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INTRODUCTION

Fundamentals of Microeconomics is a preparatory course for open entry learners who intend to pursue post graduate programs in Masters in Management (MM) and Masters of Business Administration (MBA). This program provides learners with fundamental knowledge in the area of microeconomics.

OBJECTIVES

At the end of this course, you should be able to:

1. understand economics in general, and market economy in detail;
2. understand the basis of decision-making by individuals, firms and government; and
3. describe how firms make decisions based on the market environment.

SYNOPSIS

The synopsis for each topic is as follows:

Topic 1 gives a brief description of economics in general. Several economic concepts and terms, such as scarcity, choice, and opportunity cost, will be introduced besides discussion on major problems and issues that economics attempt to address.

Topic 2 lays the foundation for understanding market economy. Almost all economic issues could be explained by applying the concept of demand and supply. Demand and supply or price mechanism will determine as to how resources, goods and services are distributed. The main discussion will relate to demand and supply and their determinants, and the equilibrium of the market.

Topic 3 discusses satisfaction or utility as a motive of consumption. Even though satisfaction is something abstract or subjective, numerical value is used with the aim of differentiating between total utility concept and marginal utility concept. When marginal utility concept is integrated with budget constraints, it will result in the equilibrium of consumer. From this condition and equilibrium, arises the law of demand and demand curve, and the consumption substitution concept.

The subsequent section discusses consumer behaviour without giving numerical value to satisfaction. Satisfaction is measured based on the ranking of the consumption combination. The combination that generates same level of satisfaction is integrated with the indifference curve. Consumer equilibrium is attained when the highest level of satisfaction is attained with a specific budget. From this, it can be seen that the condition for consumer equilibrium in the concept of satisfaction equilibrium is the same with the condition for the
marginal utility concept. Discussion is also focused on how goods are classified according to income through income consumption curve and Engel curve. Demand curve is also produced from price consumption curve. Changes in consumer equilibrium resulting from price changes will take the form of substitution effect and income effect.

**Topic 4** provides the basis for producer behaviour. Discussion begins with concepts related to production process such as input and output, firm, plant and industry, and production time frame. Subsequently, production in the short run with a fixed input and a variable input will be discussed, together with concepts related to diminishing marginal returns and production levels.

In this topic, learners will also learn about the concepts directly related to the production process, that is, the cost theory. The economic cost concept is the basic concept in discussion on the overall cost. Following this, the concept of cost in short run will be discussed.

**Topic 5** emphasises on various types of market structure; namely perfect market competition, monopoly, monopolistic competition and oligopoly. In this topic, learners will learn the characteristics for each market structure as well as examples of each type of structure.

**ADDITIONAL READING**

The text book suggested for this course is:


Other reference books suggested are:


**EVALUATION METHOD**

Refer to CAPL website http://capl.oum.edu.my for evaluation method for this program.
We always use the term ‘economy’ in our daily lives. What is actually meant by economy?

Economy covers a wide spectrum of areas in social life. Every area – education, religion, housing, health, transportation, defence and others, has aspects that can be discussed through the economics point of view. In short, economy is a theory that affects the lives of individuals and society as a whole.

In this topic, we will be discussing economics in terms of concept, definition and the importance of economics in decision-making of efficient resource utilisation.
1.1 THE SCOPE AND METHOD OF ECONOMICS STUDIES

What causes the existence of the economic field? Is it true that it is formed as a result of the unlimited human wants while resources are limited?

Since the beginning of the social system, individuals have interacted with one another in order to satisfy their respective needs. Society also interacts with nature to obtain natural resources as the necessities of life. Economy is related to daily activities of society and individuals who interact with one another.

Economy is commonly defined as a research on how a society utilises limited resources to satisfy their unlimited wants. The basic question of economy arises from the problem of resource scarcity.

The economic field exists as a result of limited resources and unlimited human wants. Both must exist simultaneously. For example, if human wants are limited and resources are limited too, hence there will be no problem of choice and the economic field will not exist and vice-versa.

1.1.1 Economic Method

Method is a systematic and orderly way of generating new facts which may not be explained before.

Economics is considered as a science because in economic research we apply scientific methods. As an economic researcher, we will attempt to establish a relationship between a variable or incident with another variable or other incident by developing theories.

Theory is the conclusion we make through general observations.
We will then verify the validity of the particular theory by using data we have collected. If the data analysed verify the validity of the theory, then our economic theory will become an economic law. This economic law will be embraced until there is a competing theory that states otherwise. Figure 1.1 shows the process of scientific method in economics.

![Figure 1.1: The process of forming economic theory](image)

### 1.1.2 Microeconomics and Macroeconomics

Economic research is commonly divided into two general categories-microeconomics and macroeconomics.

- **Microeconomics** focuses on the operations and choices made by the decision-making units namely household, firm and industry.

- **Macroeconomics** involves study on sectors and variables with wider scopes such as national production and income, aggregate demand and supply, movement of general price level, and problems such as unemployment and inflation.
TOPIC 1  INTRODUCTION TO ECONOMICS

1.2  SCARCITY, CHOICE AND OPPORTUNITY COST

Example:

Based on the particular definition, we know that the research on demand for and price of chicken in the market is a microeconomics research. Likewise, the decision you make to further studies is an outcome of microeconomic research on cost and benefits gained from completing the studies, even though it is made in an indirect way.

However, microeconomics research is not necessarily separated from macroeconomics research since both involve the social behaviour in making decisions. For example, in the case of making decision to further studies, the decision may involve an individual, but when making judgments, macroeconomic problems, such as unemployment will also be considered. You make a decision to further your studies because it was reported that the rate of unemployment for non-graduates is high.

What is the meaning of problem of scarcity, choice and opportunity cost?

As a student, you may sometimes face the problem of wanting more than what you can afford. This is known as the basic economic problem. You might have to postpone your plan of buying new things or not eating in your favourite restaurant in order for you to pay your tuition fees and buy text books. You may also need more time for studies, meeting friends or sleeping. Limited income and
time force you to make choices on the best way to divide your income and time. It is the same with the society; they also have to choose from various feasible alternatives.

Hence, an economist observes most issues based on cost and benefits. Attention given towards cost and benefit emerges as a result of the problems of scarcity.

### 1.2.1 Problems of Scarcity

What is the ‘problems of scarcity’?

Individual and societal needs for consumer goods, capital goods and others are endless and unlimited. However, the ability to fulfil all the needs, that is, the goods and services able to be produced, is limited. This is caused by scarcity of resources needed to produce the particular goods.

**Scarcity problem** emerges when our material needs exceed the ability to fulfil them due to limited resources.

The problem of scarcity occurs due to natural conditions or choices made by past generations. Choices made by individuals and society as a response to scarcity problems is the major issue in economics.

**Example:**

Scarcity is a relative concept. For instance, even though the production of crude oil is high, oil is considered to be a scarce resource because all the people who need it are not able to obtain it as much as they want free-of-charge.

**Economics** is a research on how individuals and society choose to utilise limited resources to fulfil their unlimited material needs in the best or most optimum manner.

The problems of scarcity can partly be resolved by:

(a) fully utilising all resources;
(b) upgrading the capacity of resources and technology;
(c) upgrading the administration efficiency for production and distribution; and
(d) redistributing goods or income among the members of the society.
1.2.2 Choice and Opportunity Cost

As concluded from the definition of economics, two basic issues in economics are:

(a) the need to make choices; and
(b) identifying the opportunity cost for making a specific choice.

Cost and benefit evaluation is the basis for making choices. In economics, cost and benefit evaluation is not an easy task because it requires accurate measurement. However, the concept of opportunity cost is suitable to be used as an accurate method of measuring cost and benefit in economics. The opportunity cost for carrying out a specific activity is the best benefit that had to be foregone for carrying out the particular activity. The foregone benefit is the benefit that could have been enjoyed if the best alternative was chosen.

To pursue benefit from one best activity, we have to sacrifice the other alternative which is the next best alternative. All choices with alternatives involve opportunity cost.

Example:

You have been given a choice by your father whether to go for an overseas tour or to have a car as a prize for your success in obtaining first-class honours degree. You consider your options as you have always craved for both alternatives. If you choose to have an overseas tour, then the opportunity cost for the overseas tour is the value of a car. On the other hand, if you choose the car, the opportunity cost is the opportunity to go on an overseas tour.

Exercise 1.1

TRUE (T) / FALSE (F) Statements

1. Macroeconomics focuses on aggregate variables such as national income, employment and inflation.

2. A product is said to be scarce if the total amount needed by the society exceeds the total amount that the society can obtain free-of-charge.

3. Price concept will be meaningless to a society that does not use money as a medium of exchange.

4. When you make a decision to study principles of economics, you incur opportunity cost.
1.3 PRODUCTION LIMITATIONS

We understand that our society faces a problem of resource scarcity and needs to make choices. The concepts of scarcity and choice can be explained more clearly with the use of production possibility curve (PPC).

In the field of economics, numerous models are used to study individual behaviour. PPC is the basic model used by economists to study the concepts of scarcity, choice and opportunity cost.

Before explaining the concept of production possibility curve, we need to make a number of assumptions to facilitate the analysis. Firstly, assume that the economy produces only two types of goods, that is, consumer goods and capital goods. Secondly, both goods can be produced using the same economic resources. Thirdly, in the short run, resource provision and level of technology remain constant. Fourthly, economic resources will be utilised fully and efficiently. Figure 1.3 shows an example of production possibility curve.

**Figure 1.3**: An example of production possibilities curve


1.3.1 Production Possibility Table

Production possibility table lists combinations of alternative outputs that can be produced with a batch of inputs. Opportunity cost can be measured from production possibility table.

Table 1.1 shows the combination of outputs able to be produced by an economy.

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<tr>
<th>Combination</th>
<th>Consumer Goods (Unit)</th>
<th>Capital Goods (Unit)</th>
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<tbody>
<tr>
<td>A</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>C</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>D</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>E</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>F</td>
<td>12</td>
<td>0</td>
</tr>
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As shown in the table, combination A shows that resources have been fully utilised for producing capital goods only, whereas in combination F, all the resources have been utilised for producing consumer goods only. In combinations B to E, both types of goods are produced in varying quantities. For example, if combination C is chosen, 7 units of consumer goods and 12 units of capital goods will be produced. Likewise, if combination D is chosen, only 9 units of consumer goods and 9 units of capital goods will be produced.

Assuming that society is currently positioned at the point of combination B, shifting to combination C will involve opportunity cost. The opportunity cost borne by the society when it shifts from combination B (4 units of consumer goods and 14 units of capital goods) to combination C (7 units of consumer goods and 12 units of capital goods) is (12-14)/(7-4) = -2/3, that is, to increase 1 unit of consumer goods, capital goods must be reduced as much as 2/3 units. Whereas movement from combination D to combination E involves opportunity cost as much as (5-9)/(11-9) = -2, that is, increase of 1 unit of consumer goods involves reduction of 2 units of capital goods. This example explains the concept or law of increasing opportunity cost.

1.3.2 Production Possibility Curve

THINK

In your opinion, how does opportunity cost influence the convex shape of production possibility curve?
Production possibility curve is a diagram produced from production possibility table. Hence, the curve can be used to explain the concept of opportunity cost. Production possibility curve shows optimum output combination that can be produced from a batch of inputs.

Production possibility curve in Figure 1.4 is based on Table 1.1.

![Production Possibility Curve](image)

**Figure 1.4: Production possibility curve**

Production Possibility Curve (PPC) has the following characteristics:

(a) **PPC as a Limit or Margin**
This curve shows the production capacity margin of a society in utilising existing institution, resources and technology. A country may want to own more quantities of all goods available (as at point M in Figure 1.4) but is unable to achieve it by utilising the available resource and technology. Point M shows the scarcity problem faced by the particular country.

(b) **PPC Shows the Maximum Production that can be Achieved When All Resources are Fully and Efficiently Utilised**
Production can be carried out within PPC, but it shows that resources are not fully utilised or not used efficiently. For example, point T in Figure 1.4 shows inefficient resource utilisation in economy.

(c) **PPC with Negative Slopes or Slopes Downwards**
Negative gradient indicates that the production of one good needs to be reduced in order to increase the production of another good. The negative gradient shows that each choices made has its opportunity cost. We can obtain more units of one good by reducing the other good.
(d) **PPC Shifts or Moves When Economic Growth Occur**

Economic growth may happen when there is an increase in resource quantity and quality or through technological upgrade. Shift in PPC depends on the type of resource change and the form of technological change.

Assuming that technology upgrading takes place in the production of consumer goods and with the existing resource available, consumer goods can be produced twice as much compared to before. This will cause a shift at the consumer goods axis as shown in Figure 1.5.

![Figure 1.5: Shift in production possibility curve](image)

Now, assuming that there is growth in the total workforce and that the production of consumer goods is more labour-intensive compared to that of capital goods, the form of shifting that may take place in PPC is as shown in Figure 1.6.

![Figure 1.6: Shift in production possibilities curve](image)
(e) **PPC that Convex Upwards**

When PPC slopes upwards, the gradient increases. The increase of gradient indicates that the law of increasing opportunity cost takes place. Increasing opportunity cost occurs when the total unit of one good that has to be foregone so as to obtain an additional unit of other good increases. In Table 1.1, shifting from combination A to combination B and combination C shows an increase of opportunity cost for the production of consumer goods, whereas shifting from combination C to combination B and to combination A indicates the increasing opportunity cost for the production of capital goods.

The increase in opportunity cost is caused by the nature or characteristic of the resource that is not standardised. Some resources are more productive for a specific use compared to other forms of utilisation. In measuring opportunity cost, we cannot compare the points in the curve, such as point T in Figure 1.4 with the point that exist throughout the curve, because production at point T does not utilise resources efficiently, thus it cannot become the best alternative for combinations along the curve.

(f) **The Choice between Two Types of Goods, that is, the Capital Goods and Consumer Goods is Important in Determining the Level of National Economic Growth**

Figure 1.7 shows that the society chooses combination B where production of consumer goods is more than that of capital goods. On the other hand, Figure 1.8 shows that the society chooses to produce more capital goods rather than consumer goods. After a certain period of time, economic growth is greater in Figure 1.8 compared to Figure 1.7 because in comparison to consumer goods, capital goods contribute more towards economic growth. Hence, production possibility curve shows that the society faces difficulty in making decisions related to the choice of producing these two types of goods.
TRUE (T) / FALSE (F) Statements

1. If an economy operates within a specific production possibility curve, additional output can be produced without incurring any cost.

2. Production possibility curve can explain the concepts of scarcity, opportunity cost, efficiency and choice.

3. A society can move along the production possibilities curve without incurring opportunity cost.
1.4 BASIC ECONOMIC QUESTIONS AND ECONOMIC SYSTEMS

The problem of resource scarcity forces the society to make choices. There are three basic questions to be answered in the process of making choices. These basic questions are shown in Figure 1.9 below.

Figure 1.9: Basic questions in economy

1.4.1 Basic Economic Questions

(a) What Should be Produced?
The society needs to determine the types of goods and services to be produced using limited resources to maximise their satisfaction. The selected combination must be in PPC as it is the efficient production combination.

When the type of output required has been identified, the society has to determine the production amount for every output chosen. The indifference curve of the society indicates the relative importance for every product in
the society’s point of view. If the society chooses to produce more consumer goods, then the consumer goods for current use will give more satisfaction compared to the capital goods that can increase production in the future.

(b) **How Should it be Produced?**
After deciding on the type and quantity of the output to be produced, then comes the question of how it should be produced. Here arises the need for a mechanism that can transfer resources from low-demand industry to the industry with higher demand. In free-market economy, this task is carried out by the market mechanism.

Resources are distributed through the process of demand and supply. In this process, resources will shift into the industry that offers the highest pay. Meanwhile firms in the industry have to utilise resources efficiently to avoid wastage.

(c) **For Whom Should it be Produced?**
After being produced, goods and services have to be distributed. Consumer goods will be disseminated to consumers while capital goods to firms. A mechanism should be available for this purpose. In the free-market economy, this task is carried out by the price mechanism. All consumers and producers who can afford to buy the economic product at the stated market price will be able to obtain what they require.

**THINK**
Economic system is a regulated way practiced by a particular country in managing its economy. Is it true that the weaknesses in the free-market economy have led to government intervention in economic activities?

### 1.4.2 Economic Systems

We have stated before that society needs to answer three basic economic questions of what to be produced, how and for whom it should be produced. These questions are answered based on the economic system chosen by the particular society. Here we will look at the four basic economic systems. Even though most society may not be clearly included into any of the systems, we can categorise them depending on the main characteristics that they possess. Figure 1.10 shows the society’s choice of four economic systems.
Figure 1.10: Society’s choice of economic systems

(a) **Traditional System**

This is the oldest and most influential system. The world’s early civilisations are mostly characterised by this system. In today’s modern economic system, it is almost unnoticed that the three basic economic questions are resolved based on the traditional system.

In the state of Kedah for example, why is it that the paddy planting activity is still the main source of income for most of the local people whereas other sectors have developed rapidly? Why is it that there are still many people replanting rubber trees even when they know that the price of rubber is unstable most of the time? These situations are connected to tradition. Possibly, many paddy and rubber planters prolong their activities due to tradition, not the market needs.

It is the same with usage, why many of us have to consume rice at least once daily though other food sources may provide us the same or even better nutrients? Thus, without realising, the traditional system still plays an important role in resolving society’s economic questions.

(b) **Free Market or Price System**

Free market system or price system is a system where decisions are made based on market needs. Matters such as labour, land, goods and services, including time, have its own value or market price. It is also through the market that decision to the three basic problems of economy is made: what, how and for whom. Even though there is no organisation or central coordinator making these decisions, this system does not create chaos but becomes organised instead.

Society uses price as an indication to producers on what should be produced. Price competition ensures production to answer the question of ‘how?’ by using efficient production method to face competition. The question of ‘to whom’ also can be resolved by price because those with money and willingness to spend are the ones who will acquire what they want.
Most economic research that you will encounter from this point on, such as the producer and consumer theory, is the study of the price system. However, in most macroeconomics studies, governmental roles have been included due to its importance in the real situation.

The main characteristics of free market system are:

(i) private ownership;
(ii) self-interests;
(iii) without government intervention; and
(iv) price system

The advantage of free-market system is in terms of resource allocation. Free-market gives rise to efficiency of resource allocation because resources will be distributed to the sector that gives the highest evaluation towards resource.

Whereas the downside of it is that, it causes unequal distribution of wealth, since those who are unable to compete will be left behind. This system also hardly promotes the production of public goods because public goods do not maximise personal profit.

(c) Centrally-planned System
In the centrally-planned economic system, the answers to the three basic economic questions are done by the central planning coordinator. All economic and social activities of the people are controlled and regulated by the particular body.

The main characteristics of this system are:

(i) Property Ownership by the Government
All economic resources such as land, natural resources and public facilities like transportation, industrial communication and bank system are owned by the government.

(ii) Centrally-planned Economy
All economic plans are determined by the government to ensure mutual well-being. Planning will determine what will be produced by the economy, how production will be carried out and ensuring equality of distribution.

(iii) Limited Freedom
Producers do not have the freedom in choosing goods and services to be produced because the use of resources controlled by the government has been determined. However, consumers are free to choose products and services that have been produced.
(d) **Mixed Economy System**

Mixed economy system is commonly practiced by most countries today. However, the level of mixture varies depending on the level of government intervention in the economic system. Even though the United States of America is considered as a free-market country or capitalism, its government also has its own roles due to the existence of tax and social welfare systems.

**Example:**
The terrorist attack on 11 September 2001 gave rise to a lot of government intervention and this proved that in reality, they do not practice true capitalism.

The purpose of government intervention in economic system is to patch up weaknesses of the free-market system. The government applies directive power and rules such as collecting tax and providing subsidies. The same applies with the production of public goods that are less appealing to private bodies such as electricity supply, water supply and transportation. Besides that, the government also plays a role in stabilisation and economic growth.

**YOUR IDEA**

Write a brief description on the differences between the two economic systems mentioned below:

- (a) Traditional system with free-market/price system.
- (b) Centrally-planned Economy system with Mixed Economy System

**Exercise 1.3**

**TRUE (T) / FALSE (F) Statements**

1. In the free-market economy, all economic decisions are made in the market where price and productivity are the main factors in determining what should be produced, how to produce and for whom should it be produced.
2. In centrally-planned economy, production resources are owned by individuals.
3. The decreasing opportunity cost causes the production possibility curve to have a concave shape.
1.5 CIRCULAR FLOW OF INCOME AND EXPENDITURE

In market economy, the society is divided into two main groups - the consumers and producers.

If you still remember the definition of ‘economy’ as what we have gone through before, we can describe users as a group of people having unlimited wants and needs while producers are the group that utilises limited resources in the production process in order to fulfil those unlimited needs. However, both groups are not separate entities since a consumer may be a producer at the same time and vice-versa.

The concept of consumers and producers are related to the circular flow of utilisation that is, the utilisation of end products and the utilisation of resources. On the other hand, in the circular flow of income, household is classified as resource supplier and firms as the supplier of consumer goods. Households will earn income from the sales of resources such as labour, land and capital to firms and use their earnings to buy goods and services produced by the firms. While firms will use the earnings from the sale of goods and services to pay for the resources utilised. Figure 1.12 depicts both the circular flow.

In a nutshell, households make two main decisions. Firstly in determining the total amount of production factor owned that will be sold in the factors market to earn income, and secondly, determining the quantity of goods and services that will be bought using the earnings. Firms instead, will make decision on the goods and services to be produced and determine the amount of inputs that will be bought from household.
Figure 1.12: Circular flow of production and goods factors
Topic 1: Introduction to Economics

Exercise 1.4

Fill in the blanks.

1. Scarcity occurs when ___________ wants faces ______________ resource.

2. Three main questions caused by scarcity and have to be resolved by the economic systems are: _________ should be produced, __________ resources used in production and ___________ will be obtaining the goods produced.

3. When an economist states about price or cost, he actually means the value of best ______________ forgone when a choice is made. This concept is known as ___________ or alternative cost. This cost is implicit in all choices.

4. ___________ is a study related to employment, inflation, money, tax, exchange rates, national income and other aggregate variables. ___________ is more specified to the study of how consumers and firms make decisions and interact with one another.

5. Interaction among household, business firms and the government is shown by the ______________ model.

6. If the combination of output being produced is in the production possibility curve, part of the resource is ___________; while the point outside the production possibility curve is ________________.

7. A normal production possibility curve has a convex shape because opportunity cost is _______________. The cost of producing goods increases when production level increases due to the problem of ___________ return.

8. The government’s role in the capitalism system is minimum and follows the ___________ policy. There are no societies practicing true capitalism or centrally-planned system, most of us live in the ______________ economy.
Structured Questions

1. Assume that Country A produces two types of goods, consumer goods and agricultural goods. Assume too that the production possibilities curve of Country A has a normal convex shape. By placing the consumer goods at the Y-axis and the agricultural goods at the X-axis, illustrate the effects of conditions stated below to the production possibility curve of Country A. Draw the curve for every condition in separate diagrams with the assumption that the original curves are the same before any changes take place.

(a) Technology growth occurs in the agricultural field only.
(b) Technology growth occurs in the production of consumer goods only.
(c) Education level of all labour increases in a period of three years.
(d) Investment in capital goods decreases throughout a decade.
(e) A few million acres of agricultural land are gained by sea embankment.

2. Determine whether these statements are TRUE (T) or FALSE (F) based on the figures below.

(a) If both countries are having the same resources, Country U will have a more advanced technology compared to Country R.
(b) Both countries face decreasing returns in the production of both goods.
(c) Investment of Country R is higher at point d compared to point c.
(d) If Country R is at point a, it can move to point d.
(e) Point a for both countries illustrates inefficiency and waste of resources.
(f) Opportunity cost is constant along the production possibility curve of Country U.
(g) Consumption in Country R exceeds investment at point d.
(h) Each country can experience rapid growth when moving along the curve towards capital goods.
(i) Country U can move from point e to point c without incurring cost.
(j) If both countries use the same level of technology, Country R will have more resources compared to Country U.

SUMMARY

Below is a concept map to help you visualise the content scope of this topic.
Economics is a study of how individuals and society distribute limited resources to fulfil unlimited wants. Economic research focuses on choices made by the society.

Choices have to be made as a result of the problem of scarcity. Thus, choices involve opportunity cost. Opportunity cost is the value of the best alternative foregone.

Problem of scarcity arises because of limited resources and insatiable wants and needs. Thus, emerges the questions of what should be produced, how the production process is being carried out and who will obtain the goods. These three questions are resolved based on the economic system chosen by the society.

Economic research consists of micro and macro researches. Microeconomics involves the study towards individual units while macroeconomics view the economy as an aggregate.

There are four main types of economic system; the traditional system, free market system, centrally-planned system and mixed economy system. However, most economies are based on the mixed economy system due to the intervening roles of the government.

**TUTORIAL QUESTION**

**INTRODUCTION**

The purpose of this activity is to test your understanding towards the most important concept in economy, that is, the concept of opportunity cost. In this activity, you will be exposed to the problem of scarcity, choice and opportunity cost faced by an economy.

**THE PROBLEM**

One of the main problems faced by an economy is in terms of resource distribution since resource is limited and has to be distributed towards various uses. When facing this problem, the economy has to make choices. How are choices made? The decision on resource allocation is carried out based on the priority of the particular society. When the resource allocation decision has been made, then the society has to accept the opportunity cost that rises due to the particular decision made.
QUESTION

Assume that an economy is facing a problem in choosing a production combination between consumer goods and capital goods, the production possibilities table is as shown below:

<table>
<thead>
<tr>
<th>Combination</th>
<th>Capital Goods</th>
<th>Consumer Goods</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0</td>
<td>95</td>
</tr>
<tr>
<td>B</td>
<td>10</td>
<td>90</td>
</tr>
<tr>
<td>C</td>
<td>20</td>
<td>85</td>
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<tr>
<td>D</td>
<td>30</td>
<td>65</td>
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<tr>
<td>E</td>
<td>40</td>
<td>45</td>
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<tr>
<td>F</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>G</td>
<td>60</td>
<td>0</td>
</tr>
</tbody>
</table>

(a) Draw the production possibilities curve for this economy. Use the X-axis for capital goods and Y-axis for consumer goods.

(b) Calculate the opportunity cost for an increase of one unit of capital good
(i) from point A to point B
(ii) from point E to point F

(c) Calculate the opportunity cost for an increase of one unit of consumer good
(i) from point G to point F
(ii) from point C to point B

(d) Explain why point D is said to be efficient while point H (30 units of capital goods and 35 units of consumer goods) is inefficient.

(e) Assume that economy remains unchanged but an advancement of technology in the production of consumer goods causes a two-fold increase in the production of consumer goods. Illustrate the new production possibilities table and curve. Generally, what is the effect of this technology change towards opportunity cost for one unit of consumer good?

(f) Assuming that two economies have the same resources and production technology, what might cause the economy of country 1 to grow more rapidly compared to country 2?
INTRODUCTION

In Topic 1, you have learnt about the free market economy. In a free market economy, there is no central body responsible for making decisions on production and utilisation. Instead, each individual has the freedom in making purchase decision that can provide maximum satisfaction, and producers have the freedom to sell based on the needs to maximise profit. A complex market system will regulate the decisions of both parties to determine market equilibrium.

The concept of demand and supply is the basic concept in market economy. The price system will determine how resources, products, and services are distributed. Distribution is made based on wants and the ability to pay. Anyone who has wants and is willing to pay will obtain what is required.
In this topic, we will look at the operation of market system through the concept of demand and supply. We will also try to understand factors involved in moving the market.

2.1 DEMAND

**THINK**

How is the price of a particular product or service determined in the market? Why do same goods have different price at different times?

In economic analysis, the concept of demand is used to describe, analyse and predict behaviour of buyers in market.

**Demand** can be defined as the total amount of goods required and able to be purchased by consumers at various price levels in a particular period of time.

Demand can be described by using tables or curves that relates the quantity of a product required and can be afforded by consumers in a particular period of time at various price levels, while other variables remain unchanged (you will find that some authors refer to other determinant variables as *ceteris paribus*).

Two important facts you have to understand about the definition above are the relationship between demand quantities with:

(a) price; and
(b) related variables (*ceteris paribus*)

Demand does not solely mean quantity but also refers to the relationship between demand quantity and price. Therefore, demand can be described in the form of tables or curves that connects a set of variables with another variable, that is, quantity with price.

In measuring the changes in demand quantity, it is assumed that other variables affecting consumption do not change at the same time good’s price changes. Other variables are those that can influence the demand of the particular goods, such as income, consumer preferences, price of other related goods and consumers’ predictions towards the future.
2.1.1 Law of Demand

A demand curve with negative gradient indicates an inverse relation between demand quantity and price level. When price increases, demand quantity decreases, and when price decreases, demand quantity increases. This inverse relationship is referred to as the Law of Demand. There are two explanations for this law of demand, which are:

(a) Substitution Effect
(b) Law of Diminishing Marginal Utility

Substitution effect occurs when price change causes consumers to substitute the scarce goods with other goods with lower price but still able to give the same amount of satisfaction. Law of Diminishing Marginal Utility explains this negative relation by using the concept of utility or satisfaction. You will find further discussion on both concepts in Unit 2.

Table 2.1 and Figure 2.1 illustrate the demand table and demand curve respectively, that is, the relationship between price level and quantity demanded.

<table>
<thead>
<tr>
<th>Price (RM)</th>
<th>Demanded Quantity (Unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60</td>
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<td>2</td>
<td>50</td>
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<td>3</td>
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<td>6</td>
<td>10</td>
</tr>
</tbody>
</table>
2.1.2 Demand and Quantity Demanded

It is important for us to understand the difference between these terms: demand, demanded quantity, demand curve shifts, and movement along the demand curve.

Demand curve illustrates the relationship between price and quantity at a certain point of time only; with the assumption that other factors remain unchanged. However, it cannot show the relationship for a longer period of time due to the changes in other demand determinants.

Movement along the demand curve indicates the changes of demanded quantity caused by the goods’ own price change.

This movement is related to the law of demand. When price changes, buyers will make changes to the quantity of the goods willing to be purchased.

Shifts in demand curve caused by changes in other determinant variables (such as price of particular goods, consumer opinions and preference) are known as demand change.

The right shift of demand curve indicates increase in demand while shift to the left indicates decrease in demand quantity.
Figure 2.2(a) shows the concept of changes in quantity demanded. The shift from point A to point B indicates increase in quantity demanded, while shift from point A to point C shows decrease in quantity demanded. Figure 2.2(b) shows demand change. Shift from point A to point B indicates increase in demand, while shift from point A to point C indicates decrease in demand.

2.1.3 Demand Determinants

After knowing the difference between demand change and change of quantity demanded, we will now look at demand determinants in more detail.

(a) Price of Related Goods

The change in price of goods that are related to a commodity will cause shifts in the position of demand curve. There are two types of goods related to a commodity, namely substitute goods in use and complementary goods in use.
Assume that product Y is the substitute for X, when price of Y increases, consumers will reduce the purchase of Y and substitute it by increasing the purchase of X. As a result, quantity demanded for Y decreases while demand for X increases. The opposite happens when the price of Y decreases. Figure 2.4 shows the specified position. In both diagrams, A is the original point and B is the point after the change of price.

Price increase of margarine (Y), that is, from $P_1$ to $P_2$ will result in consumers reducing the use of margarine (C₁ → C₂), and substituting it with butter (X). With that, even though the price of butter remains unchanged, demand on butter had increased as a result of the increase in margarine price.

![Figure 2.4: Changes in the price of substitute goods](image)

Now assume goods Z as the complement for goods X. The price increase of goods Z leads to decreased quantity demanded for both, Z and X. The opposite happens if price Z decreases. Figure 2.5 illustrates the position.

Let’s say the price of petrol (Z) increases from $P_1$ to $P_2$. This will cause quantity demanded for petrol to decrease (Q₁ → Q₂). As a result of the

**Substitute goods** are goods that can be used as substitutes in the use of a commodity. Examples of substitute goods are: butter to margarine or meat to fish.

**Complementary goods** are goods that can be consumed together to get satisfaction. Examples of complementary goods are: car with petrol and pen with ink.
increase of petrol price, consumers will reduce demand for cars (X); even if the price of cars remains unchanged.

![Figure 2.5: Change in the price of complementary goods](image)

When the use of a particular good does not affect the use of another good, it is known as unrelated goods. For example, a change in the price of sugar, which has no relationship to cars, does not affect the demand for cars.

(b) **Income**

Normally, income is positively related to demand. When income increases, demand also increases and vice-versa.

However, this relationship only applies to **normal goods**. Sometimes the increase in income will decrease demand for a particular product. This situation happens for **inferior goods**. Therefore, the relationship between demand and income will give indication on the type of goods. The types of goods are luxury goods, normal goods, common goods and inferior goods.

![Figure 2.6: The function of relationship between demand and income](image)
Even though classification of goods depends on the income level of the consumers, we can categorise goods generally, such as cracked rice which is considered as inferior goods by most consumers. Similarly, consumer goods bearing international brands are considered as luxury goods, such as prestige cars, clothes with international designers’ brands and others. Common goods are goods that have no changes in use with price change, such as salt and normal rice for most consumers in Malaysia.

(c) Preferences
Consumers have a variety of preferences that change from time to time. When consumers’ preference towards a commodity increases, consumers will tend to make more purchases at every price level. Demand curve for the particular commodity will shift to the right. For example, change in preferences can be seen in the fast food market such as fried chicken. People in the earlier days would have never imagined consuming chicken without having to incorporate them as a dish to go with their rice. However, due to change in time and advertisements through media, the preference towards such food has increased.

(d) Predictions on Change of Price and Income in the Future
Consumers may be able to predict future changes in price and income, for example during the festive seasons. If price is expected to increase in future, current demand will increase. On the other hand, current demand will decrease if price and income is expected to decrease in future.

To explain further about the demand determinants we have discussed before, let us look at the example of demand for butter. We will look at what increases the demand for butter and shifts the demand curve for butter to the right.

We know that butter is not a traditional food in our country. However, with the exposure of our people to foreign food, butter has been accepted by a large population of the society, especially to be served with bread or as an ingredient to prepare cakes. This change in preferences shifts the demand curve for butter to the right.

Margarine is the substitute for butter. Therefore, if the price of margarine increases, demand for butter will also increase. Bread is considered as the complement for butter, therefore, for those who increase their bread consumption due to price decrease or other reasons, will also increase the demand for butter. Likewise, if the income of consumers increases, there will be those who substitute margarine with butter because margarine is considered by some consumers as inferior good. Figure 2.7 illustrates the shift of demand curve for butter which is caused by various factors.
2.1.4 Individual Demand and Market Demand

Market consists of many individuals. Therefore, market demand table or curve is the total sum or aggregate of demand table or curve of all individual buyers present in the market. We can obtain the market demand table or curve by summing up quantities demanded by all individual buyers at each price level. The relationship between price and quantity in the market is influenced by the same determinant variables that influence individual demand.

To upgrade your understanding, explain the effects of the factors listed below towards the demand for coffee:

(a) preference
(b) price of related goods (substitute goods and complementary goods)
(c) income
(d) prediction of price and income changes in future
Table 2.2 and Figure 2.8 illustrate how we can derive market demand from individual demand curves. Assume that there are only two consumers in the market. At the price of RM2 per unit, quantity demanded by consumer 1 is 25 units and 50 units for consumer 2. Therefore, the market demanded quantity at the price of RM2 per unit is 75 units and so on for other price levels.

Table 2.2: Derivation of Market Demand

<table>
<thead>
<tr>
<th>Price (RM)</th>
<th>Quantity Demanded (Unit)</th>
<th>Market Demand (unit)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Consumer 1</td>
<td>Consumer 2</td>
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</tbody>
</table>

Figure 2.8: Derivation of market demand curve

Exercise 2.1

TRUE (T) / FALSE (F) Statements

1. Demand is the total of a good or commodity that is willingly purchased and affordable for an individual at a certain price.

2. Demand curve will shift to the right if all other determinants, excluding the price of the good itself, remain unchanged.
2.2 SUPPLY

What is meant by supply?
According to the demand theory, we have seen the behaviour of consumers in the market. However, market not only consists of buyers, but also sellers or producers. Therefore, we will now look at the behaviour of sellers in market. In economic analysis, behaviour of sellers in market is analysed and predicted using the concept of supply.

2.2.1 Law of Supply

If you are a seller or a producer of a commodity, you may earn a higher profit if selling price increases, and the opposite if the price decreases. Therefore, the quantity of goods you sell will increase with the increase in price and the contrary if the price decreases. The positive relationship between price and supply quantity is known as the Law of Supply.

Hence, supply can be defined as table or curve that relates various quantities of goods to be sold at a certain time at various price levels, while other variables remain unchanged.

In measuring the change in quantity supplied, other variables that can influence the amount of goods willing to be offered by sellers, are assumed to be unchanged. The other determinant variables referred to includes production input price, price of other goods, technology, and predictions of suppliers about the future.
Table 2.3 is a supply table, that is, a table that shows the quantity offered by sellers or producers at various price levels. Figure 2.9 is the supply curve derived and sketched based on Table 2.3. Figure 2.9 shows a supply curve with positive gradient.

**Table 2.3: Supply Table for Good X**

<table>
<thead>
<tr>
<th>Price (RM)</th>
<th>Quantity Supplied (Unit)</th>
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</thead>
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</tbody>
</table>

**Figure 2.9: Supply curve for Good X**

There are three reasons why supply has a positive relationship with price:

(a) increase in production may bring about the increase in cost due to the problem of decreasing returns. This concept will be discussed further in the production chapter in Unit 2;
(b) the increase in price may cause increase in profit, therefore, firm will be encouraged to increase production; and
(c) if price remains at a high level for a long period of time, new producers will be attracted to enter market, giving rise to total market supply. This theory will be discussed further in Unit 3.
2.2.2 Supply and Quantity Supplied

Like demand, the concept of supply and quantity supplied also differ. Change in quantity supplied occurs when there is a change in the price of the goods itself.

Price of goods positively influences quantity supplied. Increase in price will increase the quantity supplied, and vice-versa. **Change in goods supplied** triggered by change in price will show movement along the same supply curve.

**Change in supply** on the other hand, refers to shifts of the supply curve caused by changes in supply determinants. The determinants include production cost, predictions and price of other goods.

**Change in goods supplied** means movement along one supply curve, whereas **change in supply** is illustrated by the right or left shift of the curve.

![Figure 2.10: Movement along the curve and shifts in supply](image)

Figure 2.10(a) illustrates the change in quantity supplied caused by the price variation of the goods itself. Increase in price will cause an increase in quantity supplied from point A to point B. Whereas decrease in quantity supplied caused by price decrease of the product itself is shown by the movement from point A to point C. Look at how movement takes place along the same curve. This is known as **change in quantity supplied**.

Figure 2.10(b) on the other hand, shows the change in supply due to factors of supply determinants such as price of other goods, production cost, price prediction and number of producers. For example, increase in production cost will bring about decrease in supply and further causes the supply curve to shift to the left from point A in curve S₀ to point C in curve S₂. On the other hand,
decrease in production cost will increase supply in the market and will shift the supply curve to the right ($S_0 \rightarrow S_1$). Observe that price is not a factor that changes supply, but changes are caused by other factors of supply determinants. This is illustrated by shifts in supply curve known as supply change.

### 2.2.3 Supply Determinants

Now we will discuss on supply determinants in more detail.

(a) **Price of Other Goods**

Correlation of goods in production process influences the supply of a particular good when a price change for related good occurs. Correlation of goods in production process can be divided into two;

(i) substitutes in supply; and

(ii) complements in supply

Substitutes in supply refer to goods that can be produced to substitute the production of other goods without having to make significant changes in the production process. For example, the production of rice flour and glutinous rice flour can be done using the same machine.

If the profit or price of a substitute good in the production increases, producer will shift production to that particular good and decrease the production of other goods. From the example of flour mentioned above, if the price of rice flour increases, producer will suspend the production of glutinous rice flour to be substituted with the production of rice flour, in order to gain current profit.

Complements in supply refer to goods jointly produced in a production process. For example, in the process of producing petrol from crude oil, a few other products such as gas and diesel will also be yielded.

If the price of petrol increases, increase in supply of petrol also causes the increase in supply of other products, and vice-versa.

(b) **Change in Production Cost**

Production cost can change due to a few reasons including the change in price of production factors, change in technology, tax collection and subsidies provided by the government.
Producers use a combination of production factors in the production process. The price of production factors is determined in the factors market. Change in the price of factors will influence production cost. Therefore, if the price of factors decreases, production cost will also decrease. This situation provides incentive to producers to increase production, even if there is no price increase for that particular good in the market. Hence, decrease in the price of factors will shift the supply curve to the right due to increase in supply.

Changes in the government policy related to tax and subsidies will also influence the supply curve. When producers have to pay tax, production cost will increase, resulting in the left shift of the curve. On the other hand, subsidies given to producers will reduce the production cost and hence, shift the curve to the right.

The discovery of new technologies that can reduce production cost will also shift the supply curve to the right.

(c) **Prediction of Price**

If producers are able to predict an increase in price of the goods produced, production will be increased and the supply curve will shift to the right. If price is predicted to decrease, production will also be decreased and the supply curve will shift to the left.

(d) **Number of Producers**

Supply curve will shift to the right when there is an increase in the number of producers and vice-versa.
Rise in petrol price will not affect purchase of cars

KLANG: The interest of purchasing cars in Malaysia will not erode even with the rise in petrol and diesel price, says automotive expert, Tan Sri SM Nasimuddin SM Amin.

He says that the increase in price of fuel in Malaysia is not obvious compared to other countries in Europe, Japan and Korea, where the sales of automobiles continue to increase even when the price of fuel increase rapidly.

He also said that suggestions to reduce or even terminate road tax for vehicles will facilitate the selling of cars in this country, especially during this situation of fuel price increase.

“It is good as it will lessen the burden,” says the Naza Group Managing Director who supports the suggestion of terminating the road tax for all kinds of vehicles. The Naza Group, operating since 1975, has been involved in the business of importing and selling cars in need of APs.

Nasimuddin was interviewed after attending the opening ceremony of the Kia Motors showroom owned by Perstimas Sdn. Bhd. by Deputy Finance Minister, Datuk Dr. Ng Yen Yen here yesterday.

Source: Harian Metro Online (2005)

Based on the article, give your opinion about the effect of petrol price increase on the supply of cars and other goods. In your opinion, what is supposed to be done by the government to encounter the continuous problem of petrol price increase?
2.2.4 Individual Supply and Market Supply

Like market demand, market supply will also be obtained by summing up the quantity supplied by all sellers at various price levels. Table 2.4 and Figure 2.12 illustrate how market supply curve is derived.

Assuming there are only two sellers in the market, at the price of RM1 per unit, seller 1 is supplying 10 units and seller 2 supplying 5 units. Hence, market quantity supplied at RM1 per unit is 15 units and so on.

Table 2.4: Derivation of Market Supply

<table>
<thead>
<tr>
<th>Price (RM)</th>
<th>Quantity Supplied (Unit)</th>
<th>Market Supply (Unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seller 1</td>
<td>Seller 2</td>
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<td>4</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>50</td>
<td>25</td>
</tr>
</tbody>
</table>

Figure 2.12: Derivation of market supply curve

Exercise 2.2

TRUE (T) / FALSE (F) Statements

1) Increase in income will reduce the supply of inferior goods.
2) Supply curve illustrates the relation between quantity demanded and the price of the good itself, with the assumption that other determinants remain unchanged.
2.3 MARKET EQUILIBRIUM

What is meant by market equilibrium? How can demand and supply correlate?

Demand and supply are models that explain the respective behaviour of consumers and sellers in market.

To show how both interact in determining price and quantity, we need to draw the demand and supply curves in one diagram.

The point of intersection between the demand and supply curves is the market equilibrium point.

The term equilibrium is used in economics to explain a condition when all variables have reached an established position with no tendency to change any further. Equilibrium change will only happen if there is change in other influence or determinants.

At the point of market equilibrium, the need of buyers is equal to the need of sellers, that is, quantity demanded is equal to quantity supplied at a certain price level. The particular quantity and price are known as equilibrium quantity and equilibrium price.

From the past discussions, we know that demand curve has a negative gradient whereas supply curve has a positive gradient. Figure 2.12 depicts both curves drawn in the same diagram. Both curves intersect at point E. Point E is known as equilibrium point, while $P_e$ and $Q_e$ represent equilibrium price and quantity respectively.
2.3.1 Equilibrium, Surplus and Shortage

Think of which refers to shortage and which refers to surplus.

Table 2.5 describes the concept of equilibrium, excess demand and excess supply. Sometimes excess in demand is referred to shortage, while excess in supply is known as surplus. Hence, excess in demand is shown using negative value whereas excess in supply using positive value. Zero surplus value indicates equilibrium.
Table 2.5: Market Surplus, Shortage and Equilibrium

<table>
<thead>
<tr>
<th>Price (RM)</th>
<th>Quantity Demanded (Unit)</th>
<th>Quantity Supplied (Unit)</th>
<th>Shortage (-) Surplus (+)</th>
<th>Pressure on Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18</td>
<td>2</td>
<td>-16</td>
<td>Increased</td>
</tr>
<tr>
<td>2</td>
<td>16</td>
<td>4</td>
<td>-12</td>
<td>Increased</td>
</tr>
<tr>
<td>3</td>
<td>14</td>
<td>6</td>
<td>-8</td>
<td>Increased</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
<td>8</td>
<td>-4</td>
<td>Increased</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
<td>10</td>
<td>0</td>
<td>Equilibrium</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
<td>12</td>
<td>+4</td>
<td>Decreased</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>14</td>
<td>+8</td>
<td>Decreased</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>16</td>
<td>+12</td>
<td>Decreased</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>18</td>
<td>+16</td>
<td>Decreased</td>
</tr>
</tbody>
</table>

Shortage occurs when quantity demanded exceeds quantity supplied at a certain price level. From Table 2.5, shortage or excess demand occurs at the price of RM1 to RM4 per unit. At the price of RM1 shortage is at 16 units and at the price of RM4, shortage had decreased to 4 units. Shortage will increase the pressure on price. Therefore, increase in price will reduce shortage.

Surplus occurs when quantity supplied exceeds quantity demanded at a certain price level. Surplus will be reduced when there is decrease in price. Hence, surplus reduces the pressure on price. From Table 2.5, we can see that surplus decreases from 16 units to 4 units when price is reduced from RM 9 to RM6 per unit.

Equilibrium will be achieved when there is no shortage or surplus. Thus, there is no pressure for a price change. In Table 2.5, equilibrium is achieved at the price of RM5 per unit for a quantity of 10 units. Do notice that shortage will cause price increase; whereas surplus will result in price decrease.

Figure 2.14 illustrates the condition of shortage, surplus, equilibrium and pressure on price.
2.3.2 Change in Market Equilibrium

Market equilibrium will remain unchanged as long as there are no market forces affecting demand and supply. However, demand and supply always shift to the left or to the right as a response to changes in other determinant variables. Hence, change in other variables will result in the change of quantity and price equilibrium.

(a) Demand Change

Generally, changes in demand or supply lead to predictable effects on equilibrium quantity and price, such as:

(i) When demand increases while supply remains unchanged, equilibrium price and quantity will also increase. To get a clearer picture about the effect of increase in demand towards market equilibrium, let us look at Figure 2.15(a). Curve $D_0$ and $S$ are the original demand and supply curve respectively. Point $E_0$ is the point of equilibrium for the initial market, that is, where demand curve $D_0$ intersects with supply curve $S$. Equilibrium price and equilibrium quantity are $P_0$ and $Q_0$ respectively. When demand increases, demand curve $D_0$ will shift to $D_1$. $D_1$ and $E_1$ are the new demand curve and new point of market equilibrium.

(ii) When demand decreases while supply remains unchanged, equilibrium price and quantity will decrease [Refer to Figure 2.15(b)].
(b) **Supply Change**

(i) When supply increases and demand remains unchanged, equilibrium price will decrease whereas equilibrium quantity will increase [Refer to Figure 2.16(a)].

(ii) When supply decreases and demand remains unchanged, equilibrium price will increase whereas equilibrium quantity will decrease [Refer to Figure 2.16(b)].
(c) **Changes in Demand and Supply**

Changes in both demand and supply lead to predictable effects on equilibrium quantity or price.

(i) When both demand and supply increase, equilibrium quantity will increase [Refer to Figure 2.17(a)].

(ii) When both demand and supply decrease, equilibrium quantity will decrease [Refer to Figure 2.17(b)].

![Figure 2.17: Effect of shifts of demand curve and supply curve in the same direction](image)

Figure 2.17 illustrates both these conditions. Effect towards price cannot be determined because it depends on a few other matters, especially the degree of curve shifts and curve elasticity.

(i) When demand increases and supply decreases, equilibrium price will increase [Refer to Figure 2.18(a)].

When demand decreases and supply increases, equilibrium price will decrease. Effect on quantity 2.18(b).

![Figure 2.18: Effect of shifts of demand and supply curves in opposite directions](image)
TOPIC 2  DEMAND, SUPPLY AND MARKET EQUILIBRIUM

Refer to the mind map to understand what you have learned in this topic as a whole.

Demand is the quantity wanted and can be afforded by consumers at various price levels. Demand is determined by the price of the good itself, price of related goods, income, preference and predictions. The negative relationship between quantity demanded with the price of the good itself is called the Law of Demand.

Change in quantity demanded due to the change in the price of the good itself causes movement along one demand curve. Demand change that is caused by changes in demand determinants other than the price of the good itself, will result in shifts of the demand curve. Increase in demand will shift the curve to the right, while decrease in demand will shift the curve to the left.

Supply is the quantity that is willing to be sold by sellers at various price levels. Supply is determined by the price of the good itself, price of related goods, production cost, and predictions. The positive relationship between quantity supplied and the price of the good itself is known as the Law of Supply.

Change in quantity supplied caused by the price of the good itself is shown in the movement along one supply curve. Supply change due to change in supply determinants other than the price of the good itself will result in shifts of the supply curve. Increase in supply will shift the supply curve to the right while

TRUE (T) / FALSE (F) Statements

1. When market reaches equilibrium, change in demand or supply will result in surplus or shortage.

2. Most markets are able to maintain equilibrium for a long period of time.

3. Excess in demand, or shortage, will result in price decrease.

4. If demand increases, while supply remains unchanged, then the equilibrium price and quantity will increase.

SUMMARY

Refer to the mind map to understand what you have learned in this topic as a whole.

Demand is the quantity wanted and can be afforded by consumers at various price levels. Demand is determined by the price of the good itself, price of related goods, income, preference and predictions. The negative relationship between quantity demanded with the price of the good itself is called the Law of Demand.

Change in quantity demanded due to the change in the price of the good itself causes movement along one demand curve. Demand change that is caused by changes in demand determinants other than the price of the good itself, will result in shifts of the demand curve. Increase in demand will shift the curve to the right, while decrease in demand will shift the curve to the left.

Supply is the quantity that is willing to be sold by sellers at various price levels. Supply is determined by the price of the good itself, price of related goods, production cost, and predictions. The positive relationship between quantity supplied and the price of the good itself is known as the Law of Supply.

Change in quantity supplied caused by the price of the good itself is shown in the movement along one supply curve. Supply change due to change in supply determinants other than the price of the good itself will result in shifts of the supply curve. Increase in supply will shift the supply curve to the right while
decrease in supply will shift the curve to the left. Market demand is the total sum of individual demands while market supply is the total sum of all individual supplies.

After reading this topic, you know about market equilibrium and elasticity in economy. To help you understand about the contents of this chapter as a whole, build your own mind map starting with the mind map shown below:

Market equilibrium is achieved when demand is equivalent to supply. Equilibrium quantity and price will not change as long as there is no change in demand and supply. Excess in demand or shortage, causes increasing pressure towards price and excess in supply or surplus, will result in decreasing pressure towards price.

Equilibrium quantity and/or price can change when either the demand curve or supply curve shifts, or if there are shifts in both demand curve and supply curve.
You have been exposed to the basics of market behaviour. Now you must be ready to make further analysis towards demand curves. The main question that will be answered in this chapter is the factors that influence consumers to behave according to the Law of Demand. The theory of consumer behaviour is crucial in the market economy because producers who always compete with each other to attract consumers to buy their products need to know the motives underlying consumers’ demand.

The theory of consumer behaviour will further clarify the behaviour you have already known. You or anyone else, are consumers who normally have a sum of money at certain point of time to be spent on any required goods or services. You have to decide on the type and amount of goods that you want to purchase, because you know that every purchase made will take up a part of your limited
income. But at the same time, you are also aware of your preferences. In this chapter, we will analyse the consumption motives, consumer behaviour and decision making process of consumers.

3.1 CHOICE AND UTILITY THEORY

What is the meaning of utility?

Utility is the satisfaction gained by consumers from consumption of goods and services, or it can also be defined as the ability of a good to provide satisfaction to its consumer.

According to the theory of utility, consumers use satisfaction level as the basis to make consumption choices and evaluate goods based on satisfaction. Basically, there are two approaches of utility theory analysis namely, the cardinal approach and ordinal approach. Through cardinal approach, it is assumed that utility can be measured with utile as the unit of measurement. For example, eating a piece of durian gives 2 utils, while eating a piece of rambutan will give 1 util.

Meanwhile, the ordinal approach, assumes that level of satisfaction cannot be measured. For instance, eating durian gives more satisfaction compared to eating rambutan. In this condition, the measurement unit of satisfaction is not given. The level of satisfaction is determined by means of comparison only.

3.2 CARDINAL UTILITY THEORY

Do you know who introduced the cardinal utility theory? Cardinal utility theory was introduced by Alfred Marshall. What are the assumptions or presumptions made based on this theory?
TOPIC 3  UTILITY ANALYSIS

For instance, eating a piece of cake will give 8 utils, while eating biscuits will only give 4 utils. This reflects that a cake gives two-times the utility compared to biscuits. Utility level is normally reflected by the willingness of a person to pay based on the value of money. The higher the price willing to be paid, the higher the level of satisfaction gained.

3.2.1 Total Utility and Marginal Utility

**Total Utility (TU)** is the total satisfaction gained from a given level of consumption of a good.

There are two basic concepts of utility, namely, total utility and marginal utility. Table 3.1 shows the relationship between the consumption of goods with total utility and marginal utility. Observe that total utility for the first unit is 10 utils. When consumption level is increased to 2 units, total utility increases to 22 utils, and so on.

**Marginal utility (MU)** is the increase in total utility when consumption increases by 1 unit.

As you already know, marginal is addition. The formula for marginal utility is as follows:

\[
MU = \frac{\text{Change in TU}}{\text{Change in Q}}
\]

Therefore, marginal utility for the first unit is equivalent to the total utility of that unit. As we can see from Table 4.1, MU for the first unit is 10 utils while for the second unit is 12 or (22 – 10) utils, and so on.

Cardinal utility theory is a method which assumes that satisfaction can be measured using the unit of ‘util’.
Table 3.1: Total Utility and Marginal Utility

<table>
<thead>
<tr>
<th>Quantity (Q)</th>
<th>Total Utility (TU)</th>
<th>Marginal Utility (MU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>22</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>30</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>36</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>38</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>38</td>
<td>0</td>
</tr>
</tbody>
</table>

When we sum up marginal utility up to 5 consumption levels, we will obtain 38 utiles, that is, equivalent to the total utility of the unit.

Figure 3.1: Total utility and marginal utility

Figure 3.1 is the illustration of total utility and marginal utility derived from Table 3.1. Observe that marginal utility is equivalent to the gradient of total utility at each unit of consumption. Total utility reaches maximum when marginal utility is zero.

YOUR IDEA

Discuss how total utility affects marginal utility.

If a good is free-of-charge, what will happen to the level of total utility and marginal utility? Explain your opinion.
3.2.2 The Law of Diminishing Marginal Utility

Before this, we defined marginal utility as an increase in satisfaction gained from the consumption of one additional unit of good. We have seen from Table 4.1 and Figure 3.1 that marginal utility shows small increase in the beginning but later decreases until it reaches zero. This condition is referred to as **diminishing marginal utility**.

For example:
When you are so thirsty after a game session on a hot day, a glass of syrup water might give a certain amount of satisfaction. Since you are still thirsty, a second glass will give higher satisfaction increase than the first. But the third glass will give a decreasing additional satisfaction because you are becoming less thirsty. From Table 3.1, marginal utility is starting to decrease by the consumption of the third unit. You might achieve a negative marginal utility when consumption no longer gives satisfaction but discomfort.

If we measure satisfaction in terms of ringgit, then the marginal utility, MUs, for a glass of syrup water is the sum of ringgit you are willing to pay to get that drink. Therefore, when marginal utility decreases, your willingness to pay for an extra glass also decreases. If MU becomes negative, then somebody else will have to pay for you in order to encourage you to drink.

The concept of diminishing marginal utility gives the reason why individuals have various goods in their carts. The earlier economists explained about the negative gradient of demand curve based on the law of diminishing marginal utility, as what will be discussed in the following section.
3.2.3 Consumer Equilibrium

What is consumer equilibrium? As a rational consumer, you will maximise your satisfaction from consumption. However, through the definition of demand, we know that wants must be in balance with the ability to pay. Therefore, in maximising satisfaction, consumers are restricted by limited income and price of goods. Consumers’ objectives are achieved and consumers are said to have achieved consumer equilibrium when maximum utility can be attained with a certain sum of expenditure or income.

(a) Consumption Equilibrium for One Good

We will first look at consumption equilibrium of one good. If your income is limited, how can you maximise utility while utility is difficult to be measured? One way to gain maximum satisfaction from limited income is by measuring until in monetary value. Hence, until is the value for consumption. **Marginal utility becomes the sum of money willing to be paid to obtain one additional unit of good.** If you are willing to pay RM1 for an additional cup of coffee, then the cup has MU = RM1. Here, when consumption only involves one type of good, consumer will maximise satisfaction when marginal utility from the consumption of the good is equivalent to price.

**Satisfaction is maximised when price is equivalent to marginal utility** because marginal utility indicates the willingness to pay. Therefore, if marginal utility obtained from the consumption of an additional unit is much higher than the price that needs to be paid, consumers will still be able to increase satisfaction with additional purchases.

TRUE (T) / FALSE (F) Statements

1. Theory of consumer behaviour assumes that consumer will try to maximise marginal utility.
2. Law of diminishing marginal utility states that when consumption increases consistently, a level will be achieved where total utility will increase at the increasing rate.
3. When total utility increases, marginal utility is positive, and may increase or decrease.

**Exercise 3.1**
In the example of the glass of syrup water mentioned before, assume that the first glass costs RM1, but since you are evaluating it at more than RM1, you are definitely willing to buy it. The same goes for the second glass. But for the third glass, if the price does not change at RM1, you will not want to buy it because the value you place for that glass is less than RM1.

This equilibrium concept actually describes why demand curve has a negative gradient. Value or the willingness you dedicate for the following unit becomes lower when you obtain more units. Along the demand curve, marginal utility is equivalent to price ($MU = P$), where consumers are at an optimum condition.

<table>
<thead>
<tr>
<th>Quantity X</th>
<th>Total Utility</th>
<th>Marginal Utility</th>
<th>Price (RM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>22</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>32</td>
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</tr>
<tr>
<td>4</td>
<td>40</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>46</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>44</td>
<td>-2</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 3.2 shows total utility, marginal utility and price for good X. From the table, consumers achieved equilibrium at the third unit, that is, when marginal utility is equivalent to price.

What if you can obtain the particular good free-of-charge? When a good is free-of-charge, there are no more budget constraints and you are not restricted by the willingness to pay. Therefore, you will use the good until total utility is maximised at the fifth unit. The sixth unit will not be considered because it decreases the total utility. If you purchase the sixth unit, you will feel uncomfortable or reluctant due to excessive consumption.

(b) Consumer Equilibrium for Two Goods or More
We have seen the behaviour of consumers when they deal with the problem of consuming one good. Now, let us look at consumers who have to divide a certain amount of expenditure between two or more goods.

Assume that you have a sum of income (I) to be divided for the purchase of food (X) and text books (Y). As a rational consumer, you will spend all the money to choose a combination where marginal utility per ringgit for both goods are the same, that is:
If $\frac{MU_X}{P_X} > \frac{MU_Y}{P_Y}$, a rational consumer will increase consumption of good $X$ because for every ringgit spent, consumer will obtain additional satisfaction (that is, marginal utility) that is bigger. At the same time, consumer will reduce the consumption of good $Y$. Increase in demand of good $X$ will cause price $X$ ($P_X$) to increase and $\frac{MU_X}{P_X}$ becomes smaller.

At the same time, $\frac{MU_Y}{P_Y}$ becomes larger due to decline in demand of good $Y$.

This condition will prolong until $\frac{MU_X}{P_X} = \frac{MU_Y}{P_Y}$. In this condition, consumer is not inclined to change the combination of goods.

On the other hand, if $\frac{MU_X}{P_X} < \frac{MU_Y}{P_Y}$, consumer will increase the consumption of good $Y$, thus resulting in the increase of price $Y$ ($P_Y$). At the same time, $P_X$ declines. This causes $\frac{MU_Y}{P_Y}$ to become smaller and $\frac{MU_X}{P_X}$ to become bigger. This will prolong until $\frac{MU_X}{P_X} = \frac{MU_Y}{P_Y}$.

Now we look at another example:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>$MU_X$</th>
<th>$MU_X/P_X$</th>
<th>$MU_Y$</th>
<th>$MU_Y/P_Y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30</td>
<td>15</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>29</td>
<td>14.5</td>
<td>19</td>
<td>9.5</td>
</tr>
<tr>
<td>3</td>
<td>28</td>
<td>14</td>
<td>18</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>26</td>
<td>13</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>24</td>
<td>12</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>22</td>
<td>11</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>20</td>
<td>10*</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>18</td>
<td>9*</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>16</td>
<td>8*</td>
<td>5</td>
<td>2.5</td>
</tr>
</tbody>
</table>

(* $P_X$ and $P_Y$ are RM2 respectively)
Table 3.3 shows the marginal utility (that is, $MU_X$ and $MU_Y$) and marginal utility per ringgit (that is, $MU_X / P_X$ and $MU_Y / P_Y$) obtained by a consumer for the consumption of two goods, that is, $X$ and $Y$, when price $X$ and $Y$ are RM2 respectively ($P_X = 2, P_Y = 2$). It is assumed that the consumer’s income of RM22 is only spent for these two goods.

The rule

$$\frac{MU_X}{P_X} = \frac{MU_Y}{P_Y}$$

is achieved at the combination of $(X,Y) = (7,1), (8,3)$ or $(9,4)$.

However, selection must be made based on the total expenditure allocated, that is RM22. Hence, we will look at the total expenditure needed for the three combinations.

The consumer’s expenditure for the three combinations is:

- $A = (7,1) = (7 \times 2) + (1 \times 2) = 16$
- $B = (8,3) = (8 \times 2) + (3 \times 2) = 22$
- $C = (9,4) = (9 \times 2) + (4 \times 2) = 26$

Since combination $B$ meets the rule of expenditure, combination $B$ is the equilibrium combination.

What if the consumer has to divide his income for consumption of more than two goods?

When consumption involves more than two goods, we still apply the same rule. To achieve equilibrium for 3 goods, namely $X$, $Y$, and $Z$, the rule is

$$\frac{MU_X}{P_X} = \frac{MU_Y}{P_Y} = \frac{MU_Z}{P_Z}.$$  

If ‘$n$’ types of goods are consumed, equilibrium is achieved when

$$\frac{MU_1}{P_1} = \frac{MU_2}{P_2} = \ldots = \frac{MU_n}{P_n}.$$  

**YOUR IDEA**

By using the approach of cardinal utility, explain clearly why the demand curve slopes downward from left to right.
3.3 ORDINAL UTILITY THEORY

According to the ordinal utility theory, the benefit or satisfaction gained by consumers cannot be measured in quantitative form, but in terms of comparison to the consumption of other goods.

Consumer behaviour in maximising satisfaction is depicted by indifference curve. This approach also stresses on comparison with consumption of other goods to determine the level of satisfaction.

3.3.1 Choice and Priority

Do you know the difference between the meaning of ‘choice’ and ‘priority’? If you don’t, let us differentiate choice and priority. Choice does not depend on price of goods or income. Choice might change but it is not based on the ability to pay. Even though you still cannot afford to own a big house or a luxury car, it does not mean that you cannot like both. You also will not find yourself liking something that you disliked before just because there is a change in your income level or the price of the good. Choice also shows our unlimited wants and needs.
because rational consumers will always choose something that is more compared to the least.

Priority is contrary to choice. Consumers may have their own choices or preferences, but out of the many choices that they have, consumers will have to choose only one which becomes their priority. Consumer will use the concept of priority when facing various choices and ability to pay. The simplest example will be the fees that you need to pay to take up this course.

### 3.3.2 Indifference Curve

When choice involves only two goods, that is, good X and good Y, indifference curve will show various combinations of good X and good Y that can give equal satisfaction to the consumer.

Assume that you seek out the help of a friend to choose his preferred combination of the two combinations of good X and good Y.

- Combination A = 2 units of X + 6 units of Y
- Combination B = 2 units of X + 4 units of Y

Your friend will definitely choose combination A because although the quantity of X is the same in both combinations, combination A has more of good Y. If we assume that combination A is chosen, then we know that any other combination with more of good X or Y or more of both goods, will definitely be preferred than combination A. On the other hand, combination with less of X or Y or less of both, will be less preferred compared to A. Figure 3.2 illustrates the choices.

![Indifference Curve](image)

**Figure 3.2: Indifference curve**

What if the choices involve combination C with 3 units of X and 5 units of Y? Even though the quantity of Y in combination C is less compared to combination
A, quantity X is larger. Your friend may not be able to make a choice because he may feel that both combinations (A and C) can give equal satisfaction.

When you are able to identify all the combinations that can provide equal level of satisfaction and connect those combinations together, then we will obtain an indifference curve. Further, if you are able to identify other combinations that can give higher or lower level of satisfaction and build the particular curve, you have already formed an indifference map.

An indifference map consists of a series or groups of indifference curves showing various levels of satisfaction of consumers. The higher the indifference curve is from the origin, then the higher the level of satisfaction is. For example, curve $U_3$ in Figure 3.3 gives a higher level of satisfaction compared to curve $U_2$ and $U_1$. The same goes for curve $U_1$, the satisfaction gained is much higher than curve $U_2$, but lower than curve $U_3$.

![Figure 3.3: Indifference map](image)

(a) **Assumptions**

The assumptions that we will use to ensure an accurate consumer analysis are:

(i) Every combination of goods must be on the same indifference curve.

(ii) Indifference curve has a negative gradient because you must obtain more of good X if you give up a part of good Y to ensure satisfaction remains unchanged.

(iii) Higher indifference curve is more preferred because it represents a bigger consumption cart.

(iv) It is not possible for an indifference curve to intersect, because if it does, it contravenes the assumption that consumers are rational.
rational consumer, if A is more preferred than B, and if B is more preferred than C, then A is more preferred than C. According to Figure 3.4, we see that A > B, B = C, but A = C and A ≠ B. Hence, indifference curve cannot intersect.

Indifference curves normally used in analyses are convex in shape. However, there are some exceptions. For example, for two goods that are perfect substitutes, indifference curve is linear, as in Figure 3.5(a). A linear indifference curve indicates that the consumer does not mind whether he consumes only good X or good Y or any other combinations because both will give the same level of satisfaction.

Figure 3.5(b) shows the indifference curve for goods that are perfect complements. For example, if you already have a pair of shoes (at point A), an addition of the right pair of shoes (Y) only will not increase satisfaction (point B), because the complement is missing. Satisfaction will only be increased when you have both right and left pair of shoes (point D).
(b) **Diminishing Marginal Rate of Substitution**

The indifference curve we have seen in Figure 3.2 is non-linear, and convexes towards the origin. This shows that the gradient decreases when more good X are consumed. It is a normal form of indifference curve. Why is a normal indifference curve drawn in such way? This is because most goods are not perfect substitutes or perfect complements.

Some goods cannot substitute the consumption of other goods. Some goods can be substituted but only up to a certain level. You might be able to substitute a glass of syrup water for a plate of rice if you have no rice at all, but if you already have two or three plates of rice and there are two glasses of syrup water left, you might not want to make any more substitution. In indifference analysis, this imperfect substitution concept is referred to as **marginal rate of substitution**, and it changes according to consumption level.

What is meant by marginal rate of substitution? When good Y is at the Y-axis and good X at the X-axis, gradient of the indifference curve is obtained from $\frac{\Delta Y}{\Delta X}$.

Example:
Gradient at point A

$$= - \frac{\Delta Y}{\Delta X}$$

$$= -4 \frac{1}{1}$$

$$= -4$$

The gradient of the indifference curve (in example $= -4$) is referred to as marginal rate of substitution of Y for X [$\text{MRS}_{XY} = - \frac{\Delta Y}{\Delta X}$]. This gradient indicates the rate where the consumer is willing to give up Y to obtain an additional unit of X and utility remains unchanged. Since an indifference curve has a negative gradient, we will definitely obtain a negative value; however, the negative sign is ignored. We can see that as we move further downward (to the right), the gradient of the curve decreases. Therefore, marginal rate of substitution also decreases. Try comparing the gradient at point A and point B in Figure 3.6.
Diminishing marginal rate of substitution is related to the law of diminishing marginal utility that we have discussed earlier. Individuals will obtain diminishing satisfaction from every addition of consumption units. Therefore, when we move downward along the indifference curve, consumption of X increases while consumption of Y decreases, hence, marginal utility of X decreases and marginal utility of Y increases. Willingness to give up Y for every additional unit of X becomes lesser and MRS\(_{XY}\) will decrease further. In short, MRS depends on the consumption level of consumers, the lower the rate of good consumption, the harder it is to be substituted with other goods.

Let us look back at Figure 3.6. Consumption at point A gives equal satisfaction with consumption at point B. Therefore, the drop in satisfaction caused by the 4 units decrease of Y must be balanced with the addition of satisfaction gained from one additional unit of X. Marginal utility from one additional unit of X must be 4 times bigger than the marginal utility of one unit of Y sacrificed (because consumer had given up 4 units of Y).

Hence, \[
\frac{MU_X}{MU_Y} = MRS_{XY} = 4
\]

**YOUR IDEA**

Through the ordinal approach, consumers are assumed to be rational. Have you ever bought goods in an irrational condition? If you have, describe why. What will happen to the indifference curve? Explain.
3.3.3 Budget Line

You have already seen various types of lines and curves, but what is a Budget Line? Budget line is important in indifference analysis because it determines the actual choice that will be made by rational consumers. The indifference curve shows consumers’ priority while budget line indicates budget constraints or ability to purchase.

**Budget line** is a curve that shows the combinations of two goods that can be purchased by consumer using a certain amount of income and based on the market price of the good.

Assume that you have an allocation of RM10 to be spent on good X and good Y where the price of X ($P_X$) is RM1 and $P_Y = RM2$. The combination of consumption that you can afford to purchase is as shown in Table 3.4 and Figure 3.7.

### Table 3.4: Combination of Budget

<table>
<thead>
<tr>
<th>Combination</th>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>D</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>E</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>F</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>
If you spend all the money to purchase $Y$, you will obtain 5 units of $Y$; and you will obtain 10 units of $X$ if you decide to spend all the money on $X$. You can also choose any of the combinations that satisfies the rule $I = P_X X + P_Y Y$, that is, income ($I$) is equivalent to total expenditure ($P_X X + P_Y Y$).

(a) **Effect of Change in Income**

Now assume that your income has increased from RM10 to RM20 and the price remains unchanged. The increase in your income will allow you to purchase the maximum amount of 10 units for $Y$ and 20 units for $X$. Therefore, the budget line will shift in parallel with the initial line because the relative price (gradient of the curve) remains unchanged. Figure 3.8 illustrates two budget lines from two different tiers of income, RM10 and RM20, but the relative price is unchanged; RM1 for $X$, and RM2 for $Y$. 

---

**Figure 3.7: Budget line**

---

**Figure 3.8: The effect of change in income**
(b) **Effect of Change in Price**

Now we will look at the effect of price change on the budget lines. We are aware that along the budget line, income (I) is equivalent to total expenditure \((P_x X + P_y Y)\). Hence, budget line can be stated as the equation

\[
I = P_x X + P_y Y
\]

When \(Y\) is placed at the \(Y\)-axis, the equation can be written as

\[
Y = \frac{I - P_x X}{P_y}
\]

Therefore, the price ratio \(P_x/P_y\) is the gradient of the budget line. If either one of the price changes, the gradient of the curve will also change.

![Figure 3.9: The effect of price change on the budget line](image)

Assume that initially, the price of \(X\) is RM1 and price of \(Y\) is RM2, and income is RM10, the budget line is the AA line in Figure 3.9(a). When the price of \(Y\) drops to RM1, the slope becomes steeper \((AA')\). This indicates that more \(Y\) can be bought with the available income.

The budget line intersects the \(Y\)-axis at 10 units of \(Y\), but with no changes on the \(X\)-axis. If price \(X\) decreases instead, the curve will shift outside of the \(X\)-axis.

**YOUR IDEA**

What will happen when price \(Y\) of increases? You can make your own summary based on Figure 3.9(b).
3.3.4 Consumer Equilibrium

We know that indifference curve depicts choice and priority, while budget line shows the ability to pay. Choice and priority can only be achieved when there is affordability. Therefore, in order to obtain consumer equilibrium that maximises utility, we will combine the indifference curve with the budget line to determine the combination of goods that can be purchased within a certain amount of budget.

Figure 3.10: Consumer equilibrium – maximisation of satisfaction

Figure 3.10 illustrates the 4 levels of satisfaction represented by 4 indifference curves. According to the figure, consumer may definitely want to achieve a high indifference curve like U3. But this may not be achievable due to budget constraint. Consumers can only choose between U1 or U2.

Consumers can choose combination A, but that point is not optimal since downward movement along the budget line can still increase satisfaction. When point B is achieved, consumers have yet to achieve the optimal condition due to the same reason. Equilibrium is achieved at point E of curve U2 because after that point, total utility decreases.

Point E is the equilibrium point where indifference curve is tangent with the budget line. Hence, both have the equal gradient or:

Exercise 3.4

TRUE (T) / FALSE (F) Statements

1. The gradient of budget line when F is drawn at the X-axis and G at the Y-axis is equivalent to price of G divided by price of F.
2. Increase in consumers’ income will shift the budget line to the right.
This rule is the same as the **equimarginal principle** that we obtained from the cardinal theory. Therefore, both approaches are the same in terms of marginal utility concept, only here, utility does not need to be calculated.

Point E is not the only equilibrium point present, because each point where the indifference curve is tangent with the budget line is considered as the equilibrium point that maximises satisfaction given income constraints and relative price of the good.

Another way to state the maximisation rule is

\[
\frac{P_x}{P_y} = \frac{\text{MU}_x}{\text{MU}_y} \text{ atau } \frac{\text{MU}_x}{P_x} = \frac{\text{MU}_y}{P_y}
\]

For example, MRS between a cake and a glass of syrup water is the number of slices of cake you are willing to give as a substitute for an additional glass of syrup water. The relative price indicates the number of slices of cake that you can give for a glass of syrup water. If what you are willing to do is equivalent to what you can do, hence you will achieve equilibrium. But if what you are willing to do is more than what you can or able to do, you will reduce your willingness, and vice-versa.

(i) **Income-consumption Curve and Engel Curve**

Now we will look at the income-consumption curve and Engel curve. We know that a change in income without any change in price will result in a parallel shift of the budget line. This will also cause the shift of the consumption equilibrium point. Each different tier of income will produce its own consumption equilibrium point. When we connect the equilibrium points of the various tiers of income, we will derive the **income-consumption curve**.
The shape of income-consumption curve illustrates two topics you have learned earlier, namely, the income elasticity of demand and types of goods. These two concepts can be seen more clearly using the Engel curve derived from the income-consumption curve.

**Engel curve** is a curve that illustrates the relationship between consumers’ income with the demand towards a particular type of good.

Figure 3.11 illustrates (a) income-consumption curve, and (b) Engel curve for normal goods. The Engel curve for normal goods has a positive gradient due to the positive relationship between income and demand quantity. To obtain an income-consumption curve as the one in Figure 3.11, both good X and Y should be normal goods and the Engel curve derived is the Engel curve for good X.

Contrarily, Figure 3.12 shows the Engel curve with negative gradient for inferior goods. In the diagram, good X is an inferior good, and good Y is a luxury good.

Good X is an inferior good because when income increases, consumption of X will decrease. Conversely, good Y is a luxury good because an increase in income
will increase the consumption of Y. The Engel curve we have drawn in Figure 3.12(b) is the Engel curve for good X.

**YOUR IDEA**

Now, try to draw the income-consumption curve and Engel curve for good X if good X is a necessity. If you place good X at the X-axis, what are the assumptions needed for good Y?

**Figure 3.12:** Income-consumption curve and Engel curve for inferior good

(ii) **Price-Consumption Curve and Demand Curve**

We know that if price of either goods change, the budget line will revolve at the axis that represents the good with the change of price. If price of X decreases, the budget line will revolve outside the X-axis. Consumer equilibrium will also shift to the new budget line. Figure 3.13 illustrates a series of budget lines revolving at the X-axis. Each budget line represents the different tiers of price. Consumer’s income and price of Y is constant. When the budget line revolves, the equilibrium point will also shift. When
we connect the equilibrium points, we have derived a price-consumption curve.

**Price-consumption curve** shows the change in consumer equilibrium when there is a change in price.

Therefore, we can use this curve to derive individual demand curve and also to calculate price elasticity of demand. To further clarify on how demand curve is derived from the price-consumption curve, let us look at one example.

---

**Figure 3.13:** Price-consumption curve and demand curve

Assume that you have RM20 to be spent on X and Y. Line B₁ in Figure 3.13(a) is your budget line when Y is priced at RM2 per unit and X priced at RM1 per unit. Assume point E₁ as your equilibrium point and the quantity Y₁ and X₁ is your optimal consumption combination.

Other budget lines are drawn based on different prices of X, that is, curve B₂ for X priced at RM2.50, B₃ for X priced at RM3, and curve B₄ when X is priced at RM4. Each price level will produce different equilibrium combinations and
consumption quantity of X at each price level as shown by \( X_1, X_2, X_3 \) and \( X_4 \). When we connect all the equilibrium points, we have produced a price-consumption curve. When we relate the level of price X with equilibrium quantity X, we will find that a demand curve is produced, as shown by Figure 3.13(b).

Since demand curve is derived from price-consumption curve, satisfaction level will change along the demand curve; lower price will result in higher satisfaction, that is, satisfaction increases from \( U_1 \) when X is priced at RM4, to \( U_4 \) when X is priced at RM1.

**Exercise 3.5**

**TRUE (T) / FALSE (F) Statements**

1. The curve that is closer to the origin shows lower level of satisfaction for the consumer.
2. If a consumer moves from one point to another at the same indifference curve, total satisfaction gained is unchanged.
3. A consumer is said to maximise total utility when he purchases the combination of goods where the budget line intersects with the indifference curve.
4. Decrease in price of good will usually allow consumer to achieve a higher indifference curve.

**SUMMARY**

Indifference curve is a curve that connects all the combinations of consumption that gives equal satisfaction.

Marginal rate of substitution is a rate where a good is to be substituted with another. Therefore, it indicates the gradient of the indifference curve.

A convex indifference curve shows a diminishing marginal rate of substitution. Diminishing marginal rate of substitution happens when the rate of willingness to substitute, changes with the total consumption.

Budget line is a line that connects the combinations of goods able to be purchased within an amount of expenditure. Budget line shifts when total expenditure
changes and revolves at the axis when there is a price change in either one of the goods.

Budget line represents the ability to purchase, while indifference curve represents preferences and priority. Consumer equilibrium is achieved when consumer gains maximum satisfaction from his spending, that is, when indifference curve is tangent with the budget line.

Price-consumption curve is a curve that connects the consumer equilibrium when price of one of the goods changes. Demand curve is derived from price-consumption curve.

Income-consumption curve is a curve that connects consumer equilibrium when income changes. Engel curve is derived from income-consumption curve.

When quantity demanded changes due to change in price, the change is caused by two effects, namely, the income effect and substitution effect. Income effect is the change that is caused by the change in actual income, while substitution effect is caused by the change in relative price.

**TUTORIAL QUESTION**

**INTRODUCTION**

This activity will test students’ understanding towards the concept of marginal utility and its relationship with the law of demand. Among the topics that students will come across in this activity include the concept of marginal utility, consumer equilibrium and derivation of individual demand curve for one good.

**THE PROBLEM**

The main problem faced by a consumer is how to allocate limited income for various purposes and being able to maximise satisfaction at the same time.

**QUESTION**

A consumer, Miss Bee, has RM36 to be spent on good C and good D. The following table shows the total utility (TU) gained by Miss Bee for the consumption of C and D.
<table>
<thead>
<tr>
<th>Quantity</th>
<th>Total Utility (TU_C)</th>
<th>Total Utility (TU_D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>45</td>
<td>40</td>
</tr>
<tr>
<td>2</td>
<td>75</td>
<td>70</td>
</tr>
<tr>
<td>3</td>
<td>95</td>
<td>108</td>
</tr>
<tr>
<td>4</td>
<td>110</td>
<td>136</td>
</tr>
<tr>
<td>5</td>
<td>122</td>
<td>160</td>
</tr>
<tr>
<td>6</td>
<td>132</td>
<td>180</td>
</tr>
<tr>
<td>7</td>
<td>141</td>
<td>196</td>
</tr>
<tr>
<td>8</td>
<td>145.8</td>
<td>208</td>
</tr>
</tbody>
</table>

(a) Assume that price D is unchanged at RM4 per unit, but price C fluctuates between RM2, RM3, RM4 and RM6 per unit. Calculate the marginal utility for each good and calculate the marginal utility of one ringgit for C at all price levels, and the marginal utility of one ringgit for D for the price of RM4.

(b) Determine the consumption combination of C and D that fulfills the rule of consumer equilibrium for every price level of C.

(c) Complete the table below to show the quantity demanded for good C at every price level. What is the name of this table?

<table>
<thead>
<tr>
<th>Price (RM)</th>
<th>Quantity C</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

(d) Draw the Miss Bee’s demand curve for good C.
We know that there are two main sectors in the circular flow of income namely the household sector and the firm sector. In the previous chapters, we discussed about the household sector, including the background of demand theory, through theory of utility, theory of indifference, or the theory of consumer behaviour in general. The theory of consumer behaviour explains the behaviour of rational consumers who make decisions based on consideration of cost (price), and benefit (utility). In this chapter, we will look at the rationale that underlies the behaviour of producers that influences the theory of supply. We will start by discussing the concept related to production process, and subsequently we will discuss production in the short-run.

This topic also discusses the choices faced by firms in solving the questions of how outputs should be produced. When firms make decisions regarding the production techniques and combinations of inputs used, we know that the firm
operating the production process obtains its supply of inputs from household or other firms. Inputs have to be paid for according to the market price which is determined in the input market. The payment made is cost for the firm. The costs involved in production will change according to the amount of output. We all have our own understanding about the definition of costs. However, costs that we normally define only involve private costs and accounting costs. The concept of costs in economics is more extensive where economic costs involve all tangible and intangible costs. In this chapter, we will discuss the concept of costs in economics before discussing further regarding the short-run production costs.

### 4.1 PRODUCTION PROCESS

Production is very important in an economy; in fact many economists consider the success in production activities as an indication of progress of a country. Production is important due to its role in changing inputs into more valuable materials. The value enhancement will result in higher consumption satisfaction.

In connection with that, we can define:

**Production** as any activity or process of combining inputs to transform into outputs that produce utility at present time or in the future.

**Firms** are organisations that perform production processes, by combining inputs in the production process to produce outputs.

The behaviour of firms is important in determining the type of goods and services to be produced for the society, price, and its quantity. In short, firms have to face questions as shown in Figure 4.1.

![Figure 4.1: Questions of firms](image-url)
Therefore, the behaviour of firms is influenced by consumers, competitors and the environment.

How the production process is carried out and the combination of input used depends on technology. Hence, technology determines the form of production function. Production function shows the technical relationship between inputs and outputs. It explains the method used by firms to change inputs into outputs.

The general production function = \( Q = f(L, K, M, \ldots) \),

where \( Q = \text{output}, \ L = \text{labour}, \ K = \text{capital}, \ M = \text{raw materials}. \)

We can summarise the firm’s decision making process into three steps:

(a) choosing the quantity to be produced and listing all efficient methods in producing the specified quantity;
(b) choosing the economically efficient method, that is, the method of lowest cost to produce the specified quantity; and
(c) repeat step 1 and 2 for all the other quantities.

Of all the various production technologies available, one of it is assumed to be the most efficient. An efficient production technique is the production method that does not waste resources, that is, one of the inputs cannot be reduced without the addition of other inputs. If an input can be reduced without adding other inputs, the method is still considered inefficient.

Each technology only shows certain combinations of inputs that can be used to produce a certain amount of output, and firms must decide on the production plan for the most efficient technology. Basically, production technology can be divided into two, namely:

**Labour-intensive technology** - If production process uses more labour force compared to capital.

**Capital-intensive technology** - If more capital is used compared to labour.

Firms will definitely take into account the cost and profit in choosing technology besides determining the level of efficiency. Thus, the technology chosen is a technology that is able to minimise production cost. For example, if a firm operates in a country which has abundant cheap labour but lacking in capital goods, the most optimal production method will be the one that is labour-intensive.
### 4.1.1 **Industry, Firm and Plant**

The three prime movers in a production process are industry, plant and firm. What is meant by industry, plant and firm? We will look at the following explanations:

(a) **Firm**

A firm is an organisation that buys resources from the household or other firms to be used in the production of goods or services that will be sold to consumers. Firm size may vary, from a peddler selling snacks by the sidewalk to multinational firms operating worldwide.

Why do firms exist? Households have various needs and these needs cannot be fulfilled by the household itself due to various constraints such as the lack of resources, lack of expertise, or high cost. Are you able to build your own house or design a television set or refrigerator? Firms have substantial compared benefits in the use of inputs in production processes. The advantage is due to a number of factors including specialisation and economies of scale.

(b) **Plants**

Most firms have more than one plant, that is, an area, machine or tools and equipments used in the production process. Plant is the unit of production, while the firm is the unit of ownership and control. Plants owned by a large firm may consist of a number of factories with high-tech production equipments in a few areas or countries. For a small firm such as a tailor, the plants owned may consist of a few sewing machines.

(c) **Industry**

An industry consists of all firms that are competing in one market. Examples of industries are such as the fast-food industry, clothing industry and automobile industry. The interaction of firms within an industry determines the form of market structure that gives different implications towards the level of output and price. Examples of market structure are such as the perfect competition market, and monopoly, which will be discussed in the following unit.

### YOUR IDEA

Use the Venn diagram to illustrate the relationship between firm, plant and industry.
4.1.2 Input and Output

Resource used in production process is known as **input**.

Input includes raw materials, labour, area of production, machines and intermediate goods purchased from other firms.

**Output** is a good or service that is produced from the production process.

Output produced by a firm might be purchased by consumers, other firms or the government.

Input can be categorised into variable inputs and fixed inputs, as shown in Figure 4.2.

---

**Figure 4.2**: Types of input
Variable input will change according to the change in output. Its quantity is influenced by the change in output.

Examples are such as an area of agricultural land for a farmer or plant owned by a firm. Land for a farmer is an input that is very hard to be altered. A farmer may not buy land gradually when he wants to increase production a little; similarly, he cannot be selling the land in small portions if production is to be reduced a little.

Fixed inputs usually provide service for a long period of time. Factories built can be used for years; land can be used endlessly if not sold. Skilled work force is also considered as fixed input that are paid monthly salary; it may be quite difficult to change the number of these workers in a short time since advertising and interview process are required.

4.1.3 Long-Run and Short-Run

What is the relationship between inputs and period of production? Fixed input and variable input are closely related to the concept of production period.

(a) **Short-run** in production is a period where at least one of the inputs is fixed and a firm cannot enter or leave the industry.

(b) **Long-run** is the period of production where all inputs are variable, and firms can increase or reduce its production capacity, and also enter or leave the industry. Production period is not an absolute time concept such as days, weeks, months or years. It is a relative concept and refers to the rate of changing fixed input into variable input.

For a banana fritters seller for example, his short-run may be a day or a week because he can easily find a helper or add in new frying equipments such as stoves and pans. But on the contrary for an electrical power supplier of a town, the short-run will definitely take up a longer time period, maybe 10 years or more. This is because the equipments and plants needed to generate electricity are costly and cannot be easily built without proper planning.
From these two examples, we have obtained another determinant of production period, that is, the cost involved in adding or reducing inputs. If addition or reduction of input involves a high cost, the short-run will become much longer.

**Exercise 4.1**

**TRUE (T) / FALSE (F) Statements**

1. When production is being carried out, inputs will be transformed into outputs, and these outputs may be purchased by consumers, other firms or by the government.

2. In short-run, the size or capacity of a plant is fixed.

3. In long-run, there are no fixed inputs, while firms can leave or enter the industry easily.

4. All inputs are variable in long-run, and all inputs are fixed in short-run.

**4.2 PRODUCTION IN SHORT-RUN**

**THINK**

Try to recall production process. What is the relationship between fixed inputs and variable inputs with production in short-run?

After knowing a few important concepts in production, we will further discuss about the implementation of short-run productions. As defined earlier, short-run is a period where at least one input is fixed. Even though a production process usually consists of more than two inputs, we will focus on the short-run production that consists of only one fixed input and one variable input to facilitate the analysis. However, the concepts stated can be applied to any production processes which involve at least one fixed input.
4.2.1 Total Product, Average Product and Marginal Product

Here, we will discuss the characteristics and production constraints faced by firms that operate in the short-run. To facilitate the analysis, we assume that a firm uses only one fixed input, and one variable input in the production of one type of output. The general production function of this firm can be stated as:

\[ Q = f(K, L) \]
where \( Q \) is the output, capital (\( K \)) is the fixed input, and labour (\( L \)) is the variable input.

The production function can also be shown using tables and diagrams. Figure 5.3 and Table 4.1 illustrates the production function of a firm producing one type of output.

The table and diagram shows the change in output when variable input is added to fixed input in production.

There are three main concepts that you need to understand in short-run production:

(a) **Total product** is the amount of output that can be produced by combining all inputs in a particular period of time.

(b) **Average product (AP)** is the output per unit of variable input or \( AP = \frac{TP}{L} \). In Figure 4.1, we find that the average product for 2 units of labour is \( \frac{8}{2} = 4 \).

(c) **Marginal product (MP)** is the addition or increment in output when one unit of variable input is added while the total of other input is constant. Marginal product is the gradient of the Total Product curve. Marginal product of capital or \( MP_K \) is the addition in output as a result of an increase in capital input while total labour remains unchanged. Marginal product of labour or \( MP_L \) is the increase in output as a result of an additional labour input; while capital remains unchanged. In the short-run model, when labour is the variable input, discussion will be focused on the productivity of labour.

\[ MP_L = \frac{\Delta TP}{\Delta L} = \frac{\text{Change in Total Product}}{\text{Change in Variable Input}} \]
In Figure 4.1, marginal product for the fourth labour is:

\[
\frac{\Delta TP}{\Delta L} = \frac{15 - 12}{4 - 3} = \frac{3}{1} = 3
\]

We divide the change in total product (TP) with change in quantity (L), and not with one unit of input because some of the variable inputs can only be added in a few units simultaneously. For example, a labour is hired to work eight hours a day. Therefore, in knowing the addition of product by one hour of labour, we must divide the change of output produced with eight units of labour.

**Table 4.1: Total Product, Average Product and Marginal Product**

<table>
<thead>
<tr>
<th>Capital</th>
<th>Labour</th>
<th>TP</th>
<th>APL</th>
<th>MPL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>8</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>12</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>15</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>17</td>
<td>3 2/5</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
<td>17</td>
<td>3 5/6</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>7</td>
<td>16</td>
<td>2 2/7</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>8</td>
<td>13</td>
<td>1 5/8</td>
<td>-</td>
</tr>
</tbody>
</table>

Figure 4.3 is drawn based on the information from Table 4.1. Through the diagram, we can obtain information about the features and relationship between these three concepts we have just defined.
Based on Table 4.1 and Figure 4.3, we can see that total product increases rapidly with the first and second labour employed. However, the increase in production starts to decline when the third labour is hired. Similarly with MP, initially MP increased rapidly compared to AP, achieving maximum point before AP, then decreases to intersect at the maximum point of AP before reaching zero. MP is zero when TP achieves maximum point, and then becomes negative as TP decreases.

The concepts of marginal and average have general relation that can be applied in all theories involving these two concepts, which are:

(a) if marginal is equivalent to average, average remains unchanged;
(b) if marginal is higher or above average, average will increase; and
(c) if marginal is lower than average, average will decrease.

An example of average-marginal relationship is the GPA (Grade Point Average), and CGPA (Cumulative Grade Point Average) you obtain every semester. GPA is marginal while CGPA is average. If the GPA you obtain in a semester is higher than CGPA, then your CGPA will increase. If GPA is lower than CGPA, then CGPA will decrease. Therefore, to ensure CGPA increases, GPA should always be increased.

4.2.2 Law of Diminishing Marginal Returns

In your opinion, how does the law of diminishing marginal returns occur?

Based on Figure 4.3, we have seen that the total product increases with an increasing rate initially, but eventually starts to increase at a decreasing rate, before declining further. Meanwhile, the marginal product increases rapidly, and then decreases before achieving negative. The curve of marginal product starts to decline when the total product starts to increase at a decreasing rate; this is the starting point for the law of diminishing returns. This point is denoted by point A in Figure 4.3.

**Law of diminishing marginal returns** states that if variable input is added into a production process that uses at least one fixed input, increment in total output may increase at an increasing rate initially, but the rate of increase will decline after one level of input.
This law only happens in the short-run. If seen through marginal product, this law starts to occur when MP starts to decline. Due to this law of diminishing marginal returns, the optimal level of output in the short-run is achieved when \( MP_L = 0 \).

This law is very rational and can be used in various fields. In the agricultural field for example, land is a fixed input. When the first labour is hired to tap rubber, he might not be able to tap all trees available in one day. When the second labour is added, yield will increase, but if more tappers are added continuously, it will reach a stage where yield increases but at a lower rate compared to the initial rate of increase. Sooner or later, the land will become congested of rubber tappers until some of them will not have the chance to tap.

It is the same in the manufacturing field that uses machines as its fixed input. The first few labourers hired may increase production at an increasing rate. But when more labourers are hired and machines have reached a high capacity, marginal product will start to decrease.

Some say that if the law of diminishing marginal returns does not occur, the whole world population can be fed from only one flower pot, because seeds can always be added to increase the yield of food. However, through this concept, there are also predictions that at one time, a large number of world population will die of starvation due to shortage of agricultural land. We see that this condition is yet to happen because technology enables the fixed input of agriculture, which is land, to increasing its capacity. For instance, in the past, we only can plant rice once a year; but now it can be done twice a year.

### 4.2.3 Production Level

Now we will look at production level. We can use the relationship between the curves of \( AP_L \) with \( MP_L \) to define the three levels of production in the short-run, which are Level I, Level II and Level III. Figure 4.4 will help to illustrate these levels.

(a) **Level I**

Level I begins with the usage of the first labour until the maximum point of \( AP_L \). At this level, both, the average product and marginal product are positive. Since the marginal product exceeds average product, average product increases. Level I is an irrational production level because AP can always be increased by adding in labour. Increased return to fixed input also occurs at this level. Therefore, rational producers will not operate at this level.
(b) **Level II**
Level II is the area between the maximum point of \( AP_L \) and the point where \( MP_L \) is zero. Both \( MP \) and \( AP \) are still positive but \( MP \) is less than \( AP \). Thus, \( AP \) decreases. Rational producers will operate at this level because the marginal product of fixed input and variable input is positive.

(c) **Level III**
Level III covers the area of negative \( MP_L \) and total product decrease. This means that additional of variable input will further decrease the total output. Rational producers will not operate at this level.
4.3 CONCEPT OF COST

What should a producer do before deciding on the amount of output that should be produced?

Generally, costs are matters that must be exchanged or sacrificed in order to obtain something else in return. The sacrifice made can involve various forms, which can be valued monetarily or not. Costs may be in the form of money, goods, time and so on.

Firms must know the shape of the cost curves in order to make decisions. Short-run costs curve is used to make decisions regarding output and price; while long-run costs curve is used for growth planning and investment policy.
4.3.1 Economic Costs

Economists consider all costs of inputs used in production without taking into account who owns the inputs. This view influences their definition towards costs, profit and optimal production level.

You have been exposed to the concept of opportunity cost in our discussion about the production possibilities curve. The concept of opportunity costs is the basis of the concept of economic costs.

| Economic costs for a good can be defined as the value of the best alternative foregone in order to obtain the particular good. |

Therefore, to determine the economic cost of a certain good, economists must calculate the sacrifices that have to be made by the society in order to produce one additional unit of that particular good. Figure 4.5 illustrates the components of economic costs.

![Figure 4.5: Components of economic costs](image)

4.3.2 Private Costs and Social Costs

Private cost is the cost that has to be paid by an individual who is directly involved in the production or consumption of a particular good. Meanwhile, social cost or external cost is the cost burden carried by individuals who are not directly involved in the production or consumption of that particular good.
Let’s take the process of cooking oil production from oil-palm trees as an example. Private costs are costs that have to be paid by the manufacturer to the supplier of raw oil-palm, labour force, amount of electricity used and others.

However, this factory may produce industrial wastes that can pollute the river or drainage systems nearby.

This pollution problem might cause some members of the society living around the area to lose their source of income or their recreation area. Meanwhile, the government is forced to use tax revenue money to clean up the pollution. All these costs are considered as external costs or third-party costs. In this case, social cost is higher than private cost.

External costs are caused by external effects. Since external effects can be negative or positive, external costs can also reduce or increase social costs. Positive external effects such as the joy experienced by society from the scenery of a private garden, causes the private cost borne by the garden owner to be higher than the social cost. This is because society benefit from that garden.

### 4.3.3 Explicit Costs and Implicit Costs

Economists have divided private costs into explicit (tangible) costs and implicit (intangible) costs.

Explicit cost is the market value of all inputs purchased by a producer. Meanwhile, implicit cost is the market value of inputs owned by the producer himself.

Self-owned inputs of the producer are such as the value of his own building used, and the expertise possessed by the producer. Self-owned resources are valued based on opportunity cost, that is, value of the best alternative foregone. This implicit cost is the cost that differentiates economic costs and accounting costs or the related concepts, namely economic profits and accounting profits.

To further explain these two concepts, we look at one example:

Assume you have graduated from OUM and have received a job offer at the value of RM40,000 per annum. But you are determined to start your own business using the money you inherited from your grandfather at the value of RM50,000. At the end of the first year of your business, your accountant showed you the list of expenditure consisting of labour wage (RM50,000), rental (RM18,000) and other costs (RM17,000), and in all amounted to RM85,000.
However, due to a good background in the principles of microeconomics, you know that your private cost is much higher.

In your calculation, the implicit cost you have to bear includes the value of the job offered, that is, RM40,000 per annum, and value of the interests from your savings of the inherited money at the rate of 10 percent or RM5,000 per annum. Thus, you add in another RM45,000 into the amount of RM85,000 totalling up the overall private cost to RM130,000.

This concept of economic costs is the one that we will apply in our following discussion on production costs.

### Exercise 4.3

**TRUE (T) / FALSE (F) Statements**

1. Economic cost of a firm is the payment that has to be made to the owner of input to draw input from alternative usage.

2. For the owner of a firm, the cost of using own input in business is the implicit cost, while the cost for purchase of market input is the explicit cost.

### 4.4 SHORT-RUN PRODUCTION COSTS

We know that short-run production involves the use of fixed inputs and variable inputs. The cost that is related to fixed inputs is referred to as fixed cost, while cost related to variable inputs is the variable cost. Now, let us look at the definition of fixed costs and variable costs.

**Fixed costs** are costs that do not change according to change in output. Meanwhile, **variable costs** are costs that change along with the change in output.

When we only use two types of inputs in the short-run, that is, capital as the fixed input and labour as the variable input, hence, rental for capital is the fixed cost and payment of wage for labour is the variable cost.
4.4.1 Total Cost

Total cost of a firm is the economic cost of the firm. Total cost (TC) comprise of the total fixed costs (TFC) and the total variable costs (TVC) or

\[
\text{Total Cost} = \text{Total Fixed Costs} + \text{Total Variable Costs} \\
TC = TFC + TVC
\]

If \( r \) is rental for one unit of capital (K), and capital is the fixed input, hence, fixed cost is \( r \times K \); and if \( w \) is wage for one unit of labour (L), while labour is the variable input, then variable cost for one production level is \( w \times L \). Since variable cost will change along with the change in output, we state variable cost as a function to output, for example \( TVC = 2Q \). Therefore, you will obtain the function of total cost such as \( TC = 1000 + 2Q \), where 1000 is TFC and 2Q is TVC. Indirectly from here we will obtain:

\[
\text{Total Fixed Cost} = \text{Total Cost} - \text{Total Variable Cost} \\
TFC = TC - TVC
\]

and

\[
\text{Total Variable Cost} = \text{Total Cost} - \text{Total Fixed Cost} \\
TVC = TC - TFC
\]

Table 4.2 and Figure 4.6 illustrate the three types of total costs. Total fixed cost and total variable cost are calculated based on the assumption \( r = \text{RM}25 \) per unit of capital, and \( w = \text{RM}10 \) per unit of labour.
Table 4.2: Total Costs

<table>
<thead>
<tr>
<th>Fixed Input (K)</th>
<th>Variable Input (L)</th>
<th>Output</th>
<th>TFC</th>
<th>TVC</th>
<th>TC</th>
<th>AFC</th>
<th>AVC</th>
<th>AC</th>
<th>MC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>50</td>
<td>--</td>
<td>50</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>5</td>
<td>50</td>
<td>10</td>
<td>60</td>
<td>10</td>
<td>2</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>15</td>
<td>50</td>
<td>20</td>
<td>70</td>
<td>3.33</td>
<td>1.33</td>
<td>4.67</td>
<td>1.00</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>30</td>
<td>50</td>
<td>30</td>
<td>80</td>
<td>1.67</td>
<td>1.00</td>
<td>2.67</td>
<td>0.67</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>50</td>
<td>50</td>
<td>40</td>
<td>90</td>
<td>1.00</td>
<td>0.80</td>
<td>1.80</td>
<td>0.50</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>75</td>
<td>50</td>
<td>50</td>
<td>100</td>
<td>0.67</td>
<td>0.67</td>
<td>1.33</td>
<td>0.40</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>95</td>
<td>50</td>
<td>60</td>
<td>110</td>
<td>0.53</td>
<td>0.63</td>
<td>1.16</td>
<td>0.50</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>110</td>
<td>50</td>
<td>70</td>
<td>120</td>
<td>0.45</td>
<td>0.64</td>
<td>1.09</td>
<td>0.67</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>120</td>
<td>50</td>
<td>80</td>
<td>130</td>
<td>0.42</td>
<td>0.67</td>
<td>1.08</td>
<td>1.00</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>125</td>
<td>50</td>
<td>90</td>
<td>140</td>
<td>0.40</td>
<td>0.72</td>
<td>1.12</td>
<td>2.00</td>
</tr>
</tbody>
</table>

Figure 4.6: Total cost curve, total fixed cost curve and total variable cost curve

Observe that the total fixed cost curve is horizontal because fixed cost does not change along with the change in output. Meanwhile, the total variable cost curve increases at an increasing rate (curve becoming steeper) due to the law of diminishing returns in short-run. The total cost curve is the vertical sum of fixed cost and variable cost. Therefore, the distance between the total cost curve and the total variable cost curve (a) represents the total fixed cost.

### 4.4.2 Average Costs

**Average fixed cost (AFC)** is the total fixed cost divided by total output, or

\[
\text{Average Fixed Cost} = \frac{\text{Total Fixed Cost}}{\text{Total Output}} \quad \text{or} \quad AFC = \frac{TFC}{Q}
\]

If TFC = 1000, hence AFC = 1000/Q

**Average variable cost (AVC)** is the total variable cost divided by total output, or:
If TVC = 10Q, then AVC = 10Q/Q = 10

**Total Average Cost (AC)** is the total cost divided by total output;

\[
\text{Total Average Cost} = \frac{\text{Total Cost}}{\text{Total Output}} \quad \text{or} \quad AC = \frac{\text{TVC}}{Q}
\]

Average cost can also be computed by adding average fixed cost and average variable cost.

From the example above, hence AC = (1000/Q) + 10

### 4.4.3 Marginal Costs

**Marginal cost** is the change in total cost caused by one unit of output change, or

\[
\text{Marginal Cost} = \frac{\text{Change in Total Cost}}{\text{Change in Total Output}} \quad \text{or} \quad MC = \frac{\Delta TC}{\Delta Q}
\]

Total costs consist of total fixed costs and total variable costs. However, since only the total variable cost changes along with the change in output, hence marginal cost can also be obtained from:

\[
\text{Marginal Cost} = \frac{\text{Change in Total Variable Cost}}{\text{Change in Total Output}} \quad \text{or} \quad MC = \frac{\Delta TVC}{\Delta Q}
\]

Now, refer to Table 4.3 for the calculation of AFC, AVC, AC and MC; and Figure 4.7 for the drawing of AC, AFC, AVC and MC curves.
Observe that the average fixed cost will continually decline but does not reach zero due to the value of fixed cost divided by total output that is increasing. Meanwhile, average variable cost decreases a little at a lower level of output, but then increases due to the law of diminishing returns. Meanwhile, total average cost is the vertical sum between average fixed cost and average variable cost. Due to the continually decreasing average fixed cost, the distance between AC and AVC becomes narrower when output increases.

AC decreases longer than AVC because initially, the decreasing effect of AFC is bigger than the increasing rate of AVC. After one point, the increase in AVC gives a bigger effect compared to the decrease of AFC. AVC and AC are normally U shaped because average cost usually decreases in the beginning but increases after one point due to the law of diminishing returns.

Marginal cost (MC) decreases along with AVC at the early stage of production but increases after one point due to the law of diminishing returns. MC and AVC are equal at the first output level. MC intersects AC and AVC at the minimum point of AC because if marginal or addition is lower than average, average will decline; but if addition is higher than average, average will increase. The relationship between MC and AC is similar to the relationship between marginal and other averages, that is, average cost will increase if marginal cost is higher and the contrary if marginal cost is lower than average cost.

(i) **Relationship between Production and Short-Run Costs**

What is the relationship between production and short-run costs? Production involves the purchase of inputs. Therefore, cost and production have an inseparable relationship. Firms have to know the relationship between these two short-run concepts especially for the purpose of determining the output level in the short-run. Hence here we will try to look at the relationship between short-run average cost and marginal cost, with short-run average product and marginal product.
The connection between short-run cost and short-run production can be described as the following:

Assume you have just opened up a tailoring shop receiving orders to sew dresses. Workers are the variable inputs and the shop is fixed input. Here we will only look at the productivity of variable inputs. When you hire a worker with a wage of RM10 per hour \( (w = RM10) \) and the worker is able to complete sewing 2 dresses in an hour, total variable cost for 2 dresses is RM10 \( (TVC = RM10) \) and

\[
\text{Average variable cost}, \ AVC = \frac{TVC}{Q} = \frac{RM10}{2} = RM5
\]

Average product for the worker \( \frac{TP}{L} = \frac{2}{1} = 2 \)

From here we are able to see the connection between \( AVC \) and \( AP \), that is:

\[
AVC = \frac{w}{AP} = \frac{RM10}{2} = RM5
\]

\( AVC = \frac{w}{AP} \) can also be stated as \( AP = w / AVC \).

Due to increasing orders, you will hire another worker with the same amount of wage, that is, RM10 \( (w = RM10) \) per hour. Both workers are able to complete 6 dresses in an hour. Hence, marginal product is

\[
\text{MP} = \frac{\Delta TP}{\Delta L} = \frac{4}{1} = 4
\]

While marginal cost is:

\[
\text{MC} = \frac{\Delta TC}{\Delta Q} = \frac{RM10}{4} = RM2.50
\]

We see that RM2.50 can also be obtained from \( w / MP \). Therefore, we obtain the relationship between \( MC \) and \( MP \), that is, \( MC = w / MP \) or \( MP = w / MC \). \( AP \) and \( AVC \) for both workers are \( \frac{AP}{6/2} = 3 \), and \( AVC = w / AP = RM10 \div 3 = RM3.33 \). We find that \( AVC \) declined from RM5 to RM3.33, and \( AP \) increased from 2 to 3.

From the relationship that we have just described \( (AVC = w / AP) \), we can summarise that when \( AP \) is maximum, then \( AVC \) is minimum, and vice-versa. Also, because \( MC = w / MP \), hence \( MP \) is maximum when \( MC \) is minimum, and vice-versa.
The relationship between both the two cost curves and two production curves can be seen clearly in Figure 4.8, that is, the average cost curve and marginal cost curve are the mirror images for the average product and marginal product.

**Figure 4.8: Relationship between cost and production in short-run**

**YOUR IDEA**

Try to give other examples you have come across to establish the relationship between cost and production in short-run.

**Exercise 4.4**

**TRUE (T) / FALSE (F) Statements**

1. Average fixed cost (AFC) depicted by a horizontal line, is the main factor in determining decision in the short-run.

2. Average variable cost (AVC) curve and total average cost (AC) curve are intersected from the bottom by the marginal cost (MC) curve at the respective minimum point.

3. Marginal cost (MC) is the change in total cost due to increase in unit of labour.

4. Horizontal sum between AFC and AVC curves produces AC.
The production process involves industry, firm, plant, technology, input and output. The production function illustrates the form of technology used in production, that is, the process that combines inputs to produce output.

Firms are organisations that perform the production process. Firms may own several plants as the production unit. Meanwhile, industry consists of all firms competing in one market.

Inputs used by firms may consist of fixed or variable inputs. The use of fixed input will not change with change in output, while variable output changes according to the change in output quantity.

Time period is crucial in determining the choices made by firms. In short-run, firms are constrained by at least one fixed input. Meanwhile, in long-run, firms have more extensive choices since all the inputs are variable.

The three important concepts in short-run production are total product, average product and marginal product. Total product is the amount of output that can be produced by one production process in a given period of time. Average product is the output for one unit of variable input and marginal product is the addition in output when one unit of input is added.

Fixed input constraints causes short-run production to face the law of diminishing returns.

This law states that if a variable input is added in a production process that uses at least one fixed input, the increase in total output will eventually diminish after a certain level of input. Law of diminishing returns causes short-run production to fall into three levels, and optimal level is achieved when total output is maximum and marginal product is zero.

Economic costs consist of private costs and social costs. Private cost is the cost borne by the producer, while social cost is the cost borne by the society.

Private costs consist of explicit costs and implicit costs. Explicit cost is the tangible cost such as payment to production factors purchased in market, while implicit cost is the cost for inputs owned by the producer.

Short-run total production cost consists of total variable costs and total fixed costs. When total cost, total fixed cost and total average cost are divided by total output, average cost, average fixed cost and average variable cost will be obtained. Meanwhile, marginal cost is the addition in cost caused by an addition of one unit of output.

Short-run average cost and short-run marginal cost are mirror images to the short-run average product curve and short-run marginal product curve.
TUTORIAL QUESTION 1

INTRODUCTION

This activity is to ensure you have truly understood the concepts of short-run production and long-run production, and other related concepts such as marginal product, average product and production level.

THE PROBLEM

In the short-run, a firm faces constraints caused by the usage of fixed input. What is the effect of fixed input on the production process and decisions in the short-run production? This activity will answer some of the questions caused by the usage of fixed input.

QUESTION

The following table illustrates the use of fixed inputs, variable inputs and also total product produced by usage of input in production process.

<table>
<thead>
<tr>
<th>Fixed Input</th>
<th>Variable Input</th>
<th>Total Product</th>
<th>Average Product</th>
<th>Marginal Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) Complete the table for average product and marginal product of the variable inputs.

(b) Draw the total product curve, average product curve, and marginal product curve in one diagram.

(c) Show the production level in short-run.

(d) What is meant by the law of diminishing marginal returns based on the table you have completed, and when does this law starts to occur?

(e) Explain the relationship between these three curves in general.
TUTORIAL QUESTION 2

INTRODUCTION

The aim of the activity is to upgrade the students’ understanding towards the concept of short-run costs and long-run costs. Students will apply their ability in calculating short-run costs such as average variable cost and marginal cost, and draw the total cost and average cost curve.

THE PROBLEM

Knowledge regarding the shape of costs curve is important for firm to make production decisions. How is total cost and average cost calculated? What is the shape of total cost and average cost curves, and what are the relationships between various costs curves? Some of these questions will be answered through this activity.

QUESTION

The following table shows the total output and total cost for the production of good X.

<table>
<thead>
<tr>
<th>Output</th>
<th>TC</th>
<th>TFC</th>
<th>TVC</th>
<th>AC</th>
<th>AFC</th>
<th>AVC</th>
<th>MC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>196</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>4</td>
<td>212</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>310</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>430</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>570</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) Complete the table for total fixed cost (TFC), total variable cost (TVC), total average cost (AC), average fixed cost (AFC), average variable cost (AVC) and marginal cost (MC).

(b) Draw the total cost curve, total fixed cost curve, and total variable cost curve in one diagram.

(c) Draw the total average cost curve, average fixed cost curve, average variable cost curve and marginal cost curve in one diagram.
INTRODUCTION

The pricing and output decision does not only depend on demand of consumers and costs faced by firms. The pricing and output decision of the firm also depends on the structure of the market in which the firm is operating.

We will begin this topic by first understanding the characteristics of the perfectly competitive market.

5.1 ECONOMIC PROFIT AND ACCOUNTING PROFIT

THINK

Assume there are company A, B, C, and D. All of these companies produce detergent powder with different brands. How is the detergent price of company A, B, C, and D determined?
Firms (regardless in which industry structure) are assumed to have a common goal, that is, to maximise profit. Therefore, you should first understand the concept of profit. This is because profit through the perspective of economists is different from the profit calculated by accountants.

Generally, it is undeniable that the main motive of producers is to maximise profit. In other words, profit is the incentive for producers to produce goods and services.

Profit is the difference between total revenue (TR) with total costs (TC). However, the calculation of profit from the perspective of an economist differs from the calculation of profit by an accountant. This is because accountants will only consider the explicit costs. Hence, the profit calculated by accountants is referred to as accounting profit.

Meanwhile, for an economist, the explicit costs and implicit costs are both taken into account. Therefore, profit obtained from the calculation by an economist is known as the economic profit. Here, implicit cost refers to opportunity costs.

Let us look at one example:

Mr. Azman has a degree in mechanical engineering. He was offered to work as an executive with a private company with the salary of RM1,250 per month. However, he decided to open a shop selling motorcycle spare parts by withdrawing his savings of RM50,000 to be used as the capital. Rate of returns on the savings is 10% per annum.

He also rented a shop house with the rental of RM600 per month, and hired two workers with the wage of RM700 per month. Besides that, Mr. Azman spent RM40,000 in that particular year to purchase all the necessary equipments needed for his business.

If the total revenue he obtained for that year is RM120,000 minus the explicit cost amounting to RM64,000, hence Mr. Azman gained an accounting profit of RM56,000 per annum.

For an economist, Mr. Azman has to also take into account the implicit costs in calculating his profit. In this example, implicit costs refer to the opportunity costs since Mr. Azman had turned down the job as an executive, that is, at the amount of RM15,000 per annum. Mr. Azman also had to foregone the returns of RM5,000 per year for using his savings for the business.

This means that the implicit cost involved is RM20,000 per year. By subtracting the implicit cost from the accounting profit, Mr. Azman is actually gaining an economic profit of only RM36,000 per year.

The difference in calculating accounting profit and economic profit is depicted in the following table:
5.2 CHARACTERISTICS OF A PERFECTLY COMPETITIVE MARKET

Try to think for a moment what is meant by a perfectly competitive market, and explain the characteristics of the market.

Generally, a perfectly competitive market can be defined as a market that consists of many firms selling homogeneous products, having perfect market information, and with no restrictions for firms to enter or leave the industry.

A particular market is said to be operating under perfect competition if it has the following characteristics:

(a) **A Large Number of Sellers and Buyers**

The market consists of a large number of sellers and buyers. Therefore, any action by a single seller or buyer will not influence price. This is because the quantity produced (purchased) by a seller (buyer) relatively is very small compared to the quantity produced (purchased) in the market. Therefore, sellers and buyers will only accept the price fixed by the market.
(b) **Goods Produced are Homogeneous**

Every firm in the perfectly competitive market produces homogenous goods. This means that buyers are not able to differentiate the goods sold in the market. The most important implication of this characteristic is firms are not given any power in determining the price. Therefore, firms act only as the ‘price taker’.

(c) **Freedom to Leave or Enter Market**

This means that there are no restrictions for a firm to enter or leave the market. If the existing firm experiences positive economic profit, it cannot prevent new firms from entering the market. On the other hand, if the existing firm faces loss, it is free to leave the market. Since firms are free to leave and enter the market, there is always a large number of sellers and buyers in the perfectly competitive market. This freedom is only meant for the long-run. In the short-run however, firms cannot leave or enter market freely.

(d) **Perfect Information**

Every firm and buyer is assumed to have perfect information regarding the goods available in the market and the price fixed. With perfect information available, sellers will not sell goods at a price lower than the market price. Meanwhile, buyers will not purchase goods at a price higher than the market price.

After knowing the characteristics of a perfectly competitive market, now we can look at the shape of the demand curve, average revenue curve and marginal revenue curve of a firm in this market.

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**YOUR IDEA**

Can the market for petrol be considered as a perfectly competitive market? Explain your opinion.

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**5.3 CHARACTERISTICS OF A MONOPOLY MARKET**

**THINK**

In your opinion, why is there only one firm that controls the production of a particular good or service?
What is a monopoly market? A monopoly market is a market structure that contradicts the perfectly competitive market.

Besides that, there are other characteristics that differentiate monopoly market and perfectly competitive market. In this chapter, these characteristics will be described in detail.

**The monopoly market** (or usually referred to as the monopoly) can be defined as a market that consists of only one firm or seller.

The main characteristics that differentiate a monopoly from a perfectly competitive market are as shown in Figure 5.1:

![Figure 5.1: The features of a monopoly market](image)

### 5.3.1 No Close Substitutes

Goods produced by a monopoly do not have close substitutes in terms of the consumption of the good. In Malaysia, Tenaga Nasional Berhad (TNB) is the best example of a monopoly. Electricity supplied by TNB cannot be substituted with other forms of energy. Even though there might be other goods that can substitute the use of electricity, the good may still be limited in terms of its use and nature.

Candles, for example, can be used to provide light and substitute electricity power during blackout, but its use is limited. It cannot be used to receive television or radio programmes, or to turn on an electric fan.
5.3.2 Barriers to Entry into Industry

Unlike the perfectly competitive market, monopoly has the power to restrict the entry of other firms into the industry. This restriction is due to several reasons such as:

(i) license given by the government;
(ii) control over production resources; and
(iii) having the benefits of economies of scale, and others.

This will create monopoly power in a particular industry. Monopoly power will be explained in the following section of this chapter.

5.3.3 Firm as the Price Maker

As mentioned from the beginning, a monopoly market consists of only one firm that controls the whole market. This enables the monopolist to solely determine the price of goods or services provided.

YOUR IDEA

In your opinion, why can similar goods or services be sold at different prices to two different consumers?

5.4 POWER SOURCE OF MONOPOLY

THINK

Before proceeding with your readings, determine which of these are considered a monopoly?

(a) Tenaga Nasional Berhad
(b) Celcom (M) Berhad
(c) Perbadanan Urus Air Selangor (PUAS)
(d) Malaysian Airline System (MAS)
(e) Sistem Televisyen Malaysia Berhad (TV3)
There are several sources that cause monopoly power:

(a) Control over certain production resources;
(b) Economies of scale; and
(c) Legal barriers

### 5.4.1 Control Over Certain Production Resources

A monopoly can occur when a particular firm is able to control a large portion or the entire supply of raw material that cannot be afforded by other firms. Telekom Malaysia Berhad is one of the businesses attempting to control a large portion of telecommunication resources by taking over several other telecommunication companies such as Celcom and thus, becoming the monopoly in this industry.

De Beers is a common example that exemplifies world monopoly of the mining of precious gems. Almost all of the world’s precious gem mining is controlled by De Beers.

### 5.4.2 Economies of Scale

Economies of scale means a firm can produce output with a low average cost due to the large quantities produced. The output produced is able to accommodate almost all the demand in the market. This prevents new firms from entering the market because of the long time period needed to achieve economic scale.

If a new firm intends to enter the market, it needs to sell its output at a price as low as the price of the firm experiencing economies of scale; this will probably result in a loss and the new firm will soon have to leave the market.

### 5.4.3 Legal Barriers

The government creates regulatory barriers to protect the interests of the monopoly. The regulatory barriers can be in the form of licenses, patents, and copyrights. Figure 5.2 illustrates the legal barriers present.

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**Figure 5.2:** Regulatory barriers in the economy
(a) **License**

Public license is a legal right granted by the state government or the local government by imposing certain amount of payment onto the business owner. Without this license, the business operated is considered illegal and legal action can be taken towards it.

Any business such as the medical, food and other industries, will need to have a license. How can a license create monopoly power? License can create monopoly power because not all businesses will be granted license by the government.

However, granting of license seldom leads to monopoly power. In most situations, it will only reduce competition. The government will only provide license to a particular business which is considered to be more viable than other competitors. Any firm without license will be restricted from doing business.

(b) **Patent**

Patent is a form of special right given by the government to inventors or creators, with regard to their inventions or creations. This patent restricts other individuals from producing output similar to the invention that has been granted the patent right. Patent is vital in protecting new inventions and creations since it involves a very high cost. In the United States, patent for an invention is granted for a period of at least seventeen years.

(c) **Copyrights**

Copyright is also a patent that protects inventors from imitations. Copyright differs from patent as it is given to writings and publication of books, and song writing. Copyright only allows the particular writer to publish the particular book or song. Any unauthorised publication will be legally dealt with.

**YOUR IDEA**

In Malaysia, it is said that the awareness regarding patent choice of a particular invention by individuals is still low. In your opinion, what are the necessary measures that should be taken in order to increase awareness regarding this matter?

**YOUR IDEA**

Describe the reasons why monopoly power exists.
5.5 THE CHARACTERISTICS OF A MONOPOLISTIC MARKET

In the previous discussions, we have understood how two market structures having contrasting features or characteristics (the perfectly competitive market and monopoly) operate in the market. Now you are ready to learn about a type of market structure that has a combination of characteristics of the perfectly competitive market and the monopoly market, and this market structure is known as the monopolistic market.

Let us look at the characteristics of a monopolistic market. A market is classified as a monopolistic market when it has the following characteristics:

(a) a large number of sellers;
(b) unrestricted freedom of leaving or entering market; and
(c) different kinds of goods.

TRUE (T) / FALSE (F) Statements
1. Monopoly is said to be the imperfect competitive market because it only consists of one sole seller of goods that has no close substitutes.
2. Monopoly consists of only one buyer, while sellers are relatively large in number.
3. Factors such as large capital and high level of technology facilitate the monopolists to have a secured position in the market.
4. Advertising industry is preferred in increasing sale.

Exercise 5.1

The monopolistic competition market is a market that has quite a large number of firms, producing a variety of goods which are close substitutes of each other. Can you list down some examples of goods or services based on the characteristics of the monopolistic market?
5.5.1 A Large Number of Sellers

There are many sellers in a monopolistic market but not as many as in a perfectly competitive market. This means that the product of each firm is relatively small compared to the market product.

5.5.2 Unrestricted Freedom of Leaving or Entering Market

Firms have the freedom to leave or enter market as with firms in a perfectly competitive market. The effect is that the number of firms in the industry is coordinated until all firms in the market gain normal profit.

5.5.3 Goods that Can Be Differentiated

In a perfectly competitive market, goods produced are homogenous. In reality however, most goods have close substitutes, but not perfect substitutes. Therefore, goods produced by firms in a monopolistic competition market can be differentiated. Among the differences are as shown in Figure 5.3.

![Figure 5.3: Differences of goods produced](image-url)
5.6 CHARACTERISTICS OF AN OLIGOPOLY MARKET

5.6.1 A Small Number of Firms

Oligopoly is a market structure characterised by a few firms. This is different compared to the perfectly competitive market and the monopolistic market that consist of large number of sellers, whereas there is only one sole seller in the monopoly market.

Due to the small number of firms, an oligopoly firm is perceived to have the power to determine price but each firm must consider the action of competitors that is predicted to influence its decisions in determining price, output and carrying out advertising campaigns.

As a result, oligopoly firms are considered as mutually dependent since the profit of each firm not only depends on the strategies of price and sales, but also on the action of its competitors. The characteristic of mutual interdependence that exists among these firms in an oligopoly industry makes it hard to analyse the behaviour of a certain firm.
5.6.2 Homogenous Goods and Goods that Can Be Differentiated

In terms of goods, oligopoly firms may produce either homogenous goods or differentiated goods. Most of the goods produced such as zinc, aluminium, cement and steel are homogenous goods.

Meanwhile, consumer goods such as automobile, tyres, electronic equipments, cigarettes, breakfast cereals and sports equipments are goods that can be differentiated. For goods that can be differentiated, firms will usually conduct non-price competition such as advertising.

5.6.3 Barriers to Entry

Firms in an oligopoly market also face barriers as in the monopoly market. There are a few important barriers that influence the number of firms in market.

The small number of firms enables each firm to make enough sales to achieve economies of scale. For new firms, they only control a small portion of market share and definitely will not be able to achieve economies of scale. This means they run production with a high average cost and eventually, they will not be able to sustain in the industry.

![Figure 5.5: Barriers in an oligopoly market](image-url)
If seen in terms of competition, market structures can be arranged in the sequence starting from the perfectly competitive market, monopolistic competition market, oligopoly market, and finally the monopoly market.

Perfect competitive markets consist of many firms selling homogenous products, perfect market information and no restrictions for firms to enter or exit the market.

Monopoly is a type of market that consists of only one firm producing output for the entire society. A few factors have been identified as the source of monopoly power such as control towards input, economies of scale, patents, and licenses granted by the government.

The understanding towards market structure of the perfect competition and monopoly is very useful in studying the behaviour of firms in a monopolistic competition. Even though the firm has the power to determine price, it is not able to maintain profit in the long-run since there are many producers. Besides that, there are no barriers of entry or exit for firms in the market, which finally will lead to firms gaining only normal profit in the long-run.

In an oligopoly market, the firm not only has to fulfil this condition, but must also consider the action of its competitors when determining the price and output that maximises its profit.
Answers

TOPIC 1: INTRODUCTION TO ECONOMICS

Exercise 1.1
TRUE (T) / FALSE (F) Statements

1. T
2. T
3. F
4. T

Exercise 1.2
TRUE (T) / FALSE (F) Statements

1. T
2. T
3. F

Exercise 1.3
TRUE (T) / FALSE (F) Statements

1. T
2. F
3. T
Exercise 1.4

Fill in the Blanks

1. insatiable, limited
2. what, how, who
3. alternative, opportunity cost
4. Macroeconomics, Microeconomics
5. circular flow of income
6. wasted, not achieved
7. increasing, decreasing
8. non-intervention, mixed

Structured Questions

1. (a) Consumer goods

   ![Diagram](image1.png)

   Agricultural goods

   (b) Consumer goods

   ![Diagram](image2.png)

   Agricultural goods

   (c) Consumer goods

   ![Diagram](image3.png)

   Agricultural goods

   (d) Consumer goods

   ![Diagram](image4.png)

   Agricultural goods
TOPIC 2: DEMAND, SUPPLY AND MARKET EQUILIBRIUM

Exercise 2.1
TRUE (T) / FALSE (F) Statements

1. T
2. F

Exercise 2.2
TRUE (T) / FALSE (F) Statements

1. F
2. T
Exercise 2.3
TRUE (T) / FALSE (F) Statements

1. T
2. F
3. T
4. T

TOPIC 3: UTILITY ANALYSIS

Exercise 3.1
TRUE (T) / FALSE (F) Statements

1. F
2. F
3. T
4. T

Exercise 3.2
TRUE (T) / FALSE (F) Statements

1. T
2. T
3. F
Exercise 3.3
TRUE (T) / FALSE (F) Statements
1.  F
2.  T
3.  F
4.  F

Exercise 3.4
TRUE (T) / FALSE (F) Statements
1.  F
2.  T

Exercise 3.5
TRUE (T) / FALSE (F) Statements
1.  T
2.  T
3.  F
4.  T
TOPIC 4: THEORY OF PRODUCTION AND COST

Exercise 4.1
TRUE (T) / FALSE (F) Statements

1. T
2. T
3. T
4. F

Exercise 4.2
TRUE (T) / FALSE (F) Statements

1. F
2. F
3. T
4. F

Exercise 4.3
TRUE (T) / FALSE (F) Statements

1. T
2. T

Exercise 4.4
TRUE (T) / FALSE (F) Statements

1. F
2. T
3. F
4. T
TOPIC 5: MARKET STRUCTURES

Exercise 5.1

TRUE (T) / FALSE (F) Statements

1. T
2. F
3. T
4. F