Introduction to Economics & Central Problem of Economics

Name: _____
CT: 22_____

Learning Outcomes

Syllabus content

1.1 Scarcity and the Central Economic Problem

1.1.1 Scarcity, choice and resource allocation

a. Concept of scarcity and the inevitability of choices by economic agents (consumers, producers and governments)

b. Concept of opportunity cost and the nature of trade-offs in the allocation of resources

1.1.2 Rationale decision-making process by economic agents

a. Understanding objectives of economic agents
- Consumers – maximisation of utility
- Producers – maximization of profits
- Governments – maximization of social welfare

b. Recognising constraints

c. Gathering information and considering perspectives

d. Weighing costs and benefits in decision-making*

e. Recognising trade-offs

f. Recognising intended and unintended consequences

Note:
***A marginalist approach to weighing costs and benefits is the expected approach. Cost-benefit analysis (CBA) is not required.**

CHAPTER OUTLINE

1.1 INTRODUCTION TO ECONOMICS

1.1.1 What is Economics?
1.1.2 Why study Economics?
1.1.3 Approach to studying Economics
1.1.4 Scope of Economics

1.2 CENTRAL PROBLEM OF ECONOMICS

1.2.1 Scarcity, Choice & Opportunity Cost

- Scarcity
- Choice
- Opportunity Cost
- Law of Increasing Opportunity Cost

1.2.2 The Production Possibility Curve (PPC)

- Definition of the PPC
- Graphical Representation of the PPC
- Scarcity, Choice, Opportunity Cost and the PPC
- Shape of the PPC and Opportunity Cost
- Economic Growth and the PPC

1.3 FRAMEWORK OF ECONOMIC ANALYSIS

(TUTORIAL 1 is attached at the end of Chapter 1.3)

A LEVEL QUESTIONS IN RECENT YEARS

TYS 2021 Q1
The market for bicycles is often said to generate external benefits such as reduced traffic congestion and reduced air pollution.
(a) Explain how economic theory suggests consumers act rationally to decide whether or not to buy a bicycle, and how producers of bicycles act rationally to determine their level of output. [10]
(b) Discuss how government intervention in the market for bicycles could be used to maximise social welfare and consider how likely it is that such intervention will be successful in achieving this aim. [15]

TYS 2018 Q3
The proposed Cross Island MRT line would run through the Central Catchment Nature Reserve. An alternative route going round the reserve's southern edge would preserve Singapore's natural heritage and serve a much larger number of residents. The Land Transport Authority, LTA, says

that the alternative route would entail longer travelling time, higher costs, more land acquisition and possibly bigger engineering challenges.

Source: *The Straits Times*, accessed 24 May 2017

(a) Explain what needs to be considered when a government makes rational spending decisions about such projects. [10m]
(b) Discuss whether the government should proceed with the proposed alternative route for the Cross Island MRT. [15m]

TYS 2016 Q2

Singapore's spending on healthcare is about 4% of GDP. This is lower than many developed countries. However, Singapore's population is ageing and economic growth may not be as high as before. The government's share of national healthcare expenditure is expected to rise from 33% in 2012 to over 40% in the future.

(b) Discuss how the opportunity cost of increased healthcare expenditure differs, depending on whether it is financed by individuals or the Singapore government. [15m]

TYS 2015 Q1

Prospective students and governments each make decisions that affect the scarce resources that are devoted to university education.

(a) Explain the determinants of a rational prospective student's decision on whether to participate in university education. [10]
(b) Discuss the factors that governments should consider in allocating resources to university education. [15]

TYS N2013 Q1

Economics assumes rational decision-making by consumers, firms and government.

(a) Explain what is involved in rational decision-making both by consumers and by firms. [10]
(b) Discuss whether rational decision-making by consumers, firms and government always leads to an efficient allocation of resources. [15]

TYS N2011 Q1

Consumers and producers are generally assumed by economists to be motivated by self-interest.

(a) Explain how, according to economists, the pursuit of self-interest can help to address the problem of limited resources and unlimited wants. [10]

Note: Most questions on the Central Problem of Economics require understanding of concepts covered in other chapters, such as Chapter 6.1 on Economic Growth and Chapter 3 on Market Failure and Government Intervention.

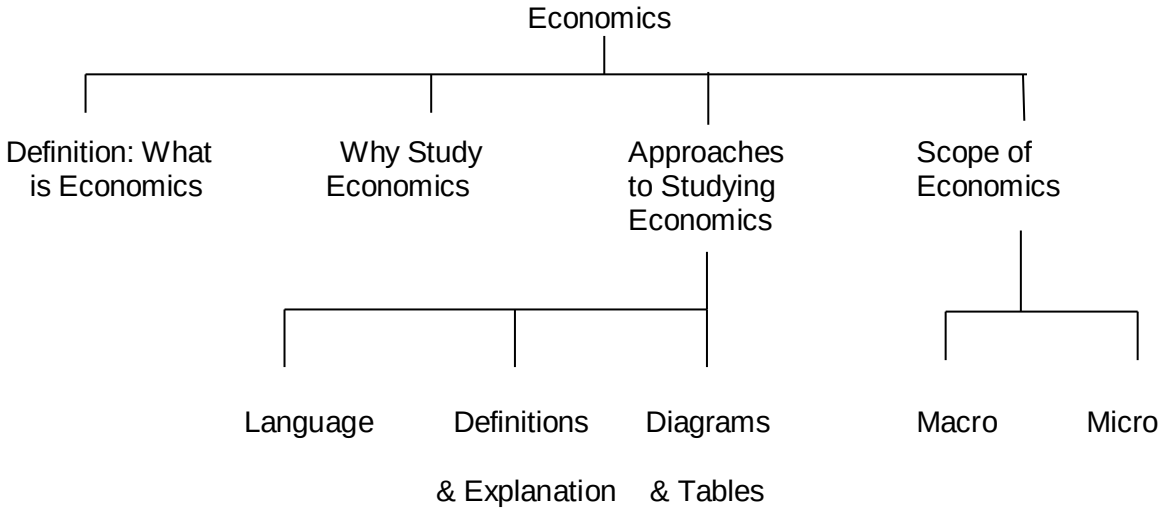
SYMBOLS

- Once you see this **'thinking-man'** icon, it means you are to stop to **check your understanding** of the concepts by attempting the questions in the space provided *(open-book)*.

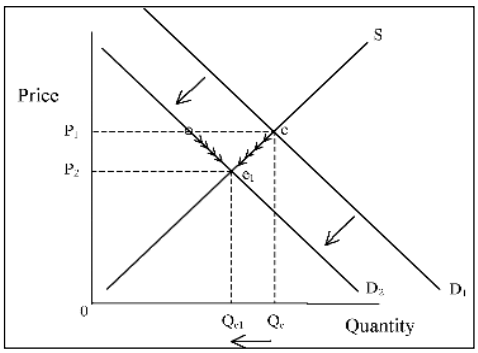
- This **'handy-man'** icon means you are to stop and attempt the **tutorial questions** which are either case studies or essays.
- Why 'handy-man'? Because it symbolizes **problem-solving and effort**.
- You are to write out full answers on separate sheets of paper *(open-book)*.

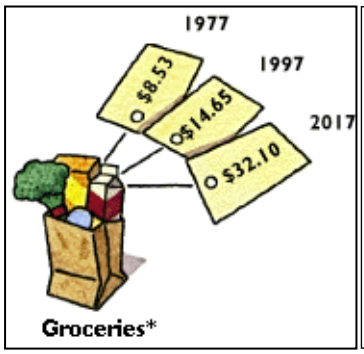
Chapter #1.1: INTRODUCTION TO ECONOMICS

Conceptual Outline:



1.1.1 WHAT IS ECONOMICS?





Some of you might think that the study of Economics involves the following:

- "Economics is something about stocks right?"
- "You need to learn economics to work in banks right?"
- "Economics is about studying money"

Whilst these statements and beliefs are not entirely wrong, the study of economics involves these things and more. Economics can be defined as a social science that involves the study of **how individuals and societies choose to allocate scarce resources among alternative uses in an attempt to satisfy their unlimited wants**.

Some other definitions offered by famous economists include:

Adam Smith (1723 - 1790) Moral Philosopher	Economics is an **inquiry** into the nature and the causes of the wealth of nations.
John Maynard Keynes (1883-1946) British Economist	Economics is a **method**, not a doctrine. It is an apparatus of the mind, **a technique of thinking** which helps its possessor to draw correct conclusions.

"Economics is the science which studies human behaviour as a relationship between the ends and scarce means which have alternative uses." Lionel Robbins (1935)

"Economics is the study of how societies use scarce resources to produce valuable commodities and distribute them among different people." Paul Samuelson and William Nordhaus (1992)

From the above definitions, we can conclude that

1) Economics is in itself, **a method of inquiry and way of thinking**, and

2) due to **scarcity of resources** as opposed to **unlimited human wants**, a **choice** has to be made which involves **opportunity cost**.

3) This decision may result in both **intended** and **unintended consequences**

1.1.2 WHY STUDY ECONOMICS?

Since economics is a study of a subject that we encounter in our daily life, it plays an essential role in our life no matter where we go, who we are, and what we do. Some motivations include:

a) To learn 'to think like an economist' by considering the factors which influence our actions so as to make the best possible choice
b) To understand society: economic issues permeate society along with politics, etc.
c) To understand global affairs: international news headlines are filled with economic stories.
d) To be an informed voter: is the cost of living really rising rapidly? Is the Electronic Road Pricing (ERP) and Certificate of Entitlement (COE) a good scheme to help alleviate traffic congestion?
e) To apply the knowledge learnt for the formation of government policies so as to benefit the country and humanity.

Thinking like an economist means framing and organising a way to examine economic issues, polices and choices by using key concepts such as efficiency, incentives and equilibrium. The decision-making approach helps to facilitate this process.

Decisions are made by three key economic agents – consumers, producers and governments. Economic agents interact with one another at both the national and

international levels. Each economic agent has their own objectives and seek to weigh the costs and benefits, to make decisions based on the given constraints.

1.1.3 SOME APPROACHES TO STUDYING ECONOMICS

There are a few points to note in approaching the study of Economics (i.e. to do well in the subject, you have to pay attention to following):

a) Language used

Economics has its own **technical jargon**. It is full of common words that have different meanings from everyday use. Understanding their meaning enables you to engage in stimulating discussion for this course.

b) Theories and assumptions

The subject or discipline is about mastering economic concepts and economic analysis. These are the tools that economists rely upon to explain their theories. The 2 years spent on learning economics for the A levels is about acquiring a good knowledge of economic concepts, models and theories. So, right from the start you should prepare yourself to learn as best as you can, the economic concepts and analysis. These are worth paying attention to as they are the core of the subject.

c) Diagrams and tables

These help to illustrate the concepts being explained. An ability to draw and interpret these items is a skill absolutely necessary to acquire.

1.1.4 SCOPE OF ECONOMICS

The scope of Economics is very wide and there are two main branches of economics: **microeconomics** and **macroeconomic*.***

Microeconomics deals with the functioning of **individual industries** and the study of behaviour of **individual economic decision-making units**: business firms and households. It is like looking through a microscope to focus on the small parts of the economy. E.g. producers' choices about what to produce and how much to charge, consumers' choices about what and how much to buy.

Macroeconomics concerns the **functioning of the whole economy**, focusing on aggregate characteristics and economy-wide factors such as interest rates, inflation, growth and unemployment. In the A levels syllabus, we look specifically at the causes, consequences and cures of macroeconomic problems. Macroeconomics deals with economy-wide phenomenon such as changes in national income, unemployment, and general price level.

Positive and Normative Economics

Economists use positive analysis, a value-free approach to inquiry. Positive analysis relates to statements such as "If A, then B". For example, if the price of petrol goes up, people will buy less. **Positive economics** seeks to describe and explain economic **facts and events** observed objectively. It is not a statement of anyone's value judgement or subjective feelings. Positive

economics tries to explain the mechanism of an economic phenomenon and it deals with what is, what was and what will be. A positive statement is a statement of fact. **It may be right or wrong, but its accuracy can be tested or verified.**

In the hard sciences such as Physics and Chemistry, the analysis can be value-free. But economists face a different problem, they deal with human behaviour and this makes it more difficult to be value-free without reference to our feelings.

When we include value in our economic analysis, we enter the realm of normative economics. **Normative economics** looks at the outcomes of economic behaviour and questions whether these are good or bad. It tries to state the way the economy should operate, i.e. what ought to be. If we consider the earlier example, i.e. if the prices of petrol increase and people will buy less, and insert the statement "so we should not allow the price of petrol to increase", then we have expressed a value judgement. Since a normative statement contains **value judgment**, it cannot be proved or disproved by merely looking at facts.

1. Indicate whether the following are microeconomic or macroeconomic issues according to various newspaper headlines.

1.	The Singapore economy grew by 0.7% in 2019.	micro / macro
2.	Australia's unemployment rate stands at 5.2% in December 2019.	micro / macro
3.	Thai Beverage, the manufacturer of Chang Beer confirmed yesterday that it is planning a takeover of Singapore, Fraser and Neave (F&N).	micro / macro
4.	In order to curb the rising prices of property, the Singapore government introduce a series of measures such as increasing stamp duties and a cap on the maximum loan that buyers can take.	micro / macro

2. Indicate whether the following are normative (N) or positive (P) statement.

1. The best policy is one that will maximise the rate of economic growth for the country. ( )

2. Government policies give more emphasis on curing inflation rather than curing unemployment. ( )

3. The government ought to put more emphasis on curing inflation than on curing unemployment. ( )

4. It is fairer that MRT commuters pay the full cost of the journey rather than pay the subsidised cost. ( )

5. The privatisation of the telecommunication industry has led to a fall in price of mobile phone subscription plans. ( )

SUMMARY

1. Economics is a social science that studies how individuals and societies allocate **limited resources** to the production of goods and services to satisfy consumers' **unlimited wants**.

2. **Microeconomics** is the branch of economics that studies individual units: e.g. households, firms, and particular industries. It studies the interrelationships between these units in determining the pattern of production and distribution of goods and services

3. **Macroeconomics** is the branch of economics that studies economic aggregates: e.g. the overall level of prices, output, and employment in the economy.

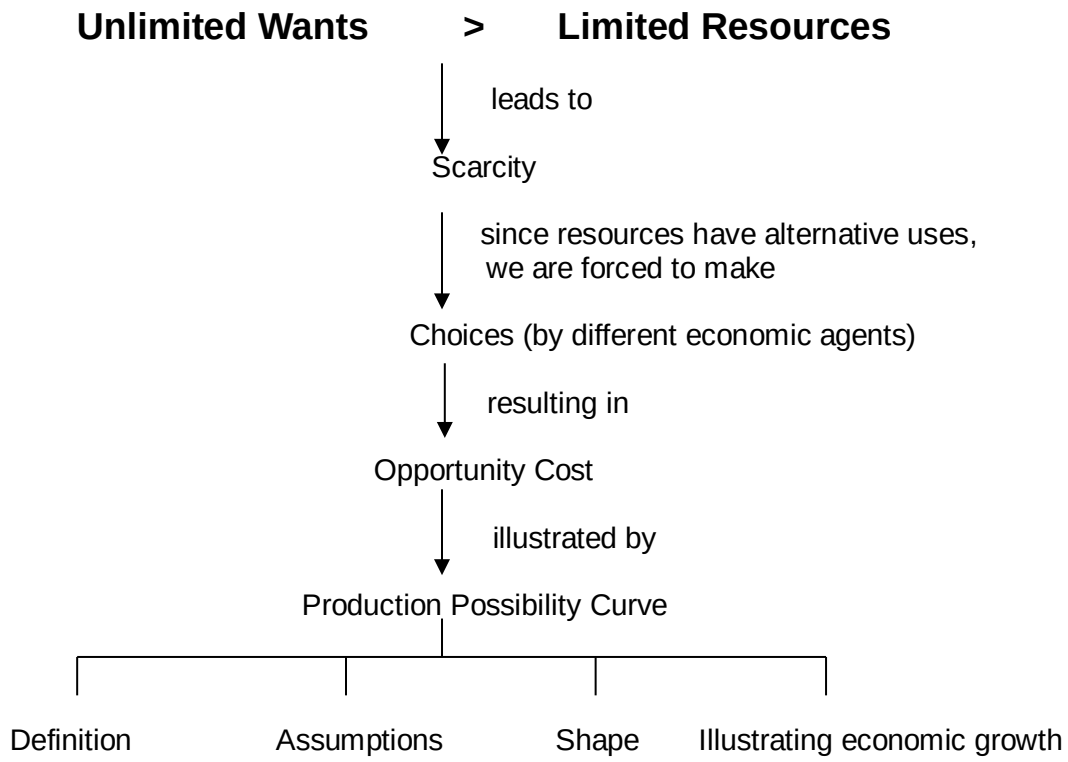
4. Positive statements are value-free statements that **appeal to the facts**.

5. Normative statement contains value judgment concerning what **ought to be**.

6. Economics is a social science that uses models to explain and predict economic phenomena.

Chapter #1.2: CENTRAL PROBLEM OF ECONOMICS

Conceptual Outline:



1.2.1 SCARCITY, CHOICE AND OPPORTUNITY COST

As mentioned in Chapter 1.1, the common problem each society faces is that our **limited resources cannot satisfy our unlimited wants.** This then makes it necessary for individuals and societies to choose. With every choice made, there is therefore opportunity cost incurred.

SCARCITY

Scarcity refers to the situation where the **limited resources** available are unable to satisfy the **unlimited** human **wants**.

Note: Scarcity must not be confused with common words used in everyday context such as 'a few', 'rare', 'minute', 'little' or 'shortage'.

Indeed, if you look around us you are likely to see lots of people, wide open spaces; forests and trees, open seas and other potentially useful resources. Yet economists describe such resources as 'scarce' - not in the absolute but **RELATIVE** sense. In other words when **compared against or relative** to our UNLIMITED wants, the available resources are **insufficient to satisfy all wants, given the finite quantities** of these resources.

Large economies such as the USA, China and India may have huge populations and vast amount of resources, yet relative to the wants of their own people, their available resources are never enough or sufficient to satisfy all wants. Hence economies large or small, rich or poor cannot escape from the problem of scarcity.

Scarcity vs. Shortages

Take note that scarcity is not the same as a shortage.

Shortages results to a situation where supply is insufficient to meet the demand (details in Chapter 2)**.** Such shortages can be eliminated over time but scarcity is rarely eliminated unless for some reasons, the resources available increase significantly or the wants decrease till the resources are able to satisfy all possible uses of the resource. Both of which are unlikely to happen.

a) Unlimited Wants

The wants are satisfied through the consumption of goods and services. Goods are tangible items (e.g. food, clothes, and houses) and services are intangible activities (e.g. banking, medical services) used to satisfy wants.

However, wants are unlimited due to the desire for ever higher levels of **consumption.** As soon as old wants are satisfied, new wants are created.

Example of Unlimited Wants
A couple may stay in a smaller apartment, and as their income rises, they may want to move in a larger apartment. While some households may remain satisfied with their current housing situation, a large number of households might want to 'upgrade' if they can afford to pay for better accommodation.

b) Limited Resources

Goods and services are generated through the process of production where resources or inputs are used. Resources are means of production and they are finite in amount at any point in time. Hence, the quantity of output produced will also be limited. These resources are divided into four categories：

Land	All natural resources or all productive resources made available to mankind by nature. These are categorized as renewable and non-renewable resources: • Renewable resource (such as wind and water) renew themselves at a fast enough rate for sustainable economic extraction. • Non-renewable natural resources (such as fossil fuels and mineral ores) do not renew themselves fast enough to allow sustainable economic extraction.
Labour	Any human effort, both mental and physical, used in the production of goods and services. The quality of labour depends on **human capital,** which is the knowledge and skill that people obtain from education, on-the-job training and work experience.
Capital	Physical assets (such as production factories, machinery and tools) which are man-made to aid in current production. It is not meant for satisfying wants directly but it is used to produce goods which are demanded directly by consumers. Here we are referring to **physical capital** rather than human or financial capital.

Entrepreneurship	The human resource that organizes land, labour and capital in production. Entrepreneurs come up with new ideas about what and how much to produce, make business decisions, and bear risks that arise from these decisions. Without entrepreneurship, virtually no business organisation can operate.

3. With reference to the 4 key factors of production, explain the resource constraints facing Singapore. The first factor of production, 'land' has been analysed for your reference.

Land	Land is acutely scarce in Singapore. With about 720 sq km and a population of 5.7 million (3rd highest population density in the world), there is competing demand in the form of industrial, commercial and residential use.
Labour	
Capital	
Entrepreneurship	

Scarcity is a universal fact. As explained in Chapter 1.1, the fundamental problem of Economics is how to use our limited resources to produce goods and services that society values most highly, i.e. how to make optimal choices. Therefore, Economics is the **study of the choices that individuals and society make to cope with scarcity**. We use the decision-making process explained in Chapter 1.1 to understand how consumers, producers and governments make **optimal choices**.

CHOICE

Because **resources** are scarce, they **have alternative uses**. Therefore, individuals and societies must **make choices** among the alternative uses so as to maximise the use of resources **to achieve** the **highest** possible level of **satisfaction**.

The term economists use to describe this goal or objective is known as welfare maximization.

For all economies, there are **3 fundamental choices to make**:

a) What and how much to produce?
This is a decision on the types of goods to produce as well as how much of each good to produce. It is a problem concerning the **allocation of scarce resources** among its alternative uses. For example, the government has to choose between producing more military equipment or building more hospitals.

b) How to produce?
This is a **decision on the method of production**, i.e. whether a labour-intensive method or capital-intensive method of production should be used. The choice of the method of production will not only vary according to the **aim of the producer**, but also on the resources available to him. Most economies would aim to choose the most (cost) efficient method of production to utilise scarce resources to the fullest.

c) For whom to produce?
How will the chosen output be divided among all the members of society? E.g. Who is entitled to the goods and in what quantities? Is the output distributed to those who need them or those who can pay for them?

FYI: The answers to the 3 questions above depends on the type of economic system adopted by the country. There are basically three types of systems: free market, command economy and the mixed economy. You may find out more on this if you are interested.

OPPORTUNITY COST

Opportunity costs measure the cost of making a choice, in terms of the **next best alternative foregone**.

You may not realize it but you instinctively use the concept of opportunity cost every day. Indeed, decisions are made every day: What to wear, what to study, what to eat and so on. Each time you make a decision, you are, in effect, rejecting available alternative choices.

And so, the real or opportunity cost of the decision you made is the **next best alternative forgone**. Opportunity costs exist simply because choices have to be made amongst alternative uses of available scarce resources. If someone offers to take you out for a free lunch, is it really FREE?

E.g. 1: Opportunity Cost from consumers' perspective
A smartphone consumer with a limited budget is considering whether to buy the latest model of the iPhone to maximize his satisfaction. In doing so, he gives up the choice to buy the latest model of the Samsung Galaxy smartphone or any other smartphones. If buying the Samsung mobile phone was his next best alternative, this would be the opportunity cost he incurs from buying the iPhone.

E.g. 2: Opportunity Cost from producers' perspective
A producer or farmer decides to utilize his existing land resource to grow rice this year for production purposes to maximize profits. This piece of land could be used to grow other crops such as sugarcane or palm oil. If growing sugarcane is the next best alternative, he will have to forego the benefits from growing sugarcane when he chooses to grow rice on his plot of land.

E.g. 3: Opportunity Cost from government's perspective
The Singapore government spent $225 million building Singapore's longest man-made waterway in Punggol New Town to maximize social welfare. This $225 million could have been put to other uses like building hospitals, schools or improving transport infrastructure. In making the choice between these

options, the Singapore government would have considered issues like the welfare of Singapore citizens, productivity, the state of existing infrastructure etc. As such, the opportunity cost of the Punggol Waterway could be the building of more schools.

Opportunity costs are incurred whenever the resources available are insufficient to meet all possible wants. However, **there are exceptional cases where there is zero opportunity cost:**

A **free good** is a good that provides satisfaction of wants and needs without imposing an opportunity cost on society by preventing the production or consumption of other consumer-satisfying goods or services.

A good is free if it can satisfy all of existing wants and needs... and then some. There is more than enough of the good for everyone who wants the good to enjoy it. In using a free good, nothing is given up in order to enjoy the good. Hence a free good is one where there is **no opportunity cost**.

Examples of free goods are air, dead leaves and sand in the desert.

Do note that "Free gifts" such as free shampoo samples are not free goods in the economic sense. The resources used to make the "free shampoo samples" could have been used for other purposes instead. Since an opportunity cost is incurred, "free shampoo samples" are not free goods in the economic sense.

The opposite of a free good is an **economic good.** An economic good is scarce in nature, hence, opportunity costs are incurred when providing it and their prices are usually positive.

In Summary:

The Central **P**roblem of **E**conomics is about
scarcity → choice → opportunity cost

LAW OF INCREASING OPPORTUNITY COST

The **Law of Increasing Opportunity Cost** states that **as more** of a particular good is **produced**, larger and **larger quantities of** the **alternative good** must be **sacrificed**, i.e. the opportunity cost of its production rises.

Almost every activity that you can think of is one that involves an increasing opportunity cost. This is because the resources present in the economy are not perfectly homogeneous or equally suited in the production of all goods. Some resources are just better suited for the production of some good than they are for other goods.

For example, production workers with many years of experience working with F&N are very good at producing canned soft drinks but not as good at making earphones. As the production of earphones increases, the firm will have to redeploy workers from F&N to Sony. However, F&N increasingly loses its experienced workers who are not adept at producing earphones. Hence, for every additional earphone produced, more units of canned drinks are sacrificed. We say that the opportunity cost of producing earphones (in terms of canned soft drinks) increases.

1.2.2 THE PRODUCTION POSSIBILITY CURVE (PPC)

The problems of scarcity, choice and opportunity cost **can all be illustrated by the Production Possibility Curve.** The PPC is also known as the **Production Possibility Frontier.**

DEFINITION OF THE PPC

The **Production Possibility Curve** shows **all** the different **maximum** attainable **combinations** of goods and services that can be **produced** in an economy, when **all** available **resources** are **fully** and **efficiently used** at a **given** state of **technology**.

GRAPHICAL REPRESENTATION OF THE PPC

Table 1 shows the combinations of the maximum amount of **consumer goods and capital goods*** that can be produced in a year when all the resources are efficiently employed.

Table 1: Possible combinations of consumer goods and capital goods the economy can produce

Combinations	Consumer goods (billion units)	Capital goods (billion units)
A	45	0
B	40	1
C	30	2
D	18	3
E	0	4

* Consumer goods are goods which are produced for consumption by households.
Capital goods (investment goods) are goods which are used for the production of other goods.

Graphically, we can represent the table above using the PPC below:

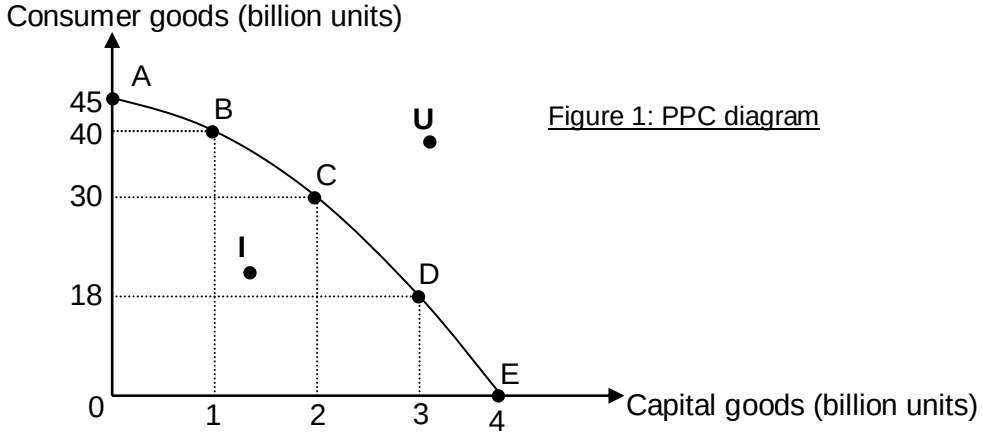


Figure 1: PPC diagram

Referring to Figure 1, PPC for the economy is shown by the **curve AE**:

Point A represents the maximum amount of consumer goods produced per year if all the economy's resources are used efficiently in the production of consumer goods.

Point E represents the maximum amount of capital goods produced per year if all the economy's resources are used efficiently in the production of capital goods.

Points B, C and D (along the curve) show the combinations of the maximum amount of consumer goods and capital goods that can be produced with efficient use of all available resources. Hence points on the PPC illustrate efficient and full employment of all available resources.

Point I is inside the PPC. It is attainable but it represents an inefficient combination because resources are not fully employed or used inefficiently. In this case, more of one or both goods can be produced by increasing the level of employment or using the resources more efficiently.

Point U is outside the PPC. It is preferred to points on or inside the PPC. However, such a combination of goods cannot be achieved given the present amount of resources and the current level of technology. Hence, this combination is unattainable.

SCARCITY, CHOICE, OPPORTUNITY COST AND THE PPC

The PPC can be used to illustrate three economic concepts:

- **Scarcity** – The concept of scarcity is illustrated by the fact that combinations outside the PPC cannot be attained. The whole area between the 2 axis represents all the possible combinations of the 2 goods. Although the economy may want a combination such as U, the present amount of resources and the level of technology make it impossible to produce such a combination. Thus, the economy faces the problem of scarcity.

- **Choice** – Combinations of goods found on the PPC are attainable but the economy can only have one of these alternative combinations, as resources cannot be used to produce all at the same time. A decision to produce at point B would mean that the combinations such as A, C, D and E cannot be considered. The choice of which combination to produce at would depend on the country's preferences.

- **Opportunity Cost** – The negative slope of the PPC illustrates opportunity cost – to get more of one good, the economy must make do with less of the other good. Referring to Figure 1, if we move progressively from point A to E, more and more resources are transferred out of the production of consumer goods into the production of capital goods. This results in more and more units of consumer goods being given up to obtain each successive unit of capital goods. The converse is true when we move from point E to A.

  A movement from production at point A to point B, for example, involves giving up 5 billion units of consumer goods in exchange for 1 billion units of capital goods. We say that the opportunity cost of producing the extra 1 billion units of capital goods is 5 billion units of consumer goods.

SHAPE OF THE PPC AND OPPORTUNITY COST

a) Concave PPC

The standard PPC is usually concave to the origin, due to the Law of Increasing Opportunity Cost. Referring to Figure 2, it can be observed that the opportunity cost of the 1st unit of capital goods is 5 units of consumer goods. To obtain the 2nd unit of capital goods, 10 units of consumer goods have to be forgone. The 3rd unit of capital goods requires sacrificing 12 units of consumer goods and so on. Thus, the opportunity cost increases as we want additional units of capital goods.

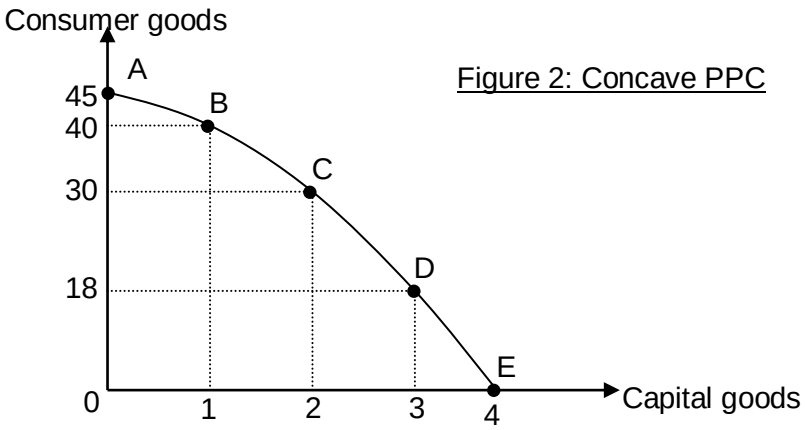


Figure 2: Concave PPC

The opportunity cost increases because resources in the economy are **not perfectly homogeneous or equally suited** in the production of all goods. Some resources are just better suited for the production of some goods than they are for other goods.
At point A, all the available resources are used to produce consumer goods. As we move from point A to point B, we will have to transfer resources out from the production of consumer goods to the production of capital goods.

However, resources that are **least suited for production of consumer goods will be deployed first**. Hence, to produce the 1st unit of capital goods, the opportunity cost is only 5 units of consumer goods. As the production of capital goods increases, resources that is **increasingly more suitable** for consumer goods production has to be re-deployed. This leads to more and more units of consumer goods being sacrificed. i.e. increasing opportunity cost.

Since the slope of the PPC represents the opportunity cost of an additional unit of the good on the horizontal axis, the increasing opportunity cost gives rise to a PPC that becomes steeper and steeper as we move from point A to E.

b) Straight-line PPC

A straight-line PPC illustrates **constant opportunity cost**. Constant opportunity cost refers to the situation where as more and more units of a good is produced, the amount of the other good being given up remains the same. It is only possible if all the resources are **homogenous** and **equally skilled** in the production of all the goods, i.e. all units of resources are equally adaptable (perfectly transferable) to all types of production.

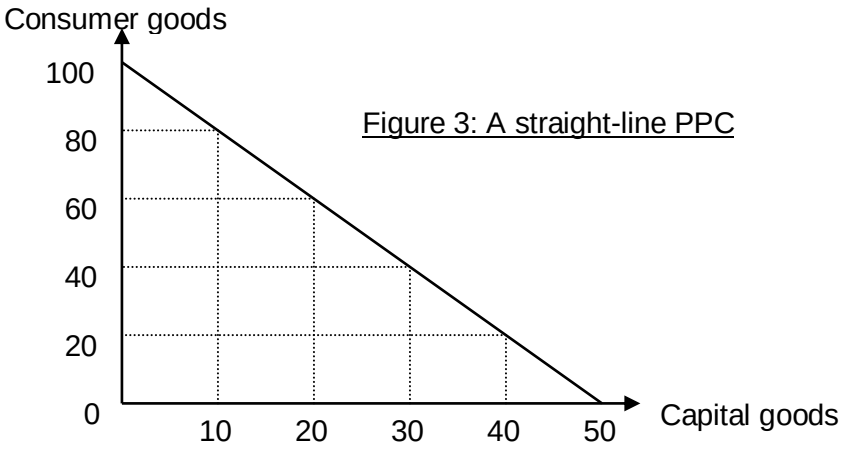


Figure 3: A straight-line PPC

Consider an economy where each worker is able to produce either 20 units of consumer goods or 10 units of capital goods (equally efficient). Assume further that this economy has only 5 workers.

If all 5 workers produce consumer goods, the total units of consumer goods produced will be 100. When the first worker is re-deployed to produce capital goods instead, the number of units of consumer goods produced falls to 80 while the production of capital goods increases by 10. The 10 units of capital goods produced are at the sacrifice of 20 units of consumer goods.

If another worker is again re-deployed to produce capital goods, the number of units of consumer goods sacrificed will still be the same. The opportunity cost of 10 more units of capital goods produced is the same regardless of the level of capital goods that have already been produced, i.e. 20 units of consumer goods. The opportunity cost is constant.
In reality, it is almost impossible for resources to be homogenous or equally efficient. For example, it is not likely that you will find all the workers in toy industry to be equally skilled as the workers in the production of computers.

ECONOMIC GROWTH AND THE PPC

Economic growth is defined as the expansion or **increase** in an **economy's** level of **output** or Gross Domestic Product (GDP) **over time**.

In theory, economic growth is made up of actual growth and potential growth. There is a distinction made between the two types of economic growth. **Actual growth refers to the expansion in the current output** and **potential growth refers to the expansion of the productive capacity** of the economy over time. Actual growth can be represented by a movement of a point within the PPC to a point nearer to or onto the PPC. Potential growth is represented by shifting of the whole PPC outwards.

Actual growth

When the economy is producing at a point inside the PPC as illustrated in Figure 4, the economy is not fully utilising its resources. Governments can decide to achieve actual growth by encouraging greater use of existing resources (i.e. reducing unemployment of resources) and by utilising its resources more efficiently (i.e. reducing underemployment of resources), resulting in increased output of both capital and consumer goods as shown in Fig. 4. Therefore, the **intended consequences** of this decision is actual growth and a fall in unemployment and under-employment of resources.

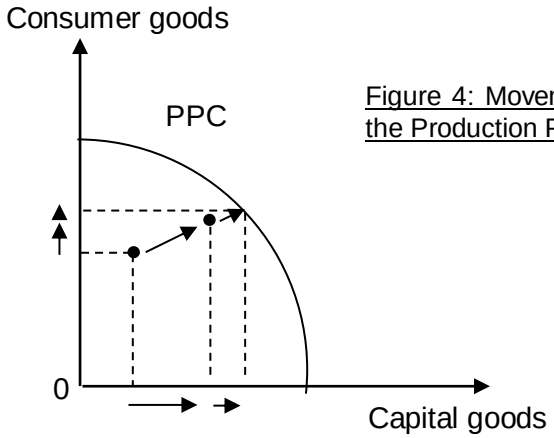


Figure 4: Movement of point inside the Production Possibility Curve

Potential growth

Governments can decide to achieve potential growth. This is represented by an outward shift of the PPC if the quantity and/or quality of resource increases the production of both goods (Refer to Figure 5). If the altered resource is suited **only** to the production of 1 good, the shift in the PPC will be pivotal (refer to Figure 6 for the case of the resource suited only for production of capital goods).

Figure 5: Shift of the Production Possibility Curve

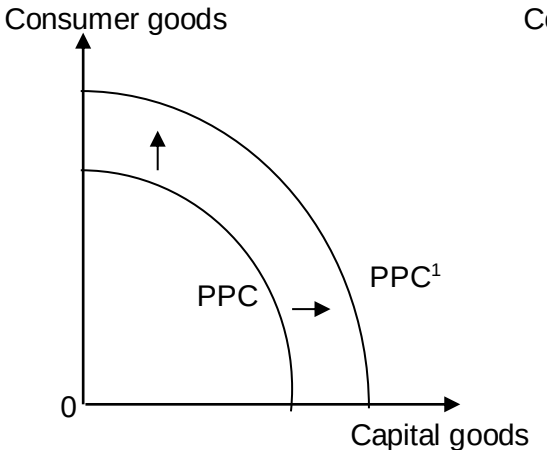
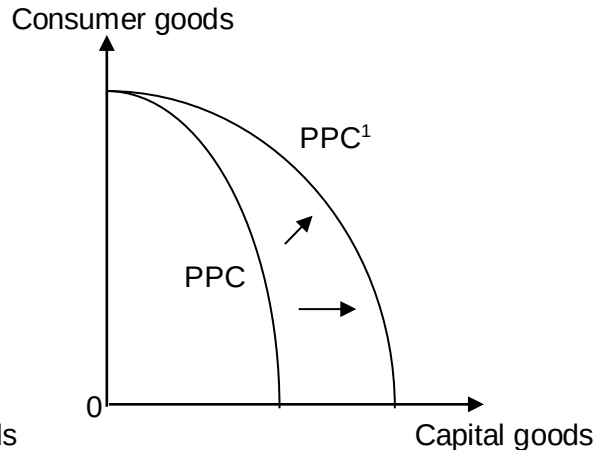


Figure 6: Pivotal shift of the Production Possibility Curve



The main sources of potential growth include:

a) Increase in the quantity of available resources:
An increase in the total quantity of resources will lead to an increase in the ability to produce more goods and services. The increase in quantity of resources can come about through the following situations:

- **Labour** – encourage population growth as a larger population would mean a larger potential workforce, or encourage greater participation of the population by women and retirees. This may involve a change in the society's view on the role of women, raising the retirement age, or lowering the minimum legal age to join the workforce. In Singapore, we depend on foreign labour to augment our labour force.

- **Land** – more intensive exploration resulting in new discovery of mineral deposits.

- **Capital** – capital refers to any man-made aid for production. An economy's PPC depends on its stock of physical capital. The more capital goods an economy produces in one period, the greater the stock of capital it accumulates and the more output those capital goods can produce in the next period, thus increasing next period's PPC. To produce more capital goods this period, an economy must reduce current consumption. In fact, the choice is typically between producing goods for current consumption and producing goods for future production and consumption.

b) Improvement in the quality of available resources:

Labour
- Improvement in skills of the workforce through higher education and training.
- Giving out incentives such as higher wages, performance bonus and fringe benefits to encourage greater work effort.

Land
- Application of fertilizers.
- Better Irrigation of land.

Capital
- **Technological improvement** – This includes discovery of new methods of production. Such changes are only possible with greater expenditure on research and development to allow for a higher rate of inventions and innovations.

Economic Growth and Opportunity Cost

Figure 7: Current and future PPC for Country A

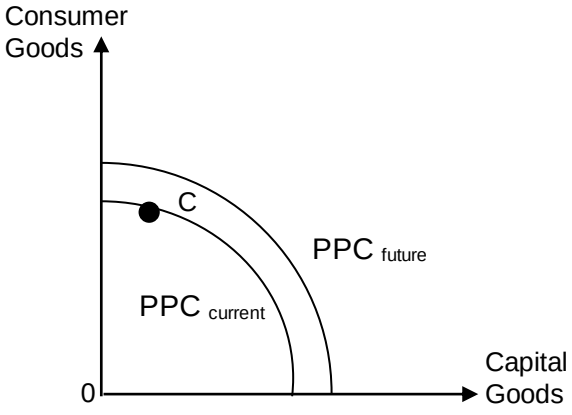
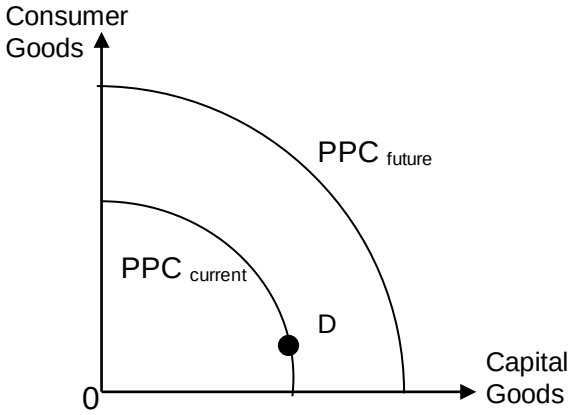


Figure 8: Current and future PPC for Country B



The PPC is useful in illustrating the idea of **opportunity cost** when a government decides on how to allocate resources over time. The opportunity cost of allocating more resources to produce consumer goods is the capital goods foregone for future production.

Both Figures 7 and 8 show the PPCs of countries A and B. Assume that currently, the two countries face the same initial PPC (PPC $_{current}$). The citizens of Country A prefer more of current consumption and hence, choose to produce at point C of the PPC $_{current}$. Thus, their maximum possible combinations of goods will not be much greater in the future. Hence, the future PPC will only shift out by very little. This means that higher current consumption raises **current** level of welfare (or standard of living) but it comes at the expense of slower improvement in **future** standard of living. The increase in current standard of living is an **intended consequence** arising from the decision to allocate resources to boost current consumption, while the slower improvement in future living standards may be an **unintended consequence**.

In contrast, the citizens in Country B produce at point D on their PPC $_{current}$. They are willing to forgo more of current consumption. This leads to greater amount of capital goods being produced and therefore a larger outward shift of the future PPC. But their current standard of living would be lower than that of Country A. Therefore, the **intended consequence** of the decision made by Country B is a lower current standard of living but a higher future standard of living.

For example, Singapore's early economic development in the 1960 has emphasised a great deal on investment and focused on increasing the capital stock especially in the manufacturing sector. This led to a large outward shift of Singapore's PPC and allowed her to enjoy strong economic growth in subsequent years.

4. With reference to Figures 7 and 8,

(a) What are the pros and cons of producing at points C and D?
(b) What is the difference between a shift in and a movement along the PPC?
(c) What may cause the PPC to shift inward?

SUMMARY

1. The central economic problem is that of scarcity. Given that there is a limited supply of factors of production, it is impossible to provide everybody with everything they want.

2. As resources have alternative uses, choices have to be made.

3. With every choice made, opportunity cost will be incurred.

4. The concepts of scarcity, choice, opportunity cost can be illustrated by the PPC.
5. Points on the PPC illustrate full and efficient employment of resources whilst points inside the PPC illustrate unemployment and/ or underemployment or inefficient use of resources.

6. Concave (to the origin) and straight-line PPC illustrate increasing and constant opportunity cost respectively.

7. The PPC can be used to illustrate both actual and potential economic growth.

1.3 THE FRAMEWORK OF ECONOMIC ANALYSIS

Economic agents face a problem of limited resources available to satisfy their unlimited wants. This problem is termed as **scarcity** – the central problem of economics. There are four types of resources – land, labour, capital and entrepreneurship**.** These resources are limited in nature hence restricting the wants that can be satisfied by each economic agent. Therefore, economic agents faced with

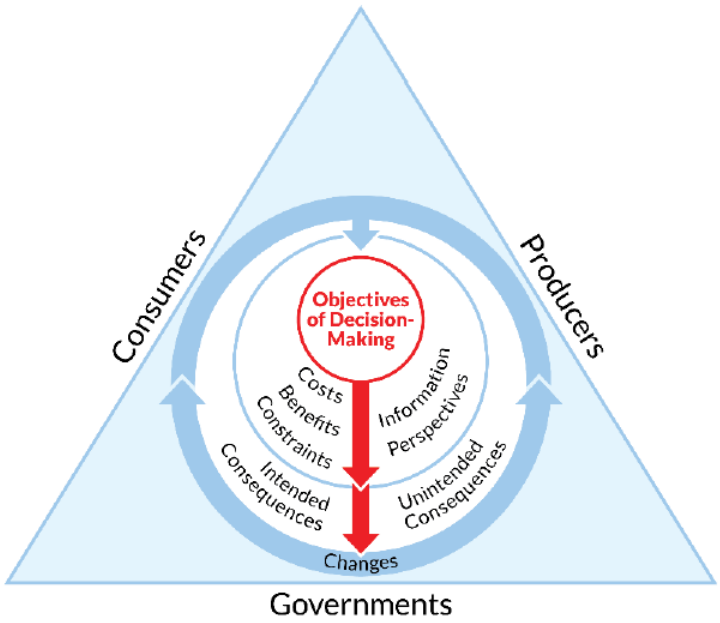
these constraints, need to decide on their highest-ranked choice to achieve their objective which in general, is to maximise their well-being, satisfaction or self-interest. With whatever decision they have made, economic agents will face trade-offs.

Objectives of the key economic agents

Consumers	Producers	Government
Maximisation of utility	Maximisation of profit	Maximisation of social welfare

The details of how each objective is determined will be illustrated in upcoming chapters.

Figure 1: Framework for Economic Decision-Making



In order for economic agents to achieve their individual objectives, the above decision making model can be used to explain their interaction with one another both at a national and international level. The **economic decision-making PROCESS** requires several considerations:

1	**Constraints**	Due to the fundamental economic problem of scarcity, choices have to be made. Economic agents have to consider the constraints they are currently experiencing because this will determine the choices available for them. Based on these choices, economic agents will decide on the best-ranked choice that enables them to maximise their self-interest/ achieve their objectives.
2	**Benefits and costs**	Economic agents have to consider the: i. Monetary and non-monetary costs and benefits of every available choice when making their decision. ii. Opportunity cost – the value of the next best alternative foregone must also be considered. Decide on the choice which offers the maximum net benefits

3	**Information**	Economic agents have to gather information, both quantitative and qualitative, of every available choice.
4	**Perspectives**	Economic agents do not make decisions in isolation of others, since the impact on and subsequent reaction of those affected by the decisions may in turn affect the intended outcome of the decision made. Examples: - Profit-driven producer will consider consumers' perspectives in analysing the effectiveness of strategies employed. - Government will consider consumers and producers in their policy decisions. When attempting to predict how incentives and disincentives influence human behaviour, economists tend to assume that economic agents are rational. However, the rationality of economic agents in maximising their self-interest is not completely free from political or social perspectives, which raises thought-provoking questions on inclusiveness and fairness in the decision- making process

Economic decision-making is often made to tackle or mitigate an economic issue. The **IMPACT of economic decision-making** can be analysed in terms of intended and unintended consequences:

1	**Intended Consequences**	The **expected** outcomes of the decision in resolving the economic issue, which include the intended positive and/or negative consequences for both the individual and/or societal level, assuming that rational behaviour and economic conditions remain unchanged.
2	**Unintended Consequences**	The outcomes that are **not expected** when making the economic decision. These may occur because economic agents may not have made their decisions under perfect information, due to imperfect information or consider all perspectives, especially when local and global conditions are subject to constant and unpredictable changes. When unintended consequences occur, the economic decision-making process is made more complex. Economic decisions may have to factor in measures to manage any adverse impact of these consequences or decisions made may have to be changed to mitigate any adverse impact of unintended consequences. As such, in order to maximise their self-interests, economic agents would have to review their decisions when the intended outcomes are not achieved or when there are adverse unintended consequences.
3	**Changes**	When changes occur, the economic decision undertaken by an agent may no longer be optimal, calling for the need for the decision-making process to be revisited to ensure that the intended outcomes can be achieved. The agents will need to consider **internal changes** that relate to factors that directly affect them or their immediate environment, as well as **external changes** to factors that occur beyond them before they decide whether to alter the earlier decision that they had made.

Example 1: Decisions brought about by the environmental issue of haze

Example 1(a): During periods of haze, should consumers purchase air purifiers?

Considerations to make a decision	
Constraints	These could be financial constraints that the consumer faces, especially if the price of air purifiers takes up a significant proportion of one's income. These could also be space constraints. For example, if an individual lives in a relatively small apartment, there may not be sufficient space to accommodate an air purifier at home.
Benefits	The health protection by air purifiers might be superior to the other methods e.g. turning on the air conditioner or putting on masks, as air purifiers with high quality filters play an additional role in helping to filter microscopic particles in the air.
Costs	The price of the air purifier will be the main cost. Peripheral costs may be maintenance costs (e.g. filter change) and cost to run the air purifier (increase in utilities bills due to higher electricity usage).
Information	A key piece of information needed is this – how long will the haze situation last? Consumers might not find it so worthwhile to purchase an air purifier if the haze is short term and non-recurring. Other information needed – what are the various models of air purifiers available, their functions and retail prices?
Perspectives	In deciding whether to purchase an air purifier, the consumer may also have other considerations, e.g. his/her elderly parents' or young children's safety, whether there is any one with respiratory problems in the family and how much he/she values air quality. A person who smokes and does not have elderly parents or young children in the household might have less motivation to purchase the air purifier.
Outcomes from the decision	
Intended Consequences	The consumer gets to breathe clean air that has been filtered from microscopic particles and is protected from the health risks that come with the haze.
Unintended Consequences	A potential spike in demand for air purifiers may cause a shortage, which drives up the price of the good. This may exacerbate the distribution of air purifiers to those of the higher income as they are the one who are willing and able to buy the product at the jacked up prices. Due to the higher demand, there may be many producers who rush to enter the market to provide the air purifiers, resulting in possibly lower quality purifier products due to the lack of expertise in product development and hastened manufacturing process. Such lower quality air purifier may not be as effective.
Changes	The consumer may need to consider **internal changes** to his environment such as a rise in his income, and **external changes** such as an announcement of government subsidy for air purifiers, which may cause him to reconsider his decision to purchase an air purifier in the future.

Example 1(b): In light of growing concerns over land clearing methods that contribute to forest fires and haze, should these firms adopt more environmentally friendly methods of production?

Considerations to make a decision	
Constraints	The decision to adopt more environmentally friendly methods of production depends on whether such alternative production options are available. If there is limited availability of cleaner production options, the firm will end up continuing with its usual practice. The ability to adopt more environmentally friendly or cleaner methods of production depends on existing levels of funding to purchase the necessary equipment or technical knowhow. The firm will not adopt cleaner methods of production if it does not have sufficient means and will to do so.
Benefits	By adopting cleaner methods of production, the firm may experience an increase in revenue due to greater support by environmentally-conscious consumers.
Costs	The cost of switching to a different production technique can be very high. Furthermore, the higher cost can cause the firm to lose its competitiveness.
Information	A key piece of information needed is this – does the increase in potential revenue from the support by environmentally-conscious consumers outweigh the eventual costs of making the switch? Also, information on the other cleaner production options is important for the firm to have certainty on whether the production method is viable for its operations.
Perspectives	In deciding whether to adopt cleaner methods of production, the firm needs to consider the social landscape, for example the attitudes of firms and consumers towards this issue. If consumers and other firms are apathetic to the haze situation, there might be less incentives for the firm to decide on the switch. On the other hand if the majority of firms in the industry are adopting cleaner methods of production, the firm might not project a good image if it does otherwise.
Outcomes from the decision	
Intended Consequences	The firm exhibits corporate social responsibility and plays its part in contributing to a better society through cleaner air. This creates a positive image for the firm.
Unintended Consequences	If firms decide to make a switch to cleaner methods of production without being sufficiently prepared for the change, e.g. they are unable to maintain previous production levels, they may suffer significant losses, which have negative consequences on the market, e.g. shortage of goods, and the economy, e.g. lower output and employment levels.
Changes	A firm will also need to consider **internal changes** to its environment such as a sudden fall in its profitability, and **external changes** such as announcement of a new carbon tax which may spur firms to adopt cleaner methods of production.

Example 1(c): In light of the regional haze, should the Singapore government enforce regulations to clamp down on local firms that are responsible for the haze?

Considerations to make a decision	
Constraints	There could be geopolitical constraints. As the issue is regional, it may not be possible for the problem to be addressed by the Singapore government alone, without a concerted effort by both foreign firms as well as other governments.
Benefits	Direct methods such a enforcing regulations targeting local firms responsible for the haze will help address solve the root of the problem, as compared to other indirect methods such as funding research and development on green technology which may not generate proportionate returns.
Costs	The cost of enforcement and monitoring can be very high. Furthermore, opportunity costs are incurred as the funding for such regulation could have been better utilised for other purposes e.g. healthcare and education.
Information	A key piece of information needed is this – does the government have full knowledge of the stakeholders that are responsible for the haze situation? As the issue is a complex one, e.g. cross border transactions taking place, it makes it difficult to pinpoint who bears the responsibility of the haze. This might render the government's efforts of enforcement ineffective.
Perspectives	In deciding whether to clamp down on the firms responsible for the haze, the government also needs to consider the welfare of consumers and firms. Clamping down on firms may cause a sudden fall in supply of the respective goods and services, which results in shortages and higher prices. If these goods and services are essential items, many consumers, especially the poor will be negatively affected. Furthermore, the government also needs to consider the possibility of a pushback by firms especially if they lack the means to opt for alternative methods of production.
Outcomes from the decision	
Intended Consequences	By weeding out the firms which engage in practices that lead to the haze, there will be cleaner air for the region. This has a direct impact on workers' health and productivity and can help the country achieve sustainable growth in the longer term.
Unintended Consequences	Strict enforcement may cause local firms to shift their operations from Singapore to other countries, which may have an adverse impact on the local economy. Furthermore, such an approach may harm international relations especially if the firms involved are multi-national corporations.
Changes	The Singapore government will also need to consider **internal changes**, such as the discovery of widespread corruption with the regulatory body which may spur it to consider alternative approaches to the problem. Or if are **external changes** such as a consensus amongst the governments in the region to adopt a common approach to penalise firms who are perpetuating the haze problem, the Singapore government may decide to adopt harsher enforcement methods.

5. Consider how students can use the economic decision-making process to decide whether to pursue higher education in university.

Considerations to make a decision	
Constraints	
Benefits	
Costs	
Information	
Perspectives	
Outcomes from the decision	
Intended consequences	
Unintended consequences	
Changes (internal/external)	
Go ahead with decision or review decision? ***(Hint: To consider net benefits/ costs and possible changes)***	

Overview of Decision-making Process

In a decision-making process, economic agents are rationale [i.e. they refer to self-interest consumers who aim to maximize utility/consumer surplus, self-interest producers who aim to maximize profits/producer surplus and governments who aim to maximize society welfare].

These economic agents:

- First **gather information** and **seek different perspectives** (only for governments) about the **expected benefits**, **costs** *(both monetary costs and opportunity costs)*, **constraints**, before making their decisions.

- If the economic agents can overcome the constraints, the final decision will depend on whether the **expected benefits** outweigh the **expected costs**.

Subsequently, economic agents will consider the **intended and unintended consequences** before making a new decision.

Tutorial 1

Question 1: TYS N2013 Case Study Question 1d

Use the concept of opportunity cost to explain one effect on each of consumers, firms and the government arising from the fall in real household disposable incomes. [6m]

** Real disposable income refers to after-tax income after removing the effects of inflation. It will have a strong relationship with spending on consumer goods and services.*

Opportunity cost of a fall in real household disposable income on _____

Opportunity cost of a fall in real household disposable income on _____

Opportunity cost of a fall in real household disposable income on _____

Question 2: N2000 Q1

Attempt the Essay Skills Exercises in the Smart Explorer App before writing out your response to part (a)

(a) Explain what is meant by the basic economic problem of scarcity? [10]

INTRODUCTION

Define key word/ state the issue/ approach.

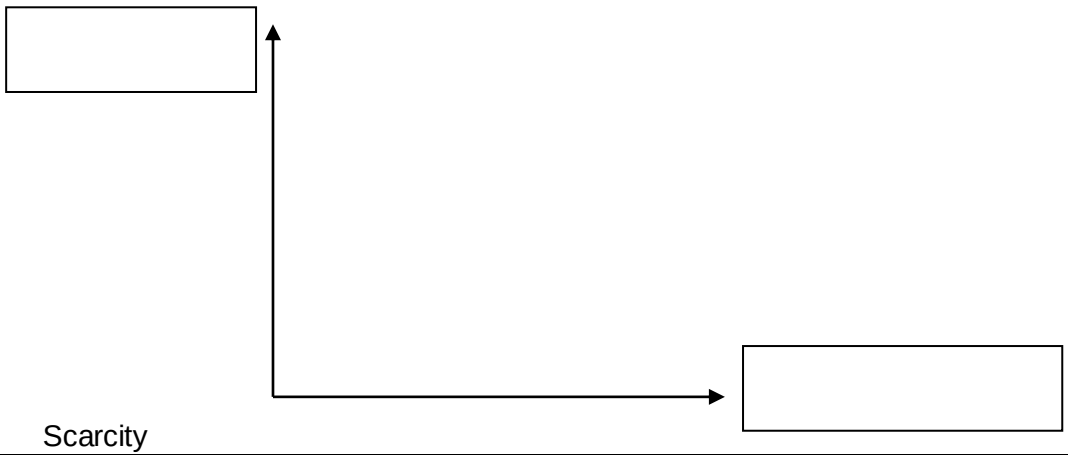
BODY

Explain how scarcity results in economic agents having to incur opportunity costs.

Use the PPC to illustrate scarcity, choice, opportunity cost and increasing opportunity cost.

Define the PPC:

Illustrate:



(i) Scarcity

(ii) Choice

(iii) Opportunity cost

(iv) Increasing opportunity cost

CONCLUSION

Conclusive statement:

(b) Discuss whether economic growth solves the problem of scarcity. [15]

Refer to Essay Writing Skills resources ☺ in HBL Part 2 on how to discuss an economics essay.

INTRODUCTION
State the key concept to be analysed in this essay: *Note: there is no need to define scarcity as this has already been done in part a.* Suggest how you will approach this question:
BODY
THESIS: Explain how economic growth can alleviate the problem of scarcity using PPC diagram 1. Unpack the concept of economic growth: Questions to consider: - Identify the types of growth have you learnt. - How is each type of growth generated?

2. Establish the link between economic growth and the problem of scarcity:
   Questions to consider:
   - What is the relation between the types of growth identified and the problem of scarcity?
   - How can this be represented on a diagram?

3. Draw an AWE-some diagram
   Make sure you make reference to the diagram in your above analysis

ANTI-THESIS: Explain why economic growth cannot solve the problem of scarcity using the PPC diagram

Why will the problem of scarcity continue to persist?
Hint: Revisit the economic definition of scarcity

How can the persistence of the problem of scarcity be represented on a PPC?
Note: No need to draw another diagram, you can make use of the diagram drawn in the Thesis for your analysis.

CONCLUSION (SYNTHESIS)

Remember refer to the evaluation LORMS *in Smart Explorer* for the requirements.