

Catholic Junior College H1 Economics (8843) & H2 Economics (9570)

THEME 1: THE CENTRAL ECONOMIC PROBLEM

1.1 Scarcity as the Central Economic Problem

Enduring Understanding

Having limited resources available to satisfy unlimited wants is the fundamental problem that necessitates choice and decision-making by all economic agents.

Essential Questions

1. Why do we need to make decisions/choices?
2. How do we make decisions?

Unit Summary

Scarcity is the fundamental problem all economies face. This means that our wants are effectively unlimited, but the resources needed to produce the goods and services to satisfy those wants are always limited. These resources are collectively known as the factors of production. Given that resources are limited, economic agents need to make choices and decisions to answer the questions of 'What and how much to produce', 'How to produce' and 'For whom to produce'.

Since scarcity exists, every choice made will always incur a sacrifice. This sacrifice is known as opportunity cost, which is the next best alternative forgone when a choice is made. Economic agents make choices using the marginalist principle, which involves the weighing of the additional costs and benefits associated with each course of action. The study of Economics is important, as it is the study of how economic agents make decisions in the face of scarcity in order to maximize their welfare.

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REFERENCES

Sloman, J & Wride, A (2009) Economics, 7th Ed, Prentice Hall. (Chapter 1)
Mankiw, G (2009) Principles of Economics, 5th Ed, South-Western Cengage Learning. (Chapter 1-3)

Overview of Microeconomics

(Topics with asterisk are for H2 Economics only)*

THE CENTRAL PROBLEM OF ECONOMICS

Every society faces the problem of Scarcity (limited resources vs. unlimited wants). When economic agents undergo decision-making, they make Choices and incur Opportunity Cost (the net benefit derived from the next best alternative forgone) as a result.

MARKETS

Price Mechanism and its Functions

- Demand and Supply Analysis and its Applications
- Price Determination of Goods and Services in the Free Market
- Wage Determination in the Labour Market
- Price Elasticity of Demand
- Income & Cross Elasticity of Demand*
- Price Elasticity of Supply

Government Intervention in Markets

FIRMS AND DECISIONS*

Objectives of Firms

- Profit Maximisation and Other Objectives of Firms

Cost and Revenue

- Short run and Long run Costs & Revenue concepts
- Internal and External Economies & Diseconomies of Scale

Firms' Decisions and Strategies

- Pricing, cost and product differentiation strategies to raise revenue and/or lower unit costs
- Levels of competition and the impact on firms' strategies
- Impact of firms' decisions & strategies on efficiency, consumer welfare & other firms

MICROECONOMIC OBJECTIVES & POLICIES

Governments' Microeconomic Objectives

- Efficiency and Equity
- Efficient resource allocation may not result in equitable outcomes

Market Failure and its Causes

- Public goods
- Externalities
- Information Failure (including asymmetric information)*
- Immobility of Factors of Production*
- Market Dominance*

H1 Economics (8823) & H2 Economics (9757) Syllabus Requirement

Check that you have mastered the following:

1.1.1 Scarcity, Choice and Resource Allocation	✓
a. The Central Economic Problem is scarcity, arising from limited resources and unlimited wants	
b. Scarcity implies that choices have to be made in the allocation of resources between different uses	
c. When choices are made, there are trade-offs and opportunity costs are incurred	
d. The concepts of scarcity, choice and opportunity cost can be explained from the perspectives of different economic agents (consumers, producers and governments)	
e. Production Possibility Curve (PPC) can be used to illustrate scarcity, choice, opportunity cost, productive efficiency, full employment, unemployment or under-utilisation of economic resources and changes in the productive capacity of an economy	
<u>1.1.2 Decision-Making Process of Economic Agents</u>	
a. Objectives of rational economic agents: consumers aim to maximise utility (satisfaction), producers aim to maximise profits and governments aim to maximise social welfare	
b. In the pursuit of their objectives, economic agents gather information, weigh benefits and costs, consider constraints and perspectives before making decisions. They take into account the intended and unintended consequences, and any changes occurring, before reviewing the decisions	
c. A marginalist approach to weighing costs and benefits is expected	
<u>Concepts & Tools of Analysis</u>	
• Scarcity, choice, opportunity cost	
• Production possibility curve (PPC)	
• Marginalist principle to weigh costs & benefits	

1. Introduction to Economics



WHAT IS ECONOMICS REALLY ABOUT?

Scarcity, Choice, Opportunity Cost in the Health Sector

These machines are used for patients who have kidneys that don't work properly – without dialysis the patients would quickly die. They are expensive – costing about \$100,000.

Some patients can get a kidney transplant, which means they won't need dialysis any longer.

A hospital in a town has one dialysis machine that can run for 30 hours per week. As the boss of the hospital, you must decide who gets the treatment.

There are a number of patients who require treatment and their needs are given below.

Patient A: 6 year old child who needs 10 hours per week. They are awaiting a kidney transplant which is expected to occur in one year.

Patient B: A 55 year old man who needs 5 hours per week. He is married with grown up children.

Patient C: A 3 year old child who will need dialysis indefinitely. Currently needs 4 hours per week.

Patient D: 78 year old female, 4 hours per week.

Patient E : 7 year old child, has three brothers and sisters, 4 hours per week.

Patient F: 8 year old child, no brothers and sisters, 5 hours per week.

Patient G: 30 year old female, two young children, 6 hours per week.

Patient H: 30 year old male, two young children, 5 hours per week.

Patient I: 30 year old male, no children, 4 hours per week.

A dialysis machine.



Questions to ponder on:

- Due to the limit of 30 hours per week to use the dialysis machine, can the hospital attend to all patients?
- What problem does this reflect?
- If the hospital made the decision to allow patient A to patient E only, what is the opportunity cost incurred?



Food for Thought: *While it would be ideal to provide all the above patients with the necessary treatment, it is not possible to do so as there is only one dialysis machine. There is therefore a need to prioritise certain patients over others! Economics seeks to study how these decisions are made!*

1.1. Definition of Economics

Definition: Economics is a social science that studies how individuals and societies tackle the problem of scarcity, having to allocate **scarce resources** among **unlimited wants**.

Human wants are unlimited. However, there are limited resources or factors of production. This fundamental problem is known as **scarcity**, which is the central problem of Economics.

1.2. Microeconomics vs. Macroeconomics

The study of Economics has traditionally been divided into two main branches: Microeconomics and Macroeconomics. This allows one to consider the various implications of decisions made by economic agents (consumers, producers, governments). Decisions made at the microeconomic level can have consequences at the macroeconomic level, and vice versa.

- **Microeconomics** can be defined as the study of economic behaviour of **individuals and firms**.
It studies the behaviour of an economy's individual units, like households (consumers), firms and industries (producers), and the government. It is concerned with the interrelationships between these units in determining the pattern of production and distribution of goods and services.
- **Macroeconomics** can be defined as the study of the economy as a whole, focusing on aggregate characteristics and economy-wide factors, such as interest rates, inflation, growth and unemployment at the **national level**.

Table 1: Differences between Microeconomics and Macroeconomics

Microeconomics	Macroeconomics
<ul style="list-style-type: none"> ▪ Price of a particular good in Singapore E.g. Cars 	<ul style="list-style-type: none"> ▪ General price level of Singapore
<ul style="list-style-type: none"> ▪ Output of a particular industry in Singapore E.g. Manufacturing industry 	<ul style="list-style-type: none"> ▪ Real National Output of Singapore

1.3. Positive Economics vs. Normative Economics

The role of Economics is a matter of constant discussion. It is often used to make predictions or to inform policy makers of the factors to be considered before making a decision. Therefore, it is important to differentiate between Positive and Normative Economics.

- **Positive Economics** can be defined as the branch of economics that describes and explains economic phenomena, focusing on facts and cause-and-effect behavioural relationships. It includes the development and testing of economic theories. It is sometimes referred to as “value-free economics”.
 - ❖ Positive statements are **value-free judgments**. For example, ‘*An increase in household incomes will lead to an increase in the demand for luxury foods*’ is a positive statement.
- **Normative Economics** can be defined as the branch of economics that expresses value judgements about economic fairness, or what the outcome of the economy and policy measure(s) ought to be.
 - ❖ Normative statements **involve making value judgments**. For example, ‘*the government should subsidise the production of cars*’ is a normative statement.

1.4. Economic Resources (Factors of Production)

Economic resources or Factors of Production are inputs used in the production of goods and services. There are four broad types: capital, entrepreneurship, land, and labour (*you can remember them with the acronym: C.E.L.L.*).

- i **Capital** (sometimes referred to as “physical capital”) refers to all man-made material/physical resources used or available for use in production, such as the factories, machinery and tools. The return paid to capital owners is known as “**interest**”.

IMPORTANT!

Under factors of production, the economic term ‘capital’ refers to real physical capital as defined above unless otherwise stated.

As we progress further on in the syllabus, the economic term ‘capital’ can refer to wealth or financial capital or human capital which is the intellectual and physical skills and labour provided by human workers.

- ii **Entrepreneurship** refers to the factor of production that takes overall responsibility for the decision-making process in the firm (e.g. organising, managing and assembling) so that the other factors of production (land, labour and capital) can be employed efficiently. They also take on the risks of the business, which include innovation of new products and methods of production. Entrepreneurs are paid **profits** for their efforts.
- iii **Land** refers to all the natural resources available. The return paid to landowners is known as **rent**.
 - Renewable natural resources (e.g. wind and water) renew themselves at a rate fast enough for sustainable economic extraction.
 - Non-renewable natural resources (e.g. fossil fuel and mineral ores) do not renew themselves at a fast enough rate for sustainable economic extraction.
- iv **Labour** refers to people, including their skills and abilities. The quantity of labour available for an economy consist of all those who are able and willing to work. Workers are paid **wages** for their effort.

2. The Central Problem of Economics

2.1. Scarcity

The central problem faced by all economies is the problem of **scarcity**.

Definition: Scarcity is the problem that arises because limited resources cannot fully satisfy unlimited human wants.

Scarcity is a problem faced by all societies. As long as there is anyone whose wants are not completely satisfied by the limited resources, the problem of scarcity exists.

Due to the problem of scarcity, there is a need to make **choices**.

2.2. Choice

As resources are limited, the world can only produce a limited amount of goods and services. These resources have alternative uses – the same resource can be used to produce a variety of goods, e.g. a piece of land can be used to build a school or a hospital. Therefore, there is a need to make choices.

Economic agents (consumers, producers and governments) face the problem of scarcity and hence have to make choices to satisfy unlimited wants.

- **Consumers** – e.g. when deciding to use limited income to buy certain goods over others.
- **Producers** – e.g. when deciding to produce one product rather than another with limited factors of production, or when deciding between different methods of production, such as capital-intensive methods vs. labour-intensive methods. (limited revenue)
- **Government** – e.g. when deciding to build a hospital rather than a sports complex with limited funds. (Limited national budget)

When a choice is made, “sacrifices” will have to be made, and opportunity cost is incurred.

2.3. Opportunity Cost

Definition: Opportunity cost is the net benefit that could have been derived from the next best alternative forgone as a result of a decision made.

Since scarcity exists and choices must be made, any option that economic agents choose entails forgoing the other options. The net benefit from the next highest-ranked option that would have been picked is termed as the opportunity cost.

Examples:

- **Consumer:** If you spend \$99 on a wagyu beef steak, you would have given up the net benefit that could be derived from the use of \$99 to purchase another item e.g. a pair of shoes or a dress. If you consider buying a dress as your next best option, then the opportunity cost of choosing to spend \$99 on the wagyu beef steak would be the satisfaction you would have gained from buying the dress.
- **Producer:** If a firm spends an hour producing 100 television console units,

it would have given up the revenue that could be derived if that one hour was used to produce another product, e.g. 600 units of computer chips or 50 units of automobiles. If it considers producing 50 units of automobiles as its next best option, then the opportunity cost of choosing to produce 100 television console units in an hour would be the revenue that the firm could have earned from producing 50 units of automobiles.

- **Government:** If a government spends 3 million dollars to build more hospitals in the country, it would have given up the increase in social welfare that could be gained if the 3 million dollars was used to build other amenities, e.g. sports complexes or schools. If it considers building schools as the next best option, then the opportunity cost of choosing to spend 3 million dollars on building more hospitals would be the increase in social welfare that could have been derived from building more schools.

2.4. Three Fundamental Questions of Economics

As a result of the problem of scarcity, all economies try to optimise the use of available resources. There are three fundamental economic decisions that all policymakers face when seeking to make decisions on how to allocate resources.

a) What and How much to produce?

The problem of scarcity forces society to decide how to allocate resources to produce desired goods and services. This decision arises because these resources have alternative uses.

Economic agents must decide and act on wants that are at the top on their list of priorities, as the decision to use resources for one purpose means they cannot be used for another.

b) How to produce?

Most goods can be produced using a variety of production methods. Economic agents should use the method that incurs the lowest cost per unit of output produced. Firms often need to decide whether to use labour-intensive or capital-intensive, e.g. with more machines, methods of production.

Ideally, society should utilise its resources in such a way that no reallocation of resources or change in production techniques could yield more of one good without yielding less of another good.

c) For whom to produce?

There are numerous groups of consumers with competing wants in society. Therefore, society needs to decide which group of consumers' wants it should meet.

Some decisions can be left to the free market – i.e. for most goods, consumers who can afford to pay will get access to the good or service. This will be explored in Theme 2: Markets.

Other decisions require the intervention of the government. For example, in the market for healthcare, the government may have to consider the accessibility of healthcare, and the ability of members of society to pay, i.e. consumers of different incomes levels ought to have equal access to healthcare. This will be explored in the topic of Market Failure.

3. The Production Possibility Curve (PPC)

3.1. What the PPC Illustrates

Definition: The Production Possibility Curve (PPC) shows the maximum attainable combinations of two goods that can be produced by an economy within a specified period of time with all its resources fully and efficiently employed, at a given state of technology.

The PPC assumes that:

- i Only two goods are being produced with all available resources;
- ii There is a fixed amount of resources that are fully and efficiently used; and
- iii The level of technology is fixed within the given time period (Technology is the state of knowledge of available techniques of production).

Illustration: Assuming Country X produces only food (Consumer goods) and machines (Capital goods).

Table 2: Maximum possible combinations of machine and food of Country X

Combinations	Machines (Units)	Food (Units)
A	0	45
B	1	43
C	2	37
D	3	25
E	4	0

The PPC is useful as it helps to illustrate the concepts of scarcity, choice and opportunity cost.

Food (Units)

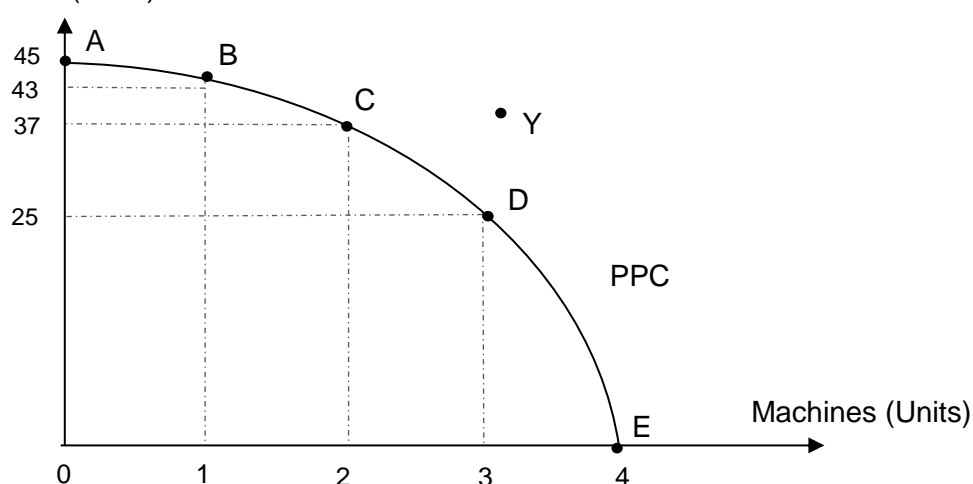


Figure 1: Production Possibility Curve

How the PPC illustrates Scarcity

The economy would like to produce at a point outside the curve (e.g. Point Y) where it is able to enjoy more of both goods. But Point Y is outside the PPC and any combination outside the PPC cannot be attained given the current amount of resources and state of technology. Therefore, points that lie outside the PPC (such as Point Y) illustrate the problem of scarcity as they represent points at which the

country would want to produce but is unable to do so due to limited resources.

How the PPC illustrates Choice

When available resources are used fully and efficiently, the economy is able to produce various combinations of food and machines on the PPC. However, it is forced to **choose among attainable combinations** of A, B, C, D & E or any other point along the PPC. This illustrates the concept of **choice**.

The need to choose among points also illustrates the concept of scarcity, as resources cannot produce all combinations of goods simultaneously.

How the PPC illustrates Opportunity Cost

Assuming all resources in the economy are fully employed, if an economy chooses to produce more machines, it will have to **sacrifice** the production of some food. The amount of food production forgone as an additional unit of machine is produced is the opportunity cost of producing that unit of machine.

For example, the economy is currently producing at Point C where it is producing 2 units of machines and 37 units of food. If the economy decides to produce at Point D, where 3 units of machines and 25 units of food can be produced, this means that 12 units of food will need to be sacrificed to produce the additional unit of machine. Therefore, the opportunity cost of increasing machine production from 2 to 3 units is 12 units of food.

3.2. The Shape of the PPC

The **concept of opportunity cost is illustrated by the downward-sloping nature of the PPC**, where in order to produce more of one good, the economy must forgo the net benefit derived from the production of the other good.

The PPC can also illustrate the concept of **increasing opportunity cost**. This means an increasing amount of one good has to be given up to produce additional units of another good. This is illustrated by the shape of the PPC that is **concave to the origin**.

Increasing opportunity cost reflects that some resources are better suited to the production of certain goods rather than others. **This is because resources are not homogenous (*perfect substitutes*)**, i.e. they are not equally efficient in the production of all goods.

An example is seen in Figure 1 where increasing amounts of food need to be forgone as the economy successively raises machine production by 1 unit.

At Point A, all available resources are used to produce foods. However, some of these resources are more suited to the production of machines (i.e. less suited to the production of food). As the economy moves from Point A towards Point B, the resources best suited to the production of machines can be used to produce machines instead of food and therefore, only 2 units of food are forgone to produce 1 more unit of machines. The opportunity cost of producing 1 unit of machine is relatively lower.

But as the economy moves from Point D to E, the economy is increasingly using resources that are more suited to the production of food (i.e. less suited to the production of machines) to produce machines. Hence, 25 units of food need to be forgone to produce 1 more unit of machines. The opportunity cost of producing 1

unit of machine is relatively higher.

3.3. A General Model of the PPC

Figure 2 shows a general model of an economy's PPC. Capital goods and consumer goods are often used to represent two goods that a country can produce.

- Consumer goods are products that have no future productive use and are used directly by consumers e.g. food, cars and mobile phones, to satisfy current wants.
- Capital goods are goods that help increase the productive capacity of a country, and they determine the capacity to produce for future consumption, e.g. machinery and equipment that are used to produce food, cars and mobile phones. Recall that capital goods are factors of production (as mentioned in **Section 1.4**)

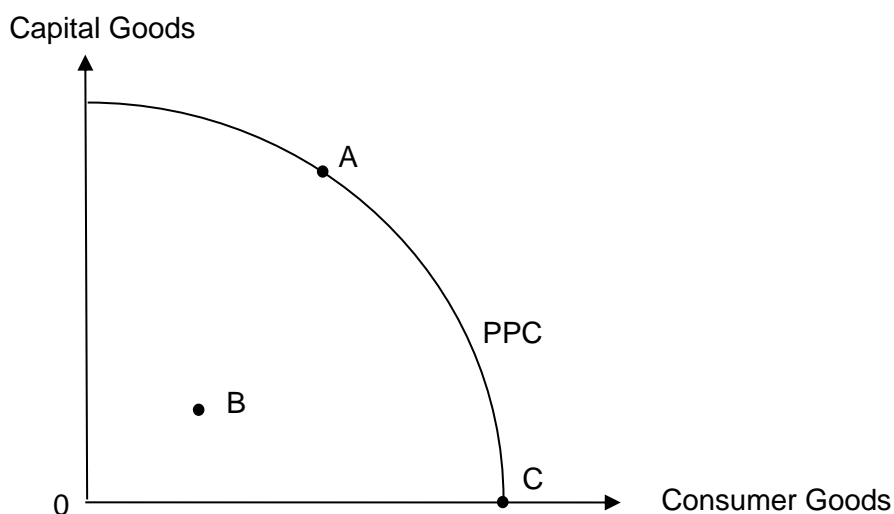


Figure 2: A General Model of PPC

3.4. Causes of an Outward Shift of the PPC

The PPC may shift due to many factors. These include:

a. Increase in the quantity of resources available to the economy

Any increase in the quantity of capital, labour, land or entrepreneurship will lead to an outward shift of the PPC (Figure 3) as more resources mean more goods can be produced.

E.g. If there is an increase in the size of the workforce due to more open immigration policies or more land becomes available due to land reclamation.

b. An improvement in the quality of resources

An increase in the quality of resources implies an improvement in the productivity of resources. E.g. an increase in labour productivity (i.e. output per labour hour), could be a result of higher levels of education by the population. With resources becoming more productive, more goods can be produced given the same amount of resources. This would hence lead to an outward shift of the PPC.

E.g. Workers who have received training on how to operate sophisticated equipment will be able to use the current resources to produce a larger quantity of goods.

c. Improvements in technology

Any technological improvement that results in new or better methods of production will cause the PPC to shift outwards. This is because new or better methods allow producers to produce more of any given good using current resources more efficiently, productivity increases and this causes the PPC to shift outwards.

E.g. Automation in machinery is an improvement in technology which increases the efficiency of the production process and hence the output level with the given amount of resources increases.

Tip!

An easy way to remember the factors that could shift the PPC is: Q.Q.T., i.e. quantity & quality of resources and the technological improvements.

3.5. Types of Shifts of the PPC

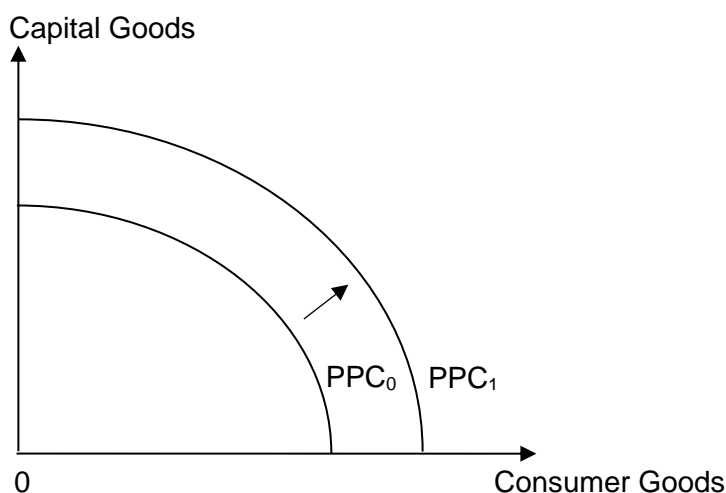


Figure 3: Outward **Parallel** Shift of PPC

The PPC will undergo a ***parallel shift*** if a positive change in any of the above factors is able to enhance the production of both goods equally. E.g. an improvement in technology that benefits the production of capital and consumer goods equally would cause the PPC to shift from PPC_0 to PPC_1 as shown in Figure 3.

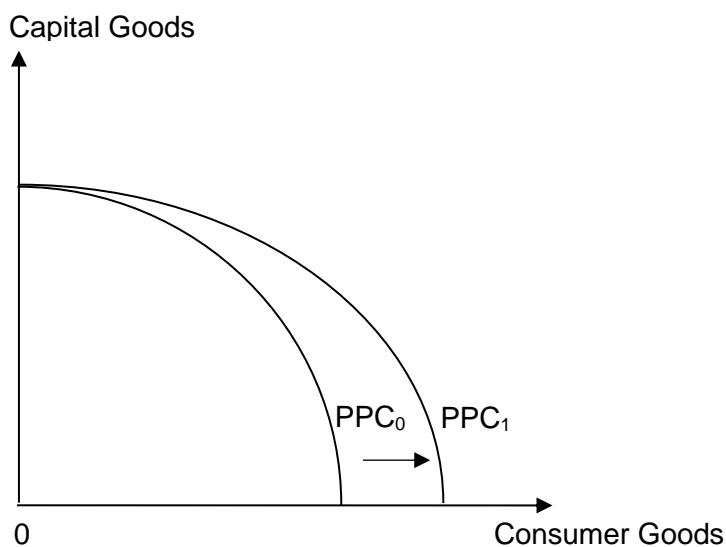


Figure 4: Outward **Pivoted** Shift of PPC

The PPC will undergo a **pivoted shift** if a positive change in any of the above factors is able to enhance the production of **one good more than the other**.

E.g. the discovery of a new raw material only benefits the production of consumer goods, but does not improve the production of capital goods. Hence, this causes an outward pivoted shift along the consumer goods axis from PPC_0 to PPC_1 as shown in Figure 4.



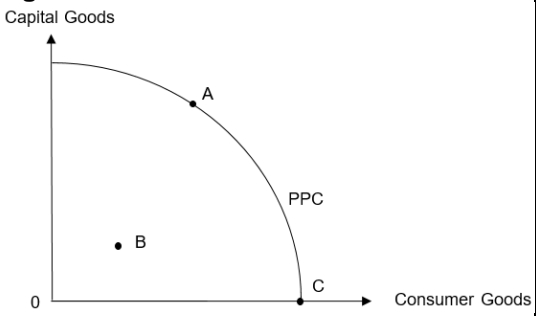
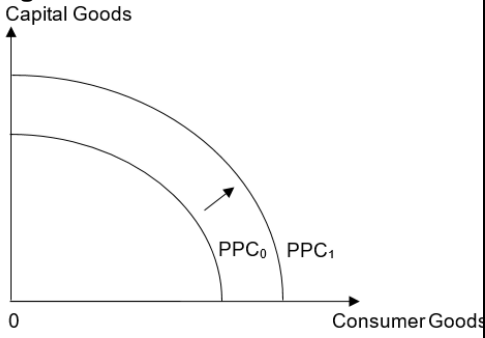
SELF-ASSESSMENT

1. Do you think it is possible for the PPC to shift inwards?
2. Under what circumstances might this happen?

3.6. Economic Growth and the PPC

Definitions	
Economic Growth:	is the increase in the real output of an economy over a period of time.
Actual economic growth:	is the percentage annual increase in <i>national output</i> .
Potential economic growth:	is the percentage annual increase in the economy's <i>capacity</i> to produce

For economic growth to be sustained, both actual and potential economic growth are needed.

Actual economic growth	Potential economic growth
Actual economic growth is illustrated on the PPC as a <u>movement from a point within the PPC to a point on or closer to the PPC</u> , from Point B within the PPC to Point A on the PPC.	Potential economic growth is shown by an <u>outward shift of PPC_0 to PPC_1</u> . With a shift in the PPC, the economy is now able to produce at points beyond PPC_0 .
Figure 5: Actual Economic Growth 	Figure 6: Potential Economic Growth 

One way a country can achieve potential economic growth over time is by producing more capital goods.

A greater amount of capital goods would enable an economy to produce larger quantities of consumer goods, or to produce them at a lower cost than existing methods currently permit. For example, increasing the production of equipment such as machinery now allows us to produce more consumer goods in the future.

Current Standard of Living vs Future Standard of Living

Definition: ***Standard of Living*** refers to the well-being of an average person in a country.

Economies often must decide whether to allocate more resources towards the production of capital goods or consumer goods.

Scenario 1: Allocating more resources to <u>capital goods</u>	Scenario 2: Allocating more resources to <u>consumption goods</u>
<p>If the economy allocates more resources towards producing <u>capital goods</u> in the current time period,</p> <ul style="list-style-type: none"> the production of more capital goods allows the PPC to shift outwards <i>in the future</i>, hence increasing <i>future</i> production possibilities. This means the economy can produce more consumption goods in future that could improve <i>future</i> standard of living. However, this means that <i>fewer</i> resources can be allocated towards the production of consumer goods in the <i>current time period</i>. This incurs an <i>opportunity cost</i> - a reduction in <i>current</i> standard of living because households consume less goods and services. 	<p>If the economy allocates more resources towards producing <u>consumption goods</u> in the current time period,</p> <ul style="list-style-type: none"> higher production of consumption goods would improve <i>current</i> living standards. However, it would result in less resources being allocated towards producing capital goods. This incurs an <i>opportunity cost</i> – the fall in production of capital goods reduces future production possibilities and hence a reduction in consumption goods that would be produced in future. This leads to a reduction in <i>future</i> standard of living

3.7. Efficiency and the PPC

As a result of scarcity, economic agents are forced to make choices. As such, they allocate resources in the most efficient way to maximise their welfare. The efficiency concepts we will be studying are **productive efficiency** and **allocative efficiency**. These concepts can be illustrated on the PPC as well.

Definition: ***Productive efficiency*** is achieved when the maximum output is produced for a given amount of inputs, or a given output is produced at the least possible cost.

Society is productively efficient at any point on the PPC, like Point A. Combinations of output inside the PPC, like Point B would be attainable but not productively efficient, as the available resources are not being used to the fullest.

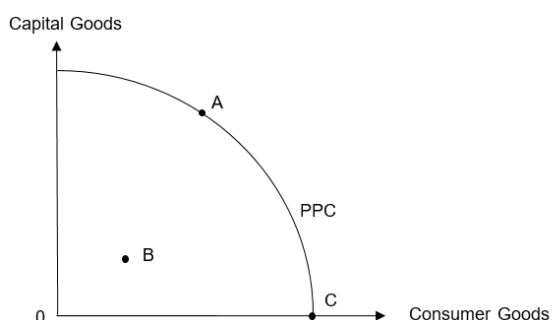


Figure 7: **Productive Efficiency** and PPC

Combinations of output inside the PPC represent situations of unemployment (where some resources are not being used at all) and/or underemployment (where some resources are not being used to their maximum potential.)

Definition: ***Allocative efficiency*** is achieved when the society produces and consumes a combination of goods that maximises its welfare. It occurs when goods and services wanted by society are produced in the right quantities.

Society is allocative efficient at only one point on the PPC. The allocative efficient combination can differ across economies and societies.

Suppose that this economy consists of people who value present consumption only, i.e. they do not want to devote any resources towards the production of capital goods to produce more goods and services in the future. Therefore, Point A in Figure 2 is productively efficient as it is on the PPC but is not allocatively efficient, as there is no desire for capital goods in the economy. Point C would be both allocatively and productively efficient, as it is on the PPC and maximum consumer goods are being produced.

Summary:

- All points on the PPC where the society is producing are **productive efficient**.
- Only **one point** on the PPC where the society is producing is **allocative efficient**.

4. The Marginalist Principle

We have seen how *scarcity* leads to the need to *make choices*. The question therefore is how should such choices (or decisions) be made?

In Economics, economic agents are expected to make choices using a marginalist approach to weigh costs and benefits. To understand the **rational decision-making** process of economic agents, we must first understand what their objectives are:

Rational Economic Agents	Objectives
Consumers	Utility Maximisation
Producers	Profit Maximisation
Government	Social Welfare Maximisation

Rational Decision Making

A rational decision maker who aims to maximise satisfaction will:

- do more of an activity when the marginal benefits of an action exceed the marginal cost ($MB > MC$); and
- do less of an activity when the marginal costs exceed the marginal benefit ($MB < MC$).

Therefore, an activity will be carried out until the:

$$\text{Marginal Benefit (MB)} = \text{Marginal Cost (MC)}$$

- Rational economic agents, such as consumers, producers and governments aim to achieve their objectives by considering the Marginal Benefit and Marginal Cost.

Rational Economic Agents	Marginal Benefit	Marginal Cost
	<i>Definition:</i> The Marginal Benefit of an activity is the increase in total benefit that results from carrying out one <u>additional</u> unit of the activity.	<i>Definition:</i> The Marginal Cost of an activity is the increase in the total costs that results from carrying out one <u>additional</u> unit of the activity.
Rational Consumer's perspective:	Marginal Utility	Cost of purchasing one <i>more</i> unit of the good
Rational Producer's perspective:	Marginal Revenue	Marginal cost of production
Rational Government's perspective:	Marginal Social Benefit	Marginal social cost

- **Rational consumers** aim to **maximise utility**, where Marginal Utility (additional satisfaction from consuming one more unit) = Marginal Cost (cost of purchasing one more unit of the good).
 - For example, when a student is deciding whether to buy one additional burger, he will consider the additional utility he is likely to obtain from one more burger, such as the satisfaction of his hunger, and compare it to the additional cost incurred, i.e. the price of an additional burger.

- As long as additional utility (Marginal Utility) is greater than additional cost (Marginal Cost), the student will buy the additional burger. The student will continue to buy additional burgers until his Marginal Utility = Marginal Cost for the last unit of burger purchased.
- **Rational producers** aim to **maximise profit**, where Marginal Revenue (MR) = Marginal Cost of production (MC).
 - For example, when a car manufacturer is deciding whether to produce one additional unit of cars, it will consider the additional cost incurred in producing the additional car, e.g. labour, raw material, utilities costs, and compare that with the extra revenue they will earn from the sale of the additional car.
 - As long as additional revenue from (Marginal Revenue) is greater than additional cost (Marginal Cost), it will be profitable for the manufacturer to continue to produce an additional unit of car. The manufacturers will continue to produce additional cars until its $MC = MR$ for the last unit of car produced.
- **Rational governments** aim to **maximise social welfare**, where Marginal Social Benefit (MSB) = Marginal Social Cost (MSC).
 - For example, when the Singapore government is deciding whether to build one additional hospital, it will consider the additional Social Benefit obtained, such as a lower level of disease in the population, and compare it to the additional Social Cost incurred, i.e. the cost of building the hospital and hiring staff.
 - As long as additional benefit (Marginal Social Benefit) is greater than additional cost (Marginal Social Cost), the government will build the additional hospital. The government will continue to build additional hospitals until the Marginal Social Benefit = Marginal Social Cost for the last hospital built.

5. The Decision-Making Framework

In light of the Central Economic Problem of scarcity, decision-making is fundamental. Scarcity makes choice and trade-offs inevitable. In the context of A-Level Economics, decision-making is framed as a process where students analyse how decisions are made from the perspective of different economic agents who respond to changes around them.

There are three economic agents in the economy (consumers, producers and governments) their decisions affect each other at both the micro and macro levels.



Figure 8: Decision-Making Framework

In order to achieve specific objectives, economic agents need to deliberate the various choices available while taking the following into consideration:

Constraints	Due to the fundamental economic problem of scarcity, choices have to be made. Hence, economic agents consider the constraints they are currently experiencing to determine the choices available to them. Based on these choices, economic agents will decide on their best-ranked choice that enables them to maximise their self-interest.
Costs and benefits	<ul style="list-style-type: none"> • Benefits to consumers are the satisfaction or utility derived from their consumption decision while costs to consumers are the implicit and explicit costs of their consumption decisions. Implicit cost includes opportunity cost, defined as the value of the next best alternative forgone, while explicit cost refers to the monetary payment. • To producers, the benefits are the revenue from their production decisions while the costs are the implicit and explicit costs of their production decisions. • Governments often take the perspective of the society as a whole, and benefits from economic decisions can be reaped in the form of societal goals, such as economic

	growth and equity. Governments are also concerned about external cost to third parties.
Information	In order to make sound decisions, economic agents gather information, both quantitative and qualitative, on the potential costs and benefits of their decision.
Perspectives <i>(i.e. how a decision undertaken by an economic agent affects other agents)</i>	<p>When a decision is made by an economic agent, its outcome is likely to affect others. Hence, when making a decision, an economic agent needs to consider the impact on and reaction of others. This may in turn affect the intended outcomes of the decision. The profit-driven producer considers the perspective of the consumer in analysing the potential effectiveness of strategies employed, while governments consider the perspectives of stakeholders (households and firms) in their policy decisions.</p> <p>Decision-Making in economics is often used to tackle or mitigate an economic issue and the impact of such decisions can be analysed in terms of intended consequences and unintended consequences.</p>
Intended consequences of the economic decision	The intended positive and/or negative consequences of an economic decision are assumed to occur because economists assume rational behaviour (i.e. economic agents pursue their self-interests) and economic conditions remain unchanged.
Unintended consequences of the economic decision	Unintended consequences refer to the outcomes that are not anticipated in the economic decision. This might occur because economic agents may not have made their decisions under perfect information conditions, due to an inability to have access to complete information or when economic conditions change.
Changes	<p>In order to maximise their self-interest, economic agents would have to undertake an iterative process of economic decision-making to achieve the intended outcomes.</p> <p>The aims, 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, calling for a revisit of the decision-making process to ensure that the intended outcomes can be achieved.</p>

Note:

The Decision Making Framework is a thinking framework, which models the way of thinking in A-Level Economics. You should utilise this thinking framework in the course of your studies. There is **no need** to reproduce the Decision-Making Framework diagram during examinations or for your assignments.

How to apply the Decision-Making Framework?

The Decision-Making Framework is useful as a thinking tool, as it helps deepens and broadens our understanding of an economic issue. We will use this framework to analyse if local Indonesian firms should adopt more environmentally friendly methods of production, in consideration of the growing concerns over land clearing methods that contribute to forest fires and haze in Indonesia.

Decision: In light of growing concerns over land clearing methods that contribute to forest fires and haze in Indonesia, should local Indonesian firms adopt more environmentally friendly methods of production?

Components of the Decision-Making Framework	Economic Analysis and Evaluation
Constraints	<p>The decision to adopt more environmentally friendly methods of production depends on alternative production options available. If there is limited availability of cleaner production options, firms will continue their usual practice.</p> <p>The ability to adopt more environmentally friendly methods of production depends on existing levels of funding to purchase the necessary equipment and technical knowledge.</p> <p>The firm will not adopt cleaner methods of production if it does not have sufficient means and the will to do so.</p>
Benefits	By adopting cleaner methods of production, the firm may experience an increase in revenue due to greater support from environmentally-conscious consumers.
Costs	The cost of switching to a different production technique can be very high. This can cause the firm to lose its cost competitiveness as it will need to charge higher prices for its products.
Information	Information on the potential increase in revenue from the support of environmentally-conscious consumers will help the firm make better decisions on whether the additional benefits will outweigh the eventual costs of making the switch. Also, sufficient information on the cleaner production method is important so the firm can accurately assess whether the method will be viable.
Perspectives	In deciding whether to adopt cleaner methods of production, the firm needs to consider the social landscape, for example the attitudes of firms and consumers towards the haze situation. If consumers and other firms are apathetic to the situation, there might be less incentive for the firm to switch. However, if most firms in the industry are adopting cleaner methods of production, the firm will have a greater incentive to portray a positive image.
Intended consequences	A firm could adopt cleaner production methods to demonstrate corporate social responsibility. This could create a positive image for the firm and it could benefit from higher demand by environmentally conscious consumers. The firm could even earn higher profits.
Unintended consequences	If firms decide to make a switch to cleaner methods of production without being ready (e.g., unable to maintain previous production levels), they may suffer significant losses. This could lead to negative consequences on the market (e.g., shortage of goods, lower output in the economy and lower employment levels). It could also lead to consumers paying higher prices due to a fall in supply and higher costs of production faced by firms.

Changes	Changes such as new legislation enacted by governments against environmentally harmful methods of production may spur firms to adopt cleaner methods of production.
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In the course of the syllabus, we will be applying this same decision-making approach to the consumers' and governments' perspectives.

Glossary of Key Terms

Actual Economic Growth	Actual economic growth is the percentage annual increase in national output.
Allocative Efficiency	Allocative efficiency is achieved when the society produces and consumes a combination of goods that maximises its welfare. It occurs when goods and services wanted by society are produced in the right quantities.
Factors of Production	Factors of production are inputs needed for the production of a good or service. They include capital, entrepreneurship, land and labour (C.E.L.L).
Macroeconomics	Macroeconomics can be defined as the study of economic behaviour of the economy as a whole.
Marginal Benefit	The Marginal Benefit of an activity is the increase in total benefit that results from carrying out one additional unit of the activity.
Marginal Cost	The Marginal Cost of an activity is the increase in total benefit that results from carrying out one additional unit of the activity.
Microeconomics	Microeconomics can be defined as the study of economic behaviour of individuals and firms.
Normative Economics	Normative Economics can be defined as the branch of economics that expresses value judgements about economic fairness. They contain value judgement.
Opportunity Cost	Opportunity cost is the net benefit that could have been derived from the next best alternative forgone as a result of a decision made.
Positive Economics	Positive Economics can be defined as the branch of economics that describes and explains economic phenomena. They are value free.
Production Possibilities Curve (PPC)	The Production Possibility Curve (PPC) shows the maximum attainable combinations of two goods that can be produced by an economy within a specified period of time with all its resources fully and efficiently employed, at a given state of technology
Productive Efficiency	Productive efficiency is achieved when the maximum output is produced for a given amount of inputs, or a given output is produced at the least possible cost.
Potential Economic Growth	Potential economic growth is the percentage annual increase in the economy's capacity to produce.
Scarcity	Scarcity is the problem that arises because limited resources are insufficient to satisfy unlimited human wants.

Appendix: Characteristics of the Free Market Economy

Since all societies face the problem of scarcity, there is a need to have a system to decide how to allocate its scarce resources to tackle this problem. While the syllabus does not require students to know the difference between the methods employed by different systems, it will be good to note that there exists a range of methods.

At one extreme lies the **planned or command** economy, where all economic decisions are taken by the government.

At the other extreme lies the **free market economy** where all economic decisions are taken by individual households and firms, with no government intervention (the free market economy may also be termed as the 'market-based' economy or 'market' economy). The free market economy relies primarily on the "price mechanism" to allocate resources. This will be examined in greater detail in the next theme on Markets, under the topic of "Price Mechanism and Its Applications".

The main difference between the command economy and the free market economy is the degree of government control.

In practice, economies often lie between the two extremes; these economies are termed as **mixed economies** e.g. Singapore.

The syllabus requires that students understand the essential features of a market-based economy (e.g. private ownership of properties, freedom of choice and enterprise, self-interest as dominant motive and competition). The characteristics of a free market economy are:

a. Limited or no government intervention

In a free market economy, the government does not engage in the production of goods and services. It does not influence the production of goods and services by imposing taxes, subsidies, price controls or any policy that interferes with producer or consumer decisions. The role of the government is to create a framework of laws and regulations to ensure fair play in the market. However, in reality, it is very difficult to find a market that is truly 'free'.

b. Freedom of choice based on self-interest

- Consumers are free to decide what to buy with their incomes with the objective of maximising satisfaction. (*We will see the economics analysis in terms of utility in the next topic*)
- Factor owners (e.g. people who own land and labour services) are free to provide their services to whoever is willing to pay the most e.g. workers are free to choose any occupation for which they are qualified.
- Firms are free to produce whatever goods they want with the objective of maximizing profits where **Profits = Total Revenue – Total Cost**.

c. Private ownership of property

Land, factories, shops, houses and other properties are owned by private individuals and firms, not by the state.

d. Competition

This is important for the proper functioning of the free market economy. Competition refers to a situation where there are many buyers and sellers, each too small to have an impact on market price (to be elaborated in the H2 Economics syllabus under the theme on Markets, under the topic of “Firms and Decisions” – specifically the model of perfect competition). In reality though, there are many examples of markets that lack competition.

e. Use of price mechanism to allocate resources

This is a key feature of the free market system. The allocation of resources is done by economic agents responding to price signals. The decisions of producers determine the supply of the commodity while the decisions of the consumers determine the demand for a commodity. The resulting supply and demand decisions of firms and consumers affect prices, which then determine resource allocation.

The price mechanism (demand and supply forces) synchronises the decisions of both consumers and producers to reach the equilibrium price and quantity of goods and services exchanged in the market.

We will look at the workings of the price mechanism in the free market economy in the next topic. It will detail how the free market allocates resources and how consumers and producers interact to determine the price and quantity traded of a particular good or service.

Selected Past Year A-Level Essay Questions Related to This Topic (for H2 Economics only):

2018 (H2) Question 3

The proposed Cross Island MRT line would through the Central Catchment Nature Reserve. An alternative route going round the reserve's southern edge would preserve Singapore's natural heritage and serve a much larger number of residents. The Land Transport Authority, LTA, says that the alternative route would entail longer travelling time, higher costs, more land acquisition and possibly bigger engineering challenges.

Source: The Straits Times, accessed 24 May 2017

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

2016 (H2) Question 2

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

Source: adapted from Singapore Public Sector Outcomes Review, 2014

- (a) Explain why a government intervenes in the provision of healthcare. [10]
- (b) Discuss how the opportunity cost of increased healthcare expenditure differs, depending on whether it is financed by individuals or the Singapore government. [15]

2015 (H2) Question 1

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

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

2013 (H2) Question 1

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

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

2011 (H2) Question 1

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

- (a) Explain how, according to economists, the pursuit of self-interest can help to address the problem of limited resources and unlimited wants. [10]
- (b) Assess whether the price mechanism will always allocate scarce resources in the most efficient manner for all goods and services in a market economy. [15]

2011 (H1) Question 4

- (a) Explain how the concept of opportunity cost can be used to analyse the basis for trade between countries. [10]
- (b) Suppose a country such as Singapore were to experience a significant fall in demand for its exports. This results in a balance of trade deficit and a rise in unemployment. Discuss the advantages and disadvantages of a government decision to respond by reducing the external value of its currency. [15]

2009 (H1) Question 3

When societies are attempting to solve the central economic problem by improving the standard of living of their citizens at a rapid rate, they are always inclined to try to do it behind protectionism trade barriers.

- (a) Using the concept of opportunity cost, explain the central economic problem that all societies have to solve. [10]
- (b) Discuss the view that the reasons for protectionism can never outweigh the benefits of free trade. [15]

2005 Question 1

- (a) Explain two ways in which an economy might move from a point within its production possibility curve (PPC) to a point on it. [10]
- (b) Discuss the most effective economic policies to move the PPC outwards. [15]

(Note: Many of the questions above require the knowledge of other topics which you will learn later on in the course.)

Selected Past Year Other JCs Prelim Essay Questions Related to This Topic:

2020(H2) Prelim SAJC Question 3

- (a) Explain how the problem of scarcity is addressed in a free market when consumers and producers aim to maximise their own welfare. [10]
- (b) Discuss whether government intervention will always lead to more efficient resource allocation. [15]

2019 (H2) Prelim DHS Question 2

- (a) Explain the relevance of opportunity cost to profit maximising firms and utility maximising consumers. [10]
- (b) In the real world, firms' pricing decision relies on awareness of potential entrants into the market, consideration of stakeholders' (such as shareholders and employees) welfare and sufficiency of information. Discuss how far firms set prices according to the profit maximising theory. [15]

2018 (H2) Prelim CJC Question 2

- (a) Explain why price and output decisions differ across producers in different markets. [10]
- (b) Assess the economic case that rational decision making by consumers and producers always results in more equitable outcomes. [15]

2018 (H2) Prelim HCI Question 1

The world has spent an estimated \$2 trillion on dams in recent decades. Many nations built dams to control floods, improve irrigation, alleviate water shortages and generate

low-carbon hydroelectricity. But recent studies have shown that mostly people living upstream are benefiting from the capture of river flows at the expense of those downstream. Dams also cause decay to the surrounding areas leading to large emissions of greenhouse gases such as methane that contributes more to global warming than carbon dioxide.

- (a) Use the concepts of public goods and imperfect information to explain why price mechanism fails to allocate resources efficiently in the provision of dams. [10]
- (b) Assess the determinants that a rational decision-making government should consider in allocating resources to build a new dam. [15]

2018 (H2) Prelim NYJC Question 3

- (a) Explain how consumers and firms make rational decisions in the pursuit of self-interest. [10]
- (b) Discuss whether rational decision-making by consumers, firms and government will always lead to an efficient allocation of resources. [15]

2018 (H2) Prelim RI Question 1

A roundtrip flight ticket from Singapore to Kuala Lumpur costs S\$183. Meanwhile, a roundtrip train ticket from Singapore to Kuala Lumpur costs S\$33.

- (a) Explain how producers and consumers act rationally to determine the market equilibrium price of flights. [10]
- (b) Discuss the effects of a rise in flight prices on the airlines market and other related markets. [15]

2018 (H2) Prelim SRJC Question 1

The rising price of healthcare is coming under closer scrutiny as medical inflation rate climbed up to 15% in 2015.

- (a) Explain the role of prices in addressing the fundamental problem of economics. [10]
- (b) Discuss the relative importance of demand and supply factors in influencing Singapore's medical inflation rate. [15]

2018 (H2) Prelim TPJC Question 1

Explain how economic agents such as consumers and firms behave rationally and discuss the extent to which elasticity concepts are useful to firms and governments in making rational decisions. [25]

(Note: Many of the questions above require the knowledge of other topics which you will learn later on in the course.)