



RAFFLES INSTITUTION

YEAR 5 ECONOMICS 2025

LECTURE NOTES

ECONOMICS

CENTRAL PROBLEM OF ECONOMICS

CONTENTS:

1. What is Economics?
2. Scarcity, Choice and Opportunity Costs
3. The Decision-Making Framework
4. The Production Possibility Curve (PPC) Model

TUTORIAL PACKAGE

- Section A: Starter Questions
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Lecture Objectives / Checklist

After the series of lectures, students should be able to:

- Differentiate between microeconomics and macroeconomics
- Differentiate between positive and normative statements
- Explain the central problem of economics (scarcity) and the inevitability of choice by economic agents
- Define and explain the concept of opportunity cost and the nature of trade-offs in the allocation of resources
- Explain rational decision making by economic agents
 - Recognise constraints
 - Weighing costs and benefits in decision making
 - Recognise intended and unintended consequences
- Use the PPC model to explain and illustrate:
 - Scarcity, choice and opportunity cost
 - Attainable and unattainable points
 - Efficiency
- Explain and illustrate the effects of changes on the PPC curve

1 WHAT IS ECONOMICS?

1.1 INTRODUCTION TO ECONOMICS

Economics is a science that studies human behaviour. It studies how individuals and societies deal with **scarcity – the central problem of economics**. Or, more commonly, it is understood as a decision science that is concerned with production, distribution and consumption of goods and services:

- The production of goods and services: how much the economy produces, both in total and of individual items; how much each firm or person produces; what methods of production are used; how many people are employed.
- The consumption of goods and services: how much the population as a whole spends on purchasing goods and services (and how much it saves); what the pattern of consumption is in the economy; how much people buy of particular items; what particular individuals choose to buy; how people's consumption is affected by prices, advertising, fashion and other factors.

Economists often attempt to construct theories, frameworks or models which are then used to simplify, explain and predict various economic phenomena. For example, a demand and supply model for the bubble tea market shows the relationships between the demand for bubble tea by consumers, the supply of bubble tea by producers and its market price and sales quantity.

Although most models can be described verbally, many can be represented more precisely or succinctly in diagrammatic or mathematical forms. However, it is important to note that most models or frameworks have shortcomings as they are based on a set of assumptions and hence are unable to perfectly represent what happens in the real world all the time.

Note:

Throughout the course of A Level Economics, you will learn many different frameworks (or models) such as the demand and supply model, the marginal cost and marginal benefit model, etc.

1.2 MICROECONOMICS VS. MACROECONOMICS

Economics is traditionally divided into two main branches – microeconomics and macroeconomics, where 'micro' means small and 'macro' means big.

- **Microeconomics** is concerned with the individual parts of the economy such as the behaviours and decisions of individuals and firms in particular markets. It is concerned with the **demand and supply** of particular goods and services. For instance, we can study the demand and supply in the market for designer shoes as well as those in the market for shipping services separately.
- **Macroeconomics** is concerned with the economy as a whole. It is thus concerned with **aggregate demand and aggregate supply** in an economy. 'Aggregate demand' means the total amount of spending in the economy (on all goods and services), whether by domestic consumers, by overseas consumers for our exports, by the government, or by firms when they buy capital equipment or stock up on raw materials. And by 'aggregate supply' we mean the total national output of goods and services. For instance, we can study the economy of Singapore and the European Union to examine how well they grow and trade.

Note:

We will be focusing on Microeconomics in Year 5 and Macroeconomics in Year 6.

Think: What makes it important for me to distinguish between micro- and macro-economics in A Level Economics?

It is a critical skill to identify whether the economics problem in a question is under the realm of microeconomics or macroeconomics. It helps you to correctly analyse the question and select the appropriate economic models (or frameworks) to construct your economic arguments and to make judgements.

In the examples above, using the demand and supply framework (a microeconomic model) to study the economy of Singapore (a macroeconomic concept) would be inaccurate and counterproductive. Instead, aggregate demand and aggregate supply

framework (a macroeconomic model) should be used to analyse the performance of the Singapore economy.

Think: What are two important types of economic statements that can help me with my own arguments and writing?

As you study more deeply into economics, you will need to construct analysis and arguments and evaluate statements presented to you to make judgements and write essays. It would thus be vital for you to be able to distinguish between two types of statements in economics: positive and normative statements.

- A **positive statement** is a statement of fact. It may be right or wrong, but its accuracy can be tested or verified by appealing to the facts. Positive economics is a branch of economics that describes and explains economic phenomena, focusing on facts and cause-and-effect relationships and includes the development and testing of economic theories.
- For instance, “Singapore's economy grew 3.6% in 2022” is an example of a positive statement because you can verify whether it is right or wrong by checking our GDP growth data in 2022.
- A **normative statement**, on the other hand, is a statement of value or opinion. It is a statement about what ought or ought not to be, about whether something is good or bad, desirable or undesirable. Such a statement cannot be proved or disproved by a simple appeal to the facts because it is often subjective and depends on different perspectives, feelings, opinions, value judgments and underlying assumptions. Normative economics is thus the branch of economics that expresses value judgements about economic fairness.
- For example, “the richest in the world should pay more taxes” is a normative statement. Depending on your individual perspectives and opinions, you may agree or disagree with this statement.
- For instance, an A Level Economics essay question asks in part (a) “Explain the benefits and costs of globalisation. [10]”. The answer to this ‘Explain’ type question can be rather factual and be presented as per it is with minimal value judgements. Thus, your answers to this question can be mostly positive statements, supported with economic frameworks and examples.
- However, the part (b) question on “Discuss the most appropriate policy measures that the Singapore government should take to increase the benefits and reduce the costs of globalisation. [15]” requires both the factual explanation of what the appropriateness and inappropriateness of at least two policies are, as well as the value judgement on which of the policies is the most appropriate in your opinion, based on your perspectives, assumptions and Singapore's context. For this ‘Discuss’ type question, you will need a combination of positive and normative statements to put your arguments across.

Think:
Are positive statements always the truth?

You will learn more about ‘Explain’ and ‘Discuss’ types of economic questions in our Case Study/ Essay Skills Package and in tutorials.

2 SCARCITY, CHOICE AND OPPORTUNITY COST

2.1 SCARCITY

All societies face the basic and central economic problem of **scarcity** which arises from **limited resources** and **unlimited wants**.

2.2 RESOURCES

No matter how many goods and services we want or desire, at any one time the world can only produce a limited amount of them. This is because the world only has a limited amount of resources. There are four broad categories of **resources, or the factors of production (FOPs)** as the economists call them, that we study in economics:

Note:
Use the acronym 'CELL' to remember the various resources or factors of production (FOPs).

- **Capital**

Capital typically refers to physical capital. Capitals in economics are man-made resources and include machines, factories, transportation, and other equipment.

IMPORTANT!

You may be tempted to include 'money' as a capital resource. However, economists are only concerned with physical capital used as the factors in the production of goods and services, e.g., steel and rubber in car production and sugar and flour in baking. 'Capital' here does NOT mean financial capital, which refers to financial assets such as cash, bonds, stocks and bank deposits.

- **Entrepreneurship**

An entrepreneur is one who performs the functions of organising and managing the other factors of production (i.e., Capital, Land and Labour in CELL) to innovate new products and ways of production and take the risks of being in business. In other words, the entrepreneur takes overall responsibility for the decision-making process in a firm so that other factors of production could be combined to provide a good or service.

- **Land**

Land refers to all the natural resources available, which could be renewable or non-renewable in nature. Renewable resources (such as wind and water) renew themselves at a fast enough rate for sustainable economic extraction. Non-renewable resources (like fossil fuels and mineral ores) do not renew themselves at a fast enough rate to allow for sustainable economic extraction.

- **Labour**

Labour, also known as human capital, refers to people, including their skills and abilities. The quantity of labour available for an economy consists of those who are willing and able to work. This includes the employed and unemployed.

2.3 INEVITABILITY OF CHOICES – MAKING RATIONAL CHOICES

Due to the fundamental economic problem of scarcity, choices have to be made.

Scarcity implies that when making a decision or choice, every individual faces constraints because of the limited resources he/she has. Resources devoted to one use would no longer be available for another use. Hence, there is always a sacrifice of an alternative when an individual makes any choice. In economics, we call this sacrificed alternative the **opportunity cost** of making a decision.

The opportunity cost is the (expected) benefits from the next best alternative that is forgone when making a decision, or the next best alternative forgone in short.

Note:
It is important to know the definition of opportunity cost.

Opportunity costs may include both **explicit costs** and **implicit costs** of making a decision. Explicit costs are costs that require a direct money payment while implicit costs are costs that do not require a direct money payment. Instead, implicit costs are the value of anything other than the direct payment that is sacrificed (e.g., time) when a decision is made.

For example, when you spend \$348 on a CAT1 ticket for the 2024 Taylor Swift concert, the explicit cost incurred for the concert is the \$348 that you paid out-of-pocket for the ticket. This could have been spent on a pair of Apple AirPods Pro (the next best alternative for your money), which you could have enjoyed but is now forgone because of the limited income you have. Besides this explicit opportunity cost, you will also incur implicit cost. This implicit cost includes the time that is spent attending the concert, which could be spent on a visit to the National Gallery (the next best alternative for your time). Thus, the total opportunity cost of attending the concert is the forgone benefits (satisfaction) from owning the AirPods Pro and a visit to the National Gallery.

In summary, opportunity cost is the **forgone benefits (or satisfaction) from the next best alternative** when an individual is compelled to make a choice due to the scarce resources available to him/her.

We will revisit explicit and implicit costs in a further topic called 'Firms and Decisions'.

EVALUATING THE CONCEPT OF OPPORTUNITY COST

Quantifying and weighing the opportunity costs of a certain decision against the potential benefits is crucial in making an optimal, or rational, decision on whether to allocate our scarce resources for a particular activity. It is important to note the following for the concept of opportunity cost:

- **Opportunity cost is subjective.**

Opportunity cost differs between individuals and between societies. Only individuals making the choice can identify the most attractive alternative based on their own preferences and needs, and quantify the value of the forgone benefits accordingly. As such, no two individuals are likely to value the forgone benefits equally.

For example, a student may feel that instead of watching lectures on Economics, he/she would rather be watching a new Netflix series. The forgone benefits from sacrificing the next best alternative (*not all alternatives*) to the student will be valued differently from another student whose next best alternative to watching Economics lectures is the benefit he/she derives from working out in a gym.

As such, the two students would both be sacrificing their time and incurring an opportunity cost if they choose to watch the Economics lectures. They are both losing the opportunity to utilise their time for their own second preferred activity. However, the valuation of the benefits forgone from their own next best alternative differs between the two students as they are based on their individual preference and choices.

- **Opportunity cost may vary with circumstances.**

The opportunity cost of undertaking a certain activity will vary with circumstances. This is because the opportunity cost could differ at different point of decision making. A person's valuation of the forgone benefits arising from not choosing the available best alternative may change with circumstances.

Let's say an individual faces the constraint of limited income (resource). Spending on healthcare services will reduce the income available for consumption of other goods and services, such as a holiday abroad. The opportunity cost here would be the forgone benefits that the trip would offer.

In this situation, the opportunity cost is likely to be greater for lower income individuals than higher income individuals since the costs of healthcare services is likely to take up a larger proportion of their income. As such, lower income individuals have less resources available for other uses, and subsequently are more likely to forgo consumption of goods and services in a greater proportion compared to higher

income individuals. Hence, the opportunity cost of spending an additional dollar on healthcare is significantly higher for lower income individuals than for higher income individuals based on their different circumstances.

In addition, with changing circumstances such as rapidly rising healthcare costs due to ageing population, the financial constraint for people may become more pronounced in the long run. For example, every visit to the healthcare facilities will imply a higher opportunity cost because healthcare services are getting more expensive; people could be forgoing more essential/luxury items.

- **It is difficult to calculate the value of opportunity costs.**

Firstly, when choosing one option over another, we seldom know the actual value of the forgone benefits because the next best alternative is “the road not taken”. For example, in order to measure the opportunity cost of spending on a ticket for Taylor Swift concert, the individual must be able to rank their preferences according to how much they value each choice. However, it is always difficult to rank these preferences by assigning an exact value to each one of them.

As such, individuals do not have an accurate measure or complete information of the forgone benefits while deciding to spend on a ticket for Taylor Swift concert over other alternatives like travelling or purchasing a pair of new AirPods Pro. This is primarily because the next best alternative was not chosen so the estimations of forgone benefits are rather arbitrarily projected and not the actual value of the next best choice to him/her. Therefore, we only know what we were expected to give up but not what we actually gave up.

Secondly, acquiring accurate information about alternatives is often costly and time consuming. Some choices made are based on limited or even inaccurate information. Although the idea that “more choices makes us better off” sounds logical, it is empirically discredited. According to “the paradox of choice”, too many choices often lead to indecisiveness and some decisions turn out to be poorly made. However, at the time we make a choice, we think we are making the best use of all our scarce resources, including the time required to gather information, and weighing the benefits and costs of the alternatives accurately.

Opportunity costs (as well as, expected benefits) arising from an activity are subjective and prone to changes under various circumstances. As such, different economic agents would make different decisions, even when they are presented with the same economic problem because they weigh costs and benefits differently from one another. This explains why, in reality, some would prefer to spend hundreds of dollars on a one-off concert ticket while others would rather save the money for a pair of AirPods Pro.

Think: Does knowing how people calculate opportunity cost differently even when faced with the same problem help me?

2023 A Levels H2 Case Study Question 1 (c)

‘Opportunity costs may make even free schooling unaffordable. Explain one example of an opportunity cost that might make free schooling unaffordable.’ [3]

For questions like this, it is important for the student to recognise that opportunity cost (time that could be spent elsewhere) differs between segments of society due to different circumstances. For low-income households, going to school for the children will reduce the contributions of earning an income for the family.

THE DECISION-MAKING FRAMEWORK

The **process of decision-making** requires every economic agent to be deliberate on the various choices available. This process takes into account various considerations such as the constraints facing the economic agents. Such constraints could include time, financial resources and their cognitive abilities to evaluate each choice against another. The economic agents also need to consider the monetary and non-monetary benefits and explicit and implicit (opportunity) costs of making a decision based on the available information and their perspectives.

Note:
Please refer to
Appendix 1 for
further details on the
decision-making
framework.

When making any economic decisions in response to an economic issue, economists assume that the economic agents are **rational**, in other words, **that they aim to maximise their own benefits and minimise the costs of the choice being made**. As such, the economic agent will assess the impact of a decision in terms of its intended consequences and unintended consequences. Economic agents might need to review their decisions should the intended consequences not turn out as anticipated or if they decide to take account of unintended consequences, or when changes occur in either the internal or external environment. The decisions made by economic agents can have multifaceted implications, impacting the other economic agents in the national and international economy.

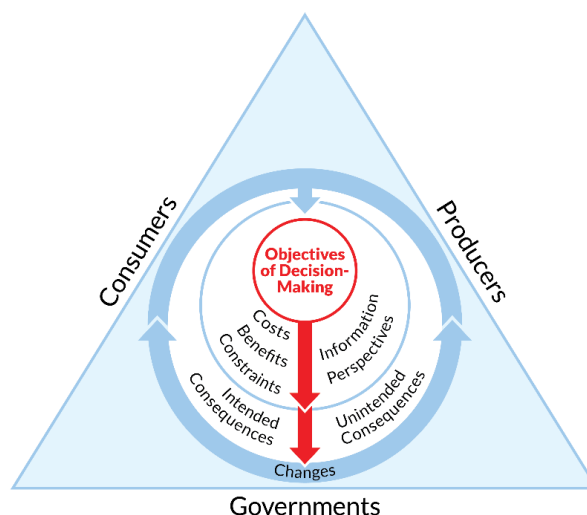


Figure 1: Decision-making Framework

3.1 RATIONAL DECISION-MAKING BY ECONOMIC AGENTS

Economic agents include consumers, producers and the government. In achieving their own objectives, economic agents must be cognisant of the constraints that they are operating within. To ensure that the decisions made are the best given their constraints, economic agents must also factor in the costs and benefits of the choices available and actively consider information and perspectives to **weigh their costs and benefits**.

In general, we can use the following **ABCDE rational decision-making approach** when analysing how different economic agents make rational decisions based on their aims.

A Aim(s)	Clarify the aim to maximise net benefits based on problem, options and constraint faced by the economic agent
B Benefits	- Include both monetary & non-monetary benefits - Consider perspectives and information available
C Costs & Constraint	- Include both explicit & implicit (opportunity) costs and constraints - Consider perspectives, information available and constraint arising from scarcity
D Decision-making	- Use the Marginalist Principle to make decisions at the margin - Weigh marginal benefit (MB) and marginal cost (MC) - Undertake more of the activity if $MB > MC$ - Stop when $MB = MC$ - Undertake less of the activity if $MB < MC$
E Evaluate	- Evaluate the outcomes of the decisions and decide whether to change decision - What if the circumstances change for the decision-maker (e.g. ABC changing over time)? - What if there are unintended consequences from the decision? - What if there are more available information? Etc.

Refer to below regarding Marginalist Principle

Note:
'Decisions at the margin' usually means making the decision of doing a little bit more (marginally more) or a little bit less (marginally less) of an activity. We often simplify it to be undertaking one more (or one less) unit of the activity.

3.2 MAKING RATIONAL DECISIONS USING MARGINALIST PRINCIPLE

In making decisions or choices, economists assume that all economic agents are **rational** which means that the economic agents aim to maximise their own net benefits. These agents use the **marginalist approach** of weighing the marginal benefits and marginal costs of an activity to achieve their aim.

THE MARGINALIST PRINCIPLE

Marginal benefit (MB) refers to the additional benefit derived from undertaking an additional unit of an activity. Marginal cost (MC) refers to the additional (opportunity) cost incurred when undertaking an additional unit of an activity.

The marginalist principle states that

- At any given unit of an activity, if the marginal benefit (MB) exceeds the marginal cost (MC), it is rational for the economic agent to undertake the activity (or do more of it) because the agent would gain more benefit than cost through this action.
- If the marginal cost (MC) exceeds the marginal benefit (MB), however, it is rational to not undertake it (or do less of it) because the agent would otherwise incur more cost than benefit.
- Thus, rational decision-making dictates that an economic agent should only undertake an activity (or do more of it) if the marginal benefit (MB) from taking the action is at least as great as the marginal cost (MC).

Key Point:
Economic decision-making involves the use of the **marginalist principle** where individuals will only undertake an activity when $MB \geq MC$.

Consumers, producers and governments each makes decisions using the ABCDE framework of rational decision making and the marginalist principle in different ways:

CONSUMERS / HOUSEHOLDS

A Aim(s)	Faced with a limited income, consumers make rational decisions on the combination of goods and services to consume so as to maximise their utility (or satisfaction).
B Benefits	Considering the perspectives and information available, the marginal benefit (MB) of consuming an additional unit of a good to the consumer is known as marginal utility (MU), which is the additional satisfaction gained from consuming one extra unit of the good within a given period of time. Up to a point, the more of a good consumed, the greater the total utility derived by the consumer. However, as the consumer becomes more satisfied, each additional unit of the good consumed will probably give less additional utility than previous units. In other words, as the quantity of a good consumed increases, the marginal utility falls. This phenomenon is known as the Law of Diminishing Marginal Utility (LDMU).
C Costs & Constraint	Assuming the consumers only faces explicit costs for the consumption of the good, the marginal cost (MC) of consuming an additional unit of a good is the price paid for the additional unit. The consumers could also face various constraints in income, time, energy and information, etc.
D Decision-making	Use the Marginalist Principle to make decisions at the margin • Weigh MU and MC=price • Consume more of the good/service if $MU > \text{price}$ • Stop when $MU = \text{price}$ • Consume less if $MU < \text{price}$ A rational consumer will thus consume up to the point where marginal utility (or marginal benefit) from the last of the good is equal to its price and the consumer's (total) utility is maximised.
E Evaluate	Evaluate the outcomes of the decisions and decide whether to change decision • What if the circumstances change for the consumer (e.g., ABC changing over time such as price increases)? • What if there are unintended consequences from the decision? • What if there are more available information? Etc.

Key Point:

Rational consumer's objective is to **maximise utility**. A consumer will consume quantities of a good up to the point where **$MU \geq \text{price}$** (or **$MB \geq MC$**) where MU diminishes with additional units of a good consumed due to **LDMU**.

PRODUCERS / FIRMS

A Aim(s)	Faced with limited factors of production (or resources), firms make rational decisions on what goods and services to produce and of what quantities to produce in order to maximise their profits, where profits = total revenue – total cost. Firms also have to decide on how to produce these goods and services (i.e. the method of production).
B Benefits	The marginal benefit (MB) of producing an additional unit of a good is the additional revenue that a producer receives from selling the additional unit of the good. This is otherwise known as marginal revenue (MR). The level of MR earned by a firm usually depends on how attractive their products are to the consumers. In other words, the higher the demand for their products by the consumers, the higher the MR to the firm.
C	The marginal cost (MC) of producing an additional unit of a good is the marginal cost of production.

Costs & Constraint	As the firm's output rises beyond a certain threshold, its marginal cost of production would start to increase as factors of production become more inefficient. This is known as the Law of Diminishing Marginal Returns (LDMR) , which states that when increasing amounts of a variable factor of production are used with a given amount of a fixed factor, there will come a point when each extra unit of the variable factor will produce less output than the previous unit.
D Decision-making	Use the Marginalist Principle to make decisions at the margin • Weigh MR and MC • Produce and sell more units of a product if $MR > MC$ • Stop when $MR = MC$ • Scale back on production and produce less if $MR < MC$ A rational producer will thus produce up to the point where its marginal revenue from the last of the good produced is equal to its marginal costs of production and the firm's profit is maximised.
E Evaluate	Evaluate the outcomes of the decisions and decide whether to change decision • What if the circumstances change for the producer (e.g., ABC changing over time such as a fall in demand for their product)? • What if there are unintended consequences from the decision? • What if there are more available information? Etc.

Note:

Variable factors are factors of production that the firm needs to use more of to produce a greater number of outputs while fixed factors do not need to be increased to produce more units of output in the short run.

We will learn more about this concept under 'Firms and Decisions'.

GOVERNMENT

A government is an organisation that provides goods and services and redistributes income and wealth in a society. The most important of services provided by the government is a social structure of law and order and a mechanism for its enforcement. Governments also provide services such as national defence, public health, transportation, and public education through its collection of government revenue from taxes, administrative charges, fines, and profits of government related companies.

A Aim(s)	Faced with government budget constraints (largely determined by its tax revenue), a rational and benevolent government will have to prioritise its spending to maximise the social welfare (all segments of society) and achieve both its microeconomic and macroeconomic objectives. • Microeconomic objectives include efficiency and equity • Macroeconomic objectives include sustainable and inclusive economic growth, price stability, full employment, and a favourable balance of trade
BCD Benefits, Costs & Constraint and Decision-making	The marginal benefit of a government's decision is called the marginal social benefit while the marginal cost of a government's decision is marginal social cost . Based on the marginalist principle, a government will make rational decisions to maximise the social welfare by weighing marginal social benefit and cost. <i>We will learn more about the government's rational decision making in the topics to come.</i>
E Evaluate	Evaluate the outcomes of the decisions and decide whether to change decision • What if the circumstances change for the government? • What if there are unintended consequences from the decision? • What if there are more available information? Etc.

Think: What makes ABCDE rational decision-making framework useful for me in answering economics questions?

2021 A Level H2 Economics Essay Question 1(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]

In the sample question above, two types of economic agents are making rational decisions, i.e., the consumers and the producers of bicycles. You can make use of the ABCD steps to consider how a consumer would decide on whether the total benefits of buying a bicycle outweighs the total costs, and apply the marginalist principle for the producer of bicycles to decide on how many bicycles to produce and sell such that its profits can be maximised. The best answers would give contextual examples of the costs and benefits considered by the buyers and sellers in the bicycle market.

Similar questions can be set for a government's rational decision-making too:

2018 A Level H2 Economics Essay Question 3(a)

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.

Explain what needs to be considered when a government makes rational spending decisions about such projects. [10]

Challenge: How would you approach this question?

3.3 RATIONAL DECISION-MAKING ON AN ECONOMY-WIDE PERSPECTIVE

Since resources are scarce, choices have to be made. Any society would need to answer three key economic questions when they make choices:

- **What and how much to produce?**
 - Since there are not enough resources to produce all the things that people want and desire, choices need to be made on what goods and services get to be produced and in what quantities.
 - Society needs to choose the composition of total output to be produced. For instance, should the economy devote more of its scarce resources to the production of consumer goods (e.g., food and clothing) or capital goods (e.g., machines and factories)?
- **How to produce?**
 - Most goods can be produced by a variety of methods with varying combinations of resources. Choices need to be made on the composition of resources used and the technology that is to be adopted.
 - For example, what resources are going to be used (e.g., more capital or more labour) and in what quantities? What techniques of production are going to be adopted (e.g., AI-powered or human-controlled)?

Note:

These three key economic questions need to be explained whenever you encounter questions on how scarce resources are allocated in an economy.

- **For whom to produce?**

- The total output needs to be distributed among members of the society. How should this distribution be carried out? Should the good be made available for all regardless of a person's ability to pay or should its consumption be restricted only to those with the ability to pay?

How a society answers these three questions and decide on the way that scarce resources are allocated will differ depending on the economic system that the society adopts. Broadly, there are three main economic systems:

- **Free market economy:** Where markets decide and allocate resources through the price mechanism based on forces of market demand and supply. An increase in demand for a good or service raises its price and encourages businesses to use more resources in the production of that good or service. The quantity of products consumed by people depends on their income and income itself depends on the market value of an individual's work. In a free market economy, there is a limited role for the government, indeed in a purely free market system, the government limits itself to protecting property rights of people and businesses using the legal system and protecting the value of money or the value of a currency.
- **Planned or command economy:** In a planned or command system usually associated with a socialist or communist system, scarce resources are owned by the government. The state allocates resources, sets production targets and growth rates and distributes (or rations) the goods and services to people according to its own view of people's wants and needs. Market prices play little or no part in informing resource allocation decisions.
- **Mixed economy:** In a mixed economy, some resources are owned by the public sector (government) while others are owned by the private sector (firms and households). The public sector typically supplies public and merit goods and intervenes in markets to correct perceived market failure. *Nearly all economies in the world are mixed* although that mix changes over time (e.g., over time, some industries are privatised, i.e., sold to the private sector, or nationalised, i.e., taken back into state ownership) and differs in extent of state vs. market control (e.g., the Chinese economy is generally more state-controlled than the US economy).

We will focus more on the free market economy in the next lecture topic on price mechanism.

4 THE PRODUCTION POSSIBILITY CURVE (PPC) MODEL

The **Production Possibility Curve (PPC)** model is a useful tool to use when explaining the concepts of scarcity, choices and opportunity cost. A PPC shows **all the maximum attainable combinations of two goods** that a country can **produce** within a specified time period with **all its resources fully and efficiently employed**, at a given state of technology.

Assume that some imaginary Country X devotes all its resources to producing just two goods – capital goods (e.g., machines) and consumer goods (e.g., food). Various possible combinations that could be produced over a given period of time (e.g., a year) are shown in the table below:

Units of capital goods (millions)	Units of consumer goods (millions)
8	0
7	2.2
6	4
5	5
4	5.6
3	6
2	6.4
1	6.7
0	7

Figure 2: Maximum Output Combinations for Country X

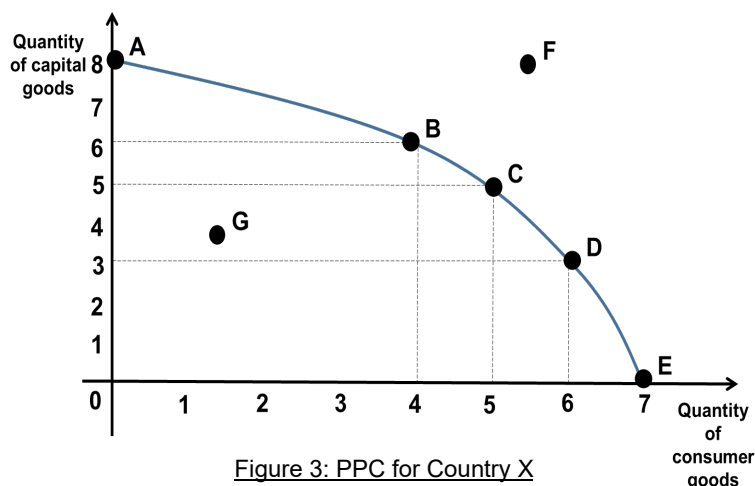


Figure 3: PPC for Country X

4.1 SCARCITY AND PPC

Given the quantity and quality of resources available and the state of technology, the **attainable combinations** of the two goods that can be produced by Country X include Points A, B, C, D, E and G.

Scarcity is illustrated by the country being able to produce only at one of the points on or within the PPC at a given point in time as well as by the country not being able to attain points outside the boundaries of the PPC such as the unattainable Point F.

Without international trade, Country X can only consume what it produces domestically and consumption is constrained by the availability of resources in its economy. However, international trade may allow countries to consume outside the PPC.

Note:

The PPC curve is sometimes known as the Production Possibility Frontier (PPF).

Note:

There is typically no need to illustrate the PPC with numbers when you are using them to explain concepts.

Key Point:

International trade allows consumers to consume points beyond an economy's PPC.

4.2 CHOICE AND PPC

Countries may choose to produce at only one point along the PPC. For example, Country X can choose to devote all of its resources to produce capital goods (Point A) or consumer goods (Point E), but it cannot produce at Points A and E at the same time.

4.3 OPPORTUNITY COST AND PPC

Reallocating scarce resources from producing one good to another involves opportunity cost. As Country X increases its production/output of consumer goods from Point B to Point C in Figure 3, fewer resources are available for the production of capital goods, meaning that to produce more consumer goods, Country X would need to forgo some production in capital goods. As such, the **negative gradient** of the PPC illustrates the presence of opportunity cost.

Key Point:

Opportunity cost is illustrated by the gradient of the PPC.

The PPC for Country X in Figure 3 is **concave to the origin** because as more consumer goods are produced, the **opportunity cost of expanding output of consumer goods measured in terms of forgone units of capital goods increases**. For instance, moving from Point B to Point C along the PPC, 1 million consumer goods are produced at the expense of 1 million capital goods. Thus, the opportunity cost of producing 1 million extra units of consumer goods would be the 1 million units of capital goods forgone. Moving from Point C to Point D, however, the additional 1 million of consumer goods produced are now at the expense of 2 million capital goods. Thus, the opportunity cost of the 1 million extra units of consumer goods produced would be the 2 million units of capital goods forgone. The opportunity cost has increased.

This is because **resources in an economy are not perfectly suited to the production of both goods**. As the country concentrates on the production of one good (e.g., consumer good), it has to start using resources that are less and less suitable for producing consumer goods (i.e., resources that would have been better at producing other goods, in this case, capital goods). To produce an additional unit of one good means having to move increasingly greater amounts of resources from the production of the alternative good, hence the greater amount of alternative good that has to be forgone. There is **increasing opportunity cost of production** as illustrated by the concavity of the PPC.

Under what circumstances would the PPC be a straight line?

Since a concave PPC illustrates increasing opportunity cost, a straight-line PPC would arise when there are constant opportunity cost where all factors of production are perfectly suited to produce both goods. This is highly unlikely in the real world.

4.4 EFFICIENCY AND PPC

Efficiency is a key concept in the study of economics. Given the problem of scarcity, it is vital that resources are fully and efficiently utilised to meet the unlimited wants of people as best as possible.

Economic Efficiency = Allocative Efficiency + Productive Efficiency

Productive Efficiency

The economy achieves productive efficiency when all the available resources are fully and efficiently employed. It is achieved when society produces at any point on the PPC. With reference to Figure 3, Points A, B, C, D and E are productively efficient.

On the other hand, all points inside the PPC are productively inefficient. Point G is an example of an attainable but inefficient combination. Resources have not been fully and efficiently employed and the economy is experiencing unemployment or

Key Point:

All points on the PPC curve are productively efficient. However, all points within the PPC are not.

underemployment. More goods can be produced by increasing the employment of the idle resources or using them more efficiently.

Allocative Efficiency

Allocative efficiency is the situation in which society produces and consumes a combination of goods and services that maximises its welfare. It is achieved when the goods and services that are wanted by the economy are produced in the right quantities. Though Points A, B, C, D and E are productively efficient, only one point on the PPC is allocatively efficient (and thus maximises society's welfare).

Key Point:

Not all points that are productively efficient are allocatively efficient.

4.5 MOVEMENT FROM A POINT WITHIN TO A POINT ON THE PPC

Actual economic growth refers to an increase in real national output (i.e., quantity of goods and services produced by an economy). This may be caused by greater and more efficient use of existing resources. Diagrammatically, this can be illustrated by a movement from a point within to a point on the PPC (e.g., from Point G to Point B).

Key Point:

Economic growth refers to **both** actual and potential economic growth.

4.6 FACTORS CAUSING SHIFTS OF THE PPC

Potential economic growth refers to an increase in an economy's ability to produce goods and services (otherwise known as productive capacity). As productive capacity increases, the maximum quantities and combinations of both capital and consumer goods produced by Country X would increase thus causing an outward shift of the PPC. Shifts in the PPC may be either in a parallel or non-parallel manner, depending on whether the change affects the production of both goods or only one good.

Factors that may affect a country's productive capacity and shifts of PPC include:

- **A change in a country's quantity of resources**

An increase in capital goods, inward migration and a government's efforts to build infrastructure are examples of factors that may increase the quantity of factors of production (FOP) in a country. Similarly, a war or a natural disaster may decrease a country's available resources.

- **A change in a country's quality of resources**

Quality of resources refer to the efficiency or productivity of the factors of production. Using labour as an example of resources available to the country; skills upgrading may raise the productivity of workers, allowing them to produce more goods with the same number of workers and hence increasing the country's productive capacity.

- **A change in technology**

Technological improvement represents new and better methods of producing goods, for example, through automation. Technology can increase the productivity of resources such that for a given amount of resources, more output can be produced (outward shift of the PPC). If the technological change can enhance the production of both goods equally, there will be a parallel outward shift of the entire PPC as shown in Figure 4. However, if the technological improvement is in the capital goods industry only, the PPC will shift in a skewed manner, as shown in Figure 5.

Key Point:

Potential growth is affected by a change in
- Quantity of FOP
- Quality of FOP
- Level of technology

An increase in any of these factors would cause an outward shift of the PPC.

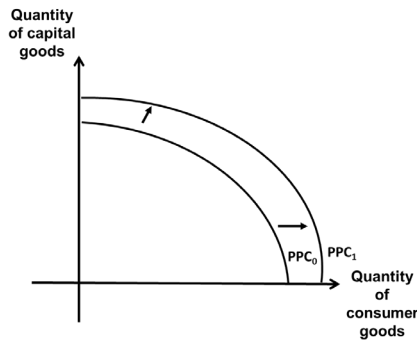


Figure 4: Parallel Shift of PPC

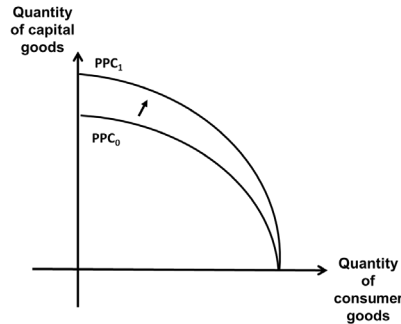


Figure 5: Skewed Shift of PPC

So, what affects the extent of Economic Growth in a country?

The available stock of capital goods (a factor of production) plays a significant role in determining the extent of economic growth that an economy enjoys in the future. However, the production of capital goods involves postponing current consumption as resources used for the production of capital goods in the current time period cannot be used to produce consumer goods, which are for current consumption.

Hence, an economy must decide on the trade-offs between producing goods for current consumption and producing goods for future production and consumption. The opportunity cost of producing for current consumption is forgoing future production and consumption.

Think: How does knowing the factors affecting the PPC help me answer economic questions?

2023 A Levels H2 Essay Qn 1

a) Explain how a PPC can be used to show the concepts of underutilisation of economic resources and opportunity cost. [10]

In such a question, you will need to indicate a point within the PPC to illustrate the concept of underutilisation of resources. To illustrate opportunity cost, it is best demonstrated by moving from one point to another whereby both are on the PPC.

5 CONCLUSION

All societies are faced with the problem of scarcity. They differ considerably, however, in the ways they tackle the problem. One important difference between societies is in the degree of government control of the economy: the extent to which government decides 'what and how much', 'how' and 'for whom' to produce.

At the one extreme lies the completely **planned or command economy**, where all the economic decisions are taken by the government. At the other extreme lies the completely **free market economy**. In this type of economy there is no government intervention at all. In such an economy, the pattern of production and consumption that results depend on the interactions of all **individual demand and supply decisions in free markets**. In reality, however, all economies are a mixture of the two. It is therefore the degree of government intervention that distinguishes different economic systems. Scarcity, however, will remain an issue in all economies that cannot be solved entirely.

TOPIC SUMMARY:

- The central economic problem is scarcity. There is a limited amount of factors of production (labour, land, capital and entrepreneurship) and unlimited wants.
- Choices have to be made regarding the allocation of scarce resources and this incurs an opportunity cost.
- All economic agents are assumed to be rational and weigh the marginal benefits of each activity against its marginal costs.
- A rational economic agent will consume or produce when their marginal benefit > marginal costs and stop at where their marginal benefit = marginal costs. This is referred to as the marginalist principle.
- The decision-making framework shows the process of decision-making which takes into account various considerations.
- The PPC is an economic framework that illustrates the central problem of economics. It can be used to explain scarcity, choice, opportunity cost and efficiency.

*****END*****

RAFFLES INSTITUTION Year 5 H2 ECONOMICS 2025 TUTORIAL PACKAGE

Section A: Starter Questions

1. Opportunity Cost

What is the definition of opportunity cost?

Scenario: After much deliberation, you accompanied your friend to Pulau Ubin for an afternoon of cycling; spending \$50 on ferry tickets, bicycle rental and lunch.

- What was the next best alternative that you have foregone?
- What were the explicit and implicit costs involved in this choice of yours?
- While both of you made the choice to do this activity, the opportunity cost incurred by you and your friend may differ. What causes the opportunity cost to differ?

2. Rational Decision Making

Using the **ABCDE** framework and the scenario below, fill in the following information.

Consumers

- You have received \$500 as CNY ang bao money. You are caught up in the Labubu doll craze and already have several in your collection. Now, Pop Mart has released a new series of them. Should you buy? And if so, how many?

A Aim(s)	Clarify the aim to maximise net benefits based on problem, options and constraint faced by the economic agent
B Benefits	- Include both monetary & non-monetary benefits - Consider perspectives and information available
C Costs & Constraint	- Include both explicit & implicit (opportunity) costs and constraints - Consider perspectives, information available and constraint arising from scarcity
D Decision-making	- Use the Marginalist Principle to make decisions at the margin ○ Weigh marginal benefit (MB) and marginal cost (MC) ○ Undertake more of the activity if $MB > MC$ ○ Stop when $MB = MC$ ○ Undertake less of the activity if $MB < MC$
E Evaluate	- Evaluate the outcomes of the decisions and decide whether to change decision ○ What if the circumstances change for the decision-maker (e.g. ABC changing over time)? ○ What if there are unintended consequences from the decision? ○ What if there are more available information? Etc.

Think about other areas in which producers and governments make decisions using the ABCDE framework.

Section B: Short Structured Questions

Question 1: Rational Decision Making for Consumers

Rational decision making involves weighing up the marginal benefit and marginal cost of any activity. If the marginal benefit exceeds the marginal cost, it is rational to do the activity (or to do more of it). If the marginal cost exceeds the marginal benefit, it is rational not to do it (or to do less of it).

Table 1 shows the marginal benefit and marginal cost of consuming various scoops of ice cream to a consumer. Each additional scoop of ice cream is priced at \$4.

No. of scoops of ice cream	Marginal Benefit (or Marginal Utility) of Consumption (\$)	Marginal Cost of Consumption = Price (\$)
0	-	-
1	6	4
2	5	4
3	4	4
4	3	4
5	2	4

Table 1: Benefits/Costs of Consumption

- What do you notice about the marginal utility of additional scoops of ice cream consumed? State the law that summarises this relationship.
- Following the marginalist principle, what is the maximum number of scoops of ice cream a consumer would consume to maximise his total net benefit (or utility)?
- Complete Table 2 and verify that number of cups of ice cream that maximises total net benefits/utility is what you have calculated in (b).

No. of scoops of ice cream	Marginal Utility of Consumption (\$)	Marginal Cost of Consumption = Price (\$)	Total Benefit (\$)	Total Cost (\$)	Total Net Benefit (or Utility) (\$)
0	0	-	0	-	-
1	6	4	6	4	2
2	5	4			
3	4	4			
4	3	4			
5	2	4			

Table 2: Benefits/Costs of Consumption

Question 2: Rational Decision Making for Producers

"Three years into working as a corporate lawyer, Mr Esmond Yue began to realise that the work he was doing was making him feel like a square peg in a round hole. The University of Nottingham law graduate had spent four years doing corporate banking in firms Allen & Gledhill and Norton Rose Fulbright before quitting.

"I enjoyed the rigour of law school and had wonderful colleagues and bosses, but three years in, I began to realise I wanted a different kind of challenge," the 31-year-old bachelor recalls. With his heart set on becoming an entrepreneur, he scoped out the scene and decided to act on his love for Japanese food - investing \$280,000 of his savings into starting sushi restaurant Chikuwa Tei in Mohamed Sultan Road in the middle of 2012. He felt that food and beverage had "the lowest barriers to entry for a newcomer".

Source: Legal Eagles who leave Law for Other Career, the Straits Times, 2016

- (a) What are the benefits (monetary and non-monetary) that an entrepreneur may derive when he sets up his own restaurant?
- (b) What are the opportunity costs that may incur from the business? (Consider the opportunity cost from all resources put into the business – this includes the money as well as time/effort).
- (c) Assume that you are rational and that your aim is to maximise total profit. Total revenue in economics refers to the total receipts from sales of a given quantity of goods or services. It is the total income of a business and is calculated by multiplying the quantity of goods sold by the price of the goods. Total profit is the difference between total revenue and total costs.

Table 3 shows the marginal benefit and marginal cost of producing various units of *chawanmushi* to a producer. Each additional unit can be sold for \$6.

No. of <i>chawanmushi</i>	Marginal Revenue (or Marginal Benefit) from producing/selling the good (\$)	Marginal Cost (\$) from producing/selling the good
0	-	-
1	6	1
2	6	2
3	6	3
4	6	6
5	6	8

Table 3: Benefits/Costs of Production

- What do you notice about the marginal cost of additional units of *chawanmushi* produced? State the law that summarises this relationship.
- Following the marginalist principle, what is the maximum number of *chawanmushi* that the producer should produce to maximise his profit?
- Complete Table 4 and verify that number of *chawanmushi* maximises profit is what you have calculated in 2).

No. of <i>chawanmushi</i>	Marginal Revenue (\$)	Marginal Cost (\$)	Total Revenue (\$)	Total Cost (\$)	Total Profits (\$)
0	-	-	0	5	-5
1	6	1	6	6	0
2	6	2	12	8	4
3	6	3			
4	6	6			
5	6	8			

Table 4: Benefits/Costs of Production

Question 3: Production Possibility Curve (True/False)

1. If an economy is operating on its production possibilities curve, it must produce less of one good if it produces more of another.
2. Points outside the production possibilities curve are attainable but inefficient.
3. All points on the production possibilities curve are allocative efficient.
4. If an economy were experiencing substantial unemployment, the economy is producing outside the production possibilities curve.
5. The opportunity cost of producing additional units of capital goods is consumer goods forgone.
6. The production possibilities curve is bowed outward because resources are perfectly substitutable to the production of both goods in the economy.
7. An advance in production technology would cause the production possibilities curve to shift outward.
8. A reduction in unemployment shifts a country's production possibilities curve outward.
9. A movement along the production possibilities curve toward capital goods today increases the rate of economic growth in the next period.
10. It is impossible for an economy to consume at a point beyond its production possibilities curve.

Section C: Discussion Questions

1. Can economic growth alleviate the problem of scarcity? How so? To what extent?

Question Guide:

- a. *What is the problem of scarcity?*
- b. *How can economic growth alleviate the problem of scarcity?*
- c. *Will economic growth worsen the problem of scarcity?*
- d. *What would your conclusion be? Will it depend on context? e.g., Different countries? Different methods of growth? Different time periods (short run vs. long run)?*
- e. *What economic framework can you use to analyse this problem?*

Past exam questions:

2020 A Level H2 Economics Case Study Question 2(b)

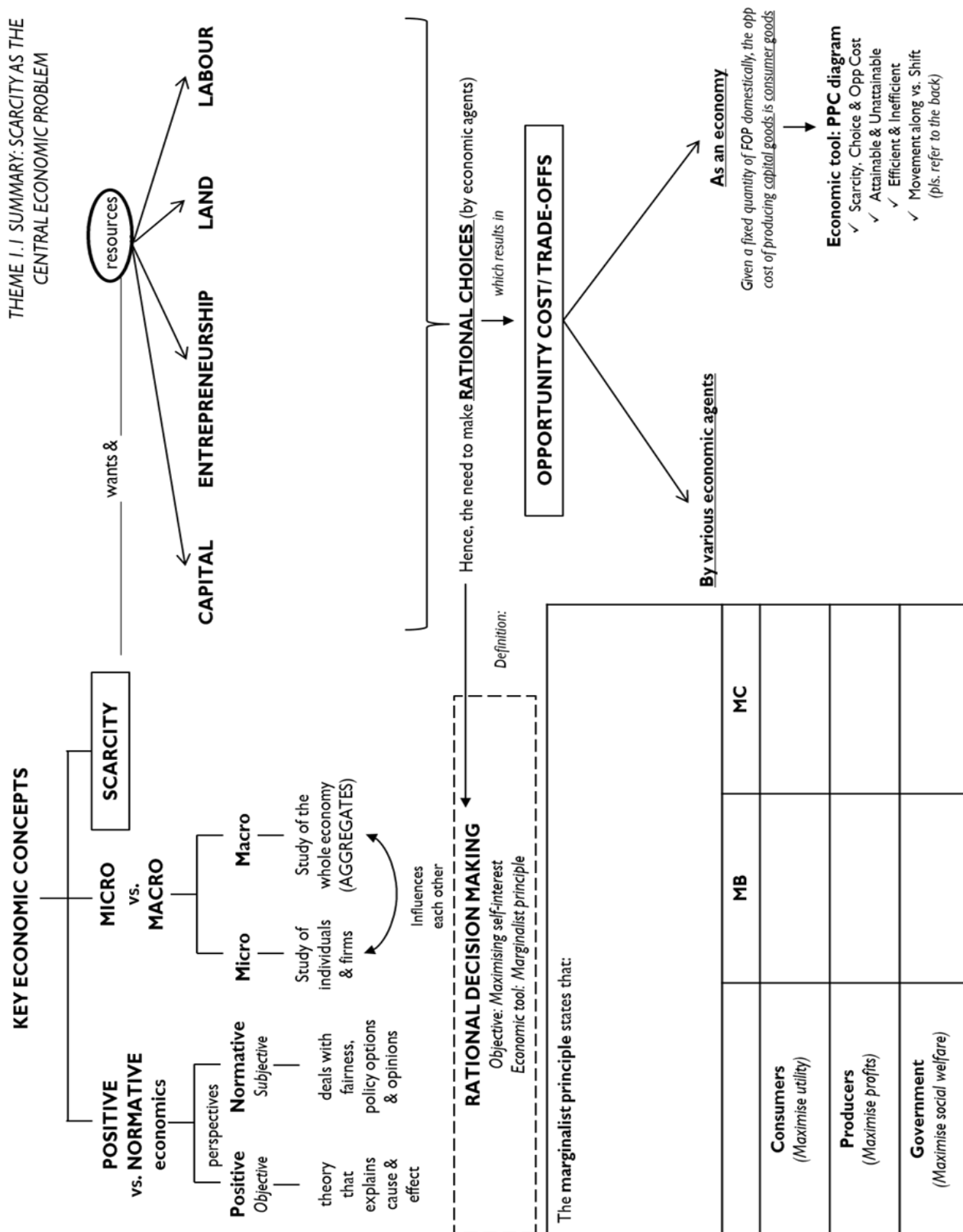
Using a production possibility curve diagram(s), explain the likely impact of the change in the labour force described in Extract 6 upon China's economic growth. [2]

2013 A Level H2 Economics Case Study Question 2(b)

Using a diagram, explain how new technology could increase the goods and services available to an economy. [2]

Section D: Mind Map

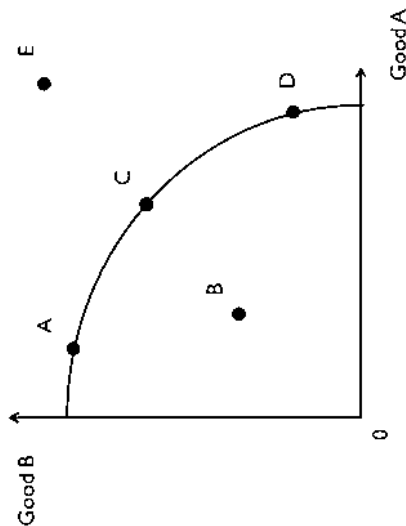
Fill in the blanks. Try to only countercheck your notes after your fill in the blanks.



PPC DIAGRAM

□ Definition:

- How does the PPC (Good A & B) illustrate the following concepts:
- Scarcity

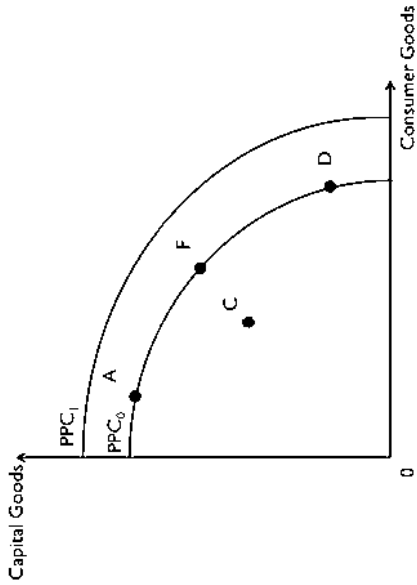


□ Shape:

- Downward sloping

- Concave

How about a straight line PPC curve?



- What brings about a movement from point C to F on PPC (Capital & Consumer Goods)?

- SHIFT OF PPC: What brings about a shift of the PPC curve from PPC_0 to PPC_1 ?

- MOVEMENT ALONG PPC: What is the likely impact on a country's current and future standard of living if it choose to produce on point A instead of point D?

APPENDIX 1: THE ECONOMIC DECISION-MAKING PROCESS

The process of decision-making requires every economic agent to deliberate on the various choices that are made available to them. This process takes into account various considerations. In achieving their objectives, economic agents must be cognisant of the constraints they are operating within. To ensure that the decision made is the best given their constraints, economic agents must also factor in the costs and benefits of the choices available. In addition, economic agents actively consider information and perspectives to weigh the costs and benefits.

- **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.
- **Costs and benefits** – Every economic decision is motivated by a set of benefits as well as a set of costs. In making any decision, every economic agent would consider the monetary and non-monetary costs and benefits of every available choice. Economic agents must also consider opportunity cost, defined as the value of the next best alternative forgone. In weighing the costs and benefits, the economic agent has to take into account the opportunity cost of a decision and undertake a decision that offers the maximum net benefits.
- **Information** – In order to make sound decisions, economic agents have to gather information, both quantitative and qualitative, on the costs and benefits of every available choice. It serves the economic agents well to attain a fairly accurate understanding of the costs, benefits, trade-offs and intended consequences pertaining to each choice, before making a decision.
- **Perspectives** – Economic agents do not make decisions in isolation of others, since the impact on and subsequent reaction from those affected by the decisions may in turn affect the intended outcome of the decision made. The profit-driven producer considers the perspectives of the consumers in analysing the effectiveness of their business strategies employed, while governments consider the perspectives of stakeholders 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 used to tackle or mitigate an economic issue, and the impact of such decisions can be analysed in terms of intended and unintended consequences:

- **Intended consequences of the economic decision** – When economic agents encounter an economic problem, they would gather information and perspectives and adopt a marginalist approach, keeping in mind constraints, benefits and costs to arrive at a decision. This is performed with the expectation that the decision will achieve its intended outcome and hence resolve the economic issue. The intended consequences of an economic decision are assumed to occur because economists assume rational behaviour and economic conditions remain unchanged.
- **Unintended consequences of the economic decision** – While most economic decisions that have intended consequences, these decisions may result in unintended consequences as well. Unintended consequences refer to the outcomes that are not intended in the economic decision. Unintended consequences may occur because economic agents may not have made their

decisions under perfect information, due to an inability to have access to complete information or consider all perspectives, especially when local and global conditions are subject to constant and unpredictable change.

When unintended consequences occur, the economic decision-making process is made more complex. In the case of unintended consequences, economic decisions may have to factor in measures to manage any adverse impact of these consequences, or, 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, when there are adverse unintended consequences or when there are changes in the internal and external environment.

- **Internal changes** – The goals, constraints, information and perspectives of economic agents can change over time. These are termed as internal changes. When such changes occur, the economic decision undertaken by an agent may no longer be optimal, calling for the need for the decision-making process to take place again.
- **Changes in the external environment** – The decisions made by economic agents are very much shaped by their external environment. As the external economic environment is constantly changing because producers and governments seek to remain competitive in the global arena, economic agents have to undertake the decision-making process again to ensure that the intended outcomes can be achieved.