



Topic 1:

The Central Economic Problem

Theme 1.1

Scarcity as the Central Economic Problem

How to use this set of lecture notes?

1) BEFORE LECTURES – UNDERSTANDING CONTENT

- Reference your notes against your H2 syllabus. Mark out the key concepts so that you know what you **MUST** know
- Read your notes ahead so that you can focus on listening and capturing additional notes during lectures

2) DURING LECTURES – APPLYING CONTENT

- Bring your hard copy notes along, and use your PLDs to refer to the lecture slides concurrently
- Capture additional notes, especially the real world examples where you can note down how concepts are applied and how economic analysis are developed in varying contexts
- You should make use of a notetaking/consolidation tool to take notes during lessons and to consolidate your learning at timely junctures. Examples are MIRO, Notion, Goodnotes, Notability, Microsoft Onenote, KAMI, and etc. The choice is yours!

3) AFTER LECTURES – TUTORIAL PREPARATION TO USE CONTENT FLEXIBLY TO SHOW APPLICATION, ANALYSIS AND EVALUATION SKILLS

- Revise concepts relevant for the case study and essay questions
- Refer to the notes and use it flexibly to prepare your answers to meet question requirements. Pure memorisation will not work as it does not involve deep understanding.
- Do share your notes with your friends to multiply learning!

Economics as a discipline to understand the human experience

- 1. Scarcity as the Central Economic Problem**
 - 1.1 Unlimited wants and limited resources
 - 1.2 Scarcity, Choice and Opportunity Cost
 - 1.3 The Production Possibility Curve (PPC)
 - 1.4 Illustrating economic growth on the PPC
- 2. Decision-Making at the Heart of Economics**
 - 2.1 An approach for decision making
 - 2.2 6-step decision-making template

Consolidation/Summary

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Essential Questions:

1. Why do consumers, producers and government make choices on the goods and services consumed and produced?
2. How do consumers, producers and governments make choices about the use of limited resources?
3. How does the free market allocate and distribute the use of limited resources?
4. Why are some outcomes of choices not efficient?

Economics as a discipline to understand the human experience

The Sciences and Mathematics provide the tools to understand the natural world. Similarly, Economics provides the tools to understand the human world. The human world is related to how we make decisions, how we live, how we produce and distribute things, why and how we interact with each other. These questions have a very tangible impact on our lives, and we can utilise the tools of Economics just as how we use scientific tools to influence our lives.

If you have ever wondered why the price of a ticket to your favourite band's concert was so expensive; why you were paid so little in your part-time job; why your movie ticket is more expensive over the weekends; or why some firms make more profits than others, then studying Economics will certainly be of relevance to you! In fact, you are already an important part of the economic system. You are a consumer of goods and services, influencing its demand. Your parents are also likely to be employed, involved in the production of goods and services. They are also paying taxes that are used by the government to finance the provision of public infrastructure and subsidised education.

We are all practitioners of Economics, consciously or subconsciously. We make decisions to make the best use of what we have. On a larger scale, governments make decisions to optimise the use of limited resources to achieve its set goals. Economists call this the problem of scarcity.

At the heart of Economics is human behaviour: what influences it and what happens when it changes. What makes people choose one course of action over another? If we want to change behaviour, what is the best way of doing this? For example, if we want people to be more environmentally friendly, is this best achieved by taxing environmentally unfriendly behaviour, or by subsidising 'good behaviour'? Economics affects a country's standard of living and how people live. The tax and benefits system will affect your incentive to work, your willingness to marry, to have children and your ability to save money. An understanding of Economics therefore provides an insight into the factors that shape society.

Microeconomics can be defined as the study of economic behaviour of individual economic agents (i.e., consumers, producers and governments) in making decisions regarding the allocation of limited resources, as well as their relationships in determining the pattern of production and consumption of goods and services.

Macroeconomics can be defined as the study of the economy *as a whole*. It examines the behaviour of the entire economy by looking at the aggregate impact of the collective decisions of households, firms and governments. This domain also examines the relationships across countries that determine the pattern of production and consumption of goods and services.

Naturally, these two domains are interdependent: changes in the macroeconomy will trickle down to individual economic agents, while changes in individual behaviour could be aggregated to cause a discernible impact at the national level.

1. Scarcity as the Central Economic Problem

We live on an earth that is endowed with a variety of natural resources. Some countries are endowed with more resources than others – think China compared to Singapore. Nonetheless, all countries face the problem of **scarcity**.

Scarcity refers to a situation where **limited resources** are insufficient to fulfil the **unlimited wants** and needs of society.

1.1 Unlimited wants and limited resources

Unlimited wants

We have an insatiable desire to consume a wish list of goods and services – the latest smartphone, running shoes, gourmet food, luxury items, basic necessities such as houses, education services, healthcare facilities and the list goes on. Collectively, this is reflected in a country's desire to consume a plethora of goods and services.

Limited resources

The means of fulfilling human wants are however limited. To produce goods and services, these resources [also known as factors of production (FOPs)] are typically required:

- a. **Land** – largely referring to natural resources available, including land, minerals and raw materials.
- b. **Labour** – refers to the mental and physical effort of workers measured in terms of man-hours. Apart from the quantity of labour which is largely determined by the population size, countries often look at improving the quality (skills and abilities) of labour by national upskilling efforts.
- c. **Capital** – also known as capital goods (a.k.a. investment goods) are manufactured resources used to produce goods and services. Examples include tools, equipment, machinery, office buildings and intermediate goods and services that require further processing to make final goods and services.
- d. **Entrepreneurship** – the factor of production that takes overall responsibility for the decision-making process to combine the other three resources for meaningful production of goods and services. The entrepreneur is key as without him, the other resources remain idle. He also takes on the risks involved in the production process.

An easy way to remember the FOPs is through the acronym **CELL**.

FOPs have alternative uses. For example, labour could be deployed to manufacturing or agricultural sectors while a plot of land could be used for tourism or medical services.



Connect, Extend, Challenge

Since China enjoys an abundance of land and human resources, is the issue of scarcity still relevant to the country? Why?

The owner of each FOP is rewarded by a factor payment as follows:

Factor of Production (FOP)	Factor Payment
Land	Rent
Labour	Wage
Capital	Interest
Entrepreneurship	Profit

1.2 Scarcity, Choice and Opportunity cost

In view of scarcity, choices amongst the many things that we desire have to be made. An economy will therefore need to think about questions relating to resource allocation.

To better understand how decisions are made relating to resource allocation in an economy, one should first understand what a free-market economy is and thus the fundamental questions relating to resource allocation.

Free-market economy (also known as a laissez-faire economy)

Consumers and producers are free to make decisions relating to consumption and production patterns. This is also known as the 'Invisible Hand' (theory by economist Adam Smith), where transactions between consumers and producers lead to maximisation of mutual self-interests.

Governments are seldom involved in these private transactions, allowing free market forces of demand and supply to work. Due to the responsiveness to changes in market conditions, consumer and producer wants are met, with no shortage or surplus of goods.

Resource allocation in the free-market economy **works via the price mechanism**. The price mechanism describes the interaction between buyers and sellers to determine the allocation of limited resources between competing uses. Demand and supply decisions are transmitted to each other through their effects on price via the price mechanism. The price mechanism allocates scarce resources in the free market through **signalling, incentive and rationing functions**. These functions are associated with the following questions regarding resource allocation, namely:

1. **What** goods and services to produce?
2. **How much** to produce, and **for whom** to produce these goods and services?
3. **How** to produce the goods and services?

As resources are automatically allocated under free markets, as opposed to being allocated in a planned manner for a command economy (see Annex), the workings of the price mechanism will be covered in *Topic 2: Price Mechanism and its Applications*.

To answer the questions regarding resource allocation, economic agents have to make choices on the allocation of resources for the production or consumption of a good or service. When choices are made, trade-offs and **opportunity costs** are incurred as the production or consumption of other goods or services will be forgone.

Opportunity cost is defined as the **value** of the **next best alternative forgone**.



Connect, Extend, Challenge

If there are several other things you could have done as opposed to going to university, is the opportunity cost the sum of all of them?

Understanding opportunity cost in the case of the Green Corridor

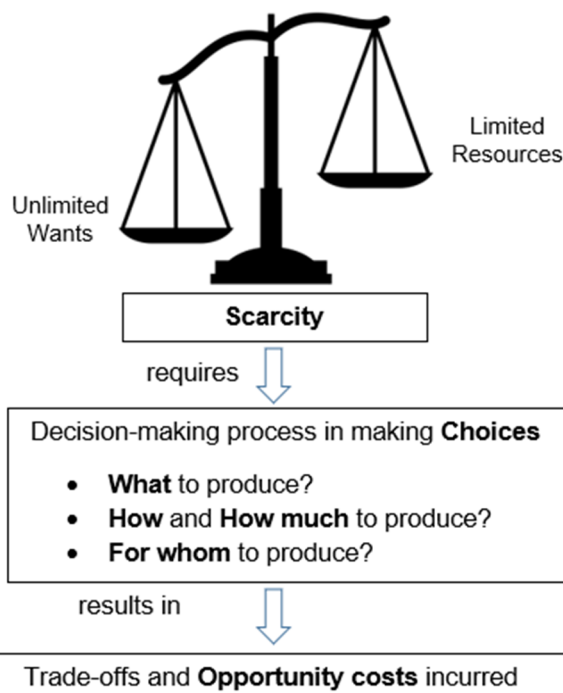
With the cessation of the railway service connecting Tanjong Pagar to Malaysia, a 24km length of greenery availed itself for the Singapore government to consider how best to use it. In land-scarce Singapore, this presented the country with an excellent exercise as it decides how to allocate its scarce resources between competing uses, to meet its unlimited wants. After many rounds of consultations and decisions with public and interest groups, the decision was to allocate the land to meet the wants of recreation and environmental conservation (Green Corridor). One can imagine that the plot of land had many alternative uses. If the next best alternative were to build commercial buildings, then the **opportunity cost** would be the benefits that building commercial buildings would have brought into Singapore - for example, greater corporate tax revenue from foreign investments forgone.



Did you know that opportunity costs apply to you as well? For example, if you were not attending school today, you might decide that your next best option is to spend the day at the Universal Studios Singapore. Hence, your opportunity cost of attending school is the satisfaction you could have derived from your visit to USS.

Implication: Given the problem of scarcity that necessitates choice, it is important that resources are allocated efficiently in order to meet the country's objectives.

To summarise, the central economic problem is about:



1.3 The Production Possibility Curve (PPC)

The Production Possibility Curve (PPC) can illustrate scarcity, choice and opportunity cost. The PPC is also known as the Production Possibility Frontier (PPF).

As we consider the limited resources available to any economy, we understand that there is a limit to how much an economy is able to produce to satisfy the insatiable human wants. In Economics, we study this tension using the PPC.

The **PPC** is a curve that shows **all the possible combinations of the maximum quantity of two goods that a country can produce** within a specified period of time with all its **resources fully and efficiently employed** at a given state of technology.

The assumptions of the PPC are:

- All available resources are used to produce only two goods.
- Within the given time period, the quantity and quality of resources remain the same.
- Resources are fully and efficiently employed to produce the goods.
- Within the given time period, the level of technology remains the same.

Consider an economy that produces only two categories of goods, consumer goods (goods that enable consumers to derive direct satisfaction e.g., mobile phones and chocolates) and capital goods (goods that are used to produce consumer goods in the future time period and do not directly satisfy consumer needs in the current time period e.g., factory conveyor belts, tractors and turbines).

Table 1

Point	Units of capital goods	Units of consumer goods	Units of consumer goods that must be given up to produce 1 more unit of capital good (illustrates opportunity cost of producing 1 more unit of capital good)
A	0	20	0
B	1	19	1
C	2	17	2
D	3	14	3
E	4	9	5
F	5	0	9

With reference to Figure 1, points A to F are possible combinations of goods that the economy could produce.

- Point F represents an outcome where all resources are allocated capital goods and none to consumer goods.
- On the other hand, point A represents an outcome where all resources are allocated to consumer goods and none to capital goods.
- Points B, C, D and E are outcomes in which both consumer goods and capital goods are produced.
- Point G cannot be attained given available resources and existing technology within the given time period.
- Point H represents inefficient allocation of resources since more consumer and capital goods could have been produced by utilising more of the available resources.

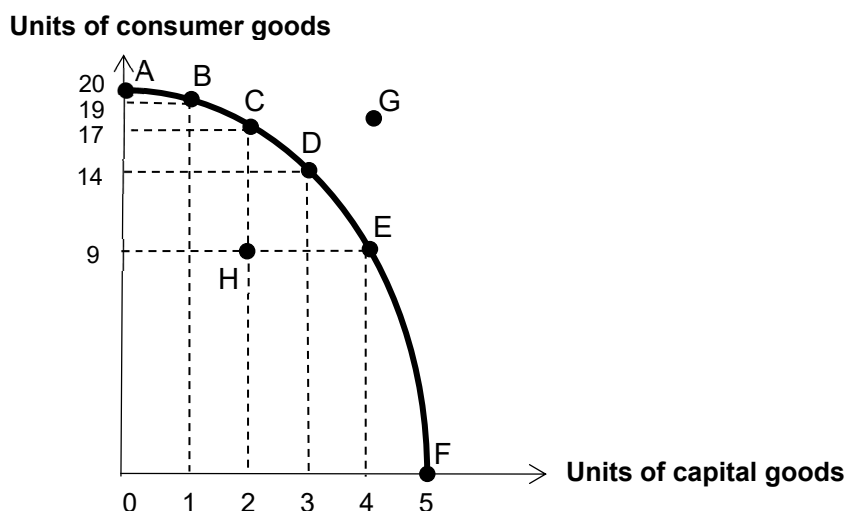


Figure 1: Increasing opportunity cost

The PPC illustrates the 3 concepts associated with the Central Economic Problem:

- Scarcity** is indicated by the unattainable combinations beyond the PPC (as illustrated by a point such as G). The economy does not have the necessary resources or the state of technology to produce that combination of consumer goods and capital goods, within the given time period.
- Choice** is indicated by the need to choose among the alternative attainable combinations along the PPC (either point A, B, C, D, E or F).
 - In addition, different choices indicate different government priorities. For example, point E indicates that the government places a higher priority on building the capacity of the economy by greater accumulation of capital goods to produce more consumer goods in the future. In contrast, point B indicates a greater focus on consumers' immediate needs and wants (with emphasis on current standard of living) but with less focus on their future needs (less focus on future standard of living).
- Opportunity cost** is reflected by the **downward sloping** PPC. Given that the limited amount of resources has been fully and efficiently employed, if the economy chooses to produce an additional unit of capital goods, it would need to give up some units of consumer goods (and vice versa).
 - Increasing opportunity cost.** This is reflected in the **concave shape** of the PPC to the origin (with reference to Figure 1).

The opportunity cost of the 1st unit of capital good is 1 unit of consumer good. To produce the 2nd unit of capital good, 2 units of consumer goods had to be forgone. The 3rd unit of capital good requires sacrificing 3 units of consumer goods. Hence, the opportunity cost increases as we produce additional units of capital goods. In other words, starting from point A, for every subsequent unit of resource (CELL) that is reallocated from the production of consumer goods to capital goods, the opportunity cost of producing capital goods rises, i.e., marginal cost increases.

The underlying reason is that resources are not homogenous. Take labour for example - some workers have skills and talents that make them

more suited to producing consumer goods rather than capital goods (consider the skills of a farmer vs. a mechanic). When there is a need to move from point A to B along the PPC, the worker who has skills more suited to produce capital goods would likely be redeployed to produce capital goods first. To produce the additional unit of the capital good, the workers who are less suited to produce capital goods will gradually be tapped upon, hence incurring a higher opportunity cost (to produce the 5th unit of capital good, 9 units of consumer goods are forgone, compared to 1 unit of consumer good forgone when the 1st unit of capital good is produced).

Efficiency concepts in the context of an economy, with reference to the PPC

Productive efficiency refers to a situation where the economy is able to produce the **maximum output for a given amount of inputs**. In other words, a given output is produced at the least cost (you will learn more under Topic 6-8 Firms and Decisions). **All points on the PPC are productive efficient.**

Allocative efficiency is achieved when society produces and consumes the **optimal/right mix** of goods and services that **maximises its welfare**. In other words, a given quantity of output gives the most amount of net social benefit (net of social cost) to the society (you will learn more under Topic 5 Government Microeconomic Objectives and Market Failure). **There can only be one combination of goods and services on the PPC that is allocative efficient.**



Connect, Extend, Challenge

How will be the PPC look like if resources are homogenous? Sketch the PPC.

1.4 Illustrating economic growth on the PPC

Two types of economic growth can be illustrated on the PPC:

- a. **Actual economic growth** refers to the annual percentage increase in real national output **actually produced**. For example, Singapore recorded a GDP (Gross Domestic Product) growth of 4.0% in 2024.

Actual growth happens when the economy is initially not operating on the PPC (with reference to Figure 2), but within it, e.g., at point A. When more of the idle resources are utilised, the output produced increases (at point B, there is more of both consumer goods and capital goods, compared to point A), contributing to actual economic growth. In doing so, the economy is also more productive efficient in terms of the utilisation of the available resources.

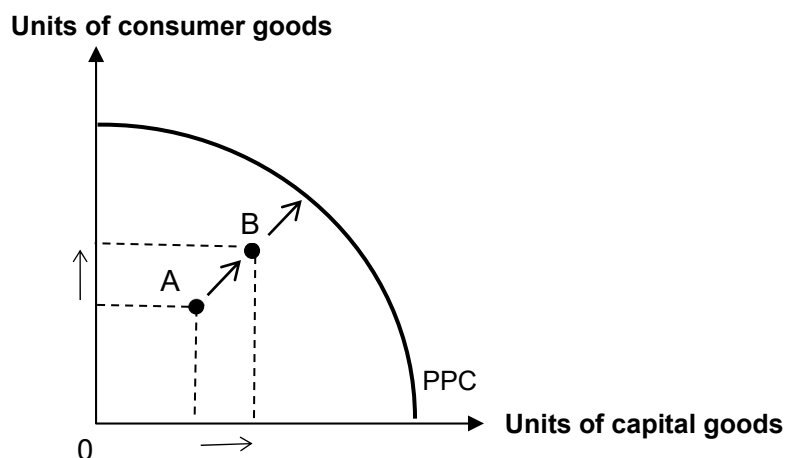


Figure 2: Actual growth as represented by movement within the PPC

***Note:** Factors leading to actual economic growth will be covered extensively under Macroeconomics.*

- b. **Potential economic growth** is defined as an increase in the **productive capacity** of an economy to produce more goods and services. It occurs when the economy shifts or expands its PPC outwards, due to:
 - i. **an increase in the QUANTITY of factors of production.** Examples include:
 - More liberal foreign worker laws enabling higher influx of workers
 - Increase in retirement age to encourage senior citizens to continue contributing to the labour force
 - Incentives for homemakers and retirees to re-join the workforce, enabling a greater labour force participation rate
 - Discovery of new mineral fields (such as crude oil deposits)
 - ii. **an increase in the QUALITY of factors of production** which enhances the productivity level (i.e., economy is able to produce more goods and services given the same amount of resources). Examples include:
 - Training more future-ready workers with higher labour productivity, through forward-looking educational system as well as ongoing incentives for upskilling and retraining for existing workers e.g., SkillsFuture initiative.

- Providing better quality healthcare to ensure a healthier workforce with higher labour productivity
- Adopting new work processes that increases labour productivity and hence yield/production

iii. Innovation efforts through research & development to develop new **technology** that can increase resource productivity. For example, new technology can create energy efficient transportation vehicles such as airplanes and buses that requires less fuel to operate. This means that with the same level of resources, more output can be produced.

Potential economic growth can be achieved via an increase in **QQT!**

Using Figure 3, consider point G that was previously unattainable with PPC_1 . With an expansion of the PPC from PPC_1 to PPC_2 , point G is now attainable.

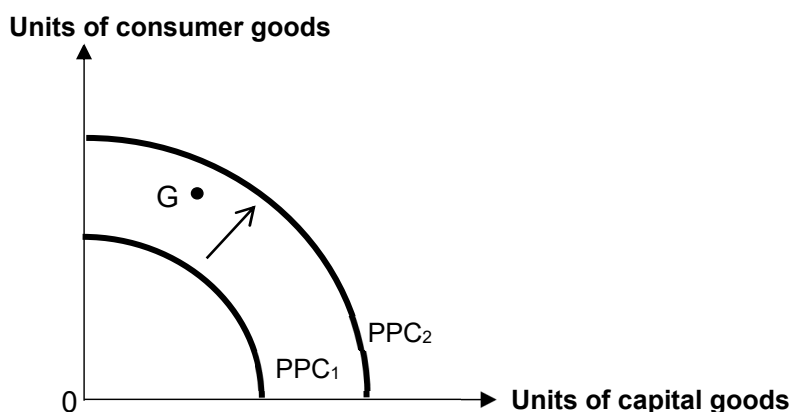


Figure 3: Potential growth as represented by outward shift of the PPC



Connect, Extend, Challenge

Suppose there is technological improvement that enhances the production process of consumer goods only. Using a PPC diagram, briefly explain how the PPC will be affected.

Trade-off between current and future standard of living

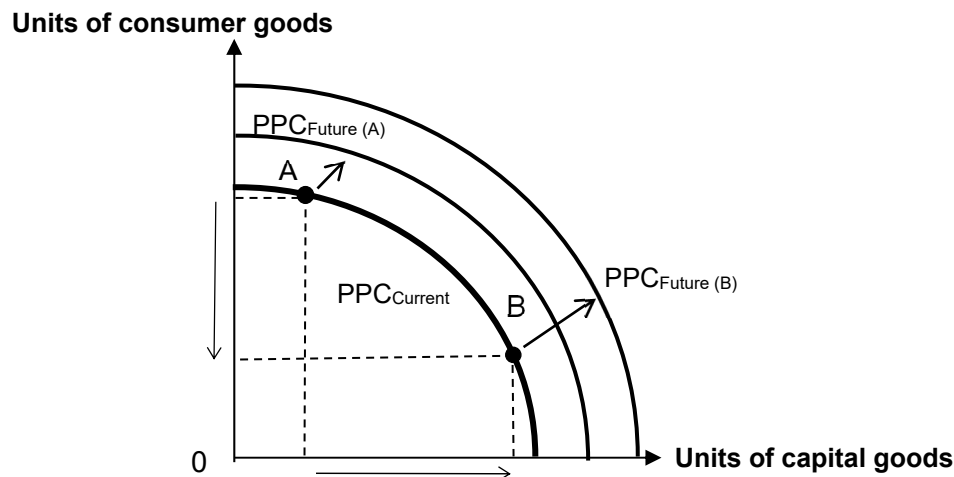


Figure 4: Trade-off between Consumption and Investment

The PPC can be used to illustrate trade-offs and opportunity cost in allocating resources over time, such as the trade-off between goods being currently produced and the potential growth of an economy in the long run (with reference to Figure 4). Assume that an economy is faced with an initial $PPC_{Current}$ and can choose between two options of producing at either point A or point B.

- If the government chooses for the economy to produce at point A, which prioritises current consumption (derived from current production of consumer goods) over future consumption (which can be derived from current production of capital goods), $PPC_{Current}$ will shift out to $PPC_{Future (A)}$.
- However, if the government choose to produce for the economy at point B, which prioritises future consumption over current consumption, $PPC_{Current}$ will shift out by a larger extent to $PPC_{Future (B)}$, meaning that the maximum possible combinations of goods is much greater in the future when point B is chosen as opposed to point A.

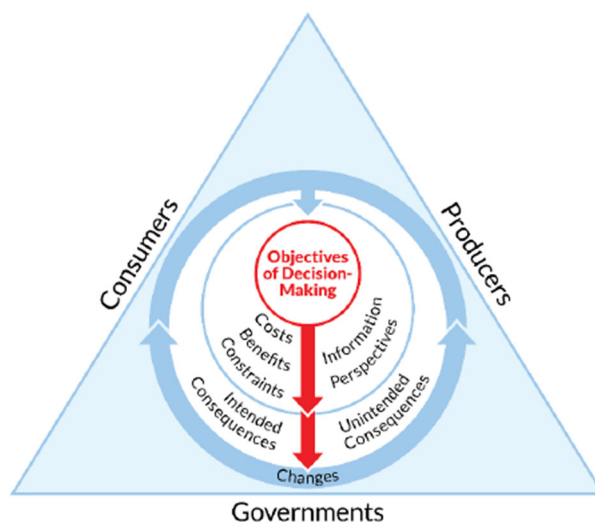
Hence to enjoy higher current potential growth and thus higher future actual growth that brings about higher future welfare (or standard of living), current investment (via production of capital goods) has to be increased while current consumption has to be sacrificed. The trade-off between investment and consumption thus means that there is a corresponding trade-off between current standard of living) and future standard of living.

2 Rational Decision-Making at the Heart of Economics

In the light of the Central Economic Problem of scarcity, rational decision-making is fundamental. As mentioned in Section 1, scarcity leads to the inevitability of choice and trade-offs. In Economics, we seek to study human behaviour that drives rational decision-making. An understanding of how consumers, producers and governments make rational decisions will give you a better appreciation of the considerations involved and likely implications at the market, national and international levels.

2.1 An approach for rational decision-making

In the context of A-level Economics, rational decision-making is framed as a process (Figure 7) where one analyses how rational decisions are made from the perspectives of different economic agents in the economy (consumers, producers and governments) and a high degree of interconnection exists among them at both the micro and macro levels.



Note:
 Figure 7 serves to aid your understanding and there is **no need** to draw this in the exams.

Figure 7: Decision-making approach in Economics

Decision-making process of economic agents

a. Understand objectives of economic agents

In Economics, **one basic assumption is that economic agents are rational**, meaning that they are motivated by their self-interests. Hence, rational decision-making involves making decisions among several options that best fulfils one's self-interests. In particular, economic agents will seek to maximise their objectives in the following manner:

- Consumers aim to maximise utility (satisfaction).
- Producers aim to maximise profits.
- Governments aim to maximise social welfare.

b. Recognise Constraints

In making decisions, economic agents consider the constraints they are currently experiencing to determine the choices available to them. Examples of constraints faced:

- Consumers consider their **budget** and **time constraints**.
- Producers consider their budget constraints as well (such as retained profits), **resource constraints** (availability of limited FOPs) and the time constraints of their work processes (e.g., deadline for product launch).
- Governments consider the government fiscal budget constraints (govt revenue collected from taxes and other government revenue from returns on investments) at their disposal.

Due to **resource and budget constraints** present, economic agents need to make choices on the allocation of resources for the production or consumption of a good or service. When choices are made, trade-offs and opportunity costs are incurred as the production or consumption of other goods or services will be forgone.

c. Weigh Benefits and Costs

Every economic decision is motivated by a set of benefits and takes into account monetary and non-monetary costs. In particular, a **marginalist approach** is used to **weigh the benefits and costs**, in order to decide:

- (i) whether an action *should be taken*

When the Benefits of a decision exceed the Costs, the action should be taken.

Broadly speaking, the value of the **economic benefits and economic costs** should be **quantitative** in nature, regardless if it is a broad analysis or marginal analysis.

Economic benefits can be assessed from different perspectives:

- **For consumers**, it is measured in terms of **private benefits** from the consumption of a good or service. For example, the benefit of consuming education services can be the personal satisfaction of learning new knowledge and skills. The level of personal satisfaction will determine the amount that consumers are willing to spend on education, and that is the quantitative measure.
- **For producers**, it is measured in terms of **firm's revenue** earned from the production of the good or service. For example, when a firm produces a new model of a product with better technology, more consumers will prefer the new model and demand more of it (You will learn more under Topic 2-4 Price Mechanism). That will generate more revenue for the firm, which is also a quantitative measure.
- **For government**, it is measured in terms of the **social benefits** from the government policies. For example, when the government provides free vaccinations against Covid-19, it will protect those who are vaccinated against the virus and generate social benefit. The level of social benefit generated will determine how much the government is willing to spend on free vaccinated, and that is the quantitative measure.

Economic costs comprise of:

- **Direct costs** are direct payments made to pay for resources e.g. rental for land, wages for labour
- **Opportunity costs** do not involve a direct payment of money. It is the value of the next best alternative forgone as a result of a decision being made.

NOTE – Economic benefits and costs can be assessed in detail with the following considerations

- Private/direct and external/indirect (e.g. the personal/direct immunity from flu virus due to a vaccination, while the external/indirect benefit is how a decreased likelihood of a flu epidemic happening benefits those who did not get vaccinated).
- short-term vs long-term (e.g. in the short-term, education generates personal satisfaction from learning, while in the long-term, education can enable individuals to be more productive and command a higher salary.)

(ii) and on the *extent* of an action

When deciding on the *extent* of an action, the Marginalist Principle captures how decisions are made at the margin when considering how much to consume/produce. In short, the **marginal benefit** of an action is the *increase in total benefit that results from carrying out one additional unit of the action*. Similarly, the **marginal cost** of an action is the *increase in total cost that results from carrying out one additional unit of the action*.

The **marginal benefit** of an action can refer to:

- Marginal Private Benefit (MPB) (from the consumer's perspective)
- Marginal Revenue (MR) (from the producer's perspective)
- Marginal Social Benefit (MSB) (from the government's perspective)

The **marginal cost** of an action can refer to:

- Marginal Private Cost (MPC) (from the consumer's perspective)
- Marginal Cost of production (MC) (from the producer's perspective)
- Marginal Social Cost (MSC) (from the government's perspective)

Using the marginalist approach to *decide whether an action should be taken*, now we will analyse how an economic agent decides among different options.

In general, the economic agent should take an action if and only if the Benefits are greater than Costs.

Consider the case of what a firm could do to increase its market share. Let us assume that this firm is deciding what to focus on for the next month:

Action	Benefit (Revenue)	Cost	Net Benefit	Decision
Open a new branch in another state	\$10m	\$2m	\$8m	Proceed since Benefits > Costs
Embark on new advertising campaign	\$8m	\$5m	\$3m	Proceed since Benefits > Costs
Hold a nationwide sale	\$1m	\$1.4m	-\$0.4m	Do not proceed since Benefits < Costs

Consider the perspective of a government whose goal is to maximise social welfare. Assume that the Singapore government is deciding how to make use of a vacant plot of land by considering different options:

Options	(Social) Benefit	(Social) Cost	Decision
Build a school	Improves skill of future labour, raising future labour productivity and national output Estimated value = 10 billion	Direct costs of school furniture, hiring teachers, building cost + Opportunity costs Estimated value = 2 billion	Proceed since Benefits > Costs
Build a hospital	Increases the capacity to provide healthcare services, resulting in a healthier workforce, higher labour productivity and higher national output Estimated value = 8 billion	Direct costs of acquiring medical equipment and hiring medically trained labour, building cost + Opportunity costs Estimated value = 4 billion	Proceed since Benefits > Costs
Farm crops	Increases the agricultural output of a country, which can be sold to increase national income Estimated value = 2 billion	Direct costs of farming machinery, fertilising the land + opportunity costs Estimated value = 3 billion	Do not proceed since Benefits < Costs

If the government can only choose one of the three options due to their budget and resource constraints, rational governments will choose the option that gives them the highest net marginal benefit, which is Option 1: build a school.

When making such decisions, governments need to consider the priority of their objectives before choosing the policy to implement. Furthermore, governments can implement a combination of policies subject to their budget and political constraints. As such, there is no hard and fast rule when making decisions that are more complex.

(i) Using the Marginalist principle to *decide on the extent of an action*

The Marginalist principle involves weighing the Marginal Benefit (MB) against the Marginal Cost (MC) resulting from a decision, to determine the optimal level of action (consumption or production).

To illustrate this, consider what happens when you eat at a sushi bar that serves each plate at \$2. The MC of each plate is \$2, meaning that every additional plate costs you \$2. If you derive \$2.50 worth of benefits from consuming the 1st plate of sushi, you will go ahead to consume since the MB exceeds MC of \$2. This goes on for a few rounds. At which point would you stop consuming?

Plate	MB (\$)	MC (\$)	Should you consume it?
1 st	2.50	2.00	Yes, since MB > MC
2 nd	2.40	2.00	Yes, since MB > MC
3 rd	2.30	2.00	Yes, since MB > MC
4 th	2.20	2.00	Yes, since MB > MC
5 th	2.10	2.00	Yes, since MB > MC
6 th	2.00	2.00	Yes, since MB = MC
7 th	1.90	2.00	No, since MB < MC
8 th	1.80	2.00	No, since MB < MC

You will not consume the 7th plate onwards since consuming an additional plate will cost more than its benefit to you. The outcome is that you will consume up to 6 plates of sushi.

Observations:

- We should do more of an activity when $MB > MC$. Doing it will yield positive net MB.
- We should do less of an activity when $MB < MC$. Doing it will yield negative net MB.

Therefore, the Marginalist principle states that an economic agent should pursue an activity up to the point where $MB = MC$. This will allow:

- Consumers to **maximise utility (satisfaction) at $MPB = MPC$**
- Producers to **maximise profits at $MR = MC$**
- Governments to **maximise social welfare at $MSB = MSC$**

d. Gather Information and Consider Perspectives

In making a decision, economic agents prefer to do so in view of all available information – both quantitative and qualitative, and to keep in mind how different stakeholders have different perspectives on the same issue since the impact on and subsequent reaction of those affected by the decisions may in turn affect the intended outcome of the decision made. For example:

- When consumers make big-ticket purchases like a residential property, they would collect information such as price, loan and instalment plans and neighbouring amenities, to facilitate their decision-making process.
- Before producers embark on the development or production of a new product, it is likely that they do market research to gather information from consumers to identify the potential of the market for the new product – in terms of consumers' willingness and ability to pay for it.
- In deliberating whether to raise income tax rates, the government needs to understand the current state of the economy, gather the predictions of economic performance in the next few years, look at the trend in incomes earned across different strata of society and make projections on the areas requiring government expenditure (e.g., increasing healthcare needs relating to an ageing population). In evaluating different perspectives, the government needs to engage different sub-groups with representation from employers and employees across different economic sectors as well as the labour union and researchers.

In the real world though, it is difficult to have a complete information set and to engage all relevant parties thoroughly. The rationality of economic agents in maximising their self-interest is also not completely free from political and social perspectives.

The impact of decision-making

e. Recognise Intended and Unintended Consequences

Intended consequences could refer to **both intended benefits and intended costs**. In making a decision, the aim is to achieve the **intended benefits**, in line with the said objectives. For example, the government's ERP policy was intended to reduce congestion along roads that are typically jammed up during peak hours. Nonetheless, such policies involve **intended costs** such as construction and testing, which are planned into the government's budgetary consideration.

More often than not, **unintended consequences (can be good and bad)**, which refer to outcomes that are unexpected when making the economic decision, also happen. These may arise due to imperfect information and difficulty in considering all perspectives, especially when local and global conditions are subject to constant and unpredictable changes. For example, one such outcome is that drivers now choose to ply along alternative routes without ERP charges, diverting the congestion to elsewhere rather than reducing congestion as a whole. Decisions made initially were never intended to result in such outcomes.

The extent of its impact would also differ across the intended recipients. For example, the ERP policy addresses the issue of traffic congestion, reducing traveling times for commuters. However, the drivers have to bear the cost if they choose to use the ERP route. The amount of ERP charges paid will differ depending on how reliant the drivers are on the route as they travel to work.

f. Respond to Changes

The objectives, constraints, costs, benefits, information and perspectives of economic agents can change over time. When changes occur, the economic decision undertaken by an agent may no longer be optimal (e.g., resulting in unintended negative consequences), hence calling for the need for the decision-making process to be revisited to ensure that the intended consequences can be achieved.

Consider the following cases:

- a. Constraints are relaxed due to availability of a larger quantum of funding. Conversely, constraints are made tighter due to a cut in the funding quantum.
- b. New information comes in to suggest that the original policy may not be sufficient to meet the objectives (perhaps learning from another country's similar experience). The projected marginal benefits and costs may also change accordingly.
- c. Intended consequences are not as impactful to meet objectives. For example, the time lag between policy formulation and implementation could mean that the policy is no longer as valid in view of a worsening of the initial situation.
- d. Unintended consequences reveal crucial blind spots of a decision.
- e. Depending on risk appetite, producers could also go beyond their budget constraints in the hope of higher returns.

2.26-step decision-making template

While there are multiple aspects [see (a) to (g) under Section 2.1) and the 6 steps to decision-making, the 5 most important aspects are **Objectives, Constraints, Benefits and Costs (OCBC)**.

For ease of remembering: the 3 most important aspects of decision-making framework: **OCBC!**

<u>Step 1</u> What is the decision to be made by the economic agent?	The consumer/producer/government is deciding whether to _____ and/or deciding the extent of a decision which is how much to _____.	
<u>Step 2</u> What is the objective of the economic agent?	• Consumers aim to maximise utility (satisfaction). • Producers aim to maximise profits. • Governments aim to maximise social welfare.	
<u>Step 3</u> What are the constraints faced by the economic agent?	• Consumers may have budget and time constraints. • Producers have budget and resource constraints. • Governments have budget and resource constraints. Due to the presence of constraints, the economic agent will face trade-offs and opportunity costs.	
<u>Step 4</u> What are the benefits and costs of this decision?	<u>Benefits</u> What are the intended benefits? • Consumer benefit is private benefit • Producer benefit is revenue • Government benefit is social benefit	<u>Costs</u> What are the intended costs? • Direct costs • Opportunity costs
	Gather Information and Consider Perspectives (these help to determine the benefits and costs)	
<u>Step 5</u> Marginalist principle - Weigh Marginal Benefits with Marginal Costs	Whether to proceed with the decision: Yes, Benefits > Costs No, if Benefits < Costs	
	Deciding the extent of the action (by how much): To do so as long as $MB > MC$ (Draw Graph for Marginalist Principle) Consumers until $MPB = MPC$ Producers until $MR = MC$ Governments until $MSB = MSC$	

<u>Step 6</u> Review Decision	Whether there is a need to review the decision depends on: - Ability to achieve intended consequences - Presence of unintended consequences (can be good and bad) - Internal changes (level of information, constraints, objective) - External changes (changes in economic condition, change in government policies, etc.)
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Application of the 6-step decision-making template

Consider the situation where a consumer is deciding whether to buy a car.

<u>Step 1</u> What is the decision to be made by the economic agent?		
<u>Step 2</u> What is the objective of the economic agent?		
<u>Step 3</u> What are the constraints faced by the economic agent?		
<u>Step 4</u> What are the benefits and costs of this decision?	<u>Benefits</u>	<u>Costs</u>

	Gather Information Consider Perspectives
<u>Step 5</u> Marginalist principle - Weigh Marginal Benefits with Marginal Costs	Deciding the extent of the action: To do so as long as $MB > MC$ (Draw Graph for Marginalist Principle) -Consumers until $MPB = MPC$
<u>Step 6</u> Review Decision	Whether there is a need to review the decision depends on: Ability to achieve intended consequences Presence of unintended consequences Internal changes External changes



Connect, Extend, Challenge

Now, take the perspective on a car manufacturer (producer), which is deciding whether to increase production of a car model. If yes, to decide how many more cars to produce as well. Use the 6-step decision-making template to help you.

<u>Step 1</u> What is the decision to be made by the economic agent?		
<u>Step 2</u> What is the objective of the economic agent?		
<u>Step 3</u> What are the constraints faced by the economic agent?		
<u>Step 4</u> What are the benefits and costs of this decision?	<u>Benefits</u>	<u>Costs</u>

	Gather Information Consider Perspectives
<u>Step 5</u> Marginalist principle - Weigh Marginal Benefits with Marginal Costs	Deciding the extent of the action:
<u>Step 6</u> Review Decision Note: Some questions may not require a review of the decision. It depends from question to question.	Whether there is a need to review the decision depends on: Ability to achieve intended consequences Presence of unintended consequences Internal changes: External changes:

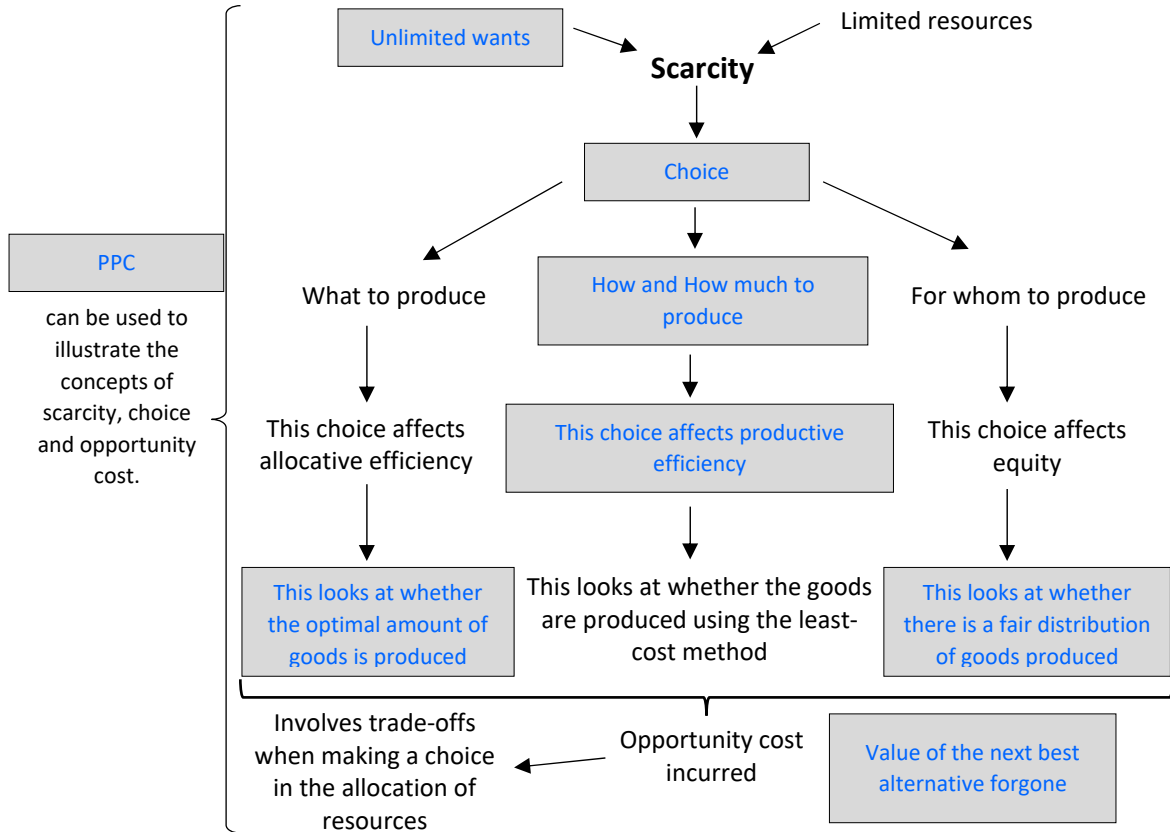
In decision-making, economic agents rely on statistics and evidence to make assessments and projections. However, they often have to make value judgements on what ought to be done as well. All in all, economists have to be adept at understanding what is positive and what is normative.

- a. **Positive economics** examines economic phenomena based on data and facts. These statements are **objective** and **can be verified or tested** using scientific methods. Such statements typically suggest a cause-and-effect relationship between variables. One example is 'An increase in alcohol tax will reduce alcohol consumption'.
- b. **Normative economics** examines economic phenomena using opinions, values and judgement. Such statements are typically **subjective** in nature and cannot be tested scientifically. One example is 'The rich should pay a higher amount of alcohol tax'.

By the end of this set of notes, you should have attained the following **Enduring Understanding**:

1. **Scarcity**, the central economic problem, requires economic agents to make **choices** since there are **unlimited wants** that cannot be fulfilled **by limited resources**.
2. When **choices** are made, **opportunity costs** are incurred.
3. Economic agents namely consumers, producers and governments are assumed to make **rational decisions** in pursuit of their self-interests.
 - Consumers aim to maximise utility (satisfaction).
 - Producers aim to maximise profits.
 - Governments aim to maximise societal welfare.
4. In the pursuit of their objectives, economic agents consider constraints, weigh benefits and costs, gather information and perspectives before making decisions. They take into account the intended and unintended consequences, and any changes occurring, before reviewing the decisions.

Consolidation/Summary



Economic agent	Consumers	Producers/Firms	Government
Objectives	Maximise utility (satisfaction)	Maximise profits	Maximise social welfare
Whether an action should be taken	Yes, if Benefits > Costs No, if Benefits < Costs		
Marginalist Principle	MPB=MPC	MR=MC	MSB=MSC
Recognise Constraints Weigh Benefits and Costs Gather Information and Consider Perspectives Review decision by considering Intended and Unintended consequences, and responding to Changes			

Rational decision-making process

Fill in the blanks using the following phrases:

Rational decision-making process	This looks at whether the optimal amount of goods is produced	Production Possibility Curve (PPC)
Producers/Firms	Maximise social welfare	Factors of production (CELL)
This looks at whether there is a fair distribution of goods produced	Choice	How and how much to produce
This choice affects productive efficiency	Maximise utility (satisfaction)	Value of the next best alternative forgone
Unlimited wants	MR=MC	

Annex

Apart from the free-market economy, there exists other types of economies. They are:

Command economy (also known as a planned economy)

A command economy is a system where all resources are collectively owned by the government. The government, rather than the free market, determines what goods should be produced, how much should be produced and the price at which the goods are offered for sale. One issue with a command economy is its inability to allocate goods efficiently because the government is not able to fully understand the needs and wants of every resident. This imperfect knowledge results in a mismatch of what is produced and what is desired, leading to surpluses in some goods and shortages in others. This outcome then does not seek to address the inherent scarcity issue.

Mixed economy

The mixed economy has features of both the free and the command economy. While the means of production are shared between the private enterprise and government, the extent and the nature of government intervention varies across countries. For example, the tobacco companies are free to sell their products but may face some forms of restrictions in terms of taxes and minimum legal age of consumers. Most economies belong to the mixed economy category.