (PES) for the identified product and outline the main factor/s that determines the PES.

Product	PES	Factor/s Determining
Nuclear Reactors	Less than 1 - inelastic	Long production cycle
Dental Services	Less than 1 - inelastic	Long production cycle
Limited Edition Coins	Less than 1 – perfectly inelastic	Fixed supply
Uber Services	Greater than 1 - Elastic	Mobility of resources, Short production cycle
Fidget Spinners	Greater than 1 - Elastic	Short production cycle

2. Refer to the estimates of the PES of Grapes in the Short-run and Long-run when answering the following questions.

PES Grapes in Short run	0.432
PES Grapes Long-run	1.045

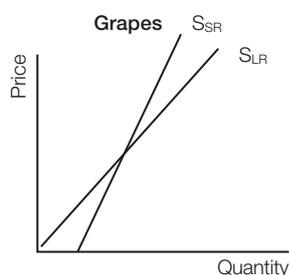
- (a) Compare and contrast the PES of Grapes in the short run and long run.

As the PED coefficient is less than 1 in short run time PES of grapes is inelastic. In the long run the value is greater than 1 so the PES is elastic although very close to unitary. Grapes PES increases in the long run.

- (b) Outline the determinant of PES that causes the change identified in the table.

Mobility of resources has changed so that resources can now be more easily transferred from one area of production to the other.

- (c) Illustrate on the following model the Supply Curves for Grapes in the Short-run and Grapes in the Long run.



3. The following table shows fictional changes in the PES of Wine for 3 consecutive years.

Year	PES
1	0.8
2	1.2
3	0.9

- (a) State the meaning of the PES coefficients of years 1 and 2.

In year 1 the PES is inelastic and a 1% increase in price leads to a 0.8% increase in quantity supplied. In year 2 the PES is elastic and a 1% increase in price leads to a 1.2% increase in quantity supplied.

- (b) Referring to the determinants of PES, explain how and why the PES coefficients for wine can vary from year 2 and 3.

As PES becomes more inelastic it could be related to less ability to store stock or less availability of resources.

4. Refer to the extract when answering the following questions.

Avocados are unusual compared to other fruits such as peaches as they do not ripen on the tree, they only ripen once they are picked. This allows growers to delay harvest to gain potentially higher prices. However, once picked avocados generally ripen quickly over a 3 day to 2-week period. Unlike other fruits like apple,

Avocados can-not be stored in refrigerated conditions to delay ripening they simply become mushy unripened wastage. Whilst the length of time for ripening cannot easily be slowed, it can be increased, by altering the ripening conditions including placing them in paper bags next to bananas. The main harvest season for Hass avocados (the main variety) in the Southern Hemisphere is September to April.

- (a) Outline how the unusual ripening characteristic of Avocados is likely to alter the PES compared to other fruits such as peaches in the market period.

Ability to keep them on the tree allows for them to be stored longer thus PES would be more elastic.

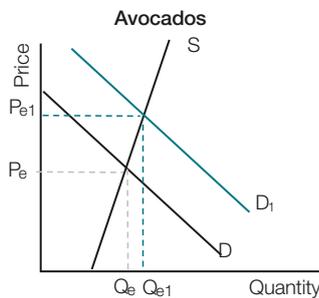
- (b) Explain how the likely PES of Hass avocados will vary between the time periods September to April and May to August.

Less availability of resources in May to August and avocados cannot be put into long-term storage resulting in a more inelastic PES. (Note: it is more likely to impact the total supply (decrease supply) rather than impact the PES)

- (c) Compare and contrast the PES of apples and avocados once fruits have been picked.

Once picked the PES of apples will be relatively more elastic as they can be stored for longer periods.

- (d) Use an appropriate demand and supply model for Avocados to assist in explaining why changes (increases or decreases) in demand will have significant impacts on Avocado prices.



An increase in demand from D to D_1 will cause prices to rise from P_e to P_{e1} . This is a large increase in price relative to the increase in quantity traded Q_e to Q_{e1} . This is because supply is relatively price inelastic, so increases in price lead to relatively smaller changes in quantity traded.

Exercise 4.1 Market Structures

1. Referring to the characteristics that define market structures, complete the following table by stating and justifying the market structure that exists in each of the following markets.

Market	Market Structure	Justification – Defining Characteristics
Banking	Oligopoly	Dominated by 4 large banks (Australia) large barriers to entry
Doctors (GP's)	Monopolistic Competition	Large number of suppliers with slightly differentiated services
Public Transport	Monopoly	1 firm operating as a government monopoly, or outsourced to 1 firm
Supermarkets	Oligopoly (duopoly)	Dominated by two large firms (Australia) high barriers to entry
Pizza Shops	Monopolistic Competition	Large number of firms selling differentiated products

2. Referring to the extract, answer the following questions.

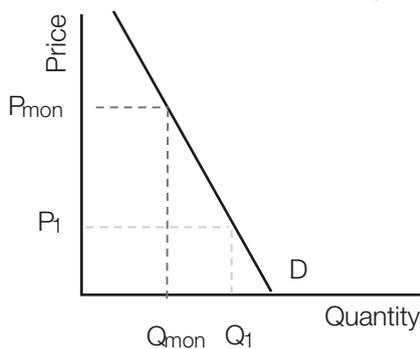
Airports in most cities in Australia tend to be Monopolies. They also tend to be heavily regulated by government especially in terms of pricing.

- (a) Explain why Airports are likely to be Monopolies in most cities in Australia.

The tend to be natural monopolies where large economies of scale are necessary and dividing the market into two or three would prevent firms from being able to sell the quantity of goods necessary to make a profit. There are large, fixed costs involved in the establishment. More efficient for one firm to provide the entire market.

- (b) Using a model of a demand curve to assist, explain why there needs to be Government regulated control of prices for Airports in Australian cities.

Airport in an Australian City



Airports would face a highly inelastic PED and as such would be able to increase price without losing sales. This would result in a higher price for consumers P_{mon} and a smaller quantity traded in the market. Therefore, governments would need to regulate price to prevent the Airports from setting prices to high.

- (c) Discuss the extent to which Airport Monopolies in Australian cities meet the needs of producers.

Needs of producers – maximise profit. Airports will have economic profits in the long run as there are significant barriers to entry. They have market power so will be able to charge higher prices although this will be likely restricted by government regulations. The absence of competitors means they do not need to spend vast sums of money on advertising or innovation resulting in higher profits. Whilst they will compete for international flights with other cities, domestic travel has no competitors meaning they have an almost guaranteed customer base.

3. Referring to the extract, answer the following questions.

The smartphone market in the USA can be divided into three distinct markets, handset manufacturers, operating systems, and service providers. Each of these markets vary in terms of the firms operating within them yet have similar overall market structures, Handsets are dominated by Apple, Samsung, LG, and Motorola who between them account for an estimated 85% of market sales. In terms of operating systems two systems Google's Android and Apples iOS combine for over 95% of all systems used, whilst for service providers AT&T Mobility, Verizon Wireless, T-Mobile US, and Sprint Corporation combine for over 70%.

- (a) State the dominant market structure present in all three markets.

Oligopoly

- (b) Outline the characteristic that best allows for this classification.

Each market has a 4 firm concentration ratio above 70%

- (c) Referring to the market for service providers explain what other characteristics are likely to exist that would confirm the market structure identified in part a).

Barriers to entry such as infrastructure costs, branding, economies of scale. Economic (above normal) profits, high degree of non-price competition, potential for collusion.

- (d) Assess whether there will be significant price competition in the handset market.

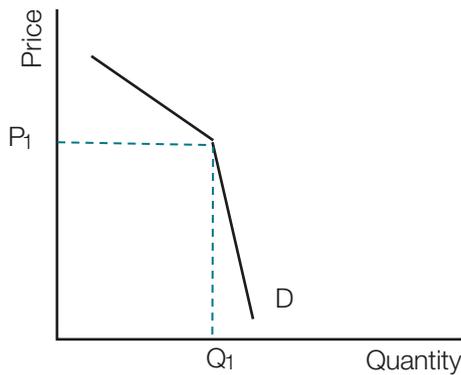
Price competition is unlikely in an oligopoly so whilst there will be variations in price and a range of prices reflecting potential quality, it is unlikely that firms will lower prices to capture market share as all firms would be worse off if there was a price war. There may be brief spells of price competition particularly around new model releases and retailers who are not the manufacturer may also occasionally discount prices.

- (e) Assess whether the handset market is likely to meet the needs of consumers.

The consumer wants to maximise utility, so will be impacted by higher prices negatively. However, there will be high degrees of innovation occurring which will enhance quality and consumer choice. In addition, firms will have economies of scale allowing them to lower prices for consumers. A range of firms competing will ensure quality and choice. Consumers will benefit from informative advertising in acquiring information to improve optimal choice.

- (f) Illustrate and explain the nature of the demand curve for Google’s android operating system.

Android Operating System



It will be a kinked demand curve representing the interdependent behaviour and competitive nature of oligopolies. Raising price above P_1 will result in loss of market share to competitors and hence revenue the PED is elastic above this point. Alternately lowering prices results in competitors also lowering prices, some minimal gain in sales occurs but there is a loss of revenue from lower prices. The PED is inelastic below P_1 . Price will therefore remain at or around this Nash equilibrium price.

4. The following table shows the market structure for retailers of soft drinks in three locations.

Location	Market Structure	Actual Location
1	Monopoly	Zoo
2	Oligopoly	Service Stations
3	Monopolistic Competition	Food Court

- (a) The three locations above are, a Zoo, a Food Court, and Service Stations on a busy corner. Complete the table above by identifying which location correctly matches the market structure.
 (b) Explain how the market structure for retailers of soft drinks can vary by location.

Varying the geographical dimensions of the market alters the number of competitors in the market. A zoo has no competitors for soft drinks as customers cannot leave the Zoo and return. Service stations have two competitors nearby whereas in a food court there are a larger number of firms selling the same product.

- (c) Explain why consumers may prefer to have a Monopolistic market over the other two alternatives.

Monopolistic Competition provides increased choice of seller and thus increased competition. Higher competition will result in lower prices which will add to utility.

5. Referring to the extract, answer the following questions.

The Chicken/Egg Problem with Google Search That Prevents Competition

BY FILIPPO LANCIERI

February 12, 2020

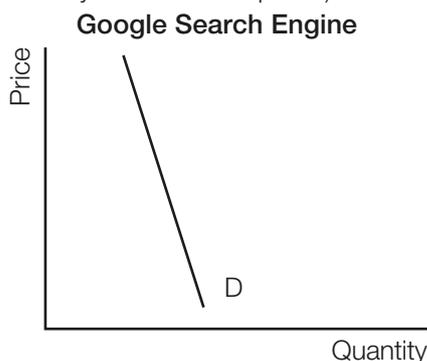
Google controls the British search market, according to the UK’s Competition and Markets Authority. Its 90 percent market share and profits from general search are protected by significant barriers to entry and expansion: economies of scale and scope, access to a large scale of query and click data and payments to Apple to have Google as the default search engine in its smartphones.

Source: <https://www.promarket.org/2020/02/12/the-chicken-egg-problem-with-google-search-that-prevents-competition/>

- (a) Justify the likely market structure present in the UK search market.

Monopoly – one firm Google dominates 90% of the market.

- (b) Given your answer to part a) illustrate the demand curve faced by Google in the UK search market.



- (c) Explain how the nature of the demand curve illustrated in part b) provides Google with Market power.

An inelastic PED allows for Google to raise price and only have a proportionately smaller fall in quantity traded. This allows the firm to set output at a profit maximizing level which will be above the equilibrium price that would exist in a perfectly competitive market.

- (d) Explain how economies of scale assist in allowing Google to maintain market power.

Economies of scale where Google can lower average costs over increased output provides a significant barrier to entry. Google's large size allows it to reduce its average costs to the point where they can provide products at a price that competitors who are smaller are unable to match.

- (e) Assess the impact that this market structure may have on innovation.

Innovation will only occur to act as a further barrier to new entrants. Whilst the firm has economic profits and the capacity to spend on R and D the lack of competition in the market may prevent this. However, the threat of a new product that replaces the existing dominant one will probably force Google to continue to innovate.

Exercise 4.2 Duopoly Behaviour

1. Referring to the extract and payoff matrix below, answer the following questions.

Our cosy duopoly's not going anywhere. (Extract)

Sergio Biggemann

March 11, 2022

Foodstuffs and Woolworths NZ have been for years enjoying a duopolistic situation that economic theory has well proven encourages collusion instead of competition, maximising profits for the sellers.

To protect their position, these dominant players have developed a habit of purchasing land where potentially a supermarket could be opened, building much higher entry barriers for potential competitors.

Source: Ideas Room <https://www.newsroom.co.nz/ideasroom/our-cosy-duopolys-not-going-anywhere>

Payoff matrix for Foodstuff and Woolworths NZ – Profits in \$millions

		Woolworths	
		Collude	Compete
Foodstuff	Collude	180 160	110 190
	Compete	190 100	120 110

- (a) Explain what is meant by a duopolistic situation.

Situation where 2 firms dominate the market, with a 2-firm concentration ratio over 70%.

(b) Explain why it is best for foodstuff and Woolworths to collude.

Competing creates profits of 120 and 110 whereas colluding creates profits of 180 and 160. Increases profits for both firms by 60 and 50.

(c) Outline why economic theory suggests that a Duopoly is likely to collude rather than compete.

The ability to collude long term relies on trust and maintaining trust between two firms is more likely than between 3 or more.

(d) (i) State the Nash Equilibrium position.

Compete/Compete 120 and 110

(ii) Explain why this is the Nash Equilibrium

Situation where neither firm can become better off by changing strategy if the other firm maintains theirs. If Foodstuffs switches to collude, they fall from 120 to 110. If Woolworths colludes, they fall from 110 to 100.

(e) Outline why both firms would buy land they are likely to not build on.

This acts as a barrier to entry for other firms allowing both firms to maintain economic profits in the long run.

2. Referring to the payoff matrix below, answer the following questions.

Payoff matrix for Firm A and Firm B – Profits in \$millions

		Firm B	
		Raise Prices	Maintain Prices
Firm A	Raise Prices	100 / 120	80 / 140
	Maintain Prices	120 / 100	85 / 105

(a) Identify and explain Nash Equilibrium.

Maintain/Maintain (85, 105) is the Nash equilibrium. A situation where neither firm can become better off by changing strategy if the other firm maintains theirs. If Firm A switches to raise price, they fall from 85 to 80. If Firm B switches to raise price, they fall from 105 to 100.

(b) Identify and explain Pareto efficiency.

Pareto efficiency is an outcome in which neither player can make themselves better off without making the other player worse off. At Raise/Raise there is Pareto efficiency as if firm A changes firm B loses (120 to 100). If Firm B changes firm A loses (100 to 80)

(c) Identify and explain the Dominant strategy for each firm.

In this case the Nash equilibrium is also dominant strategy for each firm. Both firms are better off by maintaining prices regardless of what the competitor does. For firm A (120 vs 100 and 85 vs 80) and for firm B (140 vs 120 and 105 vs 100)

(d) Provide justified reasoning for the payoffs present in the payoff matrix.

If one firm raises prices it is likely that the other firm could maintain them and capture market share resulting in an increase in revenue without higher fixed costs therefore profit will be higher for the firm who maintains. The firm who raised price however loses market share and thus revenue falls resulting in lower profits. If both firms raise price however they will see similar sales volumes but at higher prices increasing revenue and therefore profits for both firms (100 and 120).

3. Referring to each of the payoff matrices below, answer the following questions.

Each payoff matrix shows two competing firms Samsung and Motorola with Profits in millions of dollars.

In (i) firms are choosing to either focus on the Service Provider (phone company) or the End User (customer who uses the phone). In part (ii) they are deciding on whether to release a new phone.

<p>(i)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="2" rowspan="2"></td> <th colspan="2" style="text-align: center;"><i>Motorola</i></th> </tr> <tr> <th style="text-align: center;">Carrier Needs</th> <th style="text-align: center;">User Needs</th> </tr> <tr> <th rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Samsung</th> <th style="text-align: center;">Carrier Needs</th> <td style="text-align: center;">6 / 6</td> <td style="text-align: center;">4 / 16</td> </tr> <tr> <th style="text-align: center;">User Needs</th> <td style="text-align: center;">16 / 4</td> <td style="text-align: center;">10 / 10</td> </tr> </table>			<i>Motorola</i>		Carrier Needs	User Needs	Samsung	Carrier Needs	6 / 6	4 / 16	User Needs	16 / 4	10 / 10	<p>(ii)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="2" rowspan="2"></td> <th colspan="2" style="text-align: center;"><i>Motorola</i></th> </tr> <tr> <th style="text-align: center;">New Phone</th> <th style="text-align: center;">Maintain</th> </tr> <tr> <th rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Samsung</th> <th style="text-align: center;">New Phone</th> <td style="text-align: center;">190 / 0</td> <td style="text-align: center;">280 / 100</td> </tr> <tr> <th style="text-align: center;">Maintain</th> <td style="text-align: center;">160 / 260</td> <td style="text-align: center;">240 / 200</td> </tr> </table>			<i>Motorola</i>		New Phone	Maintain	Samsung	New Phone	190 / 0	280 / 100	Maintain	160 / 260	240 / 200
			<i>Motorola</i>																								
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		New Phone	Maintain																								
Samsung	New Phone	190 / 0	280 / 100																								
	Maintain	160 / 260	240 / 200																								

(a) State the Nash equilibrium, Pareto Efficiency, and Dominant Strategy of each firm.

<p>Nash Equilibrium (10 and 10) User Needs/User Needs</p> <p>Pareto Efficiency (16 and 4) (4 and 16) (6 and 6)</p> <p>Dominant Strategy User Needs</p>	<p>Nash Equilibrium (190 and 150) New Phone/New Phone</p> <p>Pareto Efficiency (240 and 200) (280 and 100) (160 and 260)</p> <p>Dominant Strategy New Phone</p>
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(b) Referring to Matrix (ii) explain how Samsung could convince Motorola to use a strategy of maintain whilst they use a strategy of New Phone.

Note this position is highly unlikely. To achieve New Phone/Maintain (280 and 100) there would need to be a cooperative strategy (collusion) between the firms. For Samsung they gain 90 million from the Nash position so the move makes sense but Motorola loses 50 million so they would not undertake this activity in a non-cooperative game. However, if Samsung was to provide 55 million of its 90 million gain to Motorola to continue to maintain the total payoff would become (225 and 155). Both firms would be better off than under the Nash position. This is still unlikely to occur though as if they are going to collude Maintain/Maintain still provides better outcomes. Samsung might be thinking long term because having a new model may allow the payoffs to change in the future.

4. Referring to the payoff matrix below, answer the following questions.

Each payoff matrix shows two competing firms Firm A and Firm B with Profits in millions of dollars, and each firm with two strategies (I or II and i or ii).

		<i>Firm B</i>	
		i	ii
Firm A	I	 9 5	 1 2
	II	 0 0	 6 10

Explain why there is no dominant strategy.

There is no dominant strategy because no one strategy provides a better outcome regardless of the actions of the other firm. For firm A strategy I is better if Firm B does i (9 vs 0) but if firm B does ii strategy II is better for Firm A (1 vs 6). This is true for firm B also, if Firm A goes strategy I Firm B is best with i (5 vs 2) but where A goes with II Firm B is better off with ii (0 vs 10).



(b) Identify the Nash equilibrium/s.

(9 and 5) Firm B cannot change to ii and become better off and Firm A has no incentive to change behaviour. Equally (6 and 10) could be a Nash Equilibrium as Firm A can not change to I and be better off and firm B has no incentive to change.

5. Referring to the payoff matrix below, answer the following questions.

The following matrix represents potential losses in billions of dollars for Boeing and Airbus based on whether they maintain or lower advertising during COVID restrictions.

		Boeing 	
		Maintain	Lower
Airbus 	Maintain	  1 1.2	  0.7 1.4
	Lower	  1.3 0.9	  0.8 1.0

(a) Explain why the Nash Equilibrium is the strategy combination of Maintain, Maintain.

Neither Boeing or Airbus can benefit from changing strategy if the other firm maintains theirs. Note the figures are losses so the best outcome is a smaller value. Boeing lowering price would increase their losses by 0.2 billion and if Airbus changes their strategy to lower their losses increase by 0.3

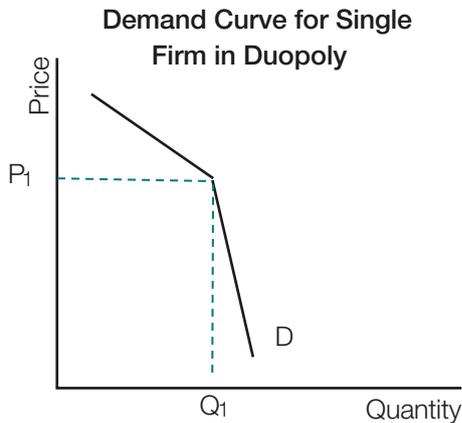
(b) Outline why the Nash Equilibrium is not pareto optimum.

The pareto optimum for both firms is, lower/lower as this results in losses of 0.8 and 1.0 which is lower for both firms than the Nash equilibrium.

(c) Outline why collusion is less likely to occur in this situation.

Collusion is less likely in this situation as there is uncertainty around the event that is causing the disruption. The expectation that this may be short term increases the incentive to 'cheat' the arrangement.

6. (a) Illustrate the demand curve faced by a single firm in a Duopoly



(b) Explain how this demand curve reflects the notion of Nash Equilibrium based on a payoff matrix.

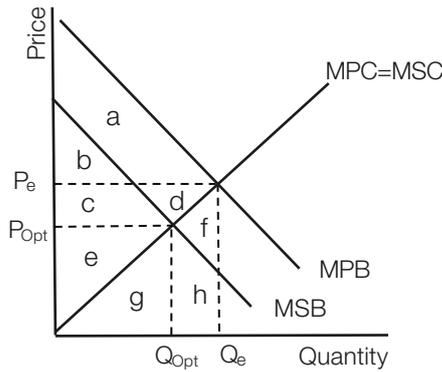
Raising price above P_1 will result in loss of market share to competitors and hence revenue the PED is elastic above this point. Alternately lowering prices results in competitors also lowering prices, some minimal gain in sales occurs but there is a loss of revenue from lower prices. The PED is inelastic below P_1 . Price will therefore remain at or around this Nash equilibrium price. Firms can not make themselves better off by raising price if the other firm maintains its current price.

Exercise 5 Market Failures

1. Complete the model to illustrate the existence of externalities in the identified market and assist in explaining how this results in a market failure.

Market	Externality Illustrated	Market Failure Explained
Honey Production		<p>Honey production provides external benefits including bees pollinating flowers in orchards. This results in the MSC being less than the MPC. The market under produces at Q_e and a DWL of area a exists.</p> <p><i>Because this refers to production it does not relate to health benefits that may arise from honey consumption</i></p>
Vaccinations		<p>Vaccinations not only reduce illness for the individual, but they assist in reducing transmission to others and increase worker productivity. These external benefits of consumption results in the MPB being less than the MSB. The market under produces at Q_e and a DWL of area a exists.</p>
Motor Vehicles		<p>Motor Vehicle use results in the release of pollutants that impact people who are not using the vehicle. Respiratory diseases are a negative externality associated with increased vehicle use. These external costs of consumption results in the MPB being more than the MSB. The market over produces at Q_e and a DWL of area a exists.</p>
Lead Production		<p>Lead production creates external costs including higher lead levels in peoples blood, and increased lead levels in soils and water ways. This results in the MSC being greater than the MPC. The market over produces at Q_e and a DWL of area a exists.</p>

2. Referring to the model below, answer the following questions.



- (a) State which of the following markets the above diagram is most likely to represent.
Airports, Steel, Sugar, Defence

Sugar

- (b) Identify with reference to the labeled areas each of the following.

Consumer Surplus	a + b
Producer Surplus	c + d + e
Externality	a + d + f
Dead Weight Loss	f

- (c) Explain why the market identified in part a) experiences a market failure.

Over production of goods results in an over allocation of resources to this market. There is a dead weight loss of area f and social surplus is not maximised.

- (d) Evaluate the statement that the most effective strategy to address the market failure in this market is through Government Regulation.

Regulation – could come in the form of restricting or banning use, this may work but need to consider Costs associated with enforcement and ensuring compliance. Incentives for compliance (motivate behaviour) needs to be sufficient. Non-compliance can still occur and not be detected. Restricting access to products can create parallel markets. Alternatives need to be compared looking at their strengths and weaknesses. Options would include Advertising and Taxation

3. Referring to extract below, answer the following questions.

Education – The Positives for Society

As an individual there are many direct benefits of completing secondary education and these benefits increase as your education journey through tertiary study is completed. Higher paid jobs, more career advancement opportunities are two of the obvious ones. But, like many your decision to complete education tends to ignore the spill over benefits to society. Higher educated people make better societal decisions, there are lower crime rates in educated populations and labour productivity increases benefiting business and consumers. Evidence even suggests that the pressure on the health system decreases as populations become more educated. Despite these external benefits providers of education such as schools and universities do not benefit from them in the form of revenue and consumers do not gain personally from them. The inability for these benefits to be internalised results in there being an under allocation of resources to this market.

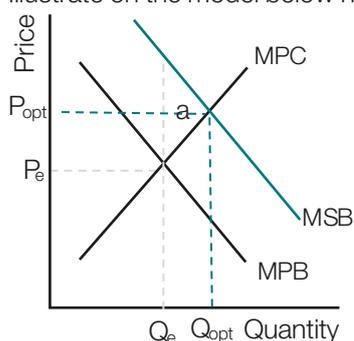
- (a) Identify the private benefits that arise from education.

Higher paid jobs, career advancement, social interaction

- (b) Identify the external benefits that arise from education.

Better decisions for society, increased worker productivity, lower crime rates

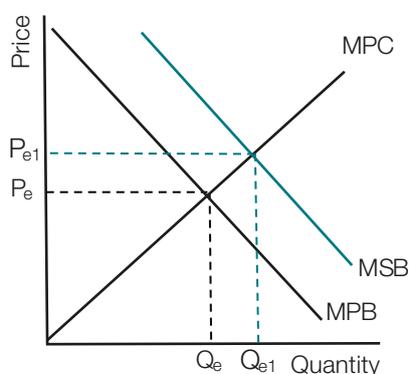
- (c) Illustrate on the model below how the existence of external benefits of education creates a market failure.



- (d) Outline one strategy that could be used to address this market failure.

Subsidy to consumers as there is an under consumption could provide subsidy to lower the cost and increase demand. (Producer subsidy, greater provision, advertising)

- (e) Illustrate how the strategy identified in part d) would impact the market for education.



4. Referring to extract below, answer the following questions.

Asymmetric Information – It occurs in almost every economic transaction.

When you think about asymmetry of information and transactions it is actually hard to come up with a real-world situation where it does not exist. So human behaviour has adapted and signalling and screening are now commonplace, and they have had success in many instances in reversing the problem of Lemons, quality products and good sellers are now dominating.

- (a) Explain what is meant by the term asymmetric information.

Asymmetric Information also known as information failure is the result of one side of the market having more information than the other side.

- (b) Explain how signalling and screening address the problem of asymmetric information.

Signalling allows sellers to provide information to consumers to assure of product quality. Screening allows consumers or producers to find and thus use information that reduces the potential for poor purchases.

- (c) Explain how warranties may be able to reduce the problem of Lemons.

Warranties act as a signal on quality providing assurance to the buyer that even if a lemon is purchased it will be able to be returned. Poor quality products are likely to be removed from the market as sellers would be unwilling to provide warranties for these.

- (d) Distinguish between Moral Hazard and Adverse selection using real-world examples.

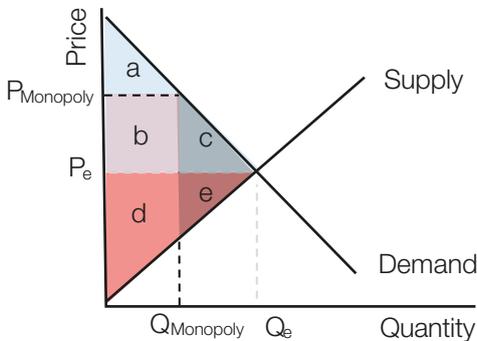
Moral Hazard a situation in which one party engages in risky behaviour or fails to act in good faith because it knows the other party bears the economic consequences of their behaviour Poor driving in insured rental cars is an example. Adverse Selection a situation in which one party in the market has relevant information the other party lacks. This increases the cost for the party who lacks the information, market for online sales.

5. Referring to extract below, answer the following questions.

Blame it on the Monopoly.

Recent research shows that electricity prices in South Australia, Victoria and Queensland are going to continue to rise. The same research suggests that for residential customers anywhere up to a third of bill rises could be avoided if monopoly electricity networks no longer allowed to extract supernormal (economic) profits.

(a) Explain using an appropriate diagram why higher prices charged in a Monopoly are considered a market failure.



At $P_{monopoly}$ there is an under provision of the good and a DWL of area c+e. There is an under allocation of resources to this market.

(b) Outline one strategy government might use to address this market failure.

Regulation, Government as a Competitor

6. Referring to extract below, answer the following questions.

Court finds nothing sweet about Peters icing out their competition. (Extract)

Joanne Jary and Kayla Plunkett - March 2022

Source: Holding Redlich <https://www.holdingredlich.com/court-finds-nothing-sweet-about-peters-icing-out-their-competition>

Peters Ice Cream received a just dessert from the Federal Court – a \$12 million penalty and a three-year competition law compliance program undertaking – after admitting to certain anti-competitive exclusive dealing behaviour in proceedings brought by the Australian Competition and Consumer Commission (ACCC).

(a) Explain what is meant by the term exclusive dealing.

Exclusive dealing an agreement where the seller forbids a buyer to purchase products from the seller's competitors.

(b) Outline how exclusive dealing may result in a market failure.

Will result in a lack of competition and therefore higher prices for consumers.

(c) Assess the effectiveness of using legislation and fines as a mechanism for reducing anticompetitive behaviour such as exclusive dealing.

Answers need to consider limitations including, Costs associated with enforcement and ensuring compliance. Incentives for compliance (motivate behaviour) needs to be sufficient. Non-compliance can still occur and not be detected. Restricting access to products can create parallel markets

7. (a) Complete the table by identifying (ticking) which of the following are public goods.

Education	
Defence	✓
Streetlights	✓
Roads	
Healthcare	

(b) Referring to your answers to part a) explain why one of the products is not a Public good.

Education is excludable therefore is not a Public good

- (c) Explain using one of the Public goods from part a) how this results in a market failure.

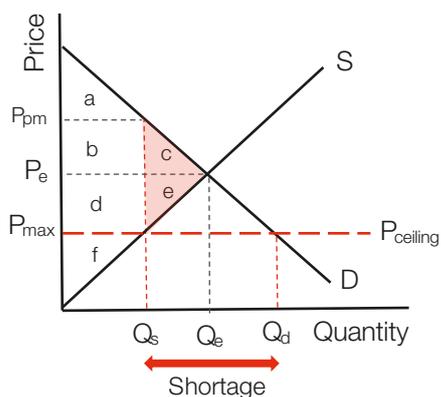
Non excludable nature creates free riders therefore private firms cannot charge a price, meaning no profit. These goods will therefore not be provided by the free market.

- (d) Justify the most appropriate solution to the market failure identified in part c).

Choices include Government provision or outsourcing or subsidising private firms. Consider the positives and negatives

Exercise 6 Government Intervention in Markets

1. The following demand and supply diagram represent the market for Rental accommodation in a city in the USA.



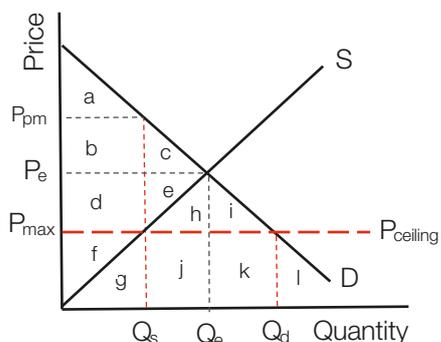
- (a) Complete the diagram above by illustrating the impacts of the introduction of a price ceiling.
 (b) Explain how a parallel market may emerge for rental accommodation in this market.

People could rent the property at P_{max} then sublet it at P_{pm} gaining profit from doing so.

- (c) Evaluate the effectiveness of a price ceiling in this market.

Creates inefficiencies, a shortage arises, and parallel markets may arise. Even for the consumer they may not be able to get access to the good even though it is now affordable.

2. Referring to the model below, answer the following questions.



- (a) After the introduction of the price ceiling and assuming no parallel market, identify with reference to the labelled areas each of the following.

Consumer Surplus	a+b+d
Producer Surplus	f
Dead Weight Loss	c+e

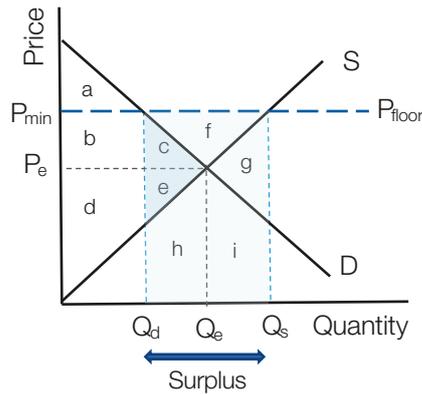
- (b) Identify how the emergence of a parallel market at P_{pm} impacts consumer and producer surplus.

Consumer Surplus	Decrease to a, loss of b+d
Producer Surplus	Increases to b+d+f, gain of b+d

- (c) Explain why the introduction of price ceiling creates allocatively inefficiency.

Creates a shortage and an under allocation of resources to the market there is a DWL of c+e.

3. The following demand and supply diagram represent the market for wool in Australia in the 1980's.



- (a) Complete the diagram above by illustrating the impacts of the introduction of a price floor.
- (b) Explain why a price floor leads to a disequilibrium in the market.

Higher prices increase supply but also result in less demand creating a surplus

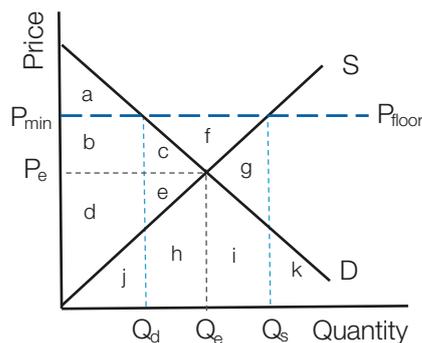
- (c) Outline the government responses to the disequilibrium explained in part b).

Purchase and stockpile, dump internationally destroy.

- (d) Explain why a government would implement a price floor if it creates a disequilibrium.

Support supplier income, guarantee a price that is sufficient to maintain the producer in the market guaranteeing the long-term supply.

4. Referring to the model below, answer the following questions.



- (a) After the introduction of the price floor and assuming no government purchases the surplus, identify with reference to the labelled areas each of the following.

Consumer Surplus	a
Producer Surplus	b+d
Dead Weight Loss	c+e

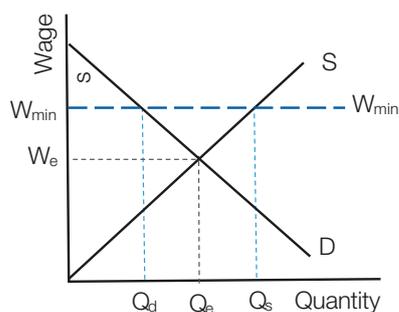
- (b) Analyse what occurs to the dead weight loss if the government does buy the surplus.

Dead Weight Loss	Increases to c+e+h+i+g
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- (c) Evaluate whether stockpiling is the most effective response from government in dealing with the surplus created.

If demand will increase in the future allowing price to rise then it would be viable as the stockpile could be resold in future periods. However, there are cost associated with stockpiling including purchase costs, storage costs and insurance. It is also highly inefficient especially if demand does not increase. Dumping in markets overseas will decrease international relationships and disposing of the surplus is also inefficient.

5. The following demand and supply diagram represent the market for labour.



- (a) Complete the diagram above by illustrating the impacts of the introduction of a minimum wage above W_e .
 (b) Explain why the introduction of a minimum wage is likely to lead to unemployment.

Creates a surplus as Q_s exceeds Q_d more people searching for jobs than firms looking to hire.

6. Referring to extract below, answer the following questions.

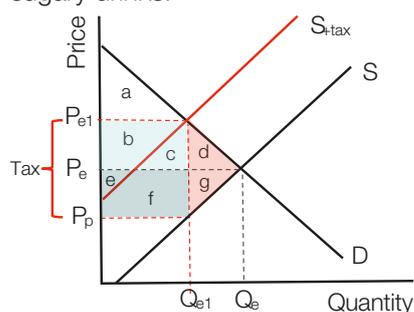
Taxes making Sugar Sourer.

Excessive sugar consumption is being blamed for obesity and diabetes and according to the WHO there is clear evidence that raising prices on sugary drinks by 20% will decrease its consumption by about 20%.

- (a) Explain why government are being encouraged to tax sugary drinks.

Attempt to decrease the consumption of a demerit good.

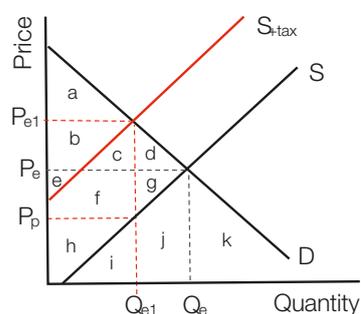
- (b) Complete the diagram below by illustrating the impacts of the introduction of a tax on the market for sugary drinks.



- (c) Evaluate the effectiveness of imposing a tax to achieve the outcome identified in part a).

Depends on the relative PED and the extent to which consumer respond to price changes. Sugar likely to be price inelastic so may not be effective. Also, will be regressive in nature impacting on those on low incomes more. Will raise revenue which could be used for other strategies such as advertising to further reduce demand.

7. Referring to the model below, answer the following questions.



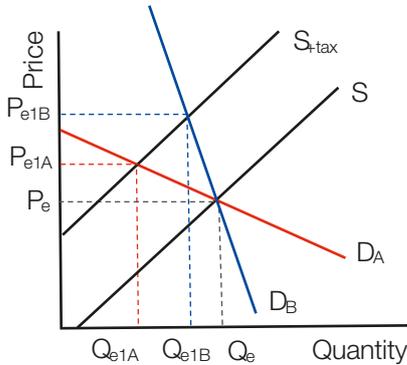
- (a) After the introduction of the excise tax and assuming a market with no market failures, identify with reference to the labelled areas each of the following.

Consumer Surplus	a
Producer Surplus	b+e
Dead Weight Loss	d+g
Government Revenue	b+c+e+f

(b) State the change to each of the following.

Producer Surplus	loss of f+g+h gain of b
Consumer Surplus	Loss of b+c+d

8. The model below shows the impact of an excise tax on the demand for tobacco of two differing consumer groups.



(a) Justify which of the demand curve is most likely to resemble long-term smokers.

D_B as they are addicted and therefore the extent of necessity rise meaning they will not respond to price rises as much as other shorter-term smokers

(b) Outline which consumer group will generate the most revenue for government.

The older smokers because quantity only falls to Q_{e1B} which is more than Q_{e1A} . Revenue is $P \times Q$ so the larger quantity traded for older smokers will increase revenue.

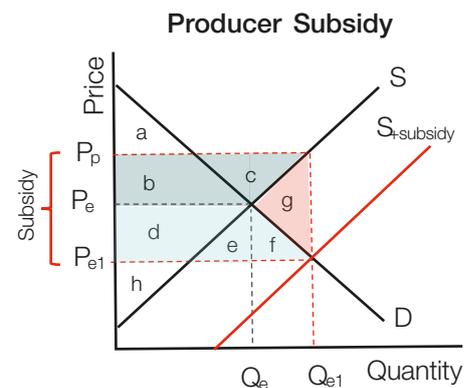
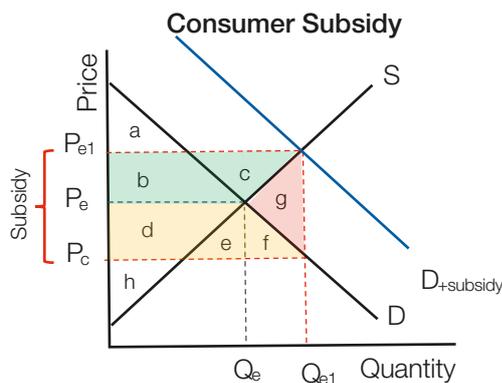
(c) (i) Explain who bears the major burden of the excise tax in relation to Long-term smokers

The consumer as price rises more to P_{e1B}

(ii) Explain how the imposition of an excise tax on tobacco may impact equity.

Likely to increase inequality as those on low incomes are affected proportionately more. The tax is regressive. Also, research shows low-income groups tend to smoke more.

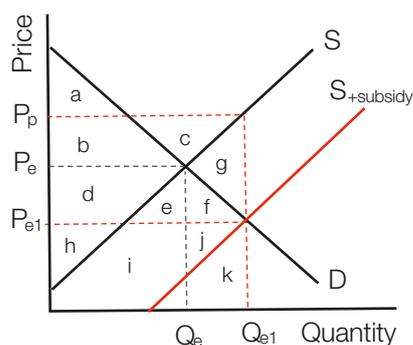
9. (a) Illustrate on the following models the impacts of imposing a consumer subsidy and a producer subsidy.



(b) Compare and contrast the impacts of producer subsidies on the market, consumers and producers.

Consumer subsidies increase demand whilst producer subsidies increase supply, the resulting impacts for consumers and producers are the same. Consumers lower price increased quantity increased consumer surplus, producers increased price increased quantity increased producer surplus.

10. Referring to the model below, answer the following questions.



- (a) After the introduction of the producer subsidy and assuming a market with no market failures, identify with reference to the labelled areas each of the following.

Consumer Surplus	a+b+d+e+f
Producer Surplus	d+h+b+c
Dead Weight Loss	g
Government Cost	b+c+d+e+f+g

- (b) State the change to each of the following.

Producer Surplus	Increase b+c
Consumer Surplus	Increase d+e+f

- (c) Explain why government are being encouraged to provide subsidies.

Encourage consumption, support producers, support those on low incomes

11. Complete the table below by justifying an appropriate form of government intervention (subsidy, price controls or taxes) to address the identified issue and listing the potential unintended consequences of this action.

Issue	Appropriate form of Intervention	Unintended Consequences
Vaping Rates Rise	Tax or Price Floor	Refer to consequences of the form of intervention
Cost of living pressures for those on low incomes.	Price Ceiling or Subsidy	Refer to consequences of the form of intervention
Rental Prices Rise	Price Ceiling or Subsidy	Refer to consequences of the form of intervention
EV sales slow	Subsidy	Refer to consequences of the form of intervention
Shortages of Essential Foods	Price Ceiling or Subsidy	Refer to consequences of the form of intervention

Microeconomics Review Test (41 marks)

Refer to the following information to answer the questions that follow.

The global orange market is the largest of all citrus fruit markets accounting for over 50% of all citrus fruit grown. Many distinct orange varieties have been developed to suit growing regions including Lane Late from Australia and Navelate from Spain. In recent years environmental factors including disease have impacted on production. Additionally, government policies to reduce water subsidies have made it less profitable to grow oranges in some of the largest growing nations. Global production is dominated by Brazil and the EU which account for almost 60% of global production. Brazil's output is expected to rise next year due to improved weather conditions. The recognition of the clear health benefits of Oranges has increased consumption in most nations, but demand is growing most in China and the USA. Oranges are in demand all year round, but there is a notable spike in sales during winter months.

Information sourced from: <https://www.mordorintelligence.com/industry-reports/orange-market>

Question 1

- (a) State the most likely structure of the global orange market.

Oligopoly or Monopolistic Competition

(1 mark)

- (b) Outline 2 reasons for your answer to part (a)

Differentiated products produced by a variety of countries

Or Production dominated by Brazil and EU

(2 marks)

- (c) Assess whether there are advantages for consumers from the market structure of the global orange market.

Product choice, Innovation, Potentially lower prices vs marketpower

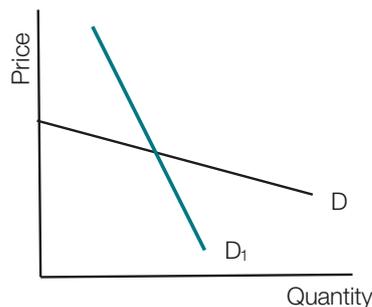
(3 marks)

- (d) (i) Explain how the development of a distinct variety of orange would impact on the Price Elasticity of demand for producers.

More price inelastic as it would reduce the closeness of substitutes

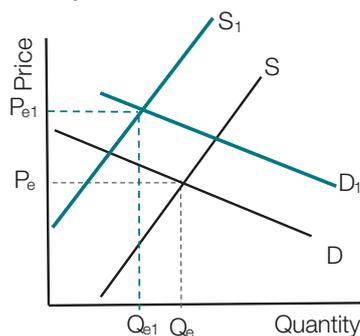
(2 marks)

- (ii) Illustrate the change identified in part (i) on the diagram below.



(1 mark)

- (e) (i) Complete the diagram below to illustrate the change in the global market for oranges over the last few years.



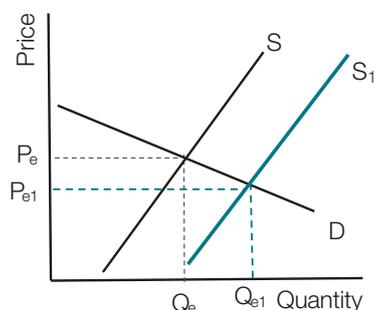
(2 marks)

- (ii) Explain the impact of this change on the price and quantity traded

Price will rise as both decrease in supply and increase in demand cause a price increase. The impact on quantity is dependent on the relative demand and supply changes, here it is assumed supply decrease is larger resulting quantity traded falling.

(2 marks)

- (f) (i) Complete the diagram below to illustrate the expected future change in the market for Oranges bought about improved weather conditions in Brazil.



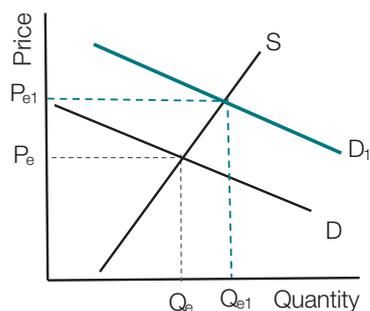
(2 marks)

- (ii) Explain how the market mechanism works to restore equilibrium in part (i)

Surplus at the original equilibrium so price will fall causing an expansion in demand and a contraction in supply until a new equilibrium forms.

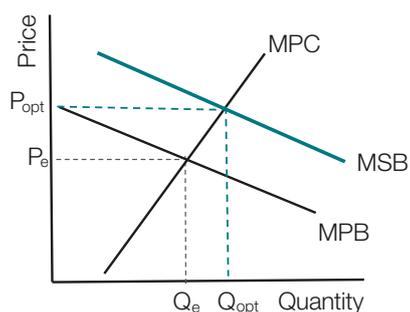
(2 marks)

- (g) Complete the diagram below to illustrate the expected change in the market for oranges during winter months.



(2 marks)

- (h) (i) The health benefits of orange consumption are likely to lead to positive externalities. Complete the diagram below to illustrate the positive externalities associated with orange consumption.



(2 marks)

- (ii) Explain why the existence of positive externalities is likely to result in a market failure in the orange market.

Under consumption as Q_e is less than Q_{opt}

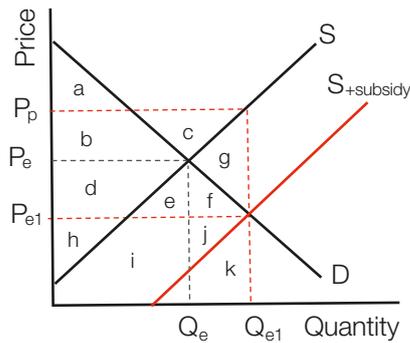
(2 marks)

- (iii) Outline one strategy (other than a subsidy) that could be implemented to address this market failure.

advertising

(2 marks)

(i) The following model illustrates the water subsidies provided to orange producers.



(i) With reference to price, quantity, revenue, and producer surplus, explain how Orange Producers benefit from a water subsidy

Producer revenue increases $d+e+h+i$ to $b+c+d+e+f+g+h+i+j+k$, producer surplus increases $d+h$ to $b+c+d+h$ there is an increase in price to P_p and an increase in quantity sold to Q_{e1}

(4 marks)

(ii) Justify whether the subsidy is likely to result in allocative inefficiency.

If there is a market failure and the subsidy can be valued at the same as the positive externality, then allocative efficiency can be attained as Q_e will equal Q_{opt} . This is very challenging though and if there are no externalities then the subsidy results in a DWL of area g.

(2 marks)

Question 2

Refer to the following information to answer the questions that follow.

In one country of the world oranges are only sold in supermarkets, and the supermarket industry is dominated by 2 firms. Each firm must decide whether to import a newly developed orange from Brazil. Each firm is seeking to maximise profit and the payoff matrix below shows the expected profits in \$ (000's) if they choose to import the new variety or maintain their current range.

		Supermarket 2	
		Import new Variety	Maintain Range
Supermarket 1	Import new Variety	90 / 90	120 / 70
	Maintain Range	70 / 120	110 / 110

(a) State the Nash equilibrium in the above market.

Import/Import (90 and 90)

(1 mark)

(b) Explain how the Nash equilibrium demonstrates the concept of mutual interdependence.

One firm's behaviour is likely to influence the behaviour of the other. Each firm must take the likely actions of the other firm into account when making their decision

(2 marks)

(c) Explain why the Nash equilibrium is not Pareto Optimum.

Pareto optimum occurs where a firm can not change their behaviour without the other firm being worse off, this occurs at 110/110 or maintain /maintain. The Nash equilibrium is a position where neither firm can be better off by changing strategy if the other firm maintains their strategy. This occurs at 90/90 or import/import.

(2 marks)

(d) Explain the likely outcome if the two firms agree to collude.

If collusion occurs then Pareto efficiency will occur at 110/110

(1 mark)

(e) Explain how the introduction of a new variety may result in the market failure of asymmetric information.

Producers will have more information about the new variety than consumers, potentially resulting in a lack of consumption as consumers are reluctant to buy. Alternately an over consumption may occur if consumers buy without knowing the quality.

(2 marks)

(f) Outline one strategy that the two supermarkets may introduce to address this market failure.

Signalling, Independent reviews, give explanation.

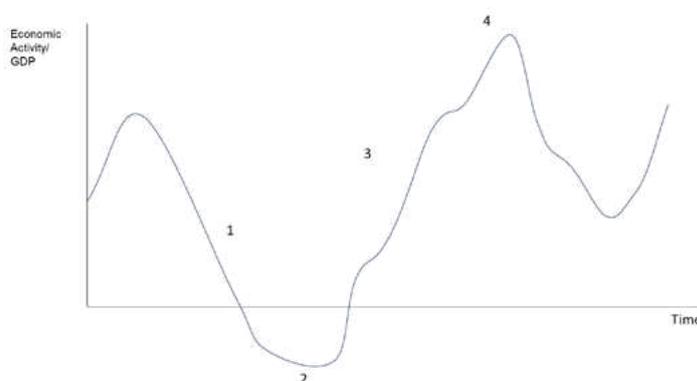
(2 marks)

Exercise 8.1: The Business Cycle

1. Identify (by ticking the appropriate box) which stage of the business cycle the following factors impact.

Factor	Peak	Downturn	Trough	Upturn
Low levels of demand for labour and high levels of unemployment.			x	
Consumption levels are growing faster than production	x			
Consumption and investment falls with declining consumer and business confidence		x		
Falls in inflation rates – demand pressure subsides		x		
Rising levels of economic activity				x
Falling stock levels as production rates lag rising total expenditure				x
Low/negative levels of economic activity			x	
Labour shortages emerge in the economy	x			

2. Identify each stage of the business cycle and state what is happening to the key aspects of the cycle



	1	2	3	4
Stage	Downturn	Trough	Upturn	Peak
Full Employment	Falling levels	Low level of Employment	Improving levels	High levels of employment Labour shortage experienced
Price Stability	Falling	Falling	Rising	Rising
Economic Growth	Falling	Falling	Rising	Rising
Consumer and Business Sentiment	Decreasing	Low	Increasing	High
Production Levels	Increasing initially until high level of excess stock	Low levels	Initial low as excess stock sold	Increasing

3. Which phase of the business cycle is the economy at in Year 3? Justify your answer.

	Year 1	Year 2	Year 3	Year 4
Unemployment rate	2.4%	3.1%	5.7%	6.9%
Economic growth	1.3%	2.2%	-1.3%	0.7%

Year 3 is in a trough.

Unemployment rate is still falling and as a lagging indicator.

Economic growth a coincidental indicator so shows what is happening during that period.

Exercise 8.2: Economic Indicators

1. Identify (by ticking the appropriate box) what type of indicators these are:

Example	Leading	Coincidental	Lagging
Consumer Confidence	X		
Retail Sales		X	
New Dwelling Approvals	X		
Unemployment Rate			X
Business Sediment	X		
Inflation Rate			X
Gross Domestic Product		X	
Business Investment Intentions	X		
Factory Overtime		X	
New Vehicle Registrations		X	

2. The economic indicators in the table below refer to a hypothetical economy.

	Year 1	Year 2	Year 3
Change in real GDP	1.4%	1.6%	2%
Business Sediment	5.5%	7.5%	5.2%
Consumer price index	3.2%	4.2%	2.1%
Unemployment rate	7.7%	5.7%	5.3%
Cash rate	0.5%	0.25%	0.25%

(a) Identify the phase of the business cycle the economy experienced in Year 2

Upturn

(b) Justify with the support of **two** indicators the phase of the business cycle in Year 2.

Change in real GDP is increasing and is yet to hit its highest level of growth – a coincidental indicator therefore reflects what is happening at the time of the business cycle.

The unemployment rate is declining. It is a lagging indicator providing validation of the business cycle.

(c) Predict the likely change in the level of economic activity in Year 3. Referring to a leading indicator.

Downturn – business sediment has seen a decline of 2.3% from 7.5% to 5.2%

3. This question refers to the data in the table below for a hypothetical economy.

Indicator	Year 1	Year 2	Year 3	Year 4	Year 5
Real GDP (% of change)	2.3%	2.5%	2.8%	3.3%	3.1%
Unemployment rate (% of labour force)	6.2%	6.3%	6.0%	5.5%	5.5%
Consumer Price Index (% of change)	2.5%	2.7%	3.2%	3.5%	3.3%
Business investment (% of GDP)	10.0%	15.6%	17.8%	15.2%	7.5%

(a) Identify the indicator in the table that is lagging.

Consumer Price Index or Unemployment Rate

(b) Identify the phase of the business cycle the economy experienced in Year 4.

Peak

(c) Justify with the support of **two** indicators the phase of the business cycle in Year 4.

Business Investment is a leading indicator and Year 3 demonstrates that it has increased from Year 2 from 15.6% to 17.8%. Year 4 helps to predict what is going to happen in Year 5.

Improved in Real GDP -a coincidental indicator, suggesting that the economy is likely to be at the peak as it has increased from 2.8% to 3.3%, this is further supported with the business investment data and the following year's Real GDP data.

Exercise 8.3: The Circular Flow Model

1. The table shows hypothetical data for an economy.

G	M	T	I	X	S
25	60	30	20	70	35

(a) State whether this economy is a balanced/unbalanced economy.

The economy is in an unbalanced position.

(b) Explain why your answer in a)

The leakages include Imports (60), Taxation (30) and Savings (35) totalling 125.

The injections include Exports (70), Government Spending (25) and Investment (70) totalling 115.

The economy has more leakages (125) than injections (115), this means that the economy is losing more money from the economy than is being put back into it.

(c) Discuss whether the Government is in a budget or surplus. (Consider Taxation and Government Spending.)

The Government would be seen to have a surplus as the Taxation is 30, while Government Spending is 25

2. Outline how each of the following events affects the size of income flows in the circular flow model:

(a) The government increases the goods and services tax.

Increases tax revenue for the government.

It decreases the ability for households to consume or save as they have less disposable income.

(b) Interest rates in an economy decrease

Decrease in cost of borrowing money – increase in investment in the economy.



- (c) The currency depreciates making imports more expensive and increasing the revenues earned from exports.

This depends on the users of the imports – if imports are used in production this leads to an increase in leakages unless firms can source intermediate goods for production.

Exports will see an increase.

A change in net exports will occur.

- (d) Income support payments such as pension and unemployment benefits are increased.

Increased consumption as people spend their benefits, an increase in savings may occur if people receiving the benefits are conscious of the future.

- (e) There is a major economic recession in a country's major export market.

It is likely to see an improvement in the number of exports in an economy, this could also be caused by the economy's currency depreciating. (See Chapter 11 for more depth)

- (f) The government increases spending on health and education.

Increasing spending on health and education → increase in employment → increase in incomes for households, in turn, leads to increased consumption and other leakages.

- (g) Consumer confidence increases

An increase in consumption leads to increased production of goods and services, firms then require more workers to meet their needs. With this increase in employment, more leakages could occur, including an increase in savings and taxation. (Multiplier effect)

- (h) Foreign imports become more price competitive within domestic markets

The domestic economy would see an increase in leakages as prices for goods and services are cheaper from overseas than they are from the domestic market. This is likely to lead to a worsening of net exports.

- (i) Retirement saving is made mandatory at 5% of income

A leakage in the economy, the increased savings means that this money cannot be spent in the economy at the time and can only be used during a person's retirement.

3. Identify and briefly describe the three sectors in the five-sector circular flow model that generate injections into the circular flow of income. Describe the injection in each case.

Investment – is an injection of money from the financial institutions into businesses. This injection of money creates opportunities for businesses to purchase new capital resources, such as plant and equipment to assist in expanding output in the economy.

Government Spending – is an injection into the economy through building infrastructure and other projects that assist in creating demand for goods and services that business produce creating employment. The increase in employment helps generate more income leading to an increase in consumption.

Exports- bring foreign (new) money into the country that businesses can invest and utilise to generate more output.

4. The following data relates to annual expenditures for Year 1 in a fictional economy.

	\$m
Investments	78 000
Imports	24 000
Household Consumption	195 000
Savings	28 000
Exports	42 000
Government Expenditure	56 000
Taxation Receipts	23 000

- (a) Calculate the value of GDP for this economy for Year 1.

C+I+G+NX = 347 000

- (b) Use your knowledge of the circular flow of income to explain why the level of production can be measured by both expenditure and income.

The expenditure method takes into consideration all the inflows of money that are entering into the economy this could be through consumption, investment, government spending and net exports. The amount of money being spent in the economy provides a good understanding of the production required to sustain the economy.

The money flows from the firms to their employees for the work they have done as wages (income), any other resources utilised also receive payment. The amount of income for the resources is the amount of income that can then be spent in the economy. This payment for resources is for the resources used in the production process and the creation of goods and services.

5. Describe the impact of the multiplier effect if:

- (a) The government injected money into the economy to help build new infrastructure in an economy.

With the injection of money from the government on infrastructure, this increases the level of employment as the infrastructure is built. These people then are willing to spend their income in the economy through the consumption of goods and services. The amount that is spent is a smaller portion of the initial amount of income. With the increase in consumption, firms may increase production and then hire employees this cycle continues, however, this is a smaller percentage each time.

- (b) Consumers and firms are importing more goods and services into the local community.

With the importation of goods and services this leads to leakage in the economy. With the increase of money leaving the economy less money is spent in the domestic economy. This declines the amount of money being spent in the economy and domestic businesses decrease the number of workers in the firm, these workers then have a decrease in their income, they spend less money in the economy. This has a negative effect in the economy and the economy will see a decline in the AD.

Exercise 9.1 Types of Unemployment

1. Identify the type of unemployment present in each of the following situations.

Situation	Unemployment Classification
A recent university or high school graduate has not yet found the right job.	Frictional
A snow ski instructor in the off-season.	Seasonal
A factory worker loses their job because the firm has started automating its production process	Structural
A hospitality worker loses their job as the economy has low economic growth	Cyclical
A fruit picker is in between fruit seasons	Seasonal
A retail worker is able to secure a job as there is growth in the economy	Cyclical
A coal miner loses their job due to the shutdown of the mine site as the economy moves towards renewable energy.	Structural

2. Differentiate between structural and cyclical unemployment.

Structural unemployment is a change in the process of production that impacts the number of employees required, while, cyclical unemployment occurs during the different stages of the business cycle, with the greatest level of unemployment levels being in a trough.

3. Explain why both cyclical and structural unemployment occur during a recession.

Structural unemployment can occur at any time due to a structural change in the way in which a firm/industry produces its goods/services. This could occur at any time of the cycle. Cyclical unemployment occurs due to the lack of demand for goods/services this is at the highest level in comparison to the other stages of the business cycle.

Exercise 9.2 Measurement of Unemployment

1. Calculate the unemployment rate in each of the following situations.

All answers are calculated using unemployed/labour force.

Situation	Unemployment Calculation
Employed 1,000,000 Unemployed 40,000 Labour Force 1,040,000 Working Age Population 2,380,000	3.8%
Employed 205,500 Unemployed 12,400 Labour Force 217,900 Working Age Population 370,000	5.7%
Employed 1,365,000 Unemployed 675,000 Labour Force 2,040,000 Working Age Population 3,750,000	33.1%
Employed 2,755,000 Unemployed 575,000 Labour Force 3,330,000 Working Age Population 4,000,000	17.4%

2. Calculate the Labour Force Participation Rate for the following situations.

All calculations are worked out using Labour Force/ Working Age Population

Situation	Labour Force Participation Rate Calculation
Employed 1,000,000 Unemployed 40,000 Labour Force 1,040,000 Working Age Population 2,380,000	43.7%
Employed 205,500 Unemployed 12,400 Labour Force 217,900 Working Age Population 370,000	58.9%
Employed 1,365,000 Unemployed 675,000 Labour Force 2,040,000 Working Age Population 3,750,000	54.4%
Employed 2,755,000 Unemployed 575,000 Labour Force 3,330,000 Working Age Population 4,000,000	83.3%

3. How does full employment contribute to a stable economy?

Full employment in an economy means that everyone who would like it job and is seeking a job is employed and the level of employment is able to sustain a low and stable level of inflation. If this level of employment increases or causes inflation this decreases the stability open economy causing more uncertainty and then the need to raise wages.

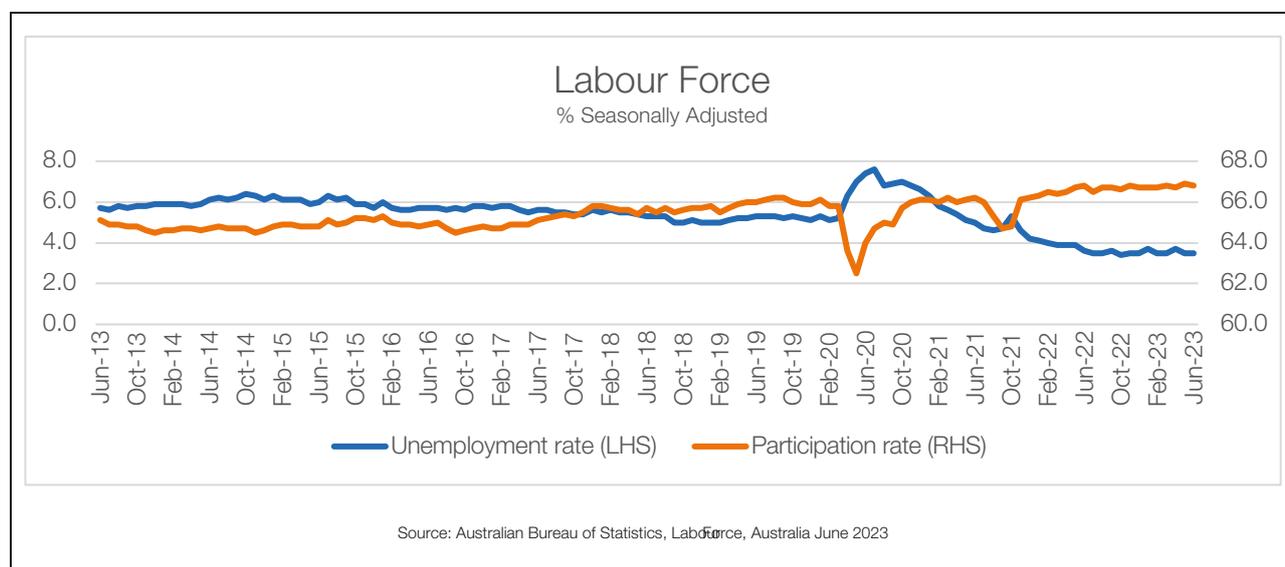
4. What are some potential challenges in achieving and maintaining full employment?

- Maintaining low and stable level of inflation,
- People are in jobs that are appropriate for their skills,
- People who have work but not getting the hours that they want.

5. How does the government's role in addressing unemployment differ during economic recessions compared to periods of economic growth?

- In periods of a recession a government will need to consider how to increase employment possibly through education and training
- If government doesn't do this the transfer payments (welfare) will continue to grow and cost the government more money.
- With government spending on training this can improve outcomes across all the macroeconomic objectives.

6. Referring to the stimulus – Labour Force Graph answer the following questions.



(a) Explain the 'general' relationship that exists between the Labour Force Participation Rate and the Unemployment Rate in the above graph and explain why this relationship exists.

Inverse relationship. As unemployment decreases the opposite usually occurs in the Labour force participation rate. The labour force participation rate moves with the business cycle, meaning that as the economy starts improving more people start looking for work, employment at this time is improving (Unemployment rate is getting lower), however, if the economy is worsening than the people will give up looking for work as the employment levels are getting worse (Unemployment rate is getting higher.)

(b) Referring to the graph, when did the unemployment rate peak and what was the rate at this time

Period/ Year **June 2020**

Unemployment Rate **7.4%**

(c) Why might some economists suggest that the unemployment rate understates the true extent of unemployment?

The unemployment rate does not take into consideration underemployment (people not working the hours they want to work) or there are people who have given up looking as they keep on being refused in their job search.

9.2.1 Focus Questions: Measuring Inflation

1. What role does the Consumer Price Index (CPI) play in measuring inflation?

It assesses variations in the process of goods and services and the expenditure of a typical household over a quarterly period.

2. Discuss some limitations of using the CPI to measure inflation.

The three broad limitations include:

- The CPI is only a sample of goods.
- The weighting and regimen do not always truly reflect all spending patterns.
- Quality changes in goods are not accounted for.

The table expands on some of the limitations of CPI for different groups.

Different rates for different income earners	The impact on different income earners is not taken into consideration. The inflation increase impacts low-income earners more than it does high-income earners.
Different rates of inflation depending on regional or cultural factors	Inflation impacts different regions in different ways. The impact of people living in regional areas tend to pay higher prices for items than those people living in city areas.
Consumer consumption patterns change when relative prices change	CPI has fixed weights and does not take into consideration any changes in consumer spending patterns.
Changes in consumption patterns with sales and discount stores and sales	As the CPI is taken at a point in time, it does not take into consideration the purchase of goods and services of bulk amounts at a discounted price.
New product introduction changes consumption patterns	New products can alter the consumption patterns of households which may not be in the current CPI regimen.
Quality changes in products not accounted for.	The impact of changes in the quality of goods and services is not taken into consideration. With improved technology, the quality of products is likely to improve over time.

9.2.2 Focus Questions: Causes of Inflation

1. What are some possible consequences of demand-pull inflation for people?

Demand- pull inflation leads to an increase in costs of goods and services.

Consumers can't purchase the same goods and services as the APL increases → decrease in economic growth → decrease in investment by firms → to a decrease in employment → decrease in income for households (multiplier effect)

2. Explain how demand-pull inflation affects the prices of goods and services.

Increases the cost of goods and services likely to increase the cost of living and households may look to the overseas market for cheaper alternatives.

3. Discuss possible effects of demand-pull inflation on businesses.

If consumers are purchasing less → firms' profits decrease → firms then decrease their investment and production → to a decrease in employment → decrease in income for households (multiplier effect)

4. What are some possible consequences of cost-push inflation for companies?

Cost push inflation is supply-side inflation this can cause the following consequences for companies/firms:

- Increases in wages paid to employees,
- Increases in interest rates and thus interest costs,
- Increases in government taxes,
- Increases in fuel costs, including oil and gas prices,
- Increases in prices for utilities (such as electricity, gas and water services),
- Increases in the cost of raw materials,
- Increases in insurance costs,
- Increases in rental costs.

5. Explain how inflation affect the competitiveness of businesses.

Reduced investment spending because of uncertainty → may impact long term competitiveness.

Depending on the firm cost of production may alter depending on whether inflation is impacting the components of production. For example, if a firm is using components that are imported it may cost less to produce than a firm using components from the domestic market and vice versa.

6. Describe the impact of inflation on a firm's competitiveness internationally.

Reduced international competitiveness → causing a decrease in net exports.

9.2.3 Focus Questions: Consequences of Inflation and Deflation

1. Explain the negative consequences of both high inflation and deflation on the economy.

The purchasing ability of certain groups is reduced if the level of inflation is too high, as the value of money is purchasing less than it did before the high levels of inflation.

In times of deflation, households and firms continue to wait to see if the price of the good or service will continue to go down.

2. Suggest potential consequences of high inflation on individuals' purchasing power.

With high inflation, several different groups of individuals' purchasing power will be impacted:

People who receive fixed wages, pensions, fixed rental income or fixed welfare payments, their income does not increase when the cost of living increases.

People who receive wages or incomes that increase less promptly than the rate of inflation will see a decrease in real wages.

People holding on to their cash will see their purchasing power falls on the cash that is held.

People saving their money (Savers) their real value of savings falls if the interest rate is less than the leave of inflation.

Lenders (Creditors) are worse off if those borrowing money have a fixed interest rate. The lenders, therefore, see a decrease in the real return.

3. What impact does deflation have on firms and employment?

When deflation occurs, firms tend to delay their spending on investments to improve the firm. To help reduce the running costs of the firm they let employees go, increasing the level of unemployment in an economy.

4. State the factors that can contribute to deflation.

- Consumers delay purchases as they anticipate the prices falling,
- Firms not borrowing money,
- Increase in cyclical unemployment,
- Increased numbers of firms closing.

5. Explain some potential long term effects of high inflation on an economy.

Potential long term effects of high inflation are reduced investment spending because of uncertainty, which leads to higher costs for producers and consumers. With reduced purchasing power of money firms have reduced international competitiveness – creating a decrease in net exports impacting economic growth, which lowers because of the decrease in both investment and net exports. This in turn can create an increased level of unemployment, which decreases household incomes and limits their consumption, further decreasing economic growth.

6. How does inflation impact different socio-economic groups within a country?

Low-income socio-economic groups tend to suffer more than the High-income groups, this is because low-income earners don't necessarily have the same sort of savings behind them and with the cost of goods and services increasing, they feel the increase more as it is a bigger proportion of their income. High-income earners do not feel this the same way as the change is likely to be a smaller proportion of their income.



7. What are the potential consequences of deflation on borrowers and lenders?

Borrowers see an increase in the real value of any debt they have, however, with the decrease in the value of their income they are more likely to default on any loans that they have. Some borrowers may end up filing for bankruptcy.

Lenders are impacted by the defaults/cancellations on any loans such as mortgages.

If an economy has widespread bankruptcy occurs this can create a major financial crisis which banks and financial institutions are impacted by.

Focus Questions 9.3 Economic Growth

1. Why is economic growth important?

Economic Growth is essential for the attainment of improved living standards of the population, as increased economic activity will allow individuals to satisfy more wants.

2. Give an example of using resources more efficiently to promote economic growth.

If resources are used more efficiently there can be an increase in production of goods and services as the underutilised resources are better utilised better. For example, if a manufacturing firm is only working at 80% production capacity and it increases to 90% production capacity this leads to more goods being produced and possibly consumed allowing the economic growth to improve.

3. Explain why economic growth is important for improving people's lives and living conditions.

As increased economic activity will allow individuals to satisfy more wants. With higher growth will lead to a reduction in cyclical unemployment, which means that more people have work that want work are able to find it and will see an increase in their incomes, however if the growth is excessive level of demand-pull inflation is likely to occur.

Focus Questions 9.3.1 Sources of Economic Growth

1. Discuss some sources of actual economic growth.

Possible sectors	Impact on Expenditure in the Economy – (Expenditure Method)
Households	Changes in consumer spending (Consumption C) → an increase in consumption have a positive impact on economic growth.
Firms	Changes in investment spending: (Investment I) → an increase in investment have a positive impact on economic growth.
Government	Changes in government spending: (Government Spending G) → an increase in Government Spending have a positive impact on economic growth.
Overseas	Changes in foreigners' spending: (Net Exports NX or X-M) → an increase in net exports (that is a higher level of exports than imports) have a positive impact on economic growth.

An increase in production could also increase economic growth if the purchase of goods and services occurs through consumption and exports.

An increase in income could lead to an increase in economic growth, however, is impacted by where the money ends up whether it is spent on goods and services (consumption), the impact of taxation, or if households place more into savings or purchasing goods in the international market (Importing goods).

2. Explain how household debt impacts consumer spending.

The higher the level of household debt the less households have to spend in the economy. A household's income covers any loans/mortgages that they have this needs to be paid before any discretionary spending in the economy.

The lower the level of household debt the more households have to spend in the economy. If the debt level is lower households may have more money to spend on discretionary spending.

3. Define the role that consumption plays in economic growth.

Consumption is usually the largest component of economic growth when working it out through the expenditure method. In Australia, consumption is approximately 60% of GDP.

4. Explain how might changes in consumption patterns affect the overall economy.

As consumption is a large component of economic growth the changes to consumption can impact the level of economic growth.

If consumption is mainly purchased from the domestic market this improves the economy's domestic growth, if the consumption of goods and services is mainly through importing goods and services this is likely to negatively impact an economy's economic growth, as it impacts the net exports.

5. Explain how changes in government spending impact the overall health of the economy.

If government spending increases this could lead to an increase in economic growth in the economy, however, depending on what the government spending is on this may be a short-term or long-term impact. If the government spending is only on welfare payments the impact will only be short-term, while if the government spending is on infrastructure, training or education for example, the impact on the economy is more likely to have a long-term impact on the overall health of the economy.

6. Discuss how improvements in firms contribute to potential economic growth.

If firms change their practices to improve productivity or implement new technology to improve production can lead to increased levels of output with the resources used. With the increased level of production, more goods and services can be consumed by households. Depending on which method is used to determine the level of economic growth, increases would be seen across the three.

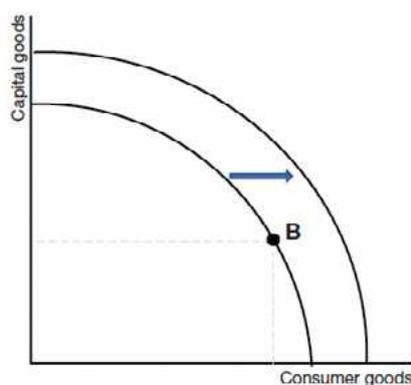
Expenditure – an increase in consumption,

Production – increase in value of output,

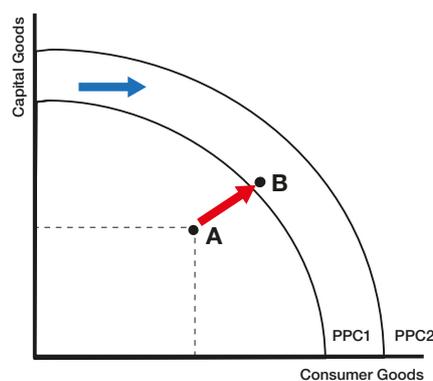
Income – increased level of wages or profit.

7. Discuss how technological improvements contribute to potential economic growth.

Technological improvements help to improve potential economic growth, depending on if the technology improves all firms' outcomes or specific industries it can push the PPC outwards, allowing economic growth to occur.



8. Demonstrate with a diagram how can actual growth be represented on the production possibilities curve (PPC).



Point A to B shows actual economic growth.

PPC1 to PPC2 demonstrates potential economic growth.

Focus Questions 9.3.2 Measuring of Economic Growth

1. State the three methods used to calculate GDP and the corresponding equation.

Expenditure Method = $C+I+G+NX$

Income Method = rent + wages + interest + profit

Production Method = Sales receipts - intermediate goods costs + Increase in stock values

2. Calculate GDP in the following situations.

GDP Method	Situation	Calculation
Expenditure	Consumption 100,000 Investment 15,000 Government Spending 40,000 Net Exports (20,000)	135,000
Production	Sales Receipts 210,000 Intermediate Goods Costs 120,000 Increase in Stock Values 45,000	135,000
Income	Rent 10,000 Wages 75,000 Interest 20,000 Profit 30,000	135,000
Averaging	Using the above three answers	135,000
Expenditure	Consumption 536,000 Investment 120,000 Government Spending 60,000 Net Exports 34,000	750,000
Production	Sales Receipts 1,255,000 Intermediate Goods Costs 530,000 Increase in Stock Values 25,000	750,000
Income	Rent 80,000 Wages 450,000 Interest 130,000 Profit 90,000	750,000
Averaging	Using the above three answers	750,000

3. Explain some limitations of using GDP as a measure of economic growth.

GDP does not take into consideration the impact on the environment, there are some firms and governments that have been more concerned about economic growth than the environment. This has caused pollution, deforestation, erosion, and all sorts of environmental negative externalities but also has led to resource depletion of scarce resources.

GDP does not take into consideration the output (goods and services) sold for cash as the transactions are not as visible. For example, someone who babysits for cash will not be included in the income measure for economic growth.

GDP does not take into consideration the improvements in quality that are made over time, it only takes into consideration the output of an economy.

See Figure 9.3.3 for other alternative answers.

4. Examine the purpose of adjusting nominal GDP to calculate real GDP.

The purpose of adjusting nominal GDP to calculate real GDP is so that it removes the effects of inflation. This allows economic growth to be more easily compared between time periods.

5. State some alternative measures that can be used to address the limitations of using GDP as a measure of living standards.

Distribution of Income

Green GDP

Wellbeing Index

Quality of Life

Focus Questions 9.3.8 Consequences of Economic Growth

1. Explain how and why governments might make changes in government spending to affect economic growth.

The government might increase their spending to improve job opportunities and standards of living if households have work, they are more likely to go and spend their money on goods and services, increasing consumption and the household's standard of living, at the same time increasing economic growth and stimulus in the economy, which may increase and further stimulate the income multiplier effect. However, the negative impacts of this stimulus could be an increase in demand pull inflation, growth that is unsustainable and externalities.

Depending on the initial injection of spending the impact of economic growth will alter.

2. Explain the potential consequences of prioritising economic growth over other macroeconomic objectives.

If economic growth is prioritised the economy is likely to see improvement in employment, however, with this there is likely to be an increase in demand pull inflation, this means that the macroeconomic objective of price stability is worsening if they are prioritising economic growth with government spending alone.

3. Describe some limitations of using GDP as a measure of living standards.

It does not take into consideration the distribution of output and income. Even if working out GDP per capita, this is an average across the population, and it is extremely unlikely that this is shared equally across the whole economy. The distribution of income tends to go to those that own the firms, not the ones that are employed in them. It also does not take into consideration those who are not of working age or currently not in the labour force.

4. Discuss some potential negative effects of economic growth on the environment.

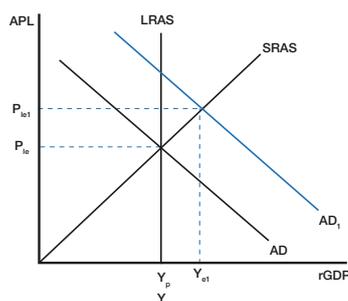
An increase in pollution can cause environmental degradation and resource depletion –

Any type of pollution has negative impacts on both the environment and the economy. No matter what type of pollution (air, water, land) it is, however, all pollution could impact the environment and the viability of unused resources. This means that the resources may not be able to be used in the future.

Focus Questions Aggregate Demand and Aggregate Supply

1. The following scenarios relate to the economy of the USA. Complete the AD-AS model to assist in explaining the impact on the economy.

- (a) Increases in house prices make households feel wealthier.



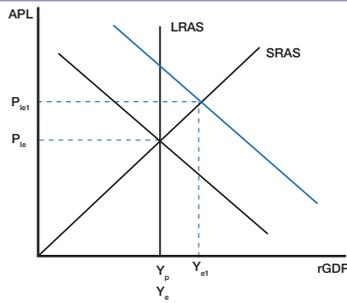
Increase in consumer confidence.

Increase in AD

Increase in Price Level – causing demand-pull inflation.

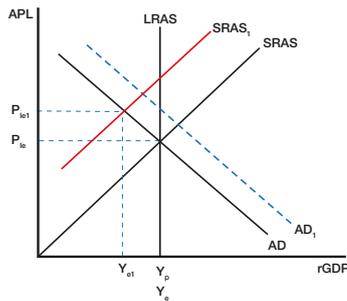
Increase in economic growth, likely, to lead to an increase in employment.

(b) A new trade deal with Canada increases exports.



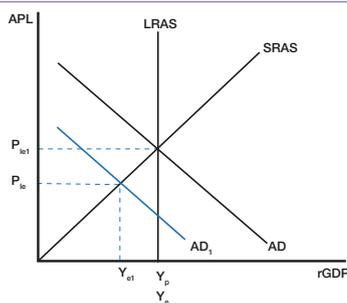
Increase in Net Exports → increase in business for the firms that are exporting to Canada
 Increase in AD
 Increase in Price Level – causing demand-pull inflation.
 An increase in economic growth, likely, to lead to an increase in employment.

(c) The government raises minimum wages.



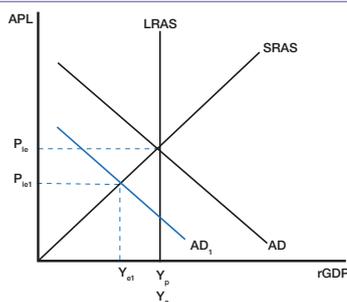
Increase in income for households → increase in consumption, depending on who is paying the wages this could be the government or firms.
 A decrease in the SRAS is also likely as the cost of production increases for firms.
 The overall impact of this will depend on the changes to the AD and SRAS curve.
 Price Level will increase either way, but the impact on the economic growth or employment is harder to determine- likely to both worsen/decrease.

(d) Falling Share prices decrease consumer confidence.



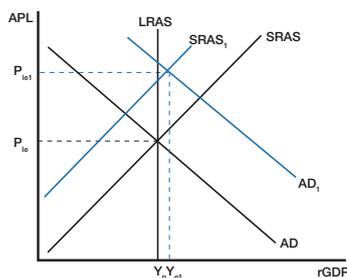
If the confidence of consumers falls due to concerns about future unemployment or falls in wages households will decrease current expenditure and increase savings.
 This causes a decrease AD shifting it to the left from AD to AD1 causing a decline in Economic Growth and employment (Ye to Ye1).
 Price stability improves Ple to Ple1.

(e) Higher interest rates make borrowing by households and firms less attractive.



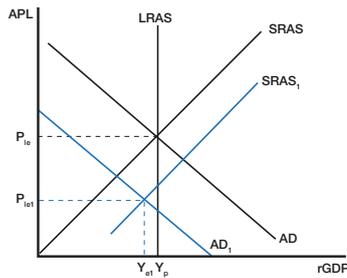
An increase interest rates deter investment and consumption decreases AD shifting it to the left from AD to AD1 causing a decline in economic growth and employment (Ye to Ye1).
 Price stability improves Ple to Ple1.

(f) A depreciation of the US dollar.



A depreciation of the currency makes the US exports cheaper.
 Causing an increase in net exports (resulting from exports rising and imports falling) increases AD to AD1. In addition, the more expensive imports increase production costs and causes the SRAS to decrease to SRAS1. The consequence of these changes is that Inflation rises Ple to Ple1. The impact on output is more difficult to determine as the relative change in AD and SRAS needs to be considered. In this instance the increase in AD is larger resulting in output rising to Ye1.

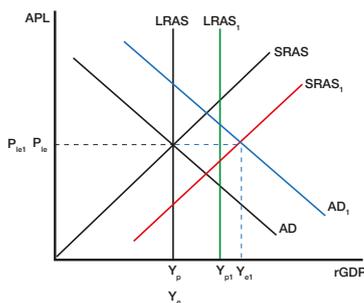
- (g) An appreciation of the US dollar.



An appreciation of the currency makes the US exports more expensive.

Causing a decrease in net exports (resulting from exports falling and imports rising) decreases AD to AD₁. In addition, the cheaper imports lower production costs and causes the SRAS to increase to SRAS₁. The consequence of these changes is that Inflation falls P_{le} to P_{le1}. The impact on output is more difficult to determine as the relative change in AD and SRAS needs to be considered. In this instance the decrease in AD is larger resulting in output falling to Y_{e1}.

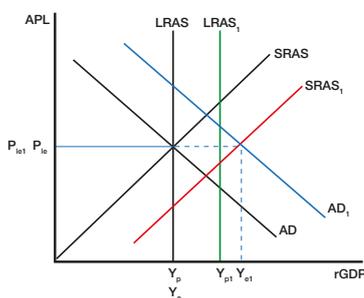
- (h) An increase in investment spending by firms.



Investment spending is a component of AD, so as investment spending increases AD will increase and shift to the right, AD to AD₁. The spending by firms on capital goods adds to the capital resources of an economy, resulting in both the LRAS and SRAS curves increasing and shifting to the right to LRAS₁ and SRAS₁.

The resulting impact of investment spending is an increase in output from Y_e to Y_{e1} which will increase the demand for labour and increase employment. APL's do not change in this situation as the increase in potential output allows increases in output to match increases in AD, without creating inflationary pressure.

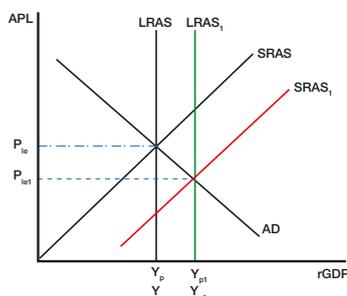
- (i) Spending by Government on building new airports.



Government spending on Infrastructure increases a component of AD. So as infrastructure spending increases AD will increase and shift to the right, AD to AD₁. The spending by the Government on capital goods adds to the capital resources of an economy and improves the productivity of industries across the country. This results in both the LRAS and SRAS curves increasing and shifting to the right to LRAS₁ and SRAS₁.

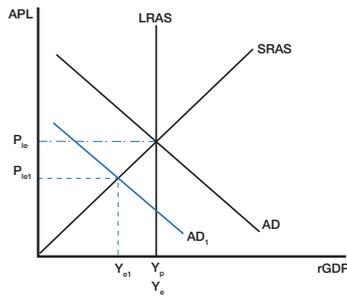
The resulting impact of spending on infrastructure is an increase in output from Y_e to Y_{e1}. This will increase the demand for labour and increase employment (particularly in the construction phase). APLs do not change in this situation, as the increase in potential output allows increases in output to match increases in AD, without creating inflationary pressure.

- (j) Looser immigration laws lead to higher amounts of skilled labour entering the economy.



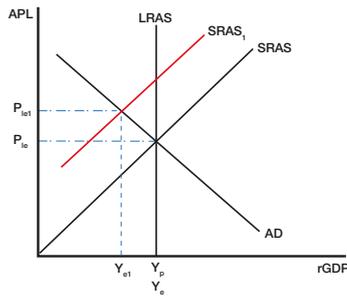
An increase in the quantity of labour it allows productivity to expand the productive capacity of the economy. That is, it allows more to be produced due to an increase in resources or alternatively an increase in output from the same quantity of resources. This shifts the LRAS to the right, LRAS to LRAS₁. (the SRAS also shifts to the right as these factors result in a decrease in the cost of production). In this model the resulting impact is an increase in output Y_e to Y_{e1} and a fall in average price levels P_{le} to P_{le1}. The economy has increased output, decreased APL and remained at full employment.

(k) Falling rGDP in the economy of Mexico a major trading partner.



The movement of AD to the left, AD to AD₁ represents a decrease in AD (caused by a decrease in one or more of C, I, G or NX). As AD decreases it creates decreased output in the economy Y_e to Y_{e1} and decreases in APL, P_{le} to P_{le1} . It will also increase unemployment as less labour is required due to lower output.

(l) Cyclone destroys crops.

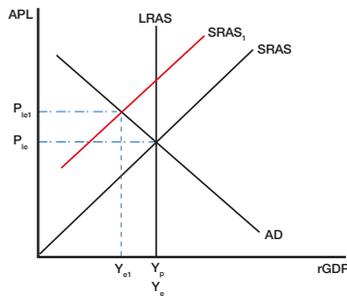


The movement of SRAS to the left, SRAS to SRAS₁ represents a decrease in SRAS (caused by an a supply shock (cyclone)). As SRAS decreases it creates a decrease in output Y_e to Y_{e1} and an increase in APL P_{le} to P_{le1} . The rising average price levels result from firms increasing prices to maintain profit margins. The decrease in SRAS creates a deflationary gap situation in that $Y_e < Y_p$ but it also results in increasing APL. This situation is often referred to as stagflation, a situation where an economy experience rising APL as well as falling levels of output and rising unemployment.

2. Refer to the extract to answer the questions that follow.

In Country E, inflation exceeds the target rates of the government being forced up by a series of supply shocks the most noticeable being higher oil prices being imported into the country from areas affected by War. Inflationary pressures are feeding through to higher inflationary expectations and higher wage demands from households. Unemployment is also increasing as firms attempt to cut costs.

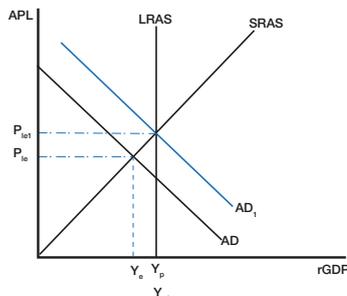
(a) Use the following AD-AS model to explain the cause of inflation in country E.



The movement of SRAS to the left, SRAS to SRAS₁ represents a decrease in SRAS (caused by an increase in the cost of production and a supply shock(war)). As SRAS decreases it creates a decrease in output Y_e to Y_{e1} and an increase in APL P_{le} to P_{le1} . The rising average price levels result from firms increasing prices to maintain profit margins. The decrease in SRAS creates a deflationary gap situation in that $Y_e < Y_p$ but it also results in increasing APL. This situation is often referred to as stagflation, a situation where an economy experience rising APL as well as falling levels of output and rising unemployment.

This type of inflation is called cost push inflation.

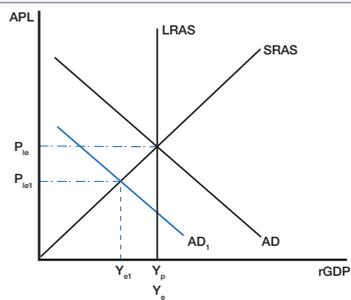
(b) Explain how inflationary expectations from households in country E will impact on the AD-AS model.



The economy depends on both the size of the change in AD and the initial short run equilibrium position. Where the economy returns to full employment having started in a deflationary gap position ($Y_e < Y_p$).

The increase in AD will increase AD₁ – households would be noticing an increase in the cost of living as prices go up. This increase in prices is caused by cost push inflation.

- (c) Explain how inflationary expectations from households will impact on the AD-AS model in future periods.

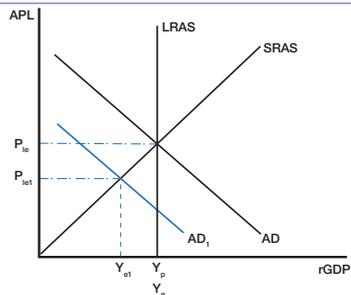


As workers lose their jobs they have less ability to consume goods and services. Households cut their consumption and a decline in economic growth occurs.

With the decrease in consumption decreases AD shifting it to the left from AD to AD1 causing a decline in Economic Growth and employment (Y_e to Y_{e1}).

Price stability improves P_{le} to P_{le1} .

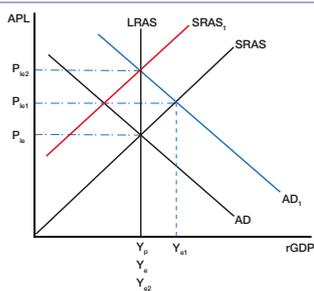
- (d) Illustrate an economy experiencing higher rates of cyclical unemployment.



There is insufficient economic growth to stimulate demand for labour and cyclical unemployment exists

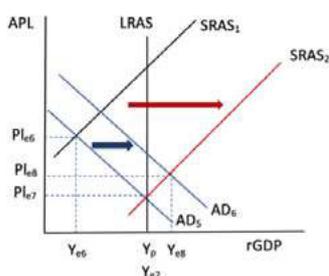
Decrease in economic growth (Y_e to Y_{e1}) \boxtimes Decrease in employment, this also sees a change in inflation from P_{le} to P_{le1} .

3. Explain using an AD-AS model to assist, how an economy experiencing an Inflationary gap would return to the long run equilibrium position without government intervention.



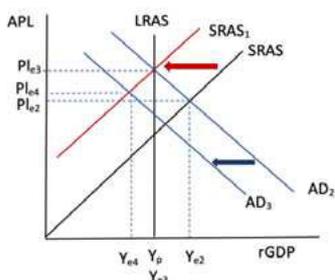
An increase in AD, AD to AD1 shifts the economy into an inflationary gap. Y_{e1} is to the right of Y_p and APL begins to rise. In the long run households will seek higher wages to maintain their purchasing power. The increase in wages will increase the cost of production for firms and decrease SRAS, SRAS to SRAS1. This results in output falling back to Y_{e2} which is equal to Y_p , and APL rising further to P_{le2} .

4. Use the AD-AS models below to assist in explaining the characteristics of an economy going through an upturn.



See model explanation for Figure 10.5.13 - Trough to Upturn as the ADAS moves into the upturn phase.

Downturn.

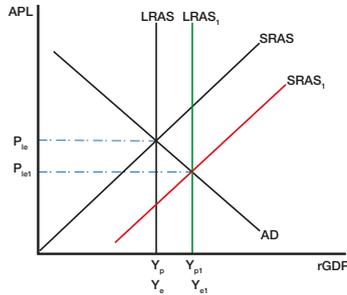


See model explanation for Figure 10.5.11 - Trough to Upturn as the ADAS moves into the upturn phase.

5. Use the following extract to answer the questions that follow.

Country A's government has spent \$1bn over the last year on a major infrastructure project. The inland Rail system will connect cities on the counties east and west coasts improving transport connectivity and boosting productivity.

(a) Illustrate and explain how the spending by government on the inland rail system will impact the economy of country A.

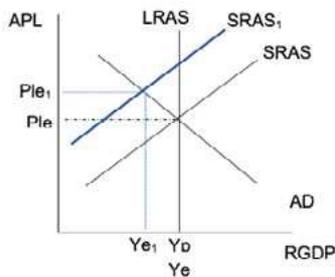


Spending on infrastructure increases the AD curve in the short run; however, it improves the capital base of country A in the long run, increasing the LRAS, which allows for improvement in all macroeconomic objectives to occur.

(b) Explain how the impact on the economy would have differed if the same amount of spending by government had been on welfare payments.

Welfare payments only go to the recipients of them, these people consume more goods and services, however, this does not improve the long term potential economic growth in the economy. While the infrastructure projects can improve both AD and AS curves.

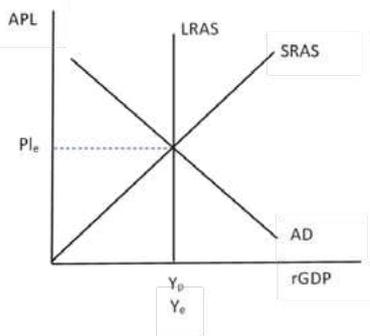
6. Explain using an AD-AS model to assist, why Oil prices have a significant impact on the economy.



Increased oil prices represent an increase in the cost of production for firms thus a decrease in the SRAS.

- Decreased Output Y_e to Y_{e1}
- Increased Average Price Levels P_{le} to P_{le1}
- Increased Unemployment

7. Explain with the aid of an AD-AS model what is meant by the equilibrium level of output.



For further information go to the Overview of the Monetarist AD-AS Model

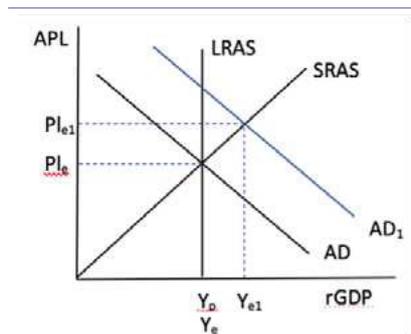
The intersection of AD and SRAS is known as the short-run equilibrium position and is represented by Y_e and P_{le} .

Y_e is the level of output currently existing in the economy and P_{le} represents APL at the same point.

The LRAS curve is vertical and represents a level of output that coincides with the NAIRU, this output level is known as Y_p the long-run potential level of output or full employment level of output.

In this model the long-run and short-run equilibrium positions are equal ($AD=SRAS=LRAS$) however, this is not always the case.

8. Outline and illustrate the effects of an increase in planned investment and consumption expenditure on the price level, output, and employment when the economy is at the 'full employment' rate of output.



The economy is initially at the full employment level of output or long run equilibrium position ($Y_e = Y_p$). The movement of AD to the right, AD to AD₁ represents an increase in AD caused by the planned investment and consumption expenditure. As AD increases it creates increased output in the economy Y_e to Y_{e1} and increases in APL, P_e to P_{e1} . It will also result in a reduction in unemployment as more labour is required to increase output. In this instance, it results in the economy shifting into an inflationary gap position.

12.1 Monetary Policy Questions

1. Discuss how expansionary monetary policy stimulates economic growth.

A decrease in the cash rate helps to stimulate economic growth as it becomes cheaper to borrow money. This means that both firms and households are more likely to take on investment opportunities, as the cost of borrowing is less than it was previously. If this investment in firms improves the productivity and output of goods and services, the economy may also see an increase in consumption and the firms may become more competitive in the export market as well. This injection into the economy could cause the multiplier effect to occur.

2. If an economy is in boom, evaluate the potential risks associated with contractionary monetary policy, relating to investment.

Contractionary monetary policy can discourage investment as the cost of borrowing increases. Firms may put on hold any further investment in the economy which may lead to a decrease in productivity/output. If firms decrease their output, they may have to let staff go and this would then cause an increase in unemployment leading to a decrease in income to households and therefore a decline in consumption, this would then cause a negative multiplier effect to occur.

3. Discuss the impact of expansionary monetary policy on Self-funded retirees and Business Owners.

With expansionary monetary policy, the interest rate falls, and anyone who has savings in financial institutions will see a decline in their interest payments. This expansionary monetary policy encourages investment and could improve business and consumer confidence, which in turn could increase consumption and the value of profit is likely to improve.

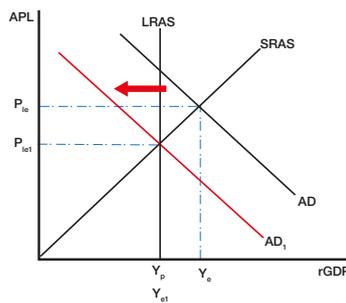
4. Explain the impact of contractionary monetary policy on the exchange rate.

In contractionary monetary policy where there is an increase in the cash rate/interest rate the local currency will appreciate. This is because international investors will want to invest in the economy, as they will receive a higher rate of return on their investments than they had in before the interest rate increase.

5. To what extent is an increase in interest rates the most effective cure for inflation.

Increases in the interest rate (contractionary monetary policy) are generally most effective in contracting an economy as financial institutions tend to quickly hand on the increase of interest rate from the central bank. This means anyone who has borrowed money is then required to pay it back at a higher rate. It also means that households are more willing to save their money. With a decrease in both consumption and investment, a decrease in economic growth occurs causing the AD curve to shift to the left. With this improvement in the levels of price stability (inflation).

6. Using an AD-AS Model, explain the role of contractionary monetary policy in controlling inflation.



Contractionary monetary policy aims to decrease investment spending due to the higher interest rates and encourage saving rather than consuming goods and services. This helps to decrease economic growth. With the decrease in investment firms may also decrease the number of employees they have or reduce their time. This decreases the income of the households and will also cause a decrease in consumption. The exchange rate is likely to appreciate due to the higher return on investment and we are likely to see a decrease in net exports as they were more expensive.

Consumption, investment and net exports are all likely to decrease causing a decline in economic growth, but also decreasing the level of inflation for P_{e1} to P_e .

12.2 Fiscal Policy Questions

1. State two (2) factors that should be considered when implementing fiscal policy.

Government Spending

Taxation

2. Explain some of the potential risks and challenges associated with fiscal stimulus.

Fiscal stimulus could impact the government budget and it may end up as a deficit budget. The government would then need to either sell government bonds or borrow from overseas or the central bank to finance their spending.

Fiscal stimulus could encourage some groups not to seek work as they receive transfer payments. Even though this is a necessity to ensure that the living standards are decent, it can be risky as some people continue to seek government payments rather than seeking employment.

If the government charges too much tax such as income tax, this may discourage workers as it decreases their disposable income and ability to consume products.

3. Describe the potential long-term effects of expansionary fiscal policy on the economy.

Long term budget deficits may occur if the government continually uses expansionary fiscal policy.

There may be limited flexibility if the government sets out too many projects, as they must continue supporting essential services; such as healthcare, education or defence. Some of the projects may be long term investments and bound by contracts so the government is required to see through the whole project.

4. Evaluate the potential consequences of a contractionary fiscal policy during an economic downturn.

The possible consequences of a contractionary fiscal policy during an economic downturn could speed up the downturn as there is a decrease in consumption. This would either occur as less employment due to less government spending or increased taxation which would lead to less disposable income.

5. Explain why contractionary fiscal policy may have a limited effect on economic activity.

If contractionary fiscal policy is implemented during the final stages of an upturn or during a boom the impact may have a limited effect as households and firms are confident that the economy is going well, so may continue maintaining or increasing their investment and consumption. The outcome depends on the size of the increase in taxation and/or the decrease in government spending.

6. Explain what might happen to the level of inflation if a government decides to move from a budget surplus to a budget deficit, if the economy is in a boom.

In this case, the government seems to be implementing an expansionary fiscal policy by either reducing taxes and/or increasing government spending. If an economy is in a boom the AD curve is moving to the right and with an expansionary fiscal policy this will accelerate the shift of the AD curve to the right and cause demand pull inflation to occur.

7. "The lower the level of government spending, the better." Evaluate this view.

In the answer you would need to consider the following aspects:

What is the difference between the government spending and taxation?

Is the government currently in a deficit or surplus or balanced budget?

The stage of the business cycle that the economy is in.

A low level of consistent government spending assist in maintaining transfer payments, education, healthcare, and defence. If there is no government spending these activities is likely to occur if left to the private market.

12.3 Monetary and Fiscal Policy Questions

1. Explain which demand-side policy is the more appropriate policy to control demand-pull inflation with high levels of consumption and investment.

Demand-side policies influence the AD curve, contractionary demand side policies aim to decrease the consumption and investment. If this occurs economic growth declines and the AD curve shifts to the left. This then reduces the level of demand pull inflation in the economy.

2. Evaluate the effectiveness of governments using demand-side policies to take an economy out of a recession.

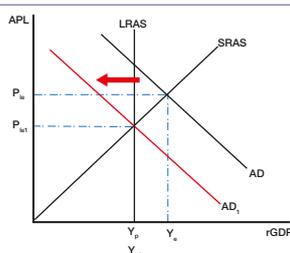
Demand-side policies, in particular fiscal policy can have a short impact lag, if used during a recession or economic trough it can increase the consumption and investment in the economy. This then improves economic growth and likely to also improve employment at the same time. This in turn increases the level of income in households and increases their ability for discretionary spending. This improves the economic growth and this continues through the multiplier effect.

3. Discuss some of the possible risks of relying solely on monetary policy to manage the economy.

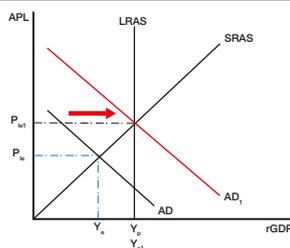
The issue with solely relying on monetary policy to manage the economy is it has limited impacts on the supply-side cause of inflation and could possible also lead to increased levels of inflation, if monetary policy is continuously used.

The use of monetary policy and its effectiveness is also dependant on future expectations and consumer and business confidence.

4. Evaluate the use of expansionary demand-side policies may lead to conflicts between the macroeconomic objectives, with the aid of an AD-AS Model.



Contractionary Monetary or Fiscal Policy can cause a decrease in economic growth (Y_e to Y_{e1}) and therefore employment while improving price stability (P_{le} to P_{le1}).



Expansionary Monetary or Fiscal Policy can cause an increase in economic growth (Y_e to Y_{e1}) and therefore employment while worsening price stability (P_{le} to P_{le1}).

In both cases, the three main macroeconomic objectives are not all met. If these policies are used in isolation two out of the three objectives are likely to be met unless the economy uses one contractionary policy and one expansionary policy.

Real World Application: Demand -Side Policies, Macroeconomic Objectives, Business Cycle and Indicators

Australia's Domestic Position 2nd Quarter 2023, adapted from KPMG Economic Outlook

The slowing of aggregate demand is now leading to forecasts that Australia is likely to demonstrate lower economic activity for the remainder of 2023 and into the first quarter of 2024.

After entering 2023 in a relatively strong economic position the impact of the higher cash rate and inflation has started to slow the growth of output. The March 2023 quarter saw GDP grow 0.2%, household consumption increased by 0.2%, investment grew by 0.4%, while net exports were -0.2%.

The June 2023 Global Economic Prospects by the World Bank states its concerns of a fragile global economy throughout 2023 and 2024, suggesting a higher risk of a further downturn if financial market instability continues and if the global economy continues to aggressive contractionary monetary policy to help control inflation. The expected Global growth throughout 2023 to 2025 is low to mid 2% range up to around 3% respectively.

The implementation of expansionary fiscal policy will counteract the inflationary pressures that the contractionary monetary policy is trying to resolve. Due to the government support provided during COVID-19 governments fiscal reserves have become exhausted.

Adapted from KPMG, 2023, **Australia's Domestic Position 2nd Quarter 2023, adapted from KPMG Economic Outlook**, <https://kpmg.com/au/en/home/insights/2023/07/economic-outlook-australia-q2-2023.html>

Using the information provided answer the following questions:

1. State **two** macroeconomic objectives referred to or implied in the article.

Economic Growth and Price Stability

2. Define the **two** macroeconomic objectives you listed in Q1. Include a discussion of target rates in your answer.

Economic Growth refers to an increase in the size of a country's economy over a period of time. Target 3-4%

Price Stability is the maintenance of low and stable rates of inflation (average or general price levels), resulting in the avoidance of long periods of inflation or deflation and sustaining the value of money). Target 2-3%

3. Explain **two** reasons why the government aims to achieve **each** of the macroeconomic objectives you have selected.

The government aims to achieve economic growth as it is important to assist in attaining improved living standards. With increased economic growth an economy will tend to see improvement in their levels of employment and consumption.

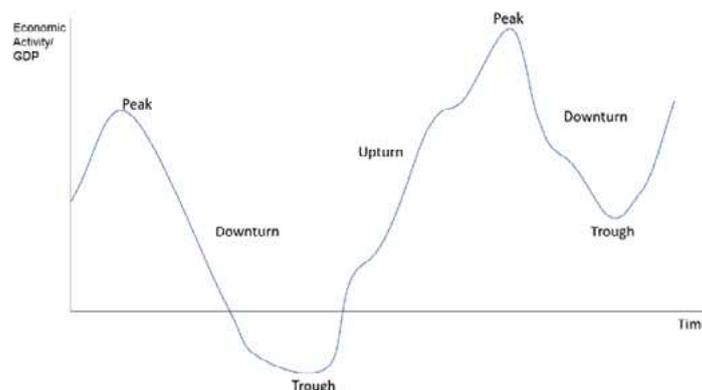
Price stability is important for a government to achieve so that fluctuations in price levels are relatively stable and to assist in maintaining the value of the economy's currency.

4. Using **one** example explain why there is a conflict between the achievement of any two macroeconomic objectives.

When trying to improve economic growth this can cause demand-pull inflation (worsening price stability).

If trying to reduce inflation (improve price stability) it shifts the AD curve to the left worsening economic growth and likely to worsen employment as well.

5. Draw a labelled diagram to represent the business cycle. Explain economic conditions associated with every phase of the business cycle.



Peak	Downturn	Trough	Upturn
<ul style="list-style-type: none"> • High levels of economic growth. • Consumption levels growing faster than production. • Income levels rising as firms are willing to pay for the most suitable candidates (labour) • Labour shortages emerge as the economy is operating beyond its long-run capacity. • Upward pressure on prices as production cannot keep pace with aggregate demand, leading to demand-pull inflation. • The level of inflation exceeding the target rate. • High levels of business and consumer confidence. • A run down in firms' stock levels as production cannot occur at a rate fast enough to match demand. 	<ul style="list-style-type: none"> • A decline in economic activity. • Consumption and investment decreasing as consumer and business confidence fall. • A decrease in the demand for labour and rising unemployment • Employee income levels decreasing as increased unemployment results in surplus labour and falling wage levels. Rising part-time employment and underemployment. • Falls in inflation rates as demand pull pressures subside. • A build up in stock levels as production occurs at a rate faster than demand. • A run down in firms stock levels as production cannot occur at a rate fast enough to match demand. 	<ul style="list-style-type: none"> • Low and perhaps negative levels of economic activity. • Consumption and investment are at their lowest points as consumer and business confidence are below long-term averages. • Low levels of demand for labour and high levels of unemployment • Employee income levels stagnate or perhaps fall, as increased unemployment results in surplus labour and falling wage levels. • Higher part-time employment and underemployment. • Falls in inflation rates and perhaps deflation as the economy operates below its long-run capacity. • Surplus stock levels as production exceeds total expenditure. • The impact of a downturn on various sectors of the economy is identified 	<ul style="list-style-type: none"> • Rising levels of economic activity. • Consumption and investment growing as consumer and business confidence begin to rise. • Increasing levels of demand for labour and falling levels of unemployment. • Employee income levels rise as increased demand for labour begins to create labour shortages and rising wages. • Higher full-time employment and lower rates of underemployment also increase income levels. • Rising inflation rates as the economy approaches or surpasses its long-run capacity. • Falling stock levels as production rates begin to lag, rising total expenditure. • The impact of an upturn on various sectors of the economy is identified in

6. Briefly explain how a government can use leading, coincident and lagging indicators to better achieve the macroeconomic objectives. In your answer include an example of each type of indicator.

Governments use economic indicators in attempts to determine the direction and magnitude of demand-side economic policies or by various non-government groups to critique the performance of government or as a basis of individual decision making.

Governments can use indicators to complete the following:

Measure what has taken place in an economy,

Map or assess the current economic situation,

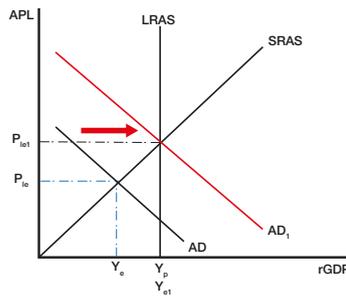
Predict likely future economic trends over the short term.

Leading- Consumer Confidence and Business Sentiment, help to determine whether there is going to be a change in consumption spending or business investment.

Coincident – GDP (this can help confirm the stage of the business cycle, even though it can take time to calculate).

Lagging- Inflation- this does lag the economic activity as the inflationary pressures do not emerge until after the change in economic activity.

7. Discuss an appropriate demand side policy that is appropriate for the situation stated in the case study, use an AD-AS Model to support your explanation.



Expansionary fiscal policy may be the most appropriate demand side policy if they maintain contractionary monetary policy. With expansionary fiscal policy the government is able to target where they want the money to go, while monetary policy is a blunt tool. This will allow economic growth to occur (Y_e to Y_{e1}) but is also likely to impact inflation (P_e to P_{e1}).

13.1 Supply-Side Policies

1. Discuss two potential problems when implementing supply-side policies.

Potential problems include:

Implementation and Impact Lag,
 Cost of Supply Side Policy,
 Distribution of Income,
 Potential for influence by pressure groups.

2. Explain the role of completion policy in promoting economic efficiency.

Encourage new firms to enter a market by reducing barriers to entry.

3. Analyse one/two advantages and disadvantages of implementing supply-side policies.

Refer to 13.4 Advantages and Disadvantages of Supply-Side Policy

4. Explain the short-run and long-run impacts of deregulation.

Short run – some firms will not be able to compete at the same level as other firms so may level the industry.
 An increase of new businesses entering the market to compete against other firms – (limiting monopolies)
 Long run – To compete some firms may try to cut costs and decrease the quality and safety around the product.

5. Evaluate the use of supply-side policies to reduce unemployment.

Improved Labour Skills
 Employment in the export sector
 Increased demand for labour

6. Explain, with reference to one example the potential impacts on income distribution of the implementation of supply-side policies.

Most supply-side policies have a negative effect on the distribution of income and equity in the economy, particularly in the short run. Some supply-side policies widen the gap between the rich and the poor. Benefits from supply side policies see business owners benefitted rather than the employee. Examples include tax breaks for businesses, incentives to enter industries.

7. Explain the impact of investment in healthcare by a government on labour productivity.

Improvement of healthcare services can improve labour productivity as there is less illness in the economy. If there are injuries, then the healthcare system can assist in getting employees back into the work force.

8. Explain how supply-side improvements to an economy may be achieved using taxes and government spending.

Spending on projects like infrastructure have an initial injection into the economy assisting to improve AD, however, long term infrastructure projects see improved economic growth shifting the LAS curve to the right. Improving the capital base of the country.

Macroeconomics Review Test (39 marks)

Question 1

Source A

The following table includes economic data for Country F over 3 years.

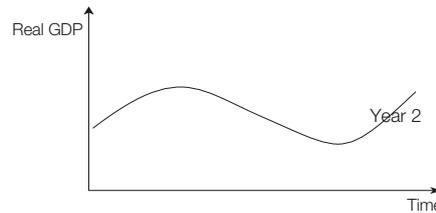
Country F has experienced a seen an increase in infrastructure projects, including education and technology by the government throughout the 3 years, this has lead to an increase in retail sales and consumption.

Country F's macroeconomic targets include:

- Unemployment of 5%
- Inflation of 2-3%
- GDP Growth 3%

	Year 1	Year 2	Year 3
GDP Growth (%)	1.2	1.4	2.2
Government Revenue (% of GDP)	16.0	17.0	18.0
Government expenditure (% of GDP)	20.0	24.0	30.0
Inflation Rate (%)	3	4	4.5
Unemployment rate (%)	7.5	5.5	5.1
Official Interest Rate	0.5	0.25	0.25

- (a) One the diagram below, identify the phase of the business cycle the economy in Country E experienced in Year 2. Justify your answer. (2 mark)



GDP growth which is a coincidental indicator is improving and has seen a growth of 0.2 from Year 1. Changing from 1.2 in Year 1 to 1.4 in Year 2.

- (b) The following indicators can be used to determine the phase of the business of an economy. State one limitation for each indicator. (2 marks)

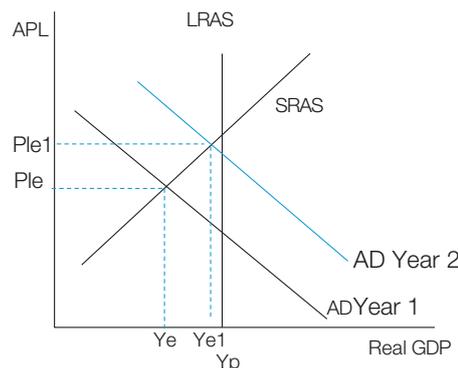
- i) Retail Sales

- Leading Indicator – it can assist in predicting the change however the prediction/forecast is not completely accurate.

- ii) Inflation Rate

-Lagging Indicator – assists in confirming the stage of the business cycle, however, lagging indicators take time to gather data and calculate and change after the movement on the business cycle.

- (c) (i) On the aggregate demand-aggregate supply model below, indicate the change in economic conditions in Country F from Year 1 and 2. (2 marks)



- (d) (i) Define the macroeconomic objective of 'full employment of labour.' (1 mark)

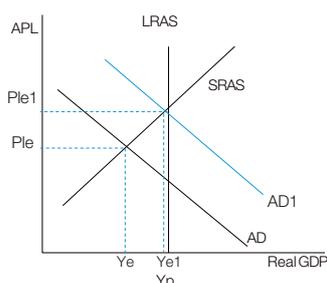
Full Employment is referred to as a situation where the only unemployment remaining in the economy is structural, frictional or seasonal in nature. It is a target rate or a level of unemployment that is consistent with maintaining low and stable rates of inflation.

- (ii) Explain one reason why the official unemployment rate may underestimate the level of unemployment in Country E. 2 marks

Explanation should include part time and casual workers that are wanting more hours to work, incorporating the concept of underemployment.

Frictional unemployment – people between jobs, between education and jobs etc.

- (e) Assess the effectiveness of the government's economic management policies in Country E in Year 3. Fully label and complete the AD-AS diagram below to support your answer. (6 marks)



The use of expansionary monetary policy and fiscal policy has improved the position of the economy overall seeing an improvement in economic growth and employment; however, the government would still be concerned about the level of inflation as it is beyond the government's target.

If the combination of these two policies continues the economy is going to continue to see economic growth and employment improve and inflation worsen due to the multiplier effect.

Additional information has been provided. Country E's Central Bank intends to raise the interest rate in Year 4 to 0.75%.

- (f) With reference to the current economic conditions in Country E, evaluate this decision. (5 marks)

Using contractionary monetary policy will assist in reducing the levels of inflation as it encourages firms to decrease their investments and households to increase their savings. As monetary policy is a blunt policy tool, it is going to impact all households and firms across Country E.

This will help to improve the level of inflation as consumption and investment are on the decline. However, as the economy is still using expansionary fiscal policy the government can target this spending and assist different groups in the economy.

The combination of these policies helps to reduce inflation but maintain the living standard of most groups in the economy.

For the best outcome, the government should try and implement a supply side policy to have both better economic output and improved levels of inflation.

- (g) Describe how one group or individual might be impacted by the monetary policy position in Year 4. (2 marks)

This answer could discuss a number of different individuals.

Savers – increased interest received for having their money in the bank

Borrowers- increased cost of borrowing, which means that it is more expensive to borrow money.

Lenders – may see a decrease in people wanting to borrow money. They also may have a number of borrowers default on their loans as they are unable to afford the increase in interest repayments.

Source B

Country E's Households (Consumers) have been watching the exchange rate with concern the exchange rate for Country E has depreciated against the US\$ from Year 1 to Year 3.

	Year 1	Year 2	Year 3
Country E \$	0.85	0.81	0.69

Country E's Government discusses with many consumer groups their concerns leading into Year 4. Households are concerned with the speculation about interest rate changes and the concern that if the dollar continues to depreciate the cost of goods and services will increase, increasing the cost of living. After these discussions, the government sees that it is evident that the consumer confidence was worsening.

(h) (i) Define the term leading indicator

(1 mark)

Leading Indicators is a measured set of data that assists in predicting the future economic activity.

(ii) Using the information from Source C, predict the stage of the business cycle in Year 4. (1 mark)

Downturn – we do not have the data to determine if it is at a trough.

(i) State likely impact on Net Exports. 1 mark

Net exports is likely to improve as imports decrease and exports increase at the lower rate.

(j) Explain the likely intended and unintended consequences of Country E's dollar depreciating. 4 marks

Could look at a range of intended and unintended consequences one example

Exports become cheaper increasing the quantity of exports sold. This means the exporters are likely to see improved market share and profits. The impact of this improved level of sales is they may not have enough stock and may need to increase production and hire more employees.

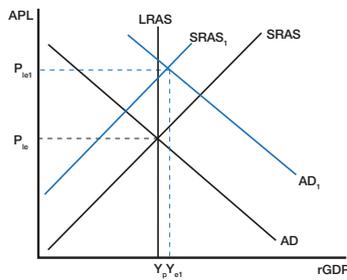
(k) (i) State the type of inflation that is likely to occur in Year 3 and possibly Year 4. (1 mark)

(1 mark)

Demand Pull Inflation

(ii) Explain the likely impact of your answer in j i) for Country E.

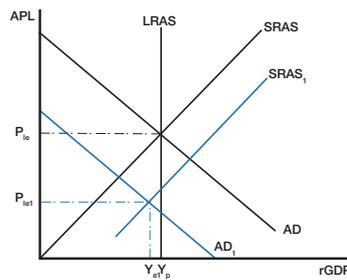
Fully label and complete the AD-AS diagram below to support your answer. (3 marks)



With exports becoming cheaper and rising and imports becoming more expensive and falling, there is a direct impact on aggregate demand, resulting in AD increasing and shifting to the right. In addition, as the price of imports increases, imported intermediate goods (materials) and resources used in production, as well as capital goods used for production become more expensive.

Question 2

Discuss the likely consequences if the Central Bank in Country E should increase the cash rate to 0.75% in light of information in Source B. Fully label and complete the AD-AS diagram below to support your answer. (6 marks)



The increase of the cash rate is likely to see an appreciation of the currency of Country E as investors are likely to receive a higher return.

This appreciation will increase the price of Exports and decrease the price of Imports thus (ceteris paribus) will decrease Exports and Increase Imports causing AD to Decrease. The decreased price of Imports will lower the cost of production by reducing input prices of imported materials thus SRAS will increase.

- Output – depends on relative change here output falls Ye to Ye1
- Decreased Average Price Levels
- Unemployment – depends on relative change here the economy is operating in deflationary gap so an increase in unemployment