

Principles of Economics (POE)



THE INSTITUTE OF BANKERS, BANGLADESH (IBB)

DR Tower (12th Floor), 65/2/2 Bir Protik Gazi Golam Dostogir Road, (Box Culvert Road) Purana Paltan, Dhaka-1000

Phone: 02-55112857-60, Fax : (8802) 55112856, E-mail : ibb.diploma@gmail.com

Web : www.ibb.org.bd & www.online.ibb.org.bd



PRINCIPLES OF ECONOMICS

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The Institute Of Bankers, Bangladesh (IBB)

Forewords

The Institute Of Bankers, Bangladesh (IBB), established in 1973, has been working for developing the professional skills of the employees of all Banks and Financial Institutions operating in Bangladesh. In this regard, IBB conducts the Banking Professional examination, JAIBB (Junior associate of the Institute Of Bankers, Bangladesh) and AIBB (Associate of the Institute Of Bankers, Bangladesh) usually held twice in a year throughout the country.

The examinations are being conducted under standard syllabus covering various aspects of banking profession. As banking is ever-evolving discipline, the syllabus for banking Professional examination is also required to be matched with the changing banking conditions. For the same purpose, A committee was formed under the leadership of Dr. Toufic Ahmad Choudhury former Director General, BIBM and comprising of Mr. Md. Ali Hossain Prodhania, Former Managing Director, Bangladesh Krishi Bank, Mr. Abul Kashem Md. Shirin, Managing Director & CEO, Dutch-Bangla Bank Ltd., Dr. Mohammad Haider Ali Miah, Former Managing Director & CEO, EXIM Bank of Bangladesh Ltd., Dr. Shah Md. Ahsan Habib, Professor, BIBM, Mr. Alamgir Morshed, CEO, IDCOL, Mr. Omar Faruque , CFCC Head, Standard Chartered Bank and Laila Bilkis Ara, Secretary General, IBB for updating and upgrading the syllabus of IBB Banking Professional examination.

The committee did a splendid job of formulating the new syllabus for both JAIBB and AIBB, which was later approved by the Syllabus and Examination Committee and Council Chairman of the institute (Honorable Governor, Bangladesh Bank). The same committee has also been entrusted to formulate standard reading materials by the subject matter specialists and practitioners under their (committee members) guidance in order to facilitate the examinees for consulting focused reading materials instead of so many (sometimes also irrelevant) books. This particular reading material on **Principles of Economics (POE)** has been prepared and compiled by Dr. Shah Md. Ahsan Habib and Dr. Toufic Ahmad Choudhury. We extend our gratitude and thanks to them for taking the trouble of writing the reading material.

All the reading materials of (both JAIBB and AIBB) will be gradually uploaded in the IBB e-library Web portal. The examinees/ readers/users are requested to send their opinion/ suggestion on any reading material and we will consider their opinion with great importance. Besides, the IBB will modify update the reading materials from time to time as per requirements of the examinees.

Finally, the Institute Of Bankers, Bangladesh takes this opportunity to express its gratitude to the learned members of IBB Council, the syllabus and examination review committee and reading material preparation committee for preparing syllabus and reading materials for IBB diploma examinations.

Laila Bilkis Ara
Secretary General, IBB

**Shah Md Ahsan Habib
Toufic Ahmad Choudhury**

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Module-A:
Economics: Introduction

Module-A: Economics: Introduction

Defining Economics

‘Economics’ analyzes human behavior scientifically. It explores the economic interactions between consumers and producers. Economics evolves continuously as current observations and experience provide new evidence about economic behaviour and relationships.

Economics examines how people choose among the alternatives available to them. It is social because it involves people and their behavior. It is a science because it uses, as much as possible, a scientific approach in its investigation of choices.

Microeconomics and Macroeconomics

Economists look at two realms of Economics. Macroeconomics is the big picture, which is concerned with how the overall economy works. Microeconomics, the little picture, is concerned with how supply and demand interact in individual markets for goods and services.

The subject matter of ‘microeconomics’ is individual behaviours and economic actions at the level of the person or organization. More specifically, ‘microeconomics’ is the study of individual behaviour in the context of scarcity. Not all individual behaviours are motivated by self-interest; many are motivated by a concern for the wellbeing of society-at-large. Philanthropic societies are goal-oriented and seek to attain their objectives efficiently.

In macroeconomics, the subject is typically a nation—how all markets interact to generate big phenomena that economists call aggregate variables. Technically, macroeconomics approaches the economy as a complete system with interactions that determine national economic performance. These interactions within the system mean that the operation of the macro-economy is more complex than the operation of the sum of its parts. It studies such things as employment, gross domestic product, and inflation-the stuff of news stories and government policy debates.

The two fields of ‘microeconomics’ and ‘macroeconomics’ coexist and complement each other. Microeconomics, in its examination of the behavior of individual consumers and firms, is divided into consumer demand theory, production theory, and related topics such as the nature of market competition, economic welfare, the role of imperfect information in economic outcomes, etc. It concerns such issues as the effects of minimum wages, taxes, price support, or monopoly on individual markets and is filled with concepts that are recognizable in the real world. It has applications in trade, industrial organization and market structure, labor economics, public finance, and welfare economics. Macroeconomics describes relationships among aggregates- such as national income, savings, and the overall price level. The field is conventionally divided into the

study of national economic growth in the long run, the analysis of short-run departures from equilibrium, and the formulation of policies to stabilize the national economy—that is, to minimize fluctuations in growth and prices. Those policies can include spending and taxing actions by the government or monetary policy actions by the central bank.

Positive vs. Normative Economics

‘Positive economics’ studies objective or scientific explanations of how the economy functions. Its aim is to understand and generate predictions about how the economy may respond to changes and policy initiatives. In this effort personal judgments and preferences are kept apart. In this particular sense, economics is similar to the natural sciences such as physics or biology. Positive economics are based on facts, actual data and numbers; and these can be scientifically proven and verified. ‘Keeping other factors constant, increase in interest rate causes decrease in demand for loans’ is an example of positive statement.

In contrast, ‘normative economics’ offers recommendations based partly on value judgments. While economists of different political persuasions can agree that raising the income tax rate would lead to some reduction in the number of hours worked, they may yet differ in their views on the advisability of such a rise. One economist may believe that the additional revenue that may come in to government coffers is not worth the disincentives to work; another may think that, if such monies can be redistributed to benefit the needy or provide valuable infrastructure, the negative impact on the workers paying the income tax is worth it. Normative economics is based on opinions and value judgments and thus may be scientifically proven and verified. ‘Considering the existing economic scenario, interest rate should be reduced for improving investment environment’ is an example of normative statement.

Scarcity and Problem of Choice

Our resources are limited, however desires are unlimited. Economics is concerned about how to meet our unlimited desires with limited resources. We would always like more and better housing, more and better education more and better of practically everything.

If our resources were also unlimited, we could say yes to each of our wants and there would be no economics. Because our resources are limited, we cannot say yes to everything. To say yes to one thing requires that we say no to another. Whether we like it or not, we must make choices.

Our unlimited wants are continually colliding with the limits of our resources, forcing us to pick some activities and reject others. Scarcity is the condition of having to choose among alternatives. A scarce good is one for which the choice of one alternative use of the good requires that another be given up.

A free good is one for which the choice of one use does not require that we give up another. Coconut on an island may be free good for a certain period of time. There are not many free goods. Scarcity confronts people with choices, and the associated fundamental economic questions. Every economy must determine what should be produced, how it should be produced, and for whom it should be produced.

What should be produced? Using the economy's scarce resources to produce one thing requires giving up another. Producing better education, for example, may require cutting back on other services, such as health care. A decision to preserve a wilderness area requires giving up other uses of the land. Every society must decide what it will produce with its scarce resources.

How should goods and services be produced? There are all sorts of choices to be made in determining how goods and services should be produced. Should a firm employ a few skilled or a lot of unskilled workers? Should it produce in its own country or should it use foreign plants? Should manufacturing firms use new or recycled raw materials to make their products?

For whom should goods and services be produced? If a good or service is produced, a decision must be made about who will get it. A decision to have one person or group receive a good or service usually means it will not be available to someone else. For example, representatives of the poorest nations on earth often complain that energy consumption per person in the United States is many *times* greater than energy consumption per person in the world's scores of poorest countries. Critics argue that the world's energy should be more evenly allocated. Should it? That is a "for whom" question.

Opportunity Cost

It is within the context of scarcity that economists define an important concept in all of economics, the concept of opportunity cost. Opportunity cost is the value of the best alternative forgone in making any choice. Opportunity cost refers to what one has to give up to buy in terms of other goods or services. When economists use the word "cost," he/she usually means opportunity cost. Thus, opportunity cost is what must be sacrificed when a choice is made. That cost may be financial; it may be measured in time, or simply the alternative foregone.

The concept of opportunity cost must not be confused with the purchase price of an item. Consider the cost of a college or university education. That includes the value of the best alternative use of money spent for tuition, fees, and books. But the most important cost of a college education is the value of the forgone alternative uses of time spent studying and attending class instead of using the time in some other endeavor. Students sacrifice that time in hopes of even greater earnings in the future or because they place a value on the opportunity to learn.

Opportunity costs play a determining role in markets. It is precise because individuals and organizations have different opportunity costs that they enter into exchange agreements. If you are a skilled plumber and an unskilled gardener, while your neighbour is a skilled gardener and an unskilled plumber, then you and your neighbour not only have different capabilities, you also have different opportunity costs, and you could gain by trading your skills.

In the context of financial industry, a simple example of opportunity cost is to let us suppose that a person is having BDT 50000 in his hand and He has the option to keep it with himself at home or deposit in the bank which will generate interest of 4% annually so now the opportunity cost of keeping money at home is BDT 2000 per year as opposed to Bank.

Economic Resources

Economic resources are the inputs we use to produce goods and services. Economic resources can be divided into four categories: labour, land or natural resources, capital, and entrepreneurship (entrepreneurial ability). Labour refers to human effort and talent. Natural resources are resources, such as land, oil, and water. Capital refers to man-made equipment like machinery, buildings, or computers. Finally, entrepreneurship involves the effort and know-how to put all the other resources together.

Natural Resources: Natural resources include land, water, metal etc. Sometimes all the natural resources and environment as a whole are classified under 'land'. Natural resources are sourced from nature and used for the production of goods and services. Natural resources are often limited in quantity due to the time it takes for them to form. Natural resources are classified further into non-renewable resources and renewable resources. Depending on the industry, the importance of land as a natural resource may vary. Land is fundamental in the agricultural industry as it's used to grow food. The 'environment' is a somewhat abstract term that includes all the resources in the surrounding environment that we can use. They primarily consist of resources like solar or wind energy; gases such as oxygen and nitrogen; physical resources such as coal, natural gas, and fresh water.

Human Resources: Human resources are also termed as labour. Human resources not only contribute to the production of goods but also play an essential role in offering services. Human resources generally possess some form of education and skills. Businesses need to ensure their labour force is capable of conducting the production processes required by providing appropriate training and ensuring the safety of the work environment. However, human resources are also capable of adjusting themselves, because they are a dynamic factor of production. They can increase their productivity to contribute more to the efficiency of production. In terms of education or training, businesses can source labour from a specific educational background to reduce the

training time. When hiring for different departments of banks, a bank looks for candidates with an educational background in banking, finance or business other similar subjects.

Capital: Capital resources are resources that contribute to the production process of other goods. Hence, economic capital is different from financial capital. There are various types of economic capital. Machinery and tools are classified as fixed capital. Partly-produced goods (work-in-progress) and inventory are considered working capital. Financial capital refers to money in a broad sense, which doesn't contribute to the production process, though it is essential for businesses and entrepreneurs to carry on their economic activities.

Entrepreneurship: Entrepreneurship is a special human resource that refers to the ability to come up with ideas that would be potentially turned into economic goods, risk-taking, decision-making, and running the business, which requires the incorporation of the other three factors of production. An entrepreneur would need to take the risks of borrowing, renting land, and sourcing appropriate employees. The risk, in this case, involves the chances of not being able to pay the loan due to a failure in the production of goods or sourcing the factors of production.

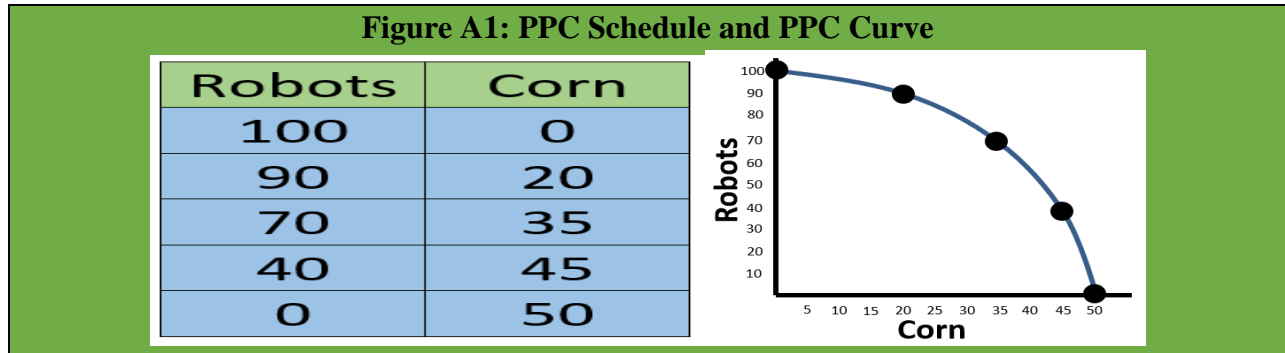
In the process of today's production process technology is playing crucial roles, the knowledge that can be applied to the production of goods and services. The interplay of entrepreneurs and technology affects all our lives. Entrepreneurs put new technologies to work every day, changing the way factors of production are used. Finance Professionals, farmers and factory workers, engineers and electricians, technicians and teachers all work differently than they did just a few years ago, using new technologies introduced by entrepreneurs.

Production Possibilities Curve

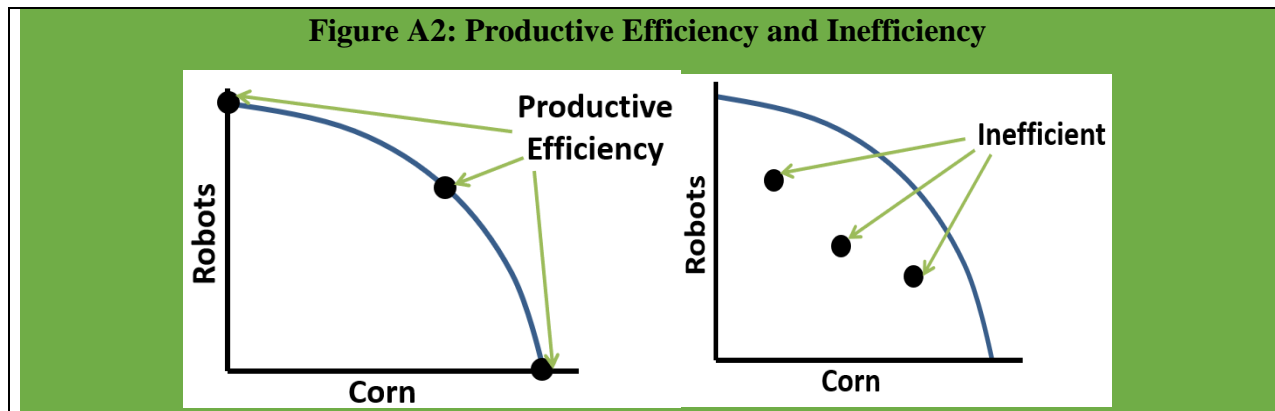
An economy's factors of production are scarce; they cannot produce an unlimited quantity of goods and services. The Production Possibilities Curve (PPC) is a model used to show the tradeoffs associated with allocating resources between the productions of two goods. The PPC can be used to illustrate the concepts of scarcity, opportunity cost, efficiency, inefficiency, economic growth, and contractions. The production possibilities curve (sometimes called the production possibilities frontier) illustrates the trade-offs and opportunity costs of production choices. The production possibilities curve is important to both microeconomics and macroeconomics.

The production possibilities curve (PPC) is a graph that shows all combinations of two goods or categories of goods an economy can produce with fixed resources. Take the example illustrated in the chart. This chart shows all the production possibilities for an economy that produces just two goods; robots and corn. The chart shows the different combinations of robots and tons of corn the economy could produce. If all resources were devoted to the production of robots, the economy would produce 100 robots, but zero tons of corn. On the other end of the chart, we see the other extreme where all resources were devoted to the production of corn. 50 tons of corn could be

produced, but then zero robots would be produced. Intermediate combinations of corn and robots are also shown (Figure A-1).

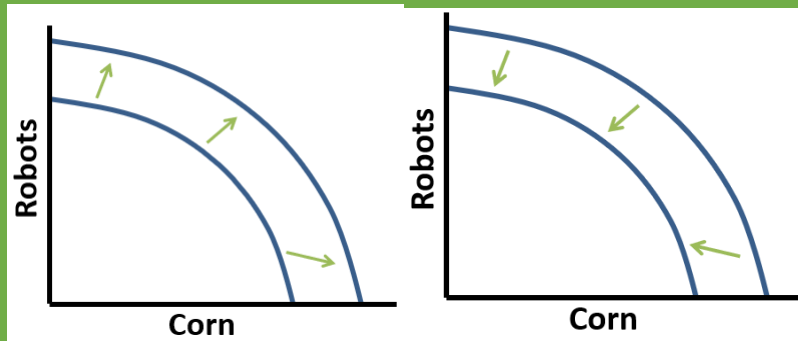


Since all points on the curve are the maximum levels of production, any point on the curve is productively efficient. Productive efficiency means you are getting the most out of your resources. It is important not to put value judgments on this economy. Whether they choose to produce only corn, only robots, or some combination of both, it is productively efficient. Any point of production inside the curve is considered inefficient because the economy is not fully utilizing its resources. In macroeconomics, points inside the curve are used to illustrate a recession. In a recession, unemployed workers are not producing goods and services, so the economy is not producing its long run potential.



Increases in the quantity or quality of resources will shift the PPC outward, making it possible to produce greater quantities of both goods. Increases in the quantity of resources include more land, labor, or capital. Increases in the quality of resources most often focus on expanding human capital (skill and knowledge of labor), but could also include anything that makes land, labor, or capital more productive. Decreases in the quantity or quality of resources will shift the PPC inward. This decreases the possible production of both goods.

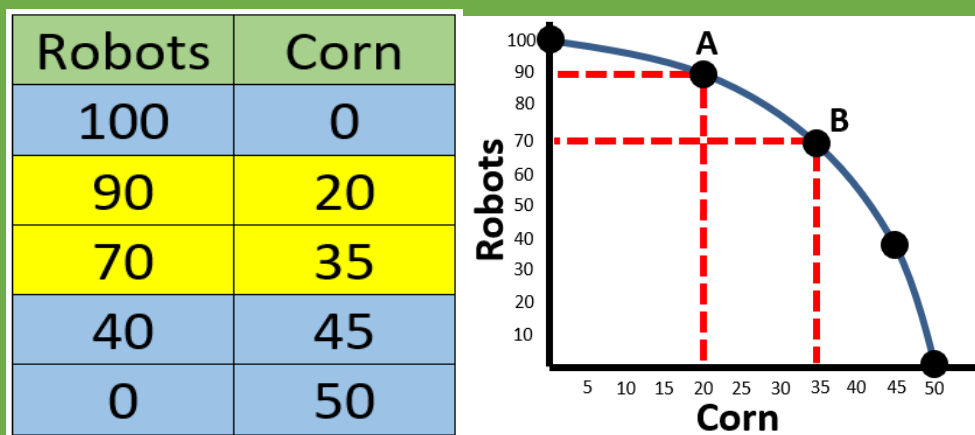
Figure A3: Shifting of PPC [Increase and Decrease]



Opportunity cost is what you lose out when you make a choice. Production possibilities curves show opportunity costs associated with different levels of production. As the economy below increases production of corn, it loses some amount of robots (and vice versa).

Opportunity costs can be found and calculated (when there are numbers) from a production possibilities curve. To figure out the opportunity cost of a given change in production just check the axes and do the math. If production for this economy moved from point A to point B the production of corn would increase from 20 tons to 35 tons. But those extra 15 tons (35-20) of corn are not free. That is because the production of robots is reduced from 90 to 70. So, the opportunity cost of those extra 15 tons of corn is 20 robots (90-70). Likewise, moving production from point B to point A comes at a cost of 15 tons of corn (Figure A4).

Figure A4: Shape of PPC and Increasing Opportunity Costs



Economic Models

All disciplines progress and develop and explain themselves using models of reality. A model is a formalization of theory that facilitates scientific inquiry. An economic model is a simplified version of reality that allows us to observe, understand, and make predictions about economic behavior. The purpose of a model is to take a complex, real-world situation and pare it down to the essentials. Economists see the world through a different lens than anthropologists, biologists, classicists, or practitioners of any other discipline. They analyze issues and problems with economic theories that are based on particular assumptions about human behavior that are different than the assumptions an anthropologist or psychologist might use. A theory is a simplified representation of how two or more variables interact with each other. The purpose of a theory is to take a complex, real-world issue and simplify it down to its essentials. If done well, this enables the analyst to understand the issue and any problems around it. A good theory is simple enough to be understood, while complex enough to capture the key features of the object or situation being studied.

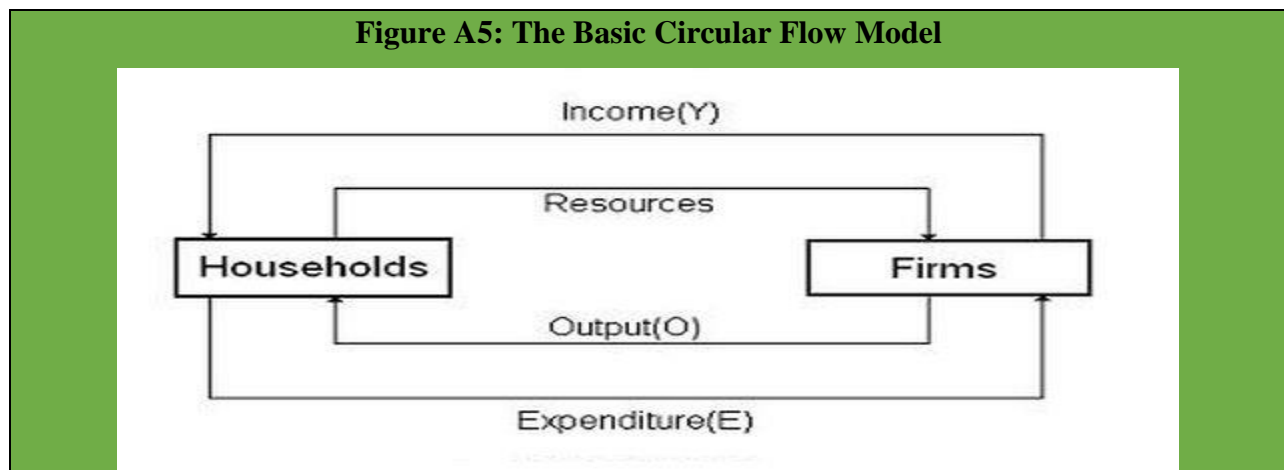
Sometimes economists use the terms model and theory interchangeably. Strictly speaking, a theory is a more abstract representation, while a model is more applied or empirical representation. Models are used to test theories.

Economic models offer a way to get a complete view or picture of an economic situation and understand how economic factors fit together. A good model to start with in economics is the circular flow diagram. Such a diagram indicates that the economy consists of two groups, households and firms, which interact in two markets: the goods-and-services market (also called the product market), in which firms sell and households buy, and the labor market, in which households sell labor to business firms or other employees.

Circular Flow Models

The circular flow model demonstrates how money moves through society. Money flows from producers to workers as wages and flows back to producers as payment for products. In short, an economy is an endless circular flow of money. The models can be made more complex to include additions to the money supply, like exports, and leakages from the money supply, like imports.

In the basic (two-factor) circular flow model, money flows from households to businesses as consumer expenditures in exchange for goods and services produced by the businesses, then flows back from businesses to households for the labor that individuals provide.



There are also concepts of three-sector model, four-sector model, and five sector model:

Three-Sector Model: In the three-sector model, the government is added to the two-sector model. In this model, money flows from households and businesses to the government in the form of taxes. The government pays back in the form of government expenditures through subsidies, benefit programs, public services, etc.

Four-Sector Model: The four-sector model contains the foreign sector, which is also known as the overseas sector or external sector. The overseas sector turns a closed economy into an open economy. It is connected to the other sectors through two flows of money: foreign trade (imports and exports) and foreign exchange (inflow and outflow of capital). Like the other sectors, each flow of money is paired with a flow of a factor of production or goods and services.

Five-Sector Model: The fifth sector – the financial sector – is added to complete the circular flow model. It includes banks and other institutions that provide borrowing and lending services to the other sectors. Savings and investments are assumed in the five-sector model, which flow from other sectors with residual cash into the financial institutions, then out to the sectors that need money. As long as lending (injection) is equal to borrowing (leakage), the circular flow reaches an equilibrium and can continue forever.

Sectors of a Circular Flow Models are:

Household Sector: In a two-sector model, circular flow models start with the household sector that engages in consumption. Households contribute to an economy by working (giving away time and labor) and by buying products (giving away money). In return, households consume products and utilize government programs.

Business Sector: In a two-sector model, circular flow models also include the business sector that produces the goods. Businesses absorb a variety of production costs including labor, materials, and overhead. As a result, many companies are able to manufacture products that benefit other parties.

Government Sector: In a three-sector model, government sector cash flows are included. The government injects money into the circle through government spending on programs such as Social Security and public goods. It also extracts money from households and businesses by way of taxes.

Foreign Sector: In a four-sector model, money also flows into the circle through exports, which bring in cash from international buyers from the foreign sector. By extension, this indicates that the two-sector or three-sector models are domestic activity only. The foreign sector is different from the domestic sector as there may be administrative inefficiencies that result in lost cash flow due to import taxes, duties, or fees.

Financial Sector: In a five-sector model, cash flow from the financial sector is added. This includes banks and other institutes that provide cash flow via lending services. Some circular flow models also outline investor activity, as cash flow from entrepreneurs and investors may represent an inflow to businesses while net profits from the company represent an outflow.

Economic Systems -Market Economy and Command Economy

An economic system is a way how a society produces and distributes goods and services. It involves how things are made, who gets to make them, how they are distributed, and how people get access to them. An economic system serves as a regulatory system for controlling different aspects of production and distribution, including capital, labor, land and other physical resources. In an economic system, there are many essential entities, agencies and decision-making authorities. Additionally, economic systems typically follow patterns of use and consumption that make up the structure of society and communities. In the context of the current global scenario, the economic systems are broadly categorized into Market Economy and Command Economy.

Market Economic System: Market economy also referred to as capitalism or in its extreme form laissez-faire economy. Market economies are economic systems wherein market decisions are governed by price fluctuations that occur when sellers and consumers interact to set the sale of products. In a market economic system communities, firms and proprietors act in self-interest to decide how to allocate and distribute resources, what to produce and who to sell to. Governments in market systems typically have little intervention in how businesses operate and generate income, however, can regulate factors like fair trade, policy development and honest business operations. Decision-making in a market economy is dictated by price fluctuations that happen between producers and consumers. Main characteristics of the market economy are private ownership, competition, and minimum to no government intervention. The amount individuals pay for items is determined by the law of supply and demand. One advantage to this type of economy is that buyers can locate what they want and purchase as many of the items as they want and can finance. An issue is that there is no pricing stability, and enterprises that are mishandled can fail.

Market Economic System is featured with certain objectives: provides incentive for innovative entrepreneurship; gives consumers a choice in goods, services and purchase prices; creates market competition for resources, resulting in quality offerings and efficient use of resources to produce goods; and inspires research, development and advances in goods and production of goods.

There are certain recognized disadvantages like highly competitive markets can cause a scarcity in resources for disadvantaged individuals; potential for monopolizing of industries and niches, such as technology, health care and pharmaceuticals; and can increase income disparity by placing focus on economic needs over societal, community and human needs.

Command Economic System: A command economy, also called planned economy, is an economic system in which the government makes all the economic decisions regarding the production, distribution, and consumption of goods and services. In command economic systems, governments and centralized powers control much of the economic processes, including allocating and distributing resources, goods and services. In a command economy, the government plays a key role in directing and intervening in business processes that provide essential goods and services to the community. Many command economies consist of governments that have total control over the distribution and use of valuable resources, like oil and gas. Additionally, these types of systems may operate under governing entities that have ownership of essential industries like transportation, utilities and energy, and technology. Command economies can be beneficial for creating sustainability, however, there are a few potential drawbacks to this type of system.

The advantages of a command economy or planned economy are that central planning allows the elimination of market failures, and in theory, better allocation of resources, prioritizing social needs over profits. More specifically, the command economy creates potential for mass mobilization of necessary resources due to government control; creates additional jobs for community members and citizens due to increased mobility of resources; focuses on benefits to society over individual interests; encourages more efficient use of valuable resources.

Disadvantages, on the other hand, include limited consumer choice and a lack of incentives for innovation. More specifically the command economic system may create scarcity due to an inability to plan for individual needs; force government rationing due to inability to calculate demand on set prices; eliminates market competition, resulting in a lack of innovation and advancement; inhibit employees' freedom to pursue creative jobs and careers.

Based on historical evidences and evaluation of the economic systems, some other forms of financial systems that are commonly named as follows:

Mixed Economic System: A mixed economy combines elements of command and market economies. All of the societies present-day have features of both systems and are frequently called mixed economies, despite the fact that almost all societies tend to lean toward one form of the economy more than the other. A mixed economy is an economy that combines parts of command and market economies. A mixed economy aims to reduce the drawbacks of both systems while implementing the advantages. In a mixed economy, government can intervene in key sectors like education, or healthcare while leaving other, less important from the perspective of a well-being of the society, sectors to private companies. The increasing government involvement also ensures that less competitive individuals are looked after. This eliminates one of the drawbacks of a market economy, which favors only the most successful or inventive.

Traditional Economic System: With traditional economies, historical norms and habits govern what and how things are created, distributed, and spent. Every individual within this society understands their place in the greater group. Because occupations are handed down through generations, there is minimal change in professions over time. Traditional economic systems are often found in rural or remote areas where access to modern technology and infrastructure is limited. These systems tend to be self-sufficient and sustainable, but they may also be susceptible to external shocks and disruptions. A traditional economy is an economy where historical norms and habits govern what and how things are created, distributed, and spent. While money can be used in traditional economies, but it is often limited to certain transactions and may not be the primary medium of exchange. In many traditional economies, bartering is more common than using money.

Economics and Financial Industry¹

The study of economics is important in the financial industry because it quintessentially relates to human behaviour on an individual, business and national level. The financial industry is an integral part of the economy and as such subject to its many forces.

Although these are generally taught and presented as separate disciplines, economics and finance are interrelated and inform and influence each other. Investors care about these studies because they also influence the markets to a great degree. There is no way to avoid 'either/or' arguments regarding economics and finance; both are important and have valid applications.

Economics is more on the big picture or general questions about human behavior around the allocation of real resources. The focus of finance is more on the techniques and tools of managing money. Both economics and finance also focus on how companies and investors evaluate risk and return. In fact, economics and finance seem to be converging in some respects.

¹ <https://www.investopedia.comeconomics.asp>; <https://www.academia.edu>

Indicative Questions and Exercises

1. What is economics? How Microeconomics and Macroeconomics are different?
2. 'Scarcity brings in the problem of choice' - Explain.
3. What is the relevance of Opportunity Cost in economics?
4. What are the three basic questions an economy confronts?
5. Give examples of positive and normative statements.
6. Interpret 'Capital' as a factor of production.
7. Explain 'Human Resources' and 'Entrepreneurship' as factors of production.
8. Draw and explain a production possibilities curve for an economy that produces milk and cookies. What happens to this frontier if disease kills half of the economy's cows?
9. Use a production possibilities frontier to describe the idea of "efficiency."
10. What are the two subfields into which economics is divided? Explain what each subfield studies.
11. What is the difference between a positive and a normative statement? Give an example of each.
12. Why do economists sometimes offer conflicting advice to policymakers?
13. 'The circular-flow diagram illustrates that, in markets for the factors of production, where households are sellers, and firms are buyers.' - Do you agree? Explain.
14. 'A point inside the production possibilities frontier is efficient, but not feasible' - Do you agree? Explain.
15. 'A point on the production possibilities curve is feasible and efficient.' - Explain.
16. Explain major economic systems following a historical perspective.
17. Explain the difference between Market and Command Economy based on their characteristics.
18. You win BDT100 in a basketball pool. You have a choice between spending the money now and putting it away for a year in a bank account that pays 5 percent interest. What is the opportunity cost of spending the BDT100 now?
19. Identify positive and normative statements from the following: a. the new law will reduce national income; b. New Bank Companies Act is a good piece of legislation; c. Parliament ought to pass law X; d. President should veto the new law.
20. Classify the following topics as relating to microeconomics or macroeconomics: a. a family's decision about how much income to save; b. the effect of government regulations on auto emissions; c. the impact of higher national saving on economic growth; d. a firm's decision about how many workers to hire; e. the relationship between the inflation rate and changes in the quantity of money

Module-B:
Basics of Microeconomics

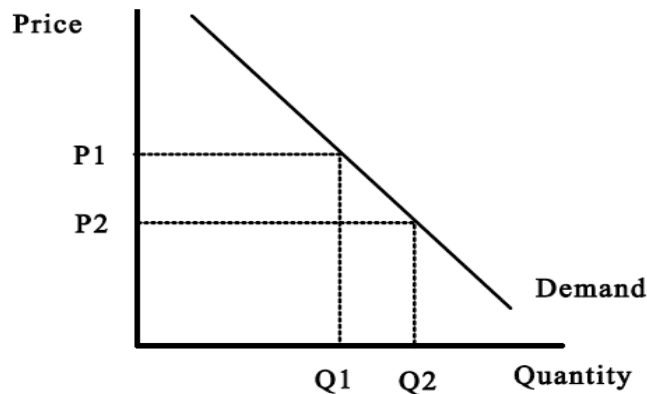
Module-B: Basics of Microeconomics

Basics of Supply-Demand and Market Equilibrium

A market is a group of buyers and sellers of a particular good or service. The buyers as a group determine the demand for the product, and the sellers as a group determine the supply of the product. A market is nothing more or less than the locus of exchange; it is not necessarily a place, but simply buyers and sellers coming together for transactions. Demand and supply, and the associated economic fundamentals are key concepts of market forces for determining market prices.

The law of demand states that as price increases (decreases) consumers' purchase less (more) of the specific commodity. The demand schedule (demand curve) reflects the law of demand it is a downward sloping function and is a schedule of the quantity demanded at each and every price. As price falls from P_1 to P_2 the quantity demanded increases from Q_1 to Q_2 (Figure A2). This is a negative relation between price and quantity, hence the negative slope of the demand schedule; as predicted by the law of demand.

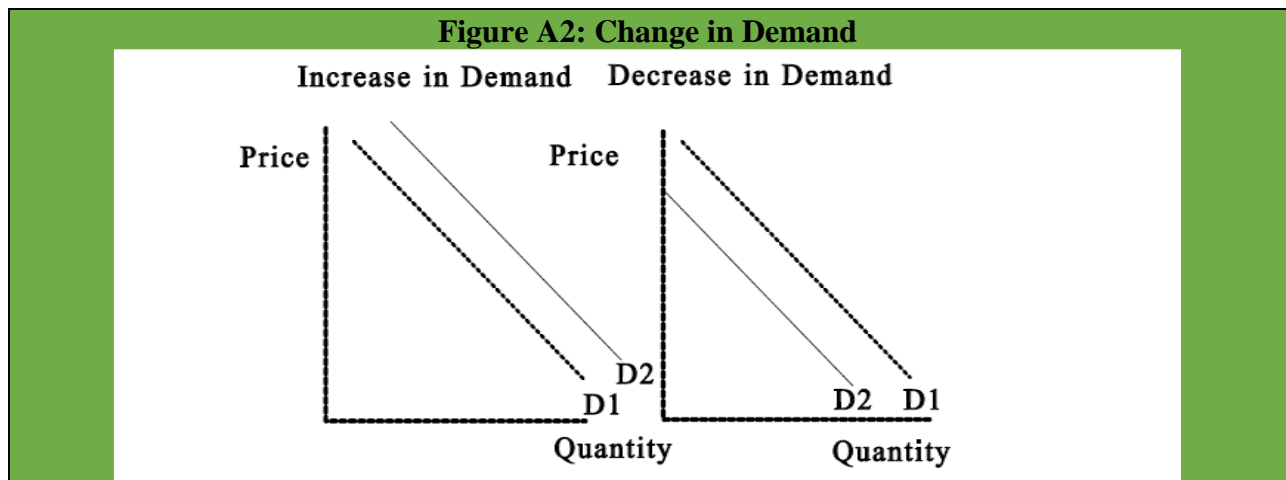
Figure A2: Demand Curve



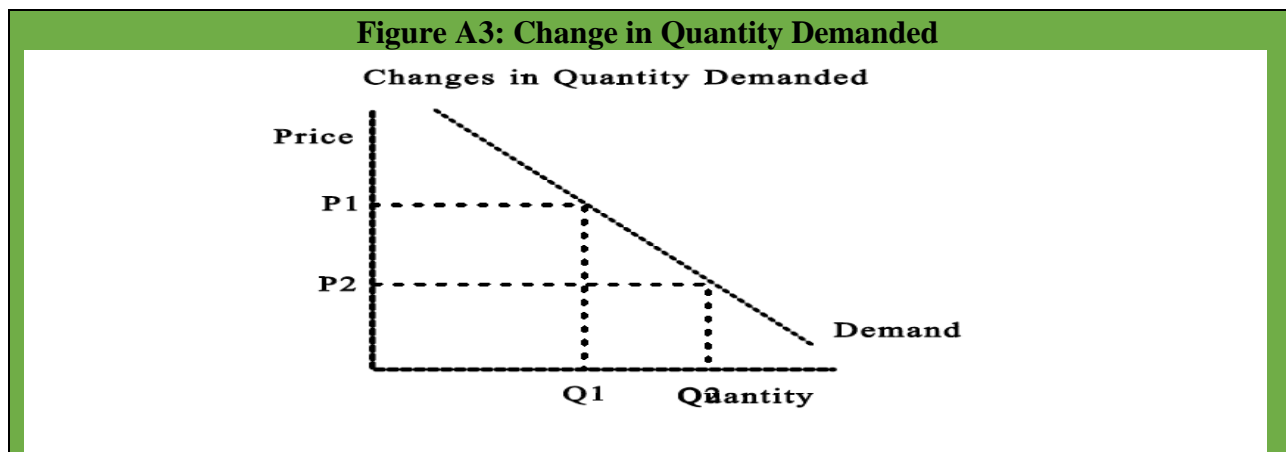
This indicates the decreasing utility (use, pleasure, jollies) from the consumption of commodities. Changes in prices caused changes in quantity demanded because of two effects: Income Effect and Substitution Effect. The income effect is the fact that as a person's income increases (or the price of the item goes down [which effectively increases command over goods] more of everything will be demanded. The substitution effect is the fact that as the price of a commodity increase, consumers will buy less of it and more of other commodities.

Quantity Demanded, Demand Curve and Change in Demand: The quantity demanded of any good is the amount of the good that buyers are willing and able to purchase. As we will see, many things determine the quantity demanded of any good, but in our analysis of how markets work, one determinant plays a central role—the price of the good. The demand curve shows the negative relation between price and quantity. Individual and market demand curves are related. An aggregation of all individual demand curves for a particular commodity.

Non price determinants of demand; and a shift to the left (right) of the demand curve is called a decrease (increase) in demand. The non-price determinants of demand are: tastes and preferences of consumers; the number of consumers; the money incomes of consumers; the prices of related goods, and consumers' expectations concerning future availability or prices of the commodity. This is true for normal goods. For inferior goods, the result would be reverse.



An increase in demand is shown in the first panel (Figure A2), notice that at each price there is a greater quantity demanded along D2 (the dotted line) than was demanded with D1 (the solid line). The second panel shows a decrease in demand, notice that there is a lower quantity demanded at each price along D2 (the dotted line) than was demanded with D1 (the solid line).

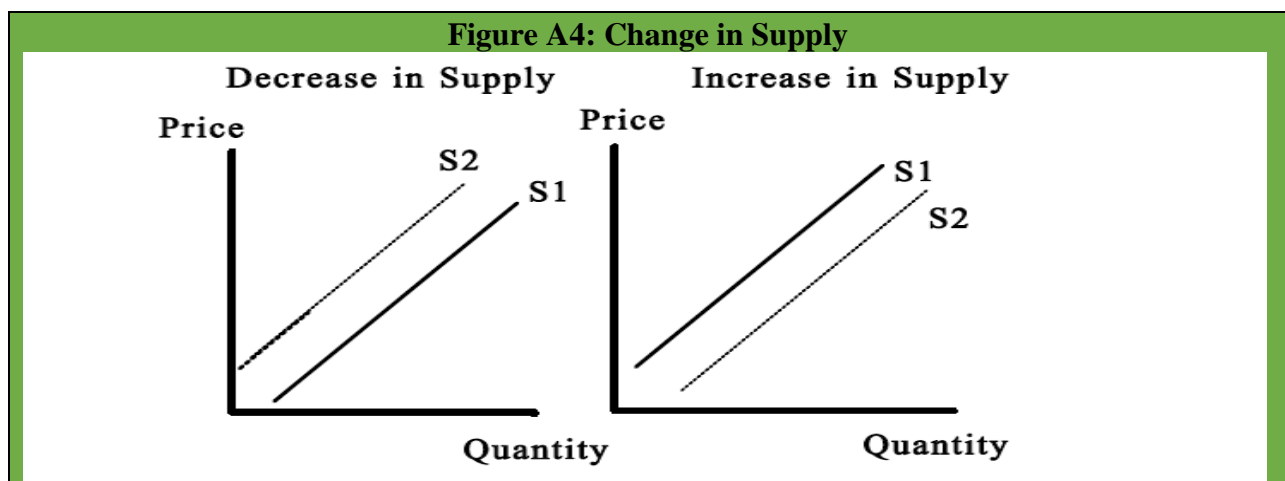


Movement along a demand curve is called a change in the quantity demanded. Changes in quantities demanded are caused by changes in price. When price decreases from P_1 to P_2 , the quantity demanded increases from Q_1 to Q_2 ; when price increases from P_2 to P_1 the quantity demanded decreases from Q_2 to Q_1 .

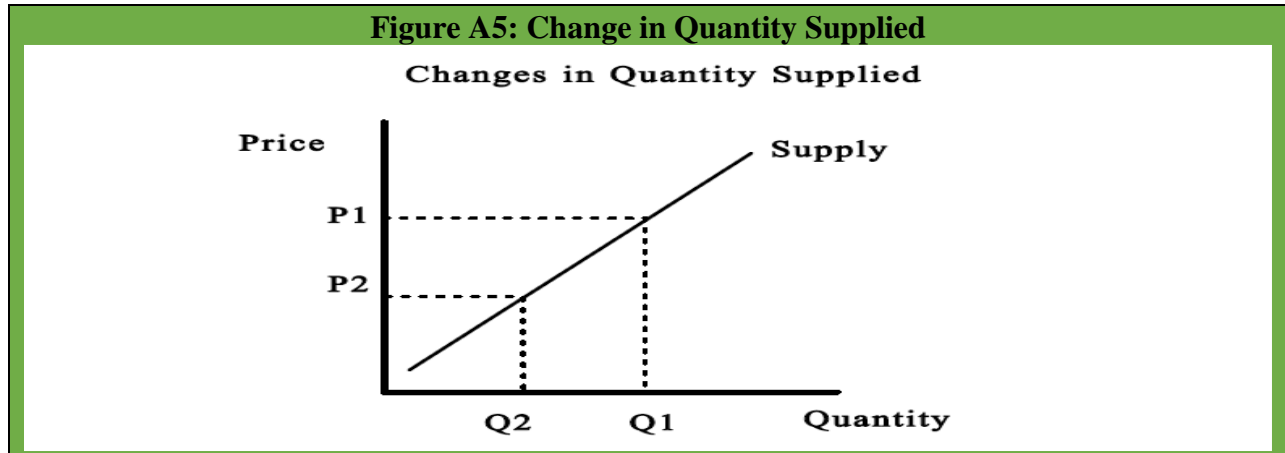
Quantity Supplied, Supply Curve and Change in Supply: The quantity supplied of any good or service is the amount that sellers are willing and able to sell. There are many determinants of quantity supplied, but once again, price plays a special role in our analysis. When the price of ice cream is high, selling ice cream is profitable, and so the quantity supplied is large. Sellers of ice cream work long hours, buy many ice-cream machines, and hire many workers. By contrast, when the price of ice cream is low, the business is less profitable, so sellers produce less ice cream. At a low price, some sellers may even choose to shut down, and their quantity supplied falls to zero. This relationship between price and quantity supplied is called the law of supply: Other things being equal, when the price of a good rises, the quantity supplied of the good also rises, and when the price falls, the quantity supplied falls as well. Supply schedule reflects the quantities supplied at each and every price. Supply curve - is nothing more than a schedule of the quantities at each and every price. There is a positive relation between price and quantity on a supply curve.

Changes in one or more of the non-price determinants of supply cause the supply curve to shift. A shift to the left of the supply curve is called a decrease in supply; a shift to the right is called an increase in supply. The non-price determinants of supply are: resource prices; technology; taxes and subsidies; prices of other goods; expectations concerning future prices; and the number of sellers.

A decrease in supply is shown in the first panel (Figure A4), notice that there is a lower quantity supplied at each price with S_2 (dotted line) than with S_1 (solid line). The second panel shows an increase in supply, notice that there is a larger quantity supplied at each price with S_2 (dotted line) than with S_1 (solid line).

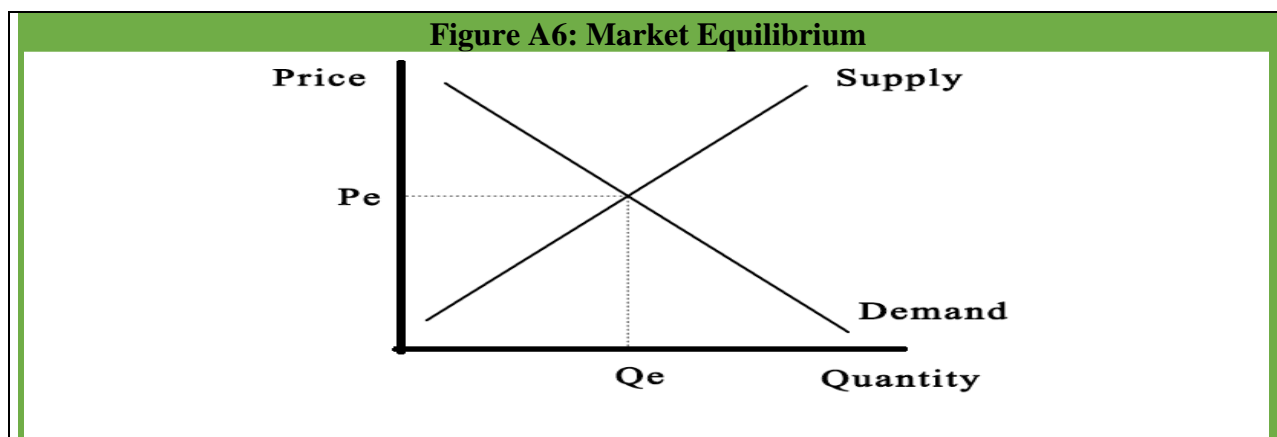


Changes in price cause changes in quantity supplied, an increase in price from P_2 to P_1 causes an increase in the quantity supplied from Q_2 to Q_1 ; a decrease in price from P_1 to P_2 causes a decrease in the quantity supplied from Q_1 to Q_2 (Figure A5).

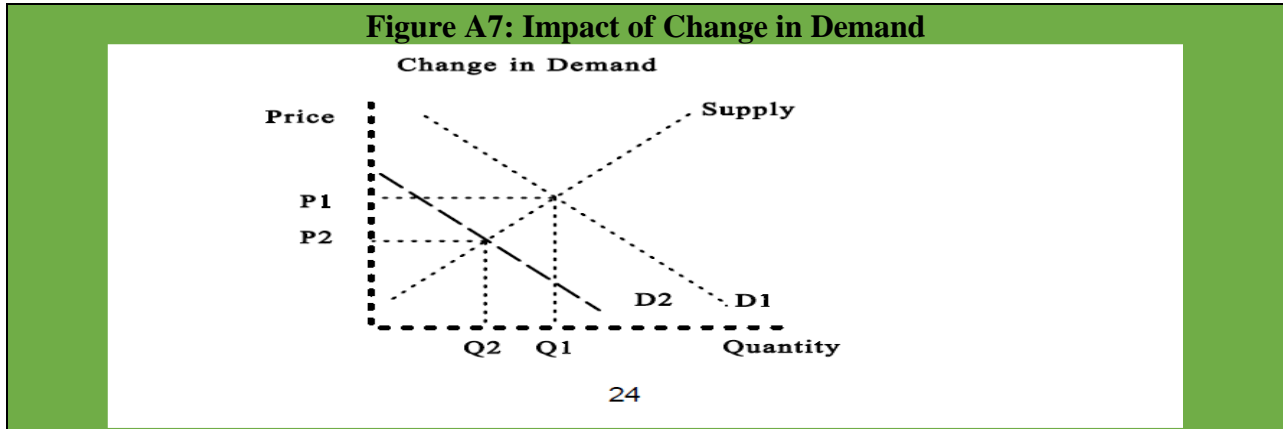


Market Equilibrium and Interaction of Demand-Supply: The dictionary defines the word equilibrium as a situation in which various forces are in balance—and this also describes a market's equilibrium. At the equilibrium price, the quantity of the good that buyers are willing and able to buy exactly balances the quantity that sellers are willing and able to sell. The equilibrium price is sometimes called the market-clearing price because, at this price, everyone in the market has been satisfied: Buyers have bought all they want to buy, and sellers have sold all they want to sell. The actions of buyers and sellers naturally move markets toward the equilibrium of supply and demand.

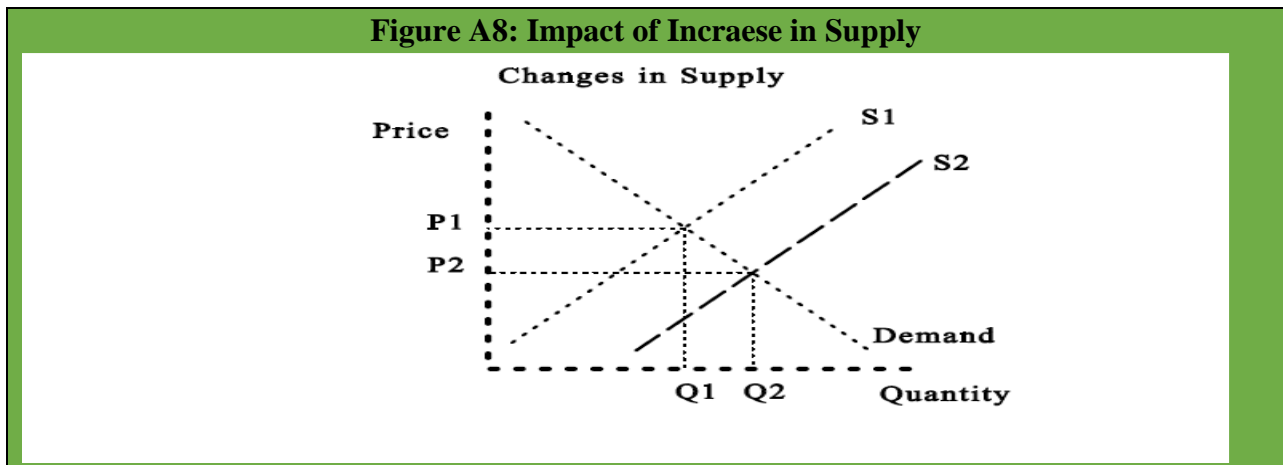
Market equilibrium occurs where supply equals demand (supply curve intersects demand curve). An equilibrium implies that there is no force that will cause further changes in price, hence quantity exchanged in the market. The following graphical analysis portrays a market in equilibrium. Where the supply and demand curves intersect, equilibrium price is determined (P_e) and equilibrium quantity is determined (Q_e)



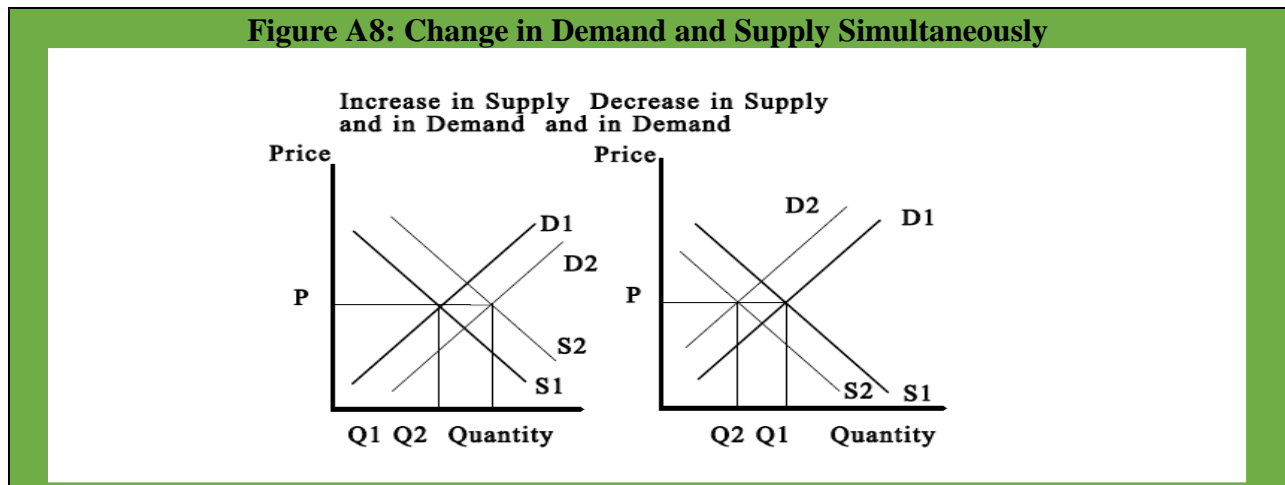
Movement of the demand curve from D1 (solid line) to D2 (dashed line) is a decrease in demand (as demonstrated in the above graph). Such decreases are caused by a change in a non-price determinant of demand (for example, the number of consumers in the market declined or the price of a substitute declined). With a decrease in demand there is a shift of the demand curve to the left along the supply curve, therefore both equilibrium price and quantity decline. If we move from D2 to D1 that is called an increase in demand, possibly due to an increase in the price of a substitute good or an increase in the number of consumers in the market. When demand increases both equilibrium price and quantity increase as a result.



Considering the following graph, movement of the supply curve from S1 (solid line) to S2 (dashed line) is an increase in supply. Such increases are caused by a change in a nonprice determinant (for example, the number of suppliers in the market increased or the cost of capital decreased). With an increase in supply there is a shift of the supply curve to the right along the demand curve, therefore equilibrium price and quantity move in opposite directions (price decreases, quantity increases). If we move from S2 to S1 that is called a decrease in supply, possibly due to an increase in the price of a productive resource (capital) or the number of suppliers decreased. When supply decreases, equilibrium price increases and the quantity decreases as a result. That is the result of the supply curve moving up along the negatively sloped demand curve (which remains unchanged).

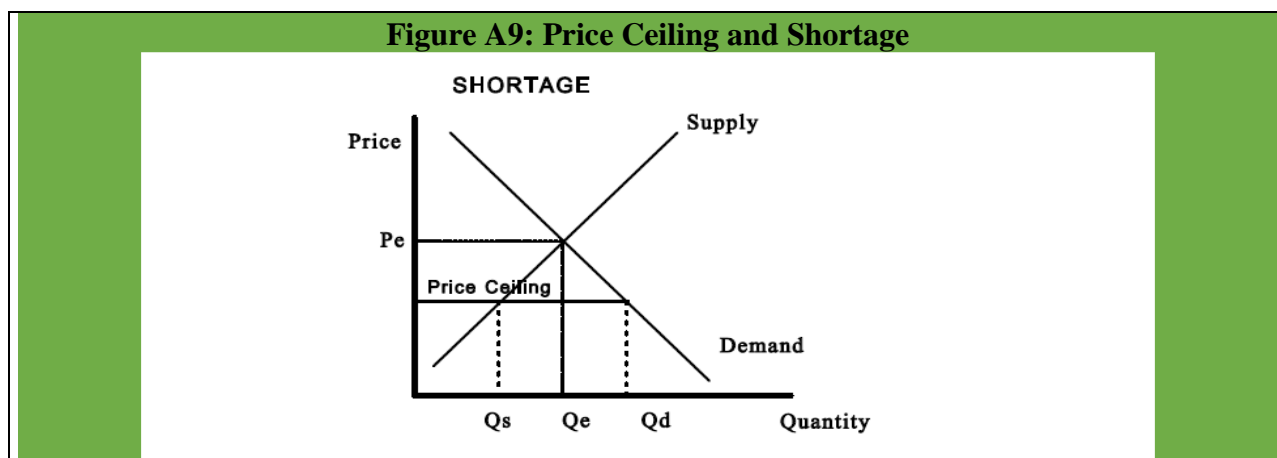


If both the demand curve and supply curve change at the same time the analysis becomes more complicated. Consider the following graphs: Notice that the quantity remains the same in both graphs. Therefore, the change in the equilibrium quantity is indeterminate and its direction and size depends on the relative strength of the changes between supply and demand. In both cases, the equilibrium price changes. In the first case where demand increases, but supply decreases the equilibrium price increases. In the second panel where demand decreases and supply increases, the equilibrium price decreases.



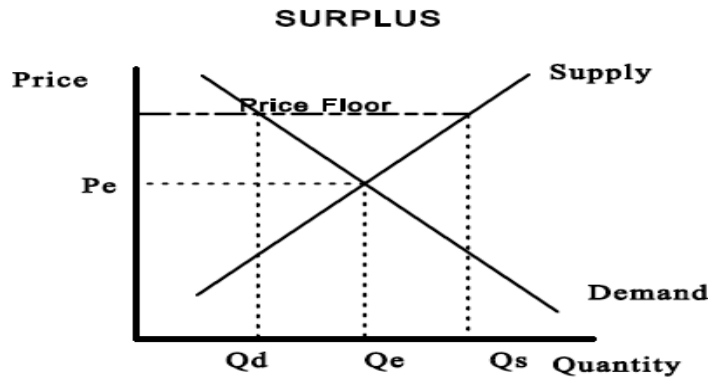
Market Intervention, Shortage and Surplus: Shortages and surpluses occur because of effective government intervention in the market. Shortage is caused by an effective price ceiling (the maximum price you can charge for the product). Consider the following diagram that demonstrates the effect of a price ceiling in an otherwise purely competitive industry.

For a price ceiling to be effective it must be imposed below the competitive equilibrium price. Note that the Q_s is below the Q_d , which means that there is an excess demand for this commodity that is not being satisfied by suppliers at this artificially low price. The distance between Q_s and Q_d is called a shortage.



Surplus is caused by an effective price floor (i.e., the minimum you can charge): For a price floor to be effective, it must be above the competitive equilibrium price. Notice that at the floor price Q_d is less than Q_s , and the distance between Q_d and Q_s is the amount of the surplus. Minimum wages are the best-known examples of price floors.

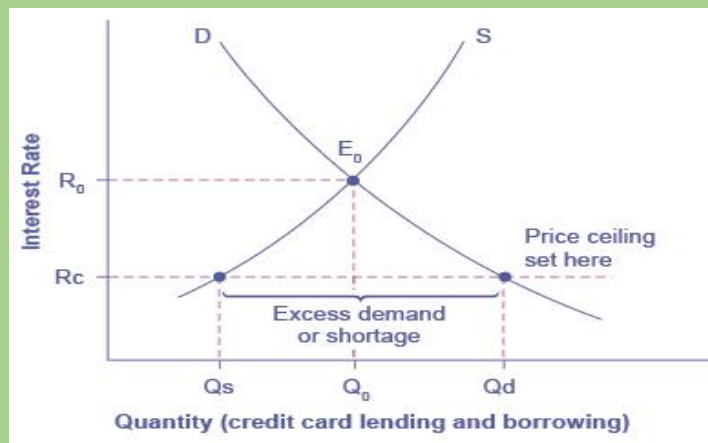
Figure A10: Price Floor and Shortage



In most respects, the supply and demand model is the beginning point for understanding markets. Monopoly, monopolistic competition, and oligopoly are, in some important respects, refinements from the purely competitive market. Therefore, the basic supply and demand model may accurately be thought of as the beginning point from which we will explore more realistic market structures.

Box- A1: Application of Price Ceiling in the Credit Card Market

In the demand and supply analysis of financial markets, the “price” is the rate of return or the interest rate received. The quantity is measured by the money that flows from those who supply financial capital to those who demand it.



The original intersection of demand D and supply S occurs at equilibrium E_0 . However, a price ceiling is set at the interest rate R_c , below the equilibrium interest rate R_0 , and so the interest rate cannot adjust upward to the equilibrium. At the price ceiling, the quantity demanded, Q_d , exceeds the quantity supplied, Q_s . There is excess demand, also called a shortage.

Indicative Questions and Exercises

1. What are the demand schedule and the demand curve, and how are they related? Why does the demand curve slope downward?
2. What is the impact of the increase in demand on equilibrium price and quantity?
3. What is the difference between the change in quantity supplied and the change in supply?
4. Does a change in consumers' tastes lead to a movement along the demand curve or a shift in the demand curve? Explain your answers.
5. Kamal's income declines, and as a result, he buys more spinach. Is spinach an inferior or a normal good? What happens to Kamal's demand curve for spinach?
6. What are the supply schedule and the supply curve, and how are they related? Why does the supply curve slope upward?
7. Does a change in producers' technology lead to a movement along the supply curve or a shift in the supply curve? Does a price change lead to a movement along the supply curve or a shift in the supply curve?
8. Define the equilibrium of a market. Describe the forces that move a market toward its equilibrium.
9. X and Y are complements because they are often enjoyed together. When the price of X rises, what happens to the demand, quantity demanded, and price in the market for Y?
10. Draw the Demand and Supply curve for the following Schedule:

Price	Quantity Demanded	Quantity Supplied
4	135	26
5	104	53
6	81	81
7	68	98
8	53	110
9	39	121

- a. What is the equilibrium price and quantity in this market?
 - b. If the actual price in this market were above the equilibrium price, what would drive the market toward the equilibrium?
 - c. If the actual price in this market were below the equilibrium price, what would drive the market toward the equilibrium?
11. "An increase in the demand for notebooks raises the quantity of notebooks demanded but not the quantity supplied." Is this statement true or false? Explain.
 12. Consider the following events: Scientists reveal that eating oranges decreases the risk of diabetes, and at the same time, farmers use a new fertilizer that makes orange trees produce more oranges. Illustrate and explain what effect these changes have on the Equilibrium price and quantity of oranges.
 13. How is equilibrium defined in the loan market? What would be a sign of a shortage in financial markets?

Consumer Behaviour

How can a consumer with a limited income decide which goods and services to buy? This is a fundamental issue in microeconomics. More specifically, how consumers allocate their incomes across goods and explain how these allocation decisions determine the demands for various goods and services. Consumer satisfactions or utility are described in two ways in the theory: ordinal and cardinal utility. A utility function that generates a ranking of market baskets is called an ordinal utility function. The ranking associated with the ordinal utility function places market baskets in the order of most to least preferred. However, it does not indicate by how much one is preferred to another. And when utility is placed using specific number, it is called cardinal utility. Three issues are practically relevant for the analyses of consumer behavior in economics: Consumer Preferences; Budget Constraints; and Consumer Choices.

Indifference Curve Analyses

A consumer's preferences can be graphically with the use of indifference curves. An indifference curve represents all combinations of market baskets that provide a consumer with the same level of satisfaction. That person is therefore indifferent among the market baskets represented by the points graphed on the curve. Given our three assumptions (Preferences are assumed to be complete, Preferences are transitive, and More is better than less) about preferences, a consumer can always indicate either a preference for one market basket over another or indifference between the two. Then this information can be used to rank all possible consumption choices. In order to appreciate this principle in graphic form, let's assume that there are only two goods available for consumption: food F and clothing C. In this case, all market baskets describe combinations of food and clothing that a person might wish to consume.

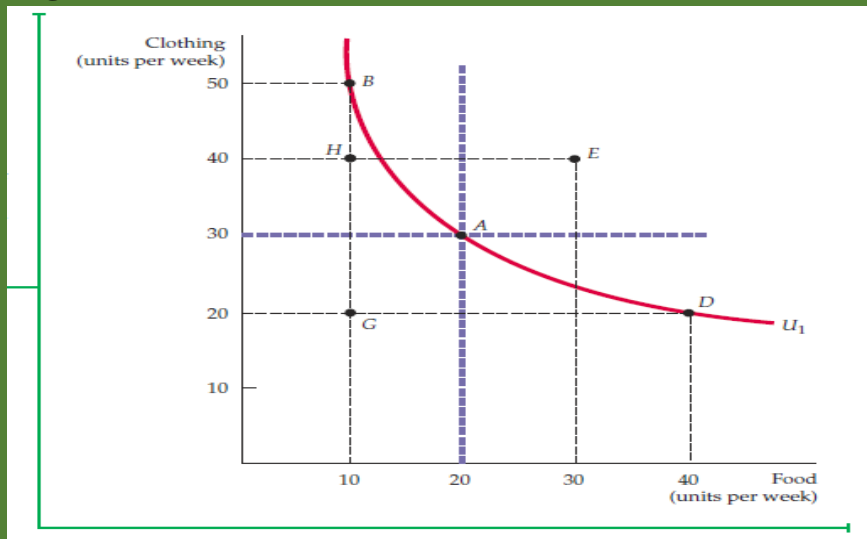
Table B1: Food Basket for the Consumer

MARKET BASKET	UNITS OF FOOD	UNITS OF CLOTHING
A	20	30
B	10	50
D	40	20
E	30	40
G	10	20
H	10	40

In figure B11, the horizontal axis measures the number of units of food purchased each week; the vertical axis measures the number of units of clothing. Market basket A, with 20 units of food and 30 units of clothing, is preferred to basket G because A contains more food and more clothing

(recall our third assumption that more is better than less). Similarly, market basket E, which contains even more food and even more clothing, is preferred to A. In fact, we can easily compare all market baskets in the two shaded areas (such as E and G) to A because they contain either more or less of both food and clothing. Note, however, that B contains more clothing but less food than A. Similarly, D contains more food but less clothing than A. Therefore, comparisons of market basket A with baskets B, D, and H are not possible without more information about the consumer's ranking.

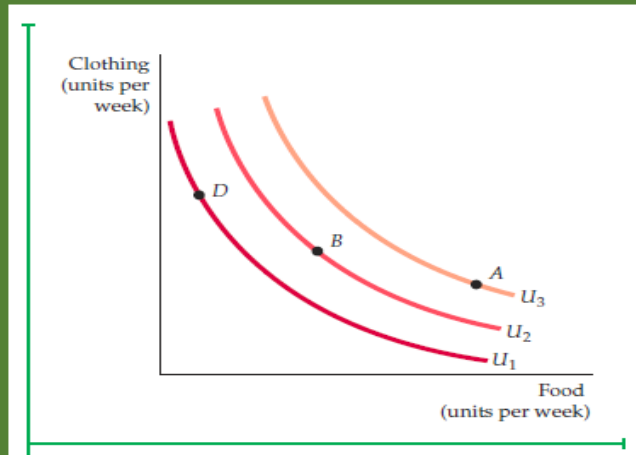
Figure B11: Indifference Curve based on Market/Food Basket



It can be seen that the indifference curve slopes downward from left to right. To understand why this must be the case, suppose instead that it sloped upward from A to E. This would violate the assumption that more of any commodity is preferred to less. Because market basket E has more of both food and clothing than market basket A, it must be preferred to A and therefore cannot be on the same indifference curve as A.

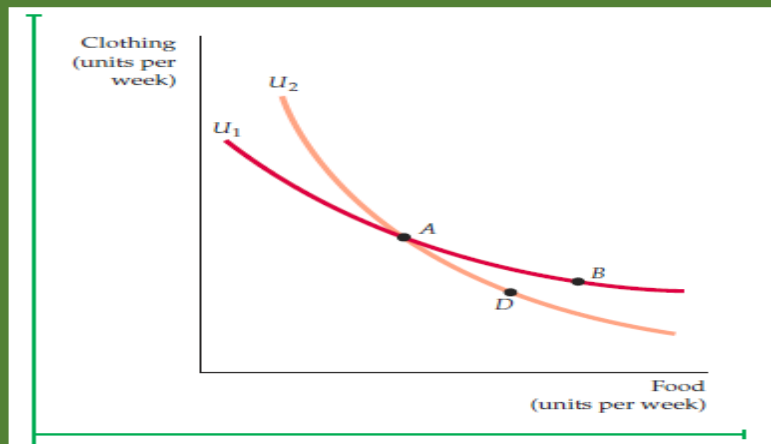
To describe a person's preferences for all combinations of food and clothing, we can graph a set of indifference curves called an indifference map (Figure B12). Each indifference curve in the map shows the market baskets among which the person is indifferent. The graph below shows three indifference curves that form part of an indifference map (the entire map includes an infinite number of such curves). Indifference curve U3 generates the highest level of satisfaction, followed by indifference curves U2 and U1.

Figure B12: Indifference Map



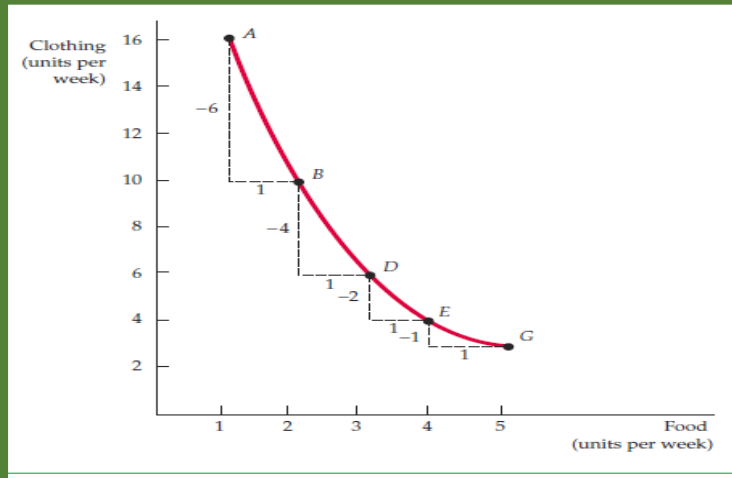
Indifference curves cannot intersect (Figure B13). The following graph shows two indifference curves, U_1 and U_2 that intersect at A . Because A and B are both on indifference curve U_1 , the consumer must be indifferent between these two market baskets. Because both A and D lie on the indifference curve U_2 , the consumer is also indifferent between these market baskets. Consequently, using the assumption of transitivity, the consumer is also indifferent between B and D , which cannot be true.

B13: Indifference Curve Cannot Intersect



Indifference curves are downward sloping (Figure B14). In the example of food and clothing, when the amount of food increases along an indifference curve, the amount of clothing decreases. The fact that indifference curves slope downward follows directly from our assumption that more of a good is better than less. If an indifference curve sloped upward, a consumer would be indifferent between two market baskets even though one of them had more of both food and clothing. The magnitude of the slope of an indifference curve measures the consumer's marginal rate of substitution (MRS) between two goods.

Figure B14: Marginal Rate of Substitution and Slope of the Indifference Curve

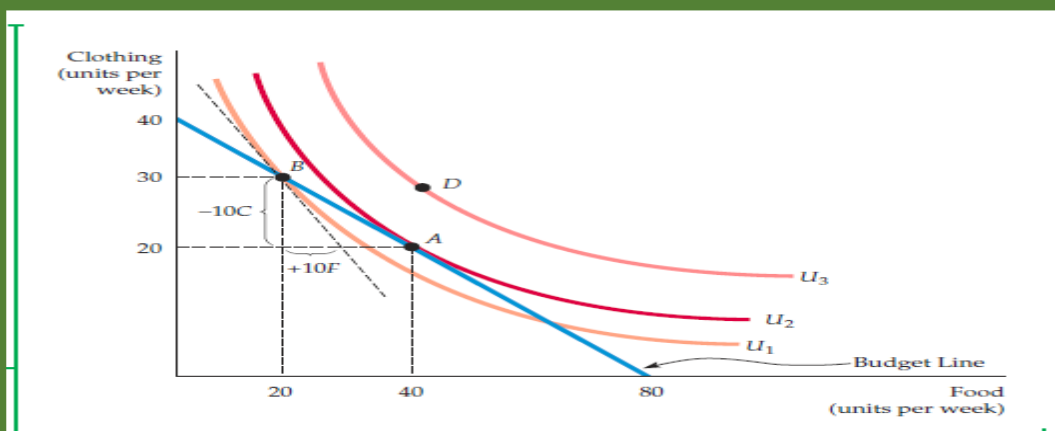


In this graph (Figure B14), the MRS between clothing (C) and food (F) falls from 6 (between A and B) to 4 (between B and D) to 2 (between D and E) to 1 (between E and G). When the MRS diminishes along an indifference curve, the curve is convex. To quantify the amount of one good that a consumer will give up to obtain more of another, we use a measure called the marginal rate of substitution (MRS). The MRS of food F for clothing C is the maximum amount of clothing that a person is willing to give up to obtain one additional unit of food.

Budget Line and Consumer Equilibrium using Indifference Curve

The budget constraints the consumers face as a result of their limited incomes. This show using Budget Line. To see how a budget constraint limits a consumer’s choices, let’s consider a situation in which a woman has a fixed amount of income, I, that can be spent on food and clothing. Let F be the amount of food purchased and C be the amount of clothing. The budget line indicates all combinations of F and C for which the total amount of money spent is equal to income.

Figure B15: Consumer Equilibrium using Budget Line



As shown in the above graph (Figure B15), a consumer maximizes satisfaction by choosing market basket A. At this point, the budget line and indifference curve U_2 are tangent, and no higher level of satisfaction (e.g., market basket D) can be attained. At A, the point of maximization, the MRS between the two goods equals the price ratio. At B, however, because the MRS $[-(-10/10) = 1]$ is greater than the price ratio (1/2), satisfaction is not maximized.

Utility Analyses

The concept of utility can also be used to recast our analysis in a way that provides additional insight. To begin, let's distinguish between the total utility obtained by consumption and the satisfaction obtained from the last item consumed. Marginal utility (MU) measures the additional satisfaction obtained from consuming one additional unit of a good. For example, the marginal utility associated with a consumption increase from 0 to 1 unit of food might be 9; from 1 to 2, it might be 7; from 2 to 3, it might be 5. These numbers imply that the consumer has diminishing marginal utility: As more and more of a good is consumed, consuming additional amounts will yield smaller and smaller additions to utility. Imagine, for example, the consumption of television: Marginal utility might fall after the second or third hour and could become very small after the fourth or fifth hour of viewing. This is the law of diminishing marginal utility. The law of diminishing marginal utility states that all else equal, as consumption increases, the marginal utility derived from each additional unit declines. Marginal utility is the incremental increase in utility that results from the consumption of one additional unit.

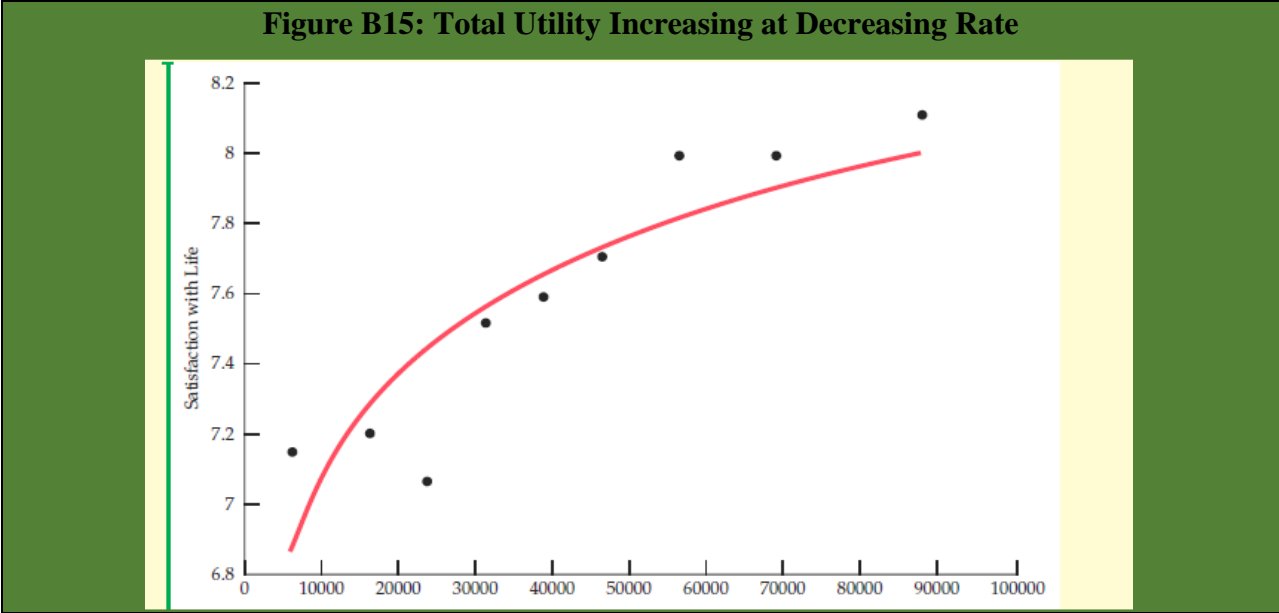
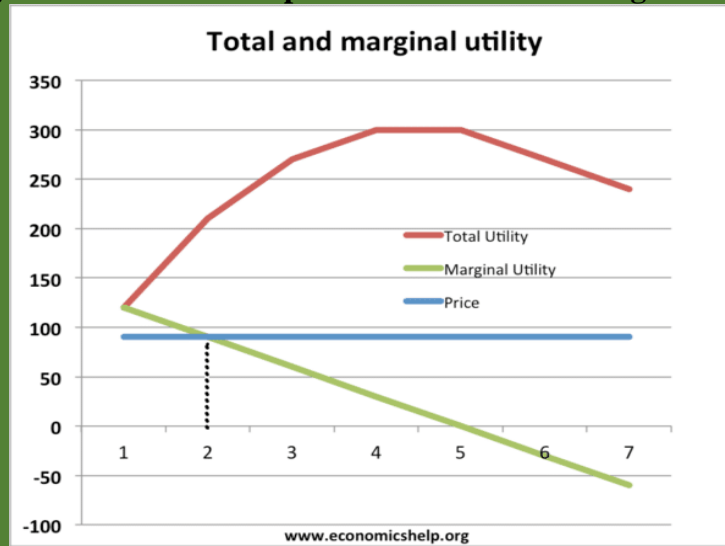


Figure B16: Relationship between Total and Marginal Utility



In figure (B16), if a piece of mango costs Tk90, it would make sense to consume two pieces. The first piece gives 120 utility, which is greater than the price of 90. The second piece gives a utility equal to the price. The third piece would give marginal utility of only 60, which is less than the price of 90. A rational consumer would not consume more than two.

Box B1: Expected Utility, Marginal Utility and Financing/Investment Decision Making²

Expected utility is used as a tool for decision-making under circumstances where the outcomes of decisions are not known. The entity computes the probability of outcomes and compares them with expected utility. The expected utility value is calculated by aggregating the products of possible outcomes with the probability of occurrence of the events. The expected utility theory considers it a logical choice to choose the event with the maximum expected utility. However, in case of risky outcomes, decision-makers may not choose the action with a higher expected utility. Expected utility theory also helps to explain the reason for availing new financing products or people taking out insurance policies.

The concepts of marginal utility and expected utility are related. The expected utility of wealth or a reward reduces when the entity possesses sufficient wealth. Such entities may go for safer alternative instead of riskier ones. The addition of BDT 1,000 to the income may not impact the marginal utility of two different entities in the same way. For example, if the annual income of a low-earning family is increased from BDT1250 to BDT2250, it will improve their quality of life as well as the marginal utility. On the contrary, if the income of a high-earning family increases from BDT120000 to BDT121000 in a year, there is a very small utility improvement.

² Source: <https://corporatefinanceinstitute.com/resources/economics/expected-utility/>

Indicative Questions and Exercises

1. What is an indifference map? What an indifference map indicates?
2. What are the four basic assumptions about individual preferences? Explain the significance or meaning of each.
3. Can a set of indifference curves be upward sloping? If so, what would this tell about the two goods?
4. Why is the indifference curve downward sloping? Explain why two indifference curves cannot intersect.
5. Draw a budget line that identifies the satisfaction-maximizing choice using indifference curve analysis. What conclusion does it say?
6. What happens to the marginal rate of substitution as you move along a convex indifference curve?
7. 'Shape of an indifference curve shows the law of marginal rate of substitution'- How?
8. What is the difference between ordinal utility and cardinal utility? 'Indifference curve is ordinal utility approach'- Do you agree? Explain your answer.
9. How is total satisfaction measured in utility analysis?
10. 'Marginal utility decreases as a consumer consumes more of a good'-Explain.
11. 'Consumer consumes upto the point where marginal utility equal to price'- Explain.
12. 'Marginal utility curve slopes downward'-Why?

Concepts of Elasticity

It is noted that consumers usually buy more of a good when its price is lower, when their incomes are higher, when the prices of its substitutes are higher, or when the prices of its complements are lower. The discussion of demand was qualitative, not quantitative. That is, it discussed the direction in which quantity demanded moves but not the size of the change. To measure how much consumers respond to changes in these variables, the relevant concept is elasticity. The basic formula for calculating a coefficient is the $\% \Delta Q / \% \Delta P$ (Δ means change). After calculating the coefficient, the absolute value (meaning positive or negative doesn't matter) can be used to determine the elasticity. Elasticity values are as follows:

- Absolute value of coefficient = 0: perfectly inelastic
- Absolute value of coefficient < 1 (but not zero): relatively inelastic
- Absolute value of coefficient = 1: unit elastic
- Absolute value of coefficient > 1 (but not ∞ or undefined): relatively elastic
- Absolute value of coefficient = ∞ or undefined: perfectly elastic.

$\% \Delta Q / \% \Delta P$ gives a price elasticity coefficient. Demand curves have a negative price elasticity coefficient due to the demand curve's inverse relationship between price and quantity. Supply curves have a positive price elasticity coefficient due to the direct relationship between price and quantity.

Price Elasticity of Demand:

The law of demand states that a fall in the price of a good raises the quantity demanded. The price elasticity of demand measures how much the quantity demanded responds to a change in price. Demand for a good is said to be elastic if the quantity demanded responds substantially to changes in the price. Demand is said to be inelastic if the quantity demanded responds only slightly to changes in the price. Economists compute the price elasticity of demand as the percentage change in the quantity demanded divided by the percentage change in the price.

The price elasticity of demand for any good measures how willing consumers are to buy less of the good as its price rises. Because a demand curve reflects the many economic, social, and psychological forces that shape consumer preferences, there is no simple, universal rule for what determines a demand curve's elasticity. There are however certain recognized factors that influences the price elasticity of demand.

Availability of Close Substitutes Goods with close substitutes tend to have more elastic demand because it is easier for consumers to switch from that good to others. For example, butter and margarine are easily substitutable. A small increase in the price of butter, assuming the price of margarine is held fixed, causes the quantity of butter sold to fall by a large amount.

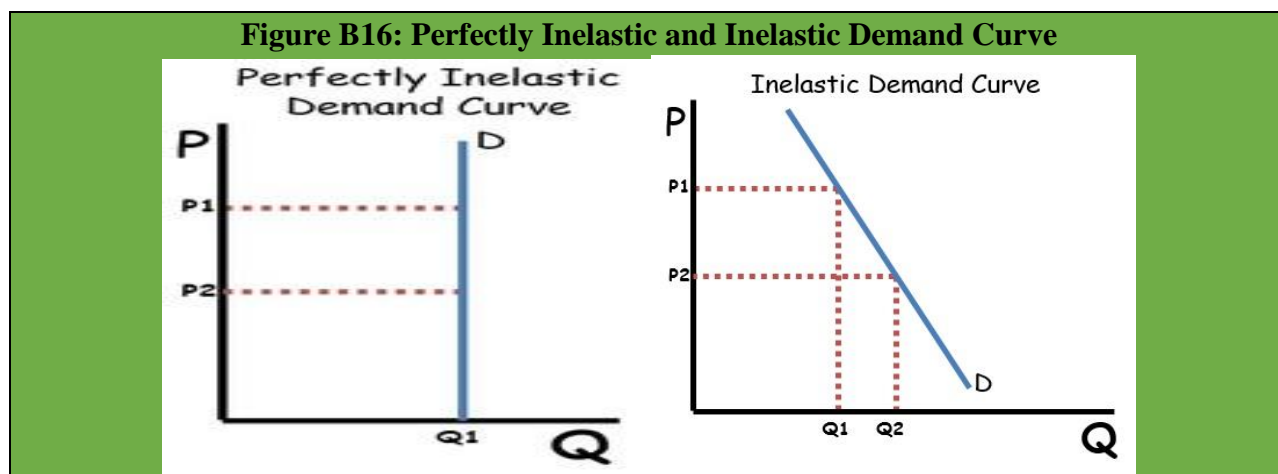
Necessities versus Luxuries Necessities tend to have inelastic demands, whereas luxuries have elastic demands. When the price of a doctor's visit rises, people will not dramatically reduce the number of times they go to the doctor, although they might go somewhat less often.

Definition of the Market The elasticity of demand in any market depends on how we draw the boundaries of the market. Narrowly defined markets tend to have more elastic demand than broadly defined markets because it is easier to find close substitutes for narrowly defined goods. For example, food, a broad category, has a fairly inelastic demand because there are no good substitutes for food. Ice-cream, a narrower category, has a more elastic demand because it is easy to substitute other desserts for ice cream. Vanilla ice cream, a very narrow category, has a very elastic demand because other flavors of ice cream are almost perfect substitutes for vanilla.

Time Horizon Goods tend to have more elastic demand over longer time horizons. When the price of gasoline rises, the quantity of gasoline demanded falls only slightly in the first few months. Over time, however, people buy more fuel efficient cars, switch to public transportation, and move closer to where they work. Within several years, the quantity of gasoline demanded falls more substantially.

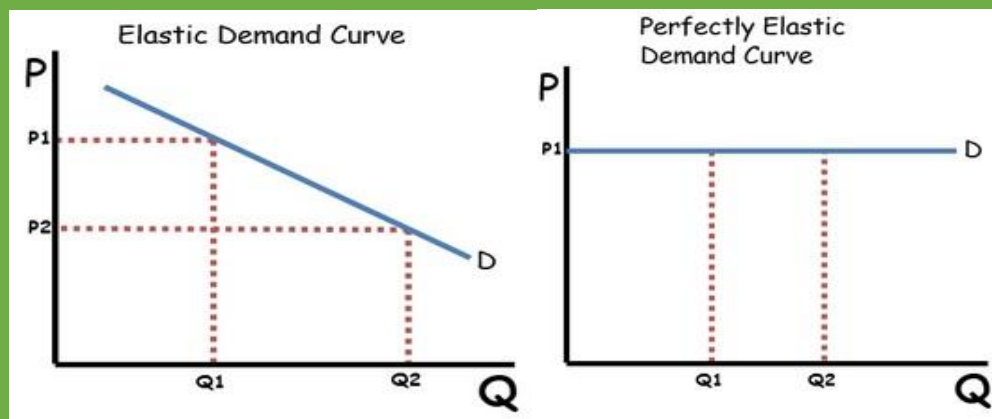
Expenses The product with relatively higher prices tend to be elastic. For example, demand for a perennial may not be affected because of the high percentage change in price, which may not be true for an expensive item like care.

When a large change in price causes a small change in quantity demanded, the demand curve is relatively Inelastic. That is, consumers are relatively Insensitive to price change. Relatively inelastic demand curves tend to be more vertical than horizontal. If consumers demand the same quantity of good regardless of the price, the demand curve is perfectly inelastic; consumers are perfectly Insensitive to price change. Perfectly inelastic demand curves are vertical. Goods or services that have inelastic demand curves tend to be: necessities, having few substitutes, and are relatively inexpensive.



When a small change in price causes a large change in quantity demanded, the demand curve is relatively elastic. That is, consumers are especially sensitive to the price change. Relatively elastic demand curves tend to be more horizontal than vertical. If consumers will demand any quantity at one maximum price, the demand curve is perfectly elastic; consumers are perfectly sensitive to the price change. Perfectly elastic demand curves are horizontal. Goods/services that have elastic demand curves tend to be luxury or not necessary, have many substitutes, and are relatively expensive.

Figure B17: Perfectly Elastic and Elastic Demand Curve



There is another type of elasticity and it is called unit elastic. A unit elastic demand curve will have equal price increases because proportional decreases in quantity demanded.

Total Revenue and Price Elasticity of Demand

When it comes to the price elasticity of demand, the simplest way to determine elasticity is the total revenue (TR) test. The formula for total revenue is $P \times Q$. On a demand curve, quantities fall as prices rise and quantities rise as prices fall. If the price rises and TR increases (P and TR are going in the same direction), the demand curve is inelastic. If the price falls and TR decreases (again P and TR are going in the same direction, the demand curve is also inelastic. If the price rises and TR falls (P and TR are going in opposite directions, the demand curve is elastic. If the price falls and TR rises (again PR and TR are going in opposite directions, the demand curve is also elastic. If price changes do not change TR the demand curve is unit elastic (an increase or decrease in price keeps TR the same).

A straight line demand curve will have an elastic portion at the top, an inelastic portion on the bottom and a unit elastic point in the middle. If there is a Marginal Revenue curve on the graph it can help you determine elasticity. Decreasing price increases total revenue as quantity increases as long marginal revenue is greater than zero. The Unit Elastic portion of the demand curve is where the $MR=0$. Then decreasing price decreases total revenue since the marginal revenue is negative. In this range, the demand curve is inelastic.

Figure B18: Total Revenue and Elasticity of Demand

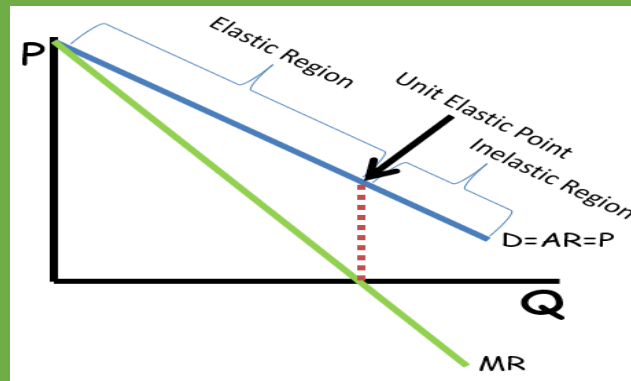


Figure (B18) illustrates some general rules:

- When demand is inelastic (a price elasticity less than 1), price and total revenue move in the same direction: If the price increases, total revenue also increases.
- When demand is elastic (a price elasticity greater than 1), price and total revenue move in opposite directions: If the price increases, total revenue decreases.
- If demand is unit elastic (a price elasticity exactly equal to 1), total revenue remains constant when the price changes.

Other Demand Elasticity

In addition to the price elasticity of demand, economists use other elasticity to describe the behavior of buyers in a market.

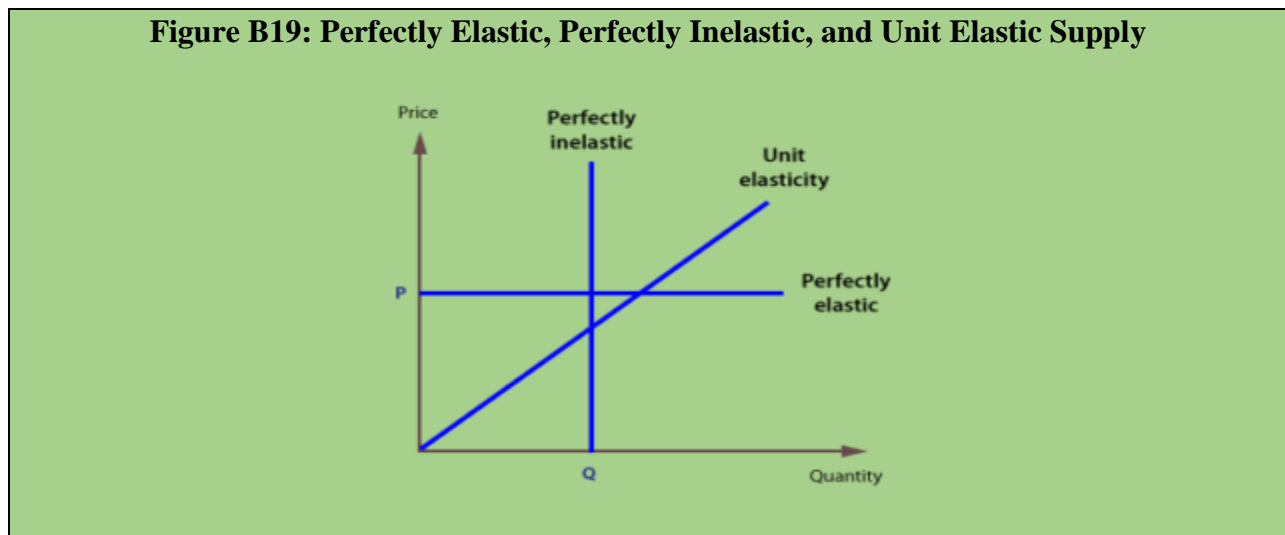
Income elasticity Income elasticity is about how much a change in consumer income causes a change in quantity demanded. Normal goods (most goods fall into this category) are goods that consumers buy more of when their incomes rise, and less of when their incomes fall. Inferior goods are goods like one-ply toilet paper, top ramen, or generic brand products. When consumers' incomes rise, consumers buy less of these goods, and when incomes fall, they buy more. One of the non-price determinants of demand is changes in income. Income elasticity tells us how much a change in income will shift the demand for a good or service. The formula for income elasticity is $\% \Delta Q / \% \Delta \text{Income}$. Normal goods have a positive income elasticity coefficient since increases in incomes cause increases in the demand for normal goods. Inferior goods have a negative income elasticity coefficient. This is because increases in incomes cause decrease in the demand for inferior goods.

Cross-Price elasticity Cross-price elasticity is about substitutes and complements. Substitutes are goods that can be used in place of each other; like butter and margarine, or jam and jelly. When the price of one increases, the demand for the other also increases. Complements are goods that are used together; like bread and butter or toothbrushes and toothpaste. When the price of one increases, demand for the other decreases. The cross-price elasticity tells us how much a change

in the price of one impacts the demand for the other. When there is a change in the price of substitute or complement, the demand for the good in question will change. The formula for cross-price elasticity is $\frac{\% \Delta Q}{\% \Delta P}$ (P is the price of the other good). Substitute goods will have a positive coefficient because an increase in the price of a substitute will cause an increase in the demand for the good in question. Complementary goods will have a negative coefficient because an increase in the price of a complement will cause a decrease in the demand for the good in question.

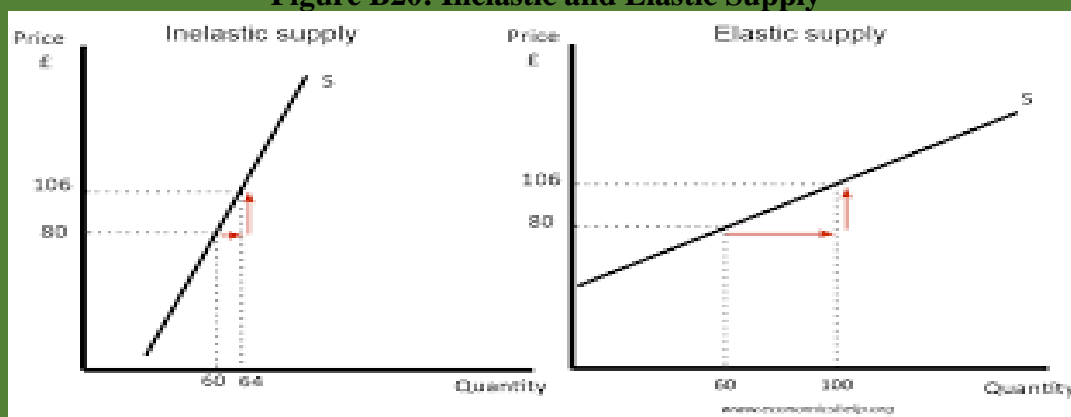
Price Elasticity of Supply

The law of supply states that higher prices raise the quantity supplied. The price elasticity of supply measures how much the quantity supplied responds to changes in the price. Supply of a good is said to be elastic if the quantity supplied responds substantially to changes in the price. Supply is said to be inelastic if the quantity supplied responds only slightly to changes in the price.



The price elasticity of supply depends on the flexibility of sellers to change the amount of the good they produce. In most markets, a key determinant of the price elasticity of supply is the time period being considered. Supply is usually more elastic in the long run than in the short run. Over short periods of time, firms cannot easily change the size of their factories to make more or less of a good. Thus, in the short run, the quantity supplied is not very responsive to the price. By contrast, over longer periods, firms can build new factories or close old ones. In addition, new firms can enter a market, and old firms can exit. Thus, in the long run, the quantity supplied can respond substantially to price changes.

Figure B20: Inelastic and Elastic Supply



Price elasticity of supply is calculated as the percentage change in the quantity supplied divided by the percentage change in the price. Because the price elasticity of supply measures the responsiveness of quantity supplied to the price, it is reflected in the appearance of the supply curve.

Box B2: Elasticity and Bank Account

An effective interest rate policy targeted at prospective consumer depositors must be concerned with the interest rate elasticity of the deposit accounts. Interest rate elasticity is a measure of the depositors' response to fluctuations in consumer account interest rates.

Deposit elasticity can be defined as $dD = dD/di$

D where: D = deposit level; i = deposit rate. The relationship or correlation of the elasticity can be either negative or positive, significant or insignificant. A negative elasticity value with respect to interest rates and deposit account demand would indicate that an increase in interest rates will subsequently lead to a decrease in deposits and a decrease in interest rates will lead to an increase in deposits. There is no theoretical basis for such a relationship and I do not expect this to occur. I will assume that the depositors represented in this data set are rational individuals seeking to maximize their interest utility. Within an econometric model the elasticity coefficient measures the effect that a 1 percent change in an independent variable will have on the dependent variable. For the purposes of this study, I will be analyzing the effect of a percentage change in interest rates on the respective deposit account level. The effect of other theoretically significant variables will also be analyzed.

Indicative Questions and Exercises

1. Define the price elasticity of demand and the income elasticity of demand.
2. List and explain the four determinants of the price elasticity of demand discussed in the chapter.
3. If the elasticity is greater than 1, is demand elastic or inelastic? If the elasticity equals zero, is demand perfectly elastic or perfectly inelastic?
4. On a supply-and-demand diagram, show the equilibrium price, equilibrium quantity, and the total revenue received by producers.
5. If demand is elastic, how will a price increase change total revenue? Explain.
6. What do we call good with an income elasticity less than zero?
7. How is the price elasticity of supply calculated? Explain what it measures.
8. If a fixed quantity of a good is available, and no more can be made, what is the price elasticity of supply?
9. A storm destroys half the fava bean crop. Is this event more likely to hurt fava bean farmers if the demand for fava beans is very elastic or very inelastic? Explain.
10. 'A life-saving medicine without any close substitutes will tend to have a small elasticity of demand.' - Do you agree? Explain your answer.
11. A price change causes the quantity demanded of a good to decrease by 30 percent, while the total revenue of that good increases by 15 percent. Is the demand curve elastic or inelastic? Explain.
12. 'Utility concept is also relevant for the banking and financial products/services'-Explain the statement.

Module-C: Production and Cost

Module-C: Production and Cost

Concept of Production

A production function serves as the foundation for business decisions regarding resource use and quantities of output. It is associated with the law of diminishing marginal returns and its relationship with the marginal cost curve. Several key terms of the Production Function are as follows:

Total Product (TP) is the number of units a firm can produce with a given quantity of inputs. According to the given table, with 2 workers the firm has a total product of 6 units of output. With 3 units of labor, the firm has 9 units of total product.

Average Product (AP) is the total number of units a firm produced divided by the quantity of inputs used. At 2 workers, the total product is 6 which means average product is 3 ($6/2$)

Marginal Product (MP) is the change in total product (the number produced by all workers) from hiring one more worker. If more than one worker is hired, the marginal product is the change in output (Q) divided by the change in the quantity of labor. With 2 workers, the firm has a total product of 6, and with 3 workers the total product is 9. The total product increased by 3 units with the addition of 1 worker so the marginal product is 3 ($3/1$).

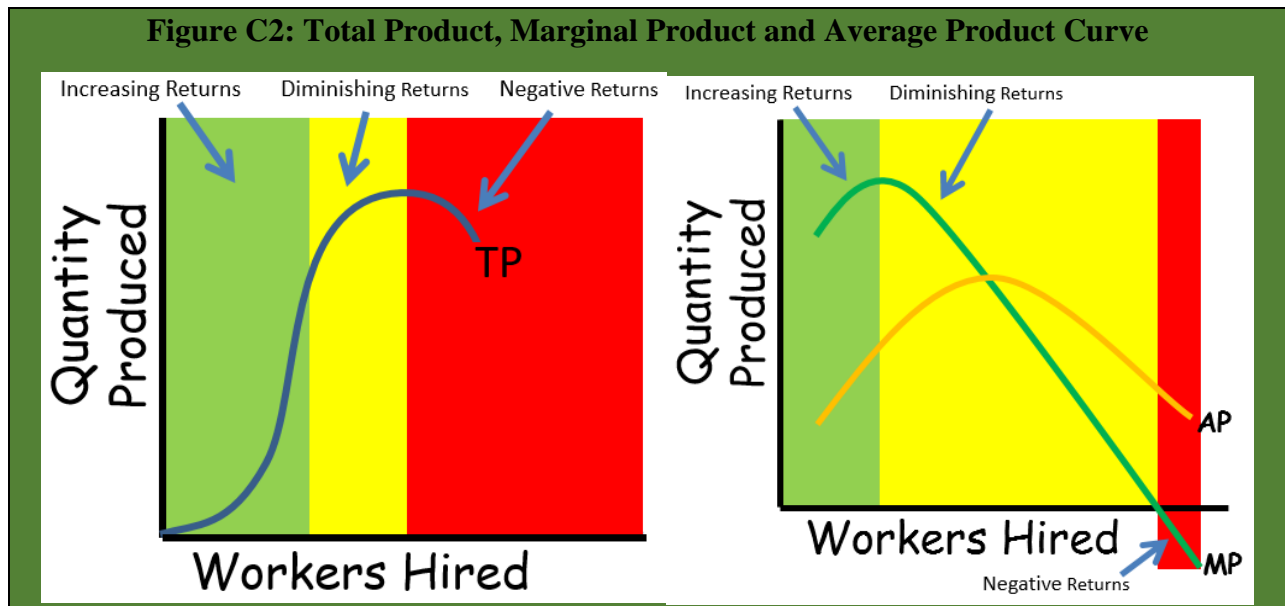
Below is a short run production function for a firm. You can see the total product, marginal product, and average product for different units of labor (workers) employed.

Table C1: Total Product, Marginal Product, and Average Product				
Workers	Total Product	Marginal Product	Average Product	Returns
0	0	-	-	
1	2	2	2	Increasing Returns
2	6	4	3	Increasing Returns
3	9	3	3	Diminishing Returns
4	11	2	3.75	Diminishing Returns
5	10	-1	2	Negative Returns

The law of diminishing marginal returns: There are three parts of a total product curve (Figure C2). Part 1 is the increasing returns portion where hiring more workers increases the marginal product because total product is increasing at an increasing rate. Increasing returns occur because of division of labor and worker specialization. Complicated tasks are broken down and workers get very good their individual roles in the production process.

Part 2 is the diminishing returns portion where hiring more workers decreases the marginal product (the Total Product curve is getting less steep) because total product is still increasing but at a decreasing rate.

Part 3 is the negative returns portion where hiring more workers results in a negative marginal product (the total Product curve is falling). Take a look at Chart B and the graph below for an example.



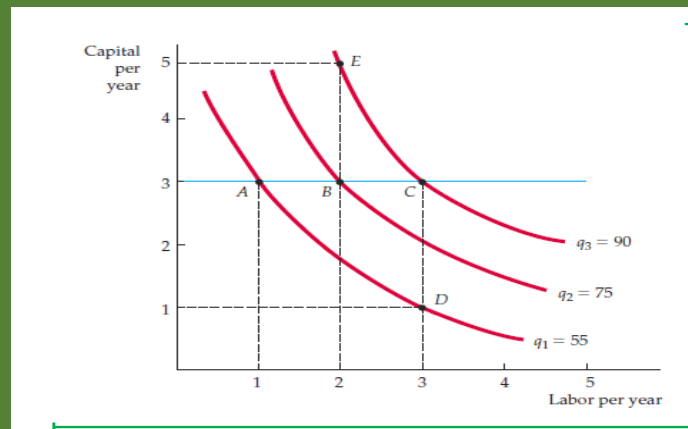
A marginal product curve tends to be shape like an upside down marginal cost curve and an average product curve tends to be shaped like an upside down average variable cost curve. That is because, for most businesses, the primary variable cost of production is the cost of labor. Also, when labor is the only variable cost the marginal cost of labor is the wage divided by the marginal product ($MC=W/MP$). So when MP is rising, MC is falling, and when MP is falling, MC is rising.

Production and Isoquants: The firm can produce its output in a variety of ways by combining different amounts of labor and capital (Table C1). In this section, we will see how a firm can choose among combinations of labor and capital that generate the same output. The information can be represented graphically using isoquants. An isoquant is a curve that shows all the possible combinations of inputs that yield the same output. The graph shows three isoquants (Figure C3). (Each axis in the figure measures the quantity of inputs) These isoquants are based on the data in the Table but are drawn as smooth curves to allow for the use of fractional amounts of inputs.

Table C2: Combination of Labour and Capital to Produce Outputs

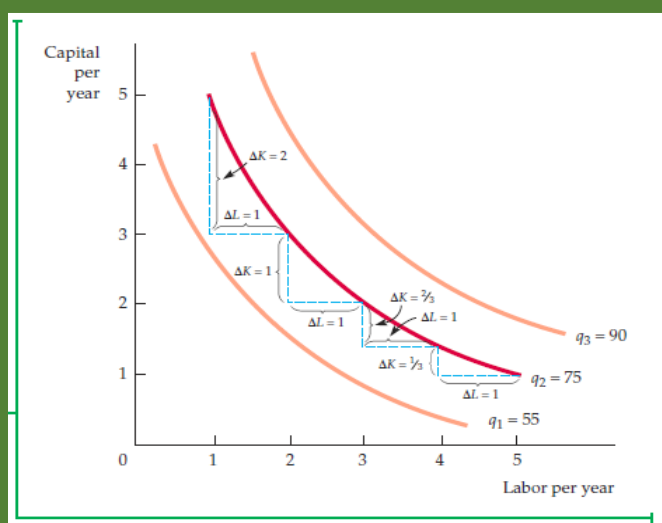
		LABOR INPUT				
CAPITAL INPUT	1	2	3	4	5	
1	20	40	55	65	(75)	
2	40	60	(75)	85	90	
3	55	(75)	90	100	105	
4	65	85	100	110	115	
5	(75)	90	105	115	120	

Figure C3: Isoquant Curves



The above graph is an Isoquant map (Figure C3). When several isoquants are combined in a single graph, we call the graph an isoquant map. It shows three of the many isoquants that make up an isoquant map. An isoquant map is another way of describing a production function, just as an indifference map is a way of describing a utility function. Each isoquant corresponds to a different level of output, and the level of output increases as we move up and to the right in the figure.

Figure C4: Isoquant and MRTS



With two inputs that can be varied, a manager will want to consider substituting one input for another. The slope of each isoquant indicates how the quantity of one input can be traded off against the quantity of the other, while output is held constant. When the negative sign is removed, we call the slope the marginal rate of technical substitution (MRTS). The marginal rate of technical substitution of labor for capital is the amount by which the input of capital can be reduced when one extra unit of labor is used, so that output remains constant. This is analogous to the marginal rate of substitution (MRS) in consumer theory. In case of indifference curve analyses, MRS describes how consumers substitute among two goods while holding the level of satisfaction constant. Like the MRS, the MRTS is always measured as a positive quantity.

It is assumed that there is a diminishing MRTS. In other words, the MRTS falls as we move down along an isoquant. The mathematical implication is that isoquants, like indifference curves, are convex, or bowed inward. This is indeed the case for most production technologies. The diminishing MRTS tells us that the productivity of any one input is limited. As more and more labor is added to the production process in place of capital, the productivity of labor falls. Similarly, when more capital is added in place of labor, the productivity of capital falls. Production needs a balanced mix of both inputs.

Returns to Scale

The analyses of input substitution in the production process has shown us what happens when a firm substitutes one input for another while keeping output constant. However, in the long run, with all inputs variable, the firm must also consider the best way to increase output. One way to do so is to change the scale of the operation by increasing all of the inputs to production in proportion. If it takes one farmer working with one harvesting machine on one acre of land to produce 100 bushels of wheat, what will happen to output if we put two farmers to work with two

machines on two acres of land? Output will almost certainly increase, but will it double, more than double, or less than double? Returns to scale is the rate at which output increases as inputs are increased proportionately.

Increasing Returns to Scale If output more than doubles when inputs are doubled, there are increasing returns to scale. This might arise because the larger scale of operation allows managers and workers to specialize in their tasks and to make use of more sophisticated, large-scale factories and equipment. The automobile assembly line is a famous example of increasing returns. The prospect of increasing returns to scale is an important issue from a public policy perspective. If there are increasing returns, then it is economically advantageous to have one large firm producing (at relatively low cost) rather than to have many small firms (at relatively high cost). Because this large firm can control the price that it sets, it may need to be regulated. For example, increasing returns in the provision of electricity is one reason why we have large, regulated power companies.

Constant Returns to Scale A second possibility with respect to the scale of production is that output may double when inputs are doubled. In this case, we say there are constant returns to scale. With constant returns to scale, the size of the firm's operation does not affect the productivity of its factors: Because one plant using a particular production process can easily be replicated, two plants produce twice as much output. For example, a large travel agency might provide the same service per client and use the same ratio of capital (office space) and labor (travel agents) as a small agency that services fewer clients.

Decreasing Returns to Scale Output may be less than double when all inputs double. This case of decreasing returns to scale applies to some firms with large-scale operations. Eventually, difficulties in organizing and running a large-scale operation may lead to decreased productivity of both labor and capital. Communication between workers and managers can become difficult to monitor as the workplace becomes more impersonal. Thus, the decreasing-returns case is likely to be associated with the problems of coordinating tasks and maintaining a useful line of communication between management and workers.

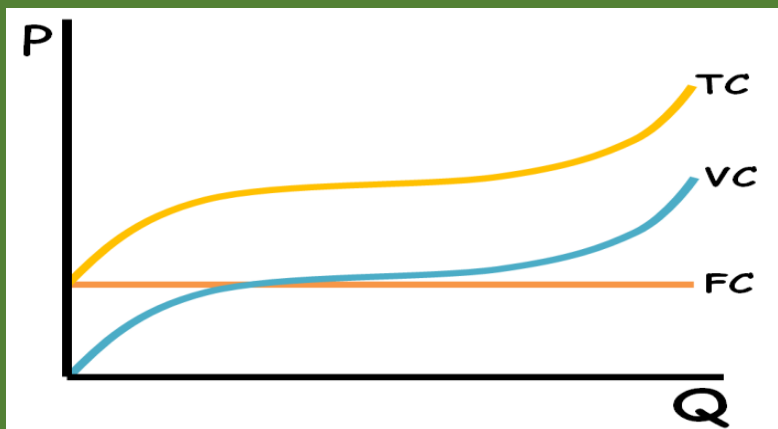
Costs and Cost Curves

Total cost is the price of input. It is calculated by multiplication of Price (per unit) and Quantity produced.

Fixed Costs: These are costs for a firm which do not change with the quantity produced (they remain fixed). Rent, loan payments, insurance, etc. will generally be the same whether a firm produces zero units of output or ten thousand. On a graph, FC is a horizontal line (indicating the same taka amount for every quantity). A firm operates as long as losses are less than fixed costs. Otherwise the firm temporarily shuts down. That is because fixed costs are 'sunk costs' meaning they are already lost.

Variable Costs: These are the costs that change with the quantity produced. Labor, electricity, and raw materials are all examples of variable costs because as more units are produced more money will be spent on labor, electricity, and raw materials. If total revenue is greater than total variable costs, the firm will operate and their losses will be less than fixed costs. If total revenue is less than total variable costs, the firm will temporarily shut down.

Figure C5: Total Cost, Variable Cost and Fixed Cost Curves

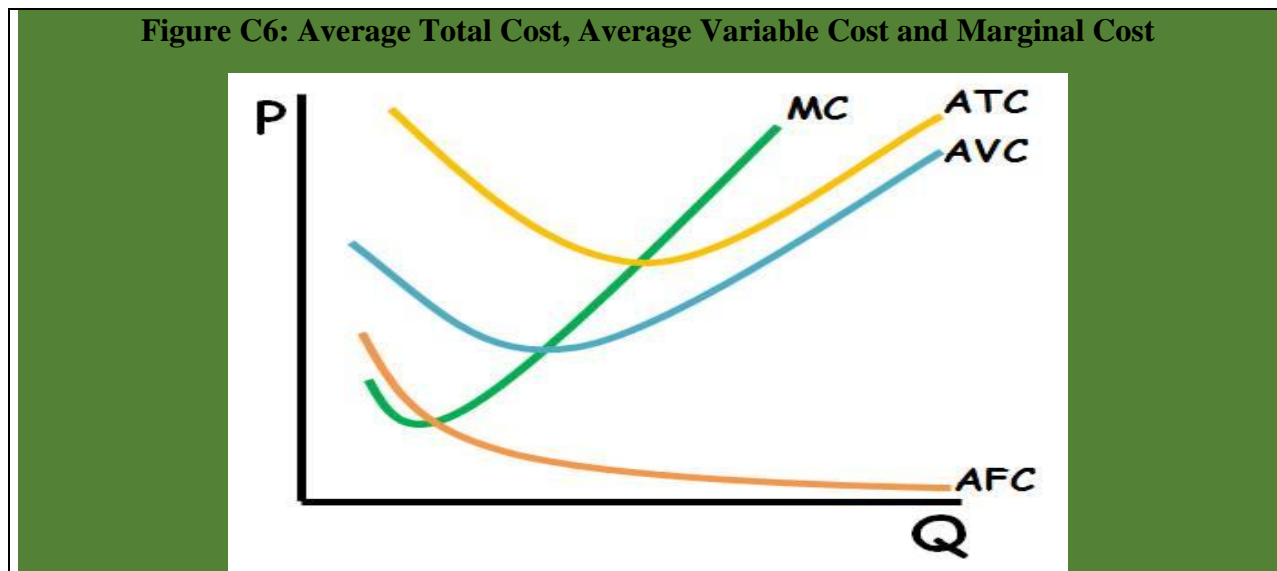


Marginal Cost: Marginal cost is the change in total cost divided by the change in quantity ($MC = \Delta TC / \Delta Q$). Usually the change in quantity is just 1 so MC is the cost associated with producing just one more unit of output. The marginal cost curve intersects the ATC and AVC at their minimum points. That relationship is because as long as the cost of producing one more unit of output (MC) is less than the current average the average will fall. Also, as long as the cost of producing one more unit of output is higher than the current average, the average will rise.

At low quantities, the marginal cost curve is downward sloping. That is due to specialization that causes increasing marginal returns. The quantity where the marginal cost curve is at its minimum is where diminishing marginal returns sets in. Diminishing marginal returns causes marginal costs to rise at higher quantities.

Average Fixed Costs: Add up all of the fixed costs for a firm and divide by the quantity produced ($AFC = FC/Q$). Continually decreases. Rarely drawn because the distance between the ATC and AVC will be equal to the AFC at that quantity. Average fixed costs continually decrease as output increases.

Average Variable Costs: Add up all of the variable costs for a firm and divide by the quantity produced ($AVC = VC/Q$). Decreases until it intersects the MC then increases. Looks like a smirk. Firms shut down (temporarily) when price falls below the minimum point on the AVC.



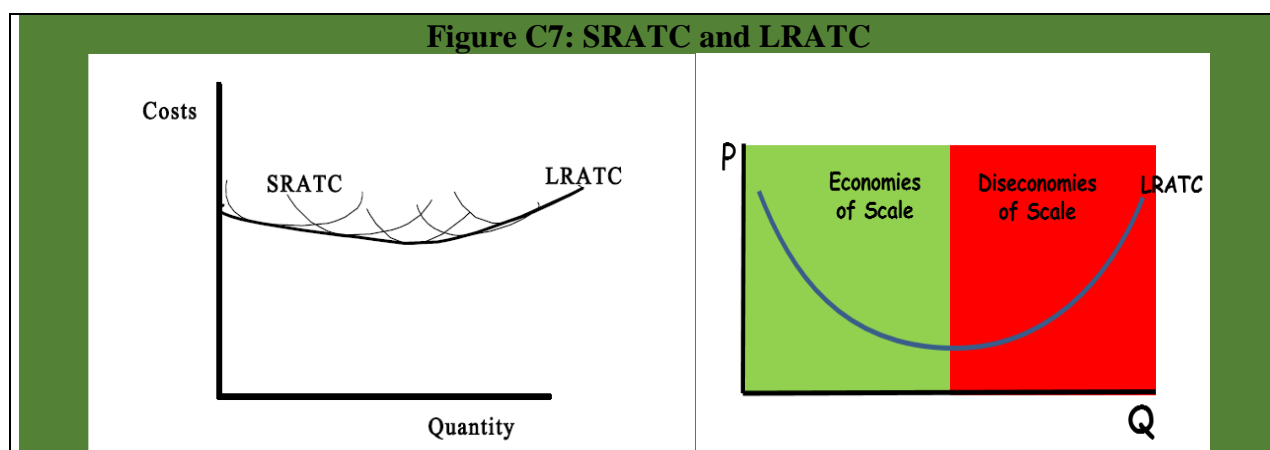
Average Variable Costs: Add up all of the variable costs for a firm and divide by the quantity produced ($AVC = VC/Q$). Decreases until it intersects the MC then increases. Looks like a smirk. Firms shut down (temporarily) when price falls below the minimum point on the AVC.

Average Total Costs: Variable costs added to Fixed costs, then divided by Quantity gives you the Average Total Costs ($ATC=TC/Q$). It decreases until it intersects the MC then increases. Looks like a smile. The ATC tends to be a flipped average product curve. Producing the quantity where the ATC is at its minimum is productively efficient.

Shifting Cost Curves: Changing a variable cost like per unit taxes or subsidies, labor costs or raw material costs will shift the ATC, AVC, and MC upward if it is a cost increase or downward if it is a cost decrease.

Changing a fixed cost like lump sum taxes or subsidies, rent payments, or insurance payments, will only shift the ATC upward if it is a cost increase or downward if it is a cost decrease.

Short-run Average Total Cost (SRATC) vs Long-run Average Total Cost (LRATC): When a business first opens, it will have a short-run average total cost curve for various quantities it can produce. In the short run, only variable costs can be changed; fixed costs cannot. The firm can only change the rate of production by changing the amount of raw materials, labor, etc. it utilizes in the production process. In the long run, all costs (fixed and variable) can change. The firm can expand capacity, by purchasing more machinery or building a new factory. That change gives the firm a new short-run average total cost curve at greater quantities. As the firm continues to grow, each new capacity creates a new short-run average total cost curve at a higher quantity. Each possible SRATC gives way to a long-run average total cost curve which shows average costs for all quantities the firm can produce in the long run at every possible capacity.



Economies of scale: When the long-run average total cost curve is downward sloping, higher quantities have a lower average cost. This occurs for many firms as they expand and get more efficient allowing them to minimize average costs. This is called economies of scale. Many businesses will eventually reach a point where continuing to expand leads to the creation of inefficient bureaucracies, etc. which increase average costs. When this occurs, the long-run average total cost curve will be upward sloping. That is called diseconomies of scale.

Between the downward sloping and upward sloping portions of the long run average total cost curve there is often a flat portion where the firm is experiencing neither economies of scale or diseconomies of scale. This area is called constant returns to scale. Here, as the business expands production capacity, the long run average costs do not change. This area where the LRATC is at its lowest is also called “Minimum Efficient Scale.” This is the production capacity a firm must reach in order to produce at a competitive cost.

Returns to scale: One of the reasons for economies of scale is that small firms can often increase resources used by a small amount while increasing output much more. This is called increasing returns to scale. Some firms may increase output at the same rate as they increase resources. That is called constant returns to scale. Other firms may increase output at a smaller rate as they increase resources. This is called decreasing returns to scale.

The easiest way to figure out if a firm is experiencing increasing, decreasing or constant returns to scale is to double all inputs and see what happens to output. If output also doubles, the firm is experiencing constant returns to scale. If output more than doubles, it is experiencing increasing returns to scale. If output less than doubles, it is experiencing decreasing returns to scale.

Calculation of Costs: It is important to realize the shapes of all the cost curves come from a typical firm's actual costs. The basic formulas were shown above; below is a chart with all costs for a fictitious firm.

Q	FC	MC	VC	TC	AVC	ATC	AFC
0	20	-	-	20	-	-	-
1	20	10	10	30	10	30	20
2	20	5	15	35	7.5	17.5	10
3	20	10	25	45	8.33	15	6.67
4	20	15	40	60	10	15	5
5	20	20	60	80	12	16	4
6	20	25	85	105	14.17	17.5	3.33

Fixed Cost

1. Total cost for making a quantity of zero: The total cost in the example above is 20 so the fixed cost is 20
2. Difference between total cost and variable cost: At the quantity of 1, the total cost is 30 and the variable cost is 10; so, the difference is 20 (30-10).
3. Difference between average total cost and average variable cost times the quantity: At the quantity of 2, the average total cost is 17.5 and the average variable cost is 7.5. The difference is 10. $10 \times 2 = 20$, so the fixed cost is 20.
4. Find average fixed cost times quantity: At the quantity of 4 the average fixed cost is 5. Since $4 \times 5 = 20$, the fixed cost is 20.

Marginal Cost

5. The change in variable cost for producing one more unit: The variable cost for a quantity of 2 is 15 and the variable cost for 3 is \$25. So, the marginal cost for the 3rd unit produced is 10.
6. The change in total cost for one more unit: The total cost for a quantity of 4 is 60 and the total cost for 5 is 80. So, the marginal cost for the 5th unit produced is 20.
7. Multiply the average variable cost by the quantity to find variable cost. Then, find the change in the variable cost for producing one more unit. At the quantity of 4, the average variable cost is 10, so the variable cost is 40 ($10 \times 4 = 40$). At the quantity of 5, the average variable cost is 12 so the variable cost is 60 ($12 \times 5 = 60$). The change in variable cost for the 5th unit produced is 20 ($60-40$).

Variable Cost

8. Add all the marginal cost up to that unit: So, if you are trying to find the variable cost for the 6th unit, you would add the marginal cost for all previous units produced. The marginal cost for all 6 units is 10, 5, 10, 15, 20 and 25. Add all those up and you get a variable cost of 85.
9. Total cost minus fixed cost: At a quantity of 1, the total cost is 30 and the fixed cost is 20. So, the variable cost is 10 ($30-20$).
10. Average variable cost times quantity. At the quantity of 2, the average variable cost is 7.5. Since $2 \times 7.5 = 15$, the variable cost for a quantity of 2 is 15.
11. Find the difference between the average total cost times the quantity and the average fixed costs times the quantity: At the quantity of 4, the average total cost is 15 and the average fixed cost is 5. Since $4 \times 15 = 60$ and $4 \times 5 = 20$, the total cost is 60 and the fixed cost is 20. The difference (the variable cost) is 40 ($60-20$).
12. Find average variable cost times quantity: At the quantity of 5, the average variable cost is 12. Since $5 \times 12 = 60$, the variable cost is 60.

Total Cost

13. Add the fixed cost and variable cost together: The first unit produced has a fixed cost of 20 and a variable cost of 10. So the total cost of one unit is 30 ($20+10$).
14. Add the fixed cost and the marginal cost of each unit produced thus far: At a quantity of 2, the fixed cost is 20. The marginal cost for the first unit is 10 and the second unit is 5. Since $20+10+5=35$, the total cost of 2 units is 35.
15. Add average variable cost times quantity and average fixed cost times quantity together: At the quantity of 5, the average variable cost is 12 and the average fixed cost is 4. Since $5 \times 12 = 60$ and $5 \times 4 = 20$, the total cost for 5 units is 80 ($60+20$).
16. Find average total cost times quantity: At 6 units, the average total cost is 17.5. Since $6 \times 17.5 = 105$, the average total cost for 6 units is 105.

Average Variable Cost

17. Find variable cost (using any method above) and divide by quantity: At the quantity of 2, the variable cost is 15. Since $15/2 = 7.5$, the average variable cost for 2 units is 7.5.
18. Difference between average total cost and average fixed cost: At the quantity of 3, the average total cost is 15 and the average fixed cost is 6.67. Since $15 - 6.67 = 8.33$.

Average Total Cost

19. Find total cost (using any method above) and divide by quantity: At the quantity of 3, the total cost is 45. Since $45/3 = 15$, the average total cost for 3 units is 15.
20. Add average variable cost and average fixed cost: At the quantity of 4, the average variable cost is 10 and the average fixed 5. Since $10 + 5 = 15$, the average total cost for 4 units is 15.

Average Fixed Cost

21. Find fixed cost (using any method above) and divide by quantity: At the quantity of 5, the fixed cost is 20. Since $20/5 = 4$ the average fixed cost for 5 units is 4.
22. Difference between average total cost and average variable cost: At the quantity of 6, the average total cost is 17.5 and the average variable cost is 14.17. Since $17.5 - 14.17 = 3.33$, the average fixed cost for 6 units is 3.33.

Revenue, Cost and Profit

Revenue is money a firm brings in from sales. Total Revenue is Price times Quantity ($TR=P \times Q$). You already learned about total revenue in the elasticity review. Marginal revenue is the change in Total Revenue divided by the change in Quantity ($MR = \Delta TR/\Delta Q$). Most often the change in quantity is just one, so marginal revenue is usually the revenue a firm brings in for producing one more unit of output.

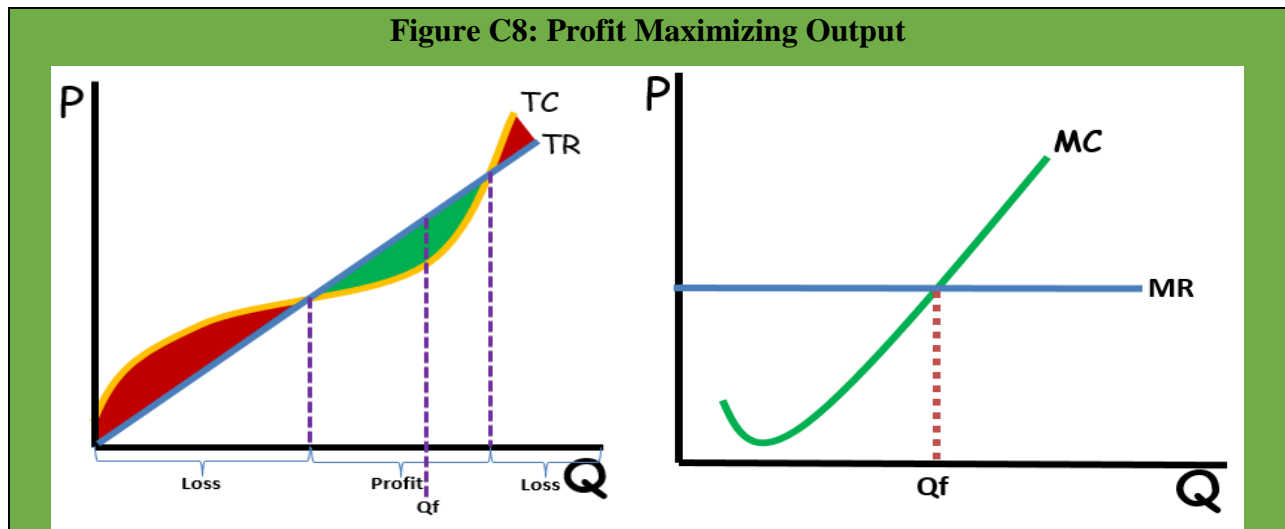
Implicit and Explicit Costs: Two types of costs would be required in microeconomics to calculate economic profit. Explicit costs and implicit costs. These ideas were touched on in the opportunity cost review, but here we are going to use terminology as it relates to a firm (business). Explicit costs are the out of pocket costs paid by the business owner. Explicit costs for this website are the hosting fees, the cost of the software, etc. Implicit costs are the implied costs, or the value of opportunities lost (aside from out of pocket money costs). The implicit costs associated with producing this website include the value of my evening leisure time.

Accounting and Economic Profit: In microeconomics there are actually two types of profit that would be required: accounting profit and economic profit. Accounting Profit is what most people think of as profit and although it isn't nearly as important as economic profit, it shows up on many economics exams. Accounting profit is total revenue minus explicit costs. For this website, accounting profit would be the revenue generated for the ads minus the web hosting fees and the cost of the software. Accounting profit is always higher than economic profit. Economic Profit is much more important to economists than accounting profit. Economic profit is Total Revenue minus Explicit and Implicit costs. So for this website, economic profit would subtract not only the hosting and software costs but also the cost of my time (labor) for creating the content.

On every one of the firm graphs, both implicit and explicit costs are contained within the cost curves. So if a firm is making a profit, it is an economic profit. If they are suffering a loss, it is an economic loss. If they are making zero economic profit (breaking even), they are still making an accounting profit.

Breaking Even or Zero Economic Profit (also called Normal Profit): When a firm is earning zero economic profit, its total revenue equals its total costs (both implicit and explicit). On the firm graphs, price will equal the average total cost (ATC). When that occurs, the entrepreneur will be earning whatever they could be earning doing the next best alternative. A teacher who quits teaching to become a street performer would break even (earn zero economic profit) if they earn a teacher's salary by street performing. This person would still be earning an accounting profit. They would have to earn more than a teacher's salary to be earning an economic profit.

Profit Maximization: One way to determine the profit maximizing quantity for a firm to produce is to look at total revenue versus total cost. Total revenue, for a perfectly competitive firm, will increase at a constant rate. The total cost will increase at varying rates. When total revenue is below total cost, the firm earns a negative economic profit. When total revenue equals total cost, the firm breaks even (earns zero economic profit). When the total revenue is greater than total cost, the firm earns a positive economic profit. Economic profit is maximized where total revenue is greater than total cost by the largest margin. In the graph, to the right, Q_f is the profit maximizing quantity.



Businesses follow this same logic. The only difference is that for a business the marginal benefit is called marginal revenue. A firm will maximize profit (total revenue – total cost) if they produce until marginal revenue (MR) is equal to marginal cost (MC). Producing less than the $MR=MC$ quantity will mean MR is greater than MC so profit can be increased by producing more. Producing more than the $MR=MC$ quantity means MC is greater than MR so profit will increase if less is produced. So, profit maximizing firms will continue to produce as long as the marginal revenue is greater than or equal to the marginal cost, but not produce any units where the marginal revenue is less than the marginal cost.

Indicative Questions and Exercises

1. Why is the marginal product of labor likely to increase initially in the short run as more of the variable input is hired?
2. What is the relationship between marginal product and average product?
3. Why does production eventually experience diminishing marginal returns to labor in the short run?
4. Explain the law of diminishing marginal product.
5. ‘Marginal Cost and Average cost curves intersect at a point where marginal cost is maximum’- Explain.
6. What is isoquant map? What does an isoquant map reflect?
7. Isoquants is generally convex to the origin- Why? What does each of these shapes tell you about the MRTS?
8. Explain “marginal rate of technical substitution?”
9. Explain different forms of Returns to Scale?
10. ‘When inputs are doubled, output becomes more than double’ - What does this tell regarding the concept of ‘Returns to Scale’-Explain.
11. How the concepts of Total Cost, Variable Cost and Fixed Cost are related in the theory of Production and Cost?
12. Explain the relationship between marginal Cost, Average Cost, and Average Variable Cost.
13. ‘Economies of scale occur when long-run average total costs rise as output increases’ - Do you agree? Explain your answer.
14. ‘Long run average cost curves can be seen as a lower “envelope” for short run average cost curves’-Explain.
15. Consider the following cost information for product X:

Quantity	Total Cost	Variable Cost
1	350	50
2	390	90
3	420	120
4	450	150
5	490	190
6	540	240

What is the X’s fixed cost? Construct a table and calculate the marginal cost per unit of Product X using the information on total cost. Also, calculate the marginal cost per unit of X using the information on variable cost. What is the relationship between these sets of numbers? Comment.

Module-D: Market Structure

Module-D: Market Structure

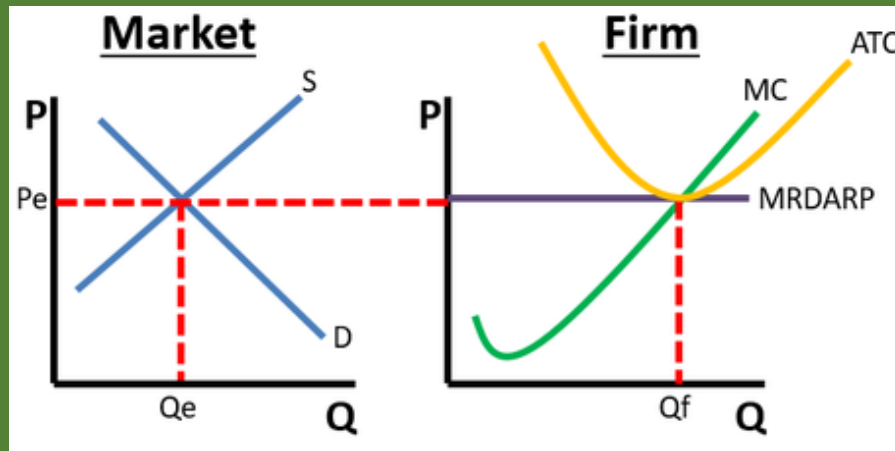
There are several models of market structure, these include a. Perfect Competition (atomized competition, price taker, freedom of entry & exit, no nonprice competition, standardized product); b. Monopoly (one seller, price giver, entry & exit blocked, unique product, nonprice competition); c. Monopolistic competition (large number of independent sellers, pricing policies, entry difficulty, nonprice competition, product differentiation); d. oligopoly (very few sellers, often collude, often price leadership, entry difficult, nonprice competition, product differentiation). Market structures are categorized based on their key features.

Key Features of the Market Structure				
	Number of Sellers/Firms	Nature of product/Services	Control Over Price	Entry/Exit
Perfect Competition	Numerous	Homogenous	No Control	Free
Monopolistic	Large	Differentiated	Some Control	Not Free
Oligopoly	Few	Homogenous/ Differentiated	May have Significant Control	May or May not
Monopoly	One	Unique	Significant Control	Entry Restricted

Perfect Competition

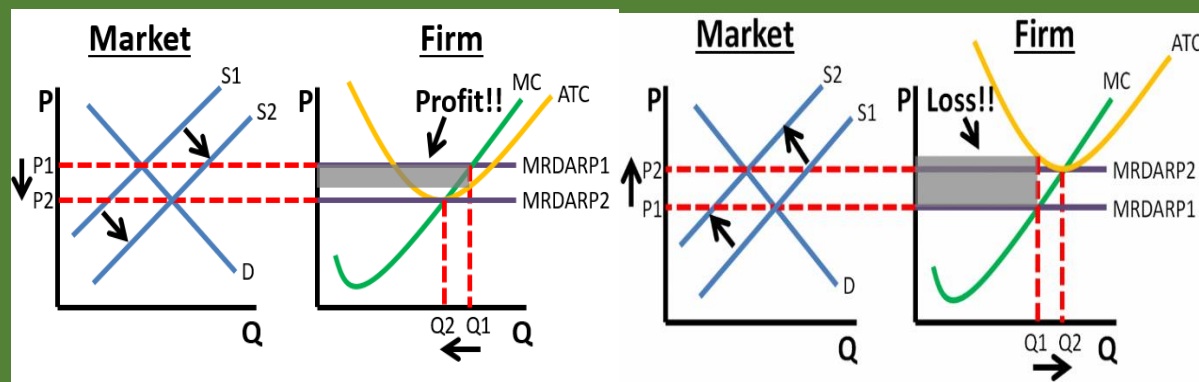
For the perfectly competitive market, a firm is a price taker and market is the price maker. The market graph is a standard supply and demand graph with an equilibrium price and quantity. Since the firm is a price taker (no ability to affect price), the firm's demand curve is horizontal (perfectly elastic) at the market price. This demand curve is also the firm's average revenue (AR), marginal revenue (MR), and price (P). Together the 4 curves in one form what is often labeled MRDARP (Marginal Revenue, Demand, Average Revenue, Price). The firm produces the quantity where $MR=MC$. The cost curves for perfect competition are the same as a monopoly and monopolistically competitive firm. The AVC and AFC are rarely needed in this graph. When a firm earns zero economic profit, it has no incentive to exit the industry. Likewise, other firms have no special incentive to enter. A long-run competitive equilibrium occurs when three conditions hold: all firms in the industry are maximizing profit; no firm has an incentive either to enter or exit the industry because all firms are earning zero economic profit; and the price of the product is such that the quantity supplied by the industry is equal to the quantity demanded by consumers (Figure D1).

Figure D1: Market and Firm Equilibrium in the Perfectly Competitive Structure



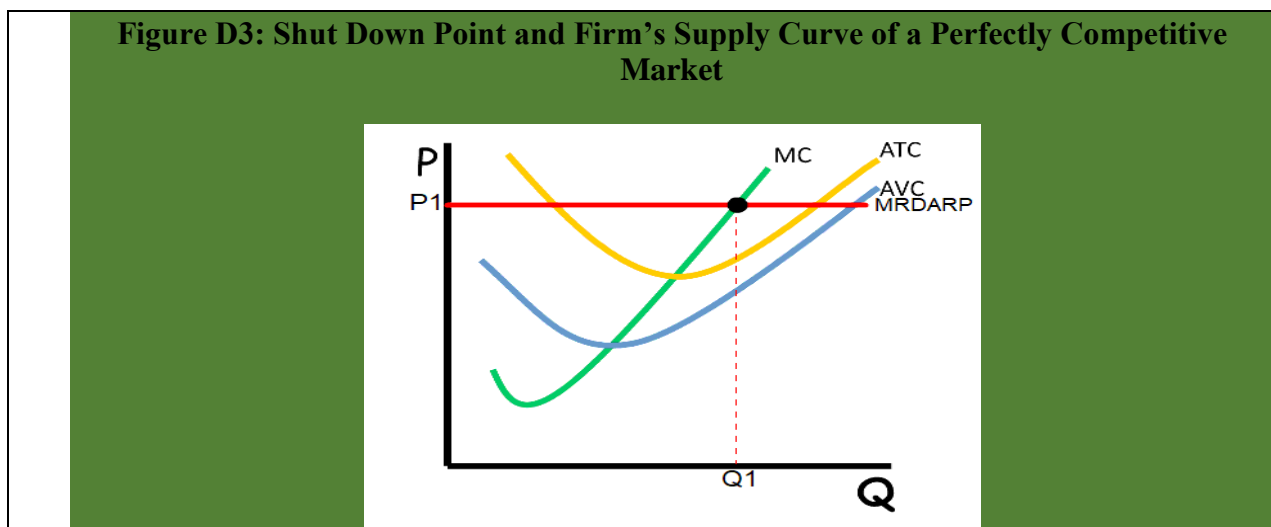
In a perfectly competitive market, a barrier to entry is anything that makes it difficult for entrepreneurs to enter the market and compete. Barriers to entry can be high startup costs, customer loyalty, government regulation, etc. In perfectly competitive markets, barriers to entry are low. That means, when firms are earning economic profits, competing firms seek that profit and enter the market in the long run. When firms enter the market, prices fall and economic profit goes to zero. When firms are earning economic losses, firms exit the market (as resources will be more profitable elsewhere) in the long run, causing prices to rise until economic losses are zero. In the end, low barriers to entry (and exit) mean competitive markets earn zero economic profit in the long run. On the graph, when firms enter the market it shifts the market supply curve to the right, decreasing the market price and $MR=D=AR=P$ until firms break even. When there are economic losses in the short run, firms exit the market in the long run which shifts the market supply curve to the left, increasing price and $MR=D=AR=P$ until the firm breaks even.

Figure D2: Short Term Profit and Loss Situation in a Perfectly Competitive Market



Long term profit for a perfectly competitive firm is zero (Figure D1). In this market, allocative efficiency is attained because price equals marginal cost in both the short-run and long-run. Productive efficiency occurs when the firm is producing at the minimum of the average total cost (ATC) curve (where it intersects the MC). In the short run, perfectly competitive firms are not productively efficient, but in the long run they are (may earn profit or loss as shown in Figure D2).

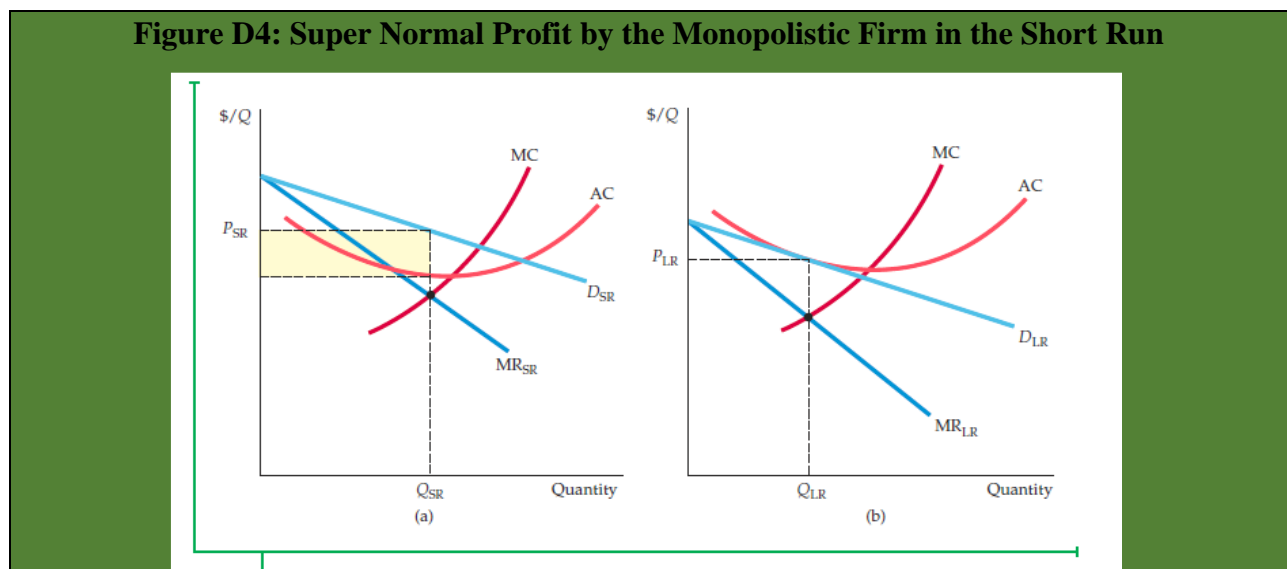
The minimum point on the AVC correlates to the lowest price a firm would be willing to accept. If the market price is above the AVC, the firm will produce the quantity where $MR=MC$. As the price falls, profit will fall but the firm will continue to produce where $MR=MC$. If the price continues to fall, the firm will produce lower quantities as long as the price stays above the AVC. If the price falls below the AVC, the firm shuts down (temporarily) as the firm will only lose its fixed costs if it shuts down. Producing at a price below the AVC would cause the firm to lose more than their fixed costs. If the price equals the minimum of the AVC, the firm will produce that quantity; it is the lowest quantity the firm would produce. As a result, the firm's supply curve is the MC curve above the AVC.



Generally perfectly competitive firms are considered as part of constant cost industries. Those are industries where the firm's cost curves do not shift based on the equilibrium output in the market. However, there could also be an increasing cost industry. That would be a product where an increase in the market equilibrium quantity would cause an increase in costs for the individual firm. Increasing cost industries occur because the long run average total cost curve for the industry as a whole is upward sloping. Precious metals are an example increasing cost industry because as more gold and silver is produced (through mining) the cost of producing more constantly increases; as gold and silver become more and more difficult and costly to mine. A decreasing cost industry is just the opposite. Cost curves will shift downward as industry output increases. This is as a result of the industry's long-run average total cost curve sloping downward. These industries capture economies of scale. Microchips are an example of a product in a decreasing cost industry. The more that are produced, the cheaper production typically gets.

Monopolistic Competition

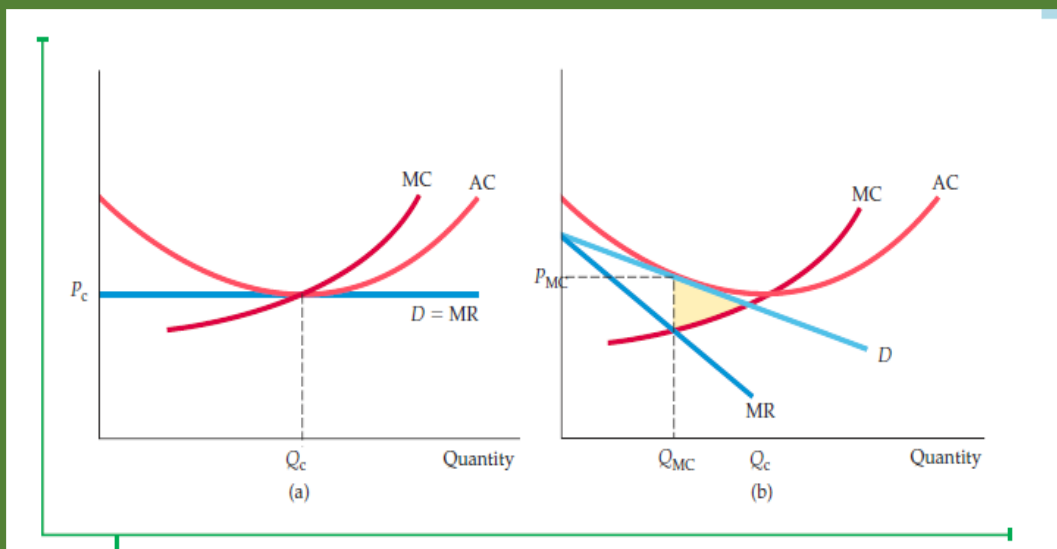
Monopolistic competition is the market structure that combines monopoly and competition. In monopolistic competition firms face downward-sloping demand curves. Therefore, they have some monopoly power. But this does not mean that monopolistically competitive firms are likely to earn large profits. Monopolistic competition is also similar to perfect competition: Because there is free entry, the potential to earn profits will attract new firms with competing brands, driving economic profits down to zero. To make this clear, let's examine the equilibrium price and output level for a monopolistically competitive firm in the short and long run. The following graph (Figure D4) shows the short-run equilibrium. Because the firm's product differs from its competitors, its demand curve D_{SR} is downward sloping. (This is the firm's demand curve, not the market demand curve, which is more steeply sloped.) The profit maximizing quantity Q_{SR} is found at the intersection of the marginal revenue and marginal cost curves. Because the corresponding price P_{SR} exceeds average cost, the firm earns a profit, as shown by the shaded rectangle in the figure (Figure D4).



In the long run (Figure D5), this profit will induce entry by other firms. As they introduce competing brands, our firm will lose market share and sales; its demand curve will shift down. (In the long run, the average and marginal cost curves may also shift. We have assumed for simplicity that costs do not change.) The long-run demand curve D_{LR} will be just tangent to the firm's average cost curve. Here, profit maximization implies the quantity Q_{LR} and the price P_{LR} . It also implies zero profit because price is equal to average cost. The firm still has monopoly power. Its long-run demand curve is downward sloping because its particular brand is still unique. But the entry and competition of other firms have driven its profit to zero. More generally, firms may have different costs, and some brands will be more distinctive than others. In this case, firms may charge slightly different prices, and some will earn small profits.

A comparison of perfectly competitive (Figure D4) and monopolistic (Figure D5) long run equilibrium indicates comparative market efficiency and optimum use of resources. Under perfect competition, as in (Figure D4), price equals marginal cost, but under monopolistic competition, price exceeds marginal cost. Thus there is a deadweight loss, as shown by the yellow-shaded area in (Figure D5). In both types of markets, entry occurs until profits are driven to zero. Under perfect competition, the demand curve facing the firm is horizontal, so the zero-profit point occurs at the point of minimum average cost. Under monopolistic competition the demand curve is downward-sloping, so the zero-profit point is to the left of the point of minimum average cost. In evaluating monopolistic competition, these inefficiencies must be balanced against the gains to consumers from product diversity.

Figure D5: Long Run Equilibrium in the Monopolistic Market



Oligopoly

Oligopoly market may take different model structure, and with the passage of time it may take different shape. It is much more difficult for an oligopoly to determine at what output it can maximize its profit. There are two major reasons for this: the interdependence of the oligopolistic firms and their diversity, especially in terms of concentration ratios. Some oligopolies have a very high concentration ratio, allowing them to act more like a monopoly, while other industries have a much lower concentration ratio, thus, making it more difficult to determine the best pricing strategy, since the number of possible responses by competitors is increased.

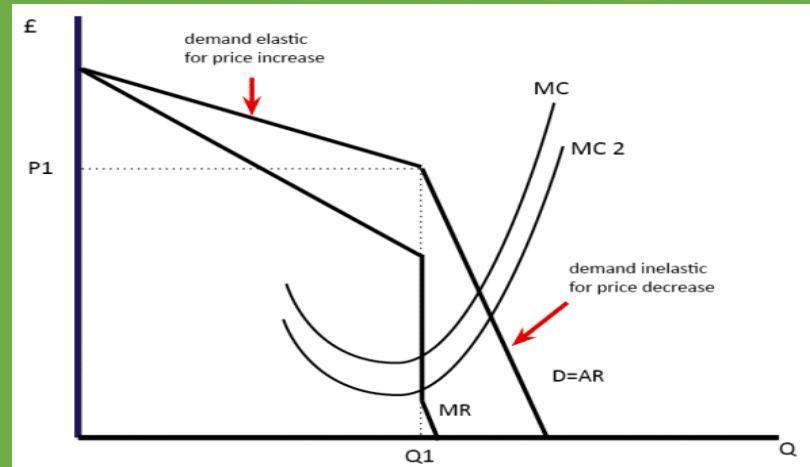
In a stable economy, oligopolies' prices change much less frequently than under any other market model, such as pure competition, monopolistic competition, and even monopoly. When prices do change, the firms generally move in the same direction and by the same magnitude in their price changes, which may be the result of collusion. There are several basic theories about oligopolistic pricing: kinked-demand model, or non-collusive oligopoly, the cartel or collusion model, the price leadership model, and contestable market model.

Kinked-Demand Model Consider a firm in an oligopoly that wants to change its price. How will the other firms react? There are 2 possibilities: they can either match the price changes or ignore them. But what the other firms will actually do will probably depend on the direction of the price change. If one firm raises its price, the others probably will not follow, since that will allow them to take market share from the price changer. This makes the demand curve more elastic, since as the firm raises its price, then many of its customers will buy from the other firms, lowering the revenue of the higher-priced firm.

If the firm lowers its price, then the other firms would surely follow, to prevent any loss of market share. This part of the demand curve is much more inelastic, since all the firms are acting in concert. This creates a kink in the demand curve, where the change in demand goes from very elastic at higher prices to inelastic at lower prices. Since the marginal revenue curve depends on prices, the marginal revenue curve is also kinked. At lower prices, the marginal revenue curve drops downward creating a gap. The marginal cost curves of both scenarios will intersect the same quantity being produced by the oligopoly, represented by the vertical line in the graph; therefore, there is no change in quantity produced as prices are lowered, as long as the change in marginal cost is within the marginal revenue gap. In the graph below (Figure D6), if a firm raises its price (elastic), the others do not match the increase, then revenue will decline in spite of the price increase. If the firm lowers its price (inelastic), then the other firms will match the decrease to avoid losing market share. Because there is a kink in the demand curve, there is a gap in the marginal revenue curve (MR1 - MR2). Since firms maximize profit by producing that quantity where marginal cost = marginal revenue, the firms will not change the price of their product as

long as the marginal cost is between MC1 and MC2, which explains why oligopolistic firms change prices less frequently than firms operating under other market models.

Figure D6: Kinked Demand Curve in the Oligopoly Market



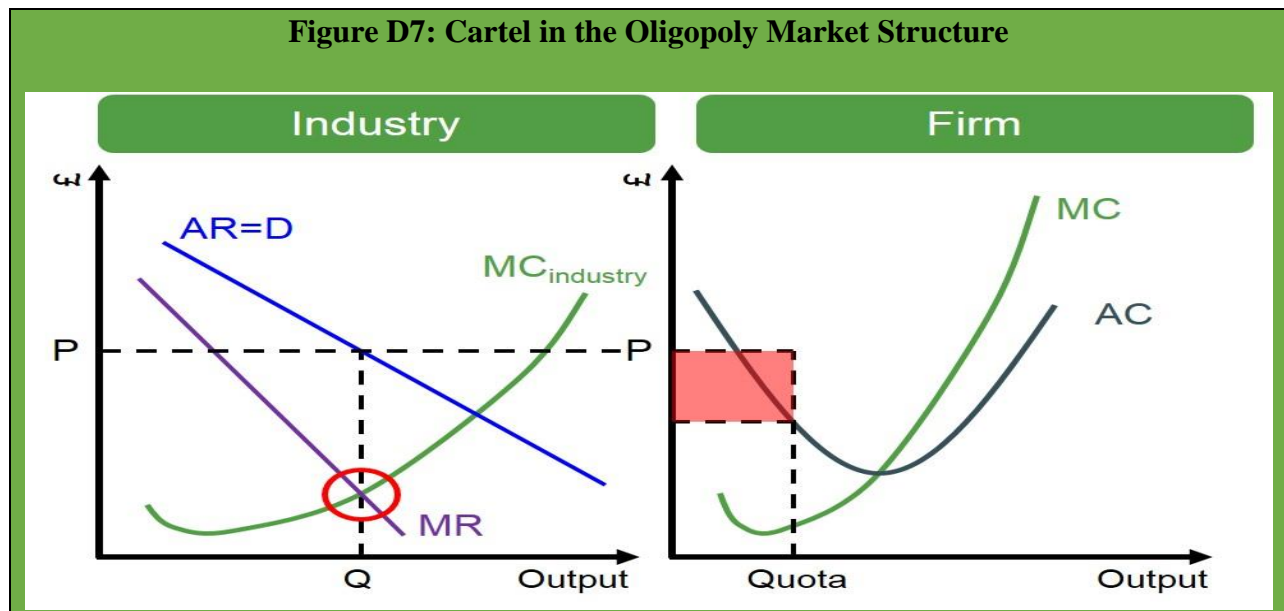
The kinked-demand curve explains why firms in an oligopoly resist changes to price. If one of them raises the price, then it will lose market share to the others. If it lowers its price, then the other firms will match the lower price, causing all the firms to earn less profit.

Critics of the kinked-demand model point out that while the model explains why oligopolies maintain pricing, it doesn't explain how its products were initially priced. Also not explained is that when the economy changes significantly, especially with high inflation, then the firms of an oligopoly do change prices often. Oligopolistic firms may even engage in a price war, where each firm charges a successfully lower price to gain market share.

Cartel or Collusion Sometimes firms in an oligopoly try to form a cartel by agreeing to fix prices or to divide the market among themselves, or to restrict competition some other way. The primary characteristic of the Cartel Model is collusion among the oligopolistic firms to fix prices or restrict competition so that they can earn monopoly profits.

If the dominant firms in an oligopoly can successfully collude to fix prices, then they can be certain of each other's output, which will allow to maximize their profits by producing that quantity of output where marginal revenue = marginal cost, just as it would be for a monopoly. However, if any of the firms cheat, then a price war may ensue, lowering the profits of all firms, and maybe even causing them to operate at a loss. In most modern economies, collusion is generally against the law, however there are certain countries that engage in collusion to maximize their profits from their natural resources. Each participating firm is then allocated with a quota.

Figure D7: Cartel in the Oligopoly Market Structure



The best example of a cartel today is the Organization of Petroleum Exporting Countries, otherwise known as OPEC, which comprises 12 oil-producing nations that supply 60% of all oil traded internationally. Prices are maintained by restricting each country of the OPEC cartel to a specific production allocation. The OPEC cartel is largely responsible for the large fluctuations in gasoline prices that occurred in the United States since 1973, although recently, speculation in the commodity markets has also increased volatility.

Collusion is often difficult to detect, because it is often based on tacit or covert agreements that are made during social interactions between the executives of oligopolistic firms. Nonetheless, there are several obstacles to collusion.

One common obstacle is differences in demand and cost. Firms that serve different geographic markets will have varying levels of demand, and they may also have different efficiencies, resulting in different production costs. If economies of scale are steep for an industry, then smaller firms will aggressively compete on price to increase their market share, so that they can earn reasonable profits. In such cases, it will be difficult for the firms to agree on the price, because they will have different marginal cost curves. A good example is Saudi Arabia and Venezuela in the production of oil. Saudi Arabia is efficient in producing oil, whereas Venezuela, governed by an inept communist government, is highly inefficient, so it would be very difficult for Venezuela to accept a price that would be suitable for Saudi Arabia. Consequently, there is a great temptation for inefficient producers to cheat, and if they cheat, then price competition ensues.

Another factor that increases cheating is recessions. During recessions, demand declines, which shifts the firm's marginal cost and demand curve to the left. Firms often respond by reducing prices

so that they can better utilize their production capacity and to try to gain market share from the other firms.

A larger number of firms in the oligopoly make it difficult both to create and maintain collusion. If there are only 2 or 3 firms in the oligopoly, then it is fairly easy to collude to set prices or to limit competition. However, if there are 6 or more firms with a smaller share of the market, then collusion becomes increasingly difficult. Indeed, the likelihood of successful collusion decreases as the number of firms increases.

Another possible barrier to collusion is that if prices are maintained too high, then it may allow new entrants into the industry that will provide more competition, or, smaller firms that did not have much market power can cut prices and increase production to grab market share.

The other major barrier to collusion is antitrust law. Most modern economies prohibit collusion, since it is against the public interest, although there are some exceptions. A very common exception is the pricing of insurance products, since many insurance companies depend on rating companies that gather information on insurance risks and how to price them.

Price Leadership Model In many industries, there is a dominant firm in an oligopoly, and the other firms often follow the dominant firm in price changes, which can be viewed as a type of implicit price collusion. Hence, the dominant firm also becomes the price leader. Since most firms have been in the business for a number of years, they can observe how their competitors react to changes in the industry, allowing them to reach an understanding of how their competitors will react to any price changes. Firms in an oligopoly do not often change prices, certainly not for minor changes in costs, but they will change prices if cost changes are substantial. Indeed, if there is a general price increase in the inputs of an industry, then all firms will surely increase their prices. Increasing price of inputs, of course, helps to protect the industries from antitrust prosecutions since they have a reasonable basis for increasing the price of their products that is not related to restricting competition.

Oftentimes, the price leader will communicate the need to raise prices through press releases, trade publications, and speeches by major executives, especially when announcing quarterly earnings.

There are many times when a price leader will limit price increases to discourage the entrance of new competitors — a practice called limit pricing. This will be particularly true if the economies of scale are not that steep, since high prices can allow the entrance of new competitors who will be able to survive on a small market share.

Sometimes price leadership breaks down and price wars result. However, price wars are self-limiting, since they will often lead to losses. Eventually, the firms will capitulate and return to the practice of following the price leader.

Contestable Market Model The contestable market model is an oligopolistic model based on barriers to entry and barriers to exit that determine the firm's price and output. If the barriers are high, then the oligopolist will set higher prices. On the other hand, if the barriers are low, then the oligopolist will set low prices to prevent new firms from entering the industry or to promote the exit of its competitors.

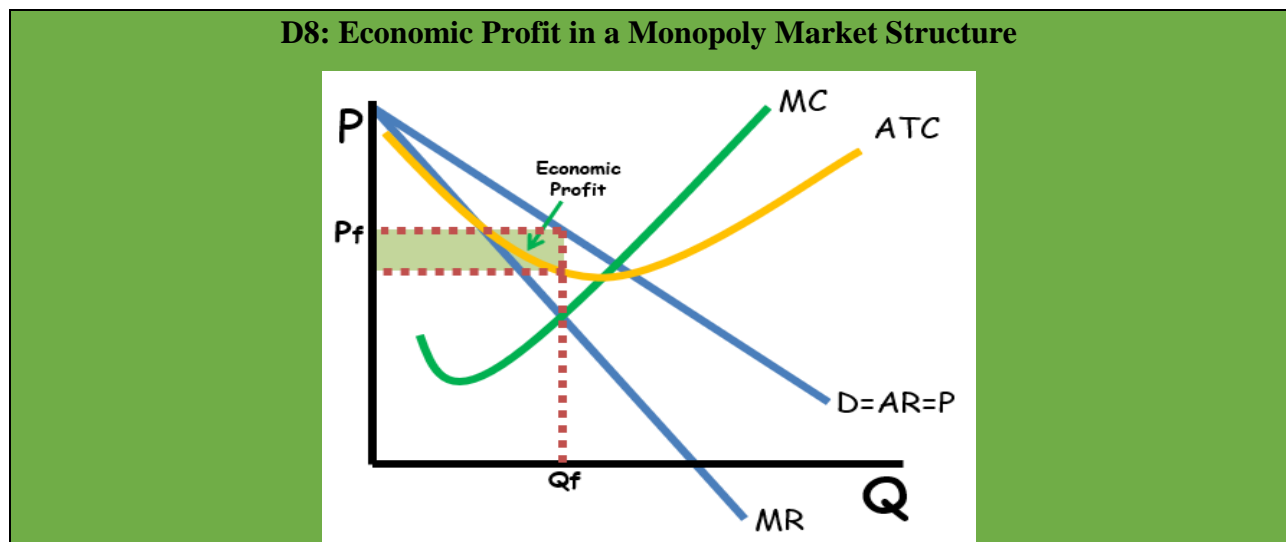
Productive Inefficiency Pure competition achieves productive efficiency by producing products at the minimum average total cost. They also achieve allocative efficiency because they produce until their marginal cost = price. However, because oligopolies produce only until marginal cost = marginal revenue, they lack both the productive and allocative efficiency of pure competition.

Because oligopolies can successfully thwart competition, they restrict output to maximize profits, producing only until marginal cost = marginal revenue. Hence, oligopolies exhibit the same inefficiencies as a monopoly. Because the marginal cost curve intersects the marginal revenue curve before it intersects the average total cost curve, oligopolies never reach an efficient scale of production efficiency, since they never operate at their minimum average total cost. Similarly, the marginal cost curve never intersects the market demand curve; therefore, oligopolies produce less product than what the market desires, so oligopolies lack allocative efficiency.

Monopoly

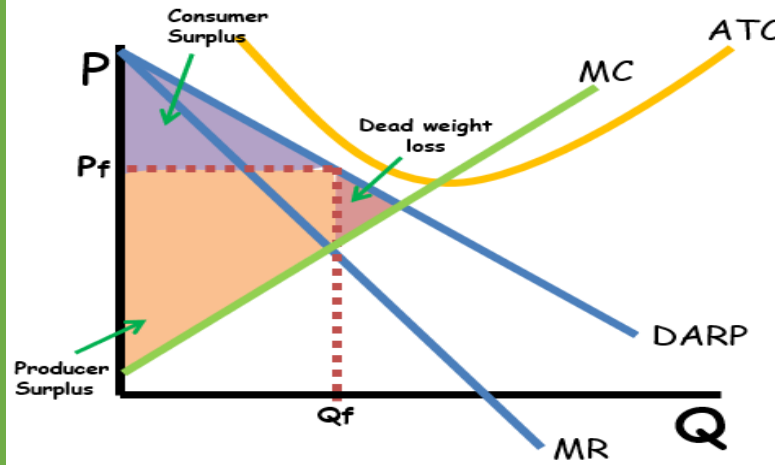
There are no close substitutes and no competitors, and the product is unique. High barriers prevent any competitors from entering. Monopolies may engage in rent seeking behavior (working to pass voter initiatives, lobbying politicians, etc), to maintain a monopoly. These actions will increase the firm's ATC and erode some economic profits. Due to the high barriers to entry, super normal economic profit is possible in the long run. Monopoly power gives firms the ability to charge higher prices than would be charged in a competitive market. High barriers to entry are the driving force behind giving firms monopoly power. Monopolies price above marginal cost and do not produce at the lowest average cost so they are not allocative or productively efficient and they have deadweight loss. Monopolies usually capture economies of scale because the profit maximizing quantity is on the downward sloping portion of their long-run average total cost curve.

Since there is only one firm, the market is firm. As a result, the firm's demand curve is downward sloping. The average revenue, and price will also be the demand curve (DARP). If the firm is a single price monopoly, the marginal revenue curve is below demand. The cost curves for a monopoly are the same as a perfectly competitive firm and monopolistically competitive firm. The AVC and AFC are rarely needed in this graph.



Single price monopolies have both consumer and producer surplus. But since they do not produce the allocative efficient quantity (where $P=MC$), they create deadweight loss and are inefficient.

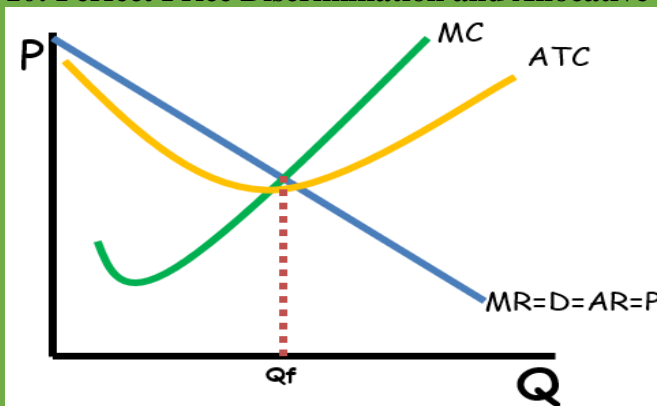
Figure D9: Allocative Inefficiency in the Monopoly Market



A natural monopoly is an industry which captures economies of scale at the allocative efficient quantity resulting in much lower average costs when there is a large single provider. These businesses usually have extremely high start-up costs but have a very low marginal cost of production. Electricity providers are a prime example of natural monopolies. The most expensive part of providing homes in a city with electricity is putting up wires and cables all over town to carry the electricity. If electric service was not a monopoly and consumers had multiple choices regarding who to purchase electricity from, the costs of production would be dramatically higher (as multiple sets of cables and wires would need to be strung) and price would likely be higher as a result. So, the natural monopoly may actually benefit consumers.

Governments will often regulate natural monopolies by imposing price ceilings which may be more efficient than the unregulated price. The socially optimal price is efficient and creates no deadweight loss where price equals marginal cost, but the firm may suffer economic losses at this price. If forced to earn economic losses, the firm will eventually exit the market so the government must provide the firm with a lump sum subsidy (equal to its loss) to eliminate deadweight loss.

Figure D10: Perfect Price Discrimination and Allocative Efficiency



Some monopolies are able to price discriminate and charge different prices for different units of output. Price discrimination occurs when a firm is able to charge different customers different prices for the same product. Like letting kids eat free or giving senior citizens discounts at restaurants. Firms charge lower prices to people with a lower willingness to pay and higher prices to people with a higher willingness to pay. If the firm is able to figure out the maximum price each customer is willing to pay and charge them that price, the firm would be a perfect price discriminator. That would cause the MR curve to be the same curve as the Demand, Average Revenue, and Price (MRDARP). Perfect price discriminators are allocative efficient. The last unit produced will be priced at the marginal cost.

Banking Industry- Monopolistic or Oligopoly Market Structure

In several published literature, banking industry has been terms as close to the monopolistic market structure considering the number of firms or banks with high density branch networks in a country; the nature of differentiated financial products or services; involvement of sunk costs; entry restrictions etc. And, it was expected that the industry would continue to be monopolistic competition to allow more players into the market. However, in several recent publications, there are opinions that banking industry is no longer monopolistic competition. The allowance of more players into the market would mean that the customers would get more choice and due to increased competition, interest rates and other banking services would reduce. The ideal economic situation that was projected was an industry full of many players that offer differentiated products.³

However, there are claims that banking industry is changing its market structure due to maturation, and currently, the industry operates like an oligopoly. The oligopoly condition was made possible through consolidation and mergers to make 'few bigger' banks that influence the market since they have a huge customer base. There are existence of dominant firms despite high number of banks in global economies. In USA, some banks have huge customer bases such as Citibank, JP Morgan & Chase, and Bank of America. Therefore, these banks control almost three-quarters of the customer base and their decisions is accepted. Unlike, to popular belief that in the long run, the banking industry should be more like 'Perfect Competition' or normal profit, the new phenomena are marking the customers lose even more.⁴

Australia's banking system has become so concentrated its major banks can pass on costs and set prices to boost profits without fear of losing market share, through every stage of the economic cycle, the Productivity Commission has found. The "four pillars" policy, which has underpinned Australia's banking system since the 1990s, and which was designed to prevent mergers between the four biggest banks to maintain competition. The reality of Australia's 'oligopolistic banking system' means the biggest banks are now regularly exploiting the inertia of existing customers, maintaining their market position with persistently opaque pricing, conflicted advice and remuneration arrangements, and a lack of easily accessible information that induces their customers to maintain loyalty to unsuitable products.⁵

³Astrid A. Dick. 2002. Market Structure and Quality: An Application to the Banking Industry: <https://www.federalreserve.gov>

⁴<https://www.coursehero.com/file/18114612/Banking-Industry-is-no-longer-Monopolistic-Competition/>

⁵<https://www.theguardian.com/australia-news/2018/aug/03/banking-industry-found-to-be-an-oligopoly-that-exploits-its-customers>

Indicative Questions and Exercises

1. Identify and compare features of the four major market structures.
2. 'The conditions for profit maximization by a firm is when $MC = MR$ and MC cuts MR from' - Explain your answer.
3. 'A perfectly competitive firm earns zero or normal profit in the long run' - Why and How?
4. Show how allocative efficiency is attained in a perfectly competitive market.
5. 'Average Revenue is the lowest in the perfectly competitive market as compared to that of the other forms of market structure' - Explain.
6. What are differentiated products? 'Market price of oligopolistic firms are higher than the perfectly competitive firms in the long run' - Show using graphs.
7. Compare the shape of the demand curve for perfectly competitive and monopolistic competition in the long and short run.
8. 'Advertisement cost is an integral part of a monopolistic market structure' - Why? Explain
9. Explain allocative inefficiency in case of monopolistic completion as compared to that of the perfectly competitive market.
10. Explain short run and long run equilibrium situations in a monopolistic market situation.
11. When demand curve might be kinked? Explain the shape of marginal revenue curve in a kinked demand curve model.
12. What is the collusion? Why is it very difficult to maintain an oligopoly cartel?
13. Examine the key features of monopolistic and oligopoly market structure and make distinction between them.
14. How a dominant firm may become market leader and create price leadership model in an oligopoly market structure?
15. Compare Oligopoly and Monopoly market structure based on their key features.
16. Explain short run and long run market equilibrium for a monopoly market structure.
17. Why Monopoly is considered as inefficient as compared to that of perfect competition and monopolistic market structure?
18. Identify dead weight loss in a monopolistic market structure.
19. What is price discrimination? 'Perfect Price Discrimination may create allocative efficiency' - How? Explain.
20. Assess the banking industry of Bangladesh based on the features of the market structure, and comment on the market structure of t banking in Bangladesh.

Module-E:
Market Failure and Market Intervention

Module-E: Market Failure and Market Intervention

Market Failure

Market failure which generally means failure of the price of demand-supply system may be caused by: market power, incomplete information, externalities, and public goods. We will discuss each in turn.

Market Power Inefficiency arises when a producer or supplier of a factor input has market power. Suppose, for example, that the producer of food has monopoly power. It therefore chooses the output quantity at which marginal revenue (rather than price) is equal to marginal cost and sells less output at a price higher than it would charge in a competitive market. The lower output will mean a lower marginal cost of food production.

Incomplete or Asymmetric Information If consumers do not have accurate information about market prices or product quality, the market system will not operate efficiently. This lack of information may give producers an incentive to supply too much of some products and too little of others. In other cases, while some consumers may not buy a product even though they would benefit from doing so, others buy products that leave them worse off. For example, consumers may buy pills that guarantee weight loss, only to find that they have no medical value. Finally, a lack of information or information gap may prevent some markets from ever developing. It may, for example, be impossible to purchase certain kinds of insurance because suppliers of insurance lack adequate information about consumers likely to be at risk. Each of these informational problems can lead to competitive market inefficiency.

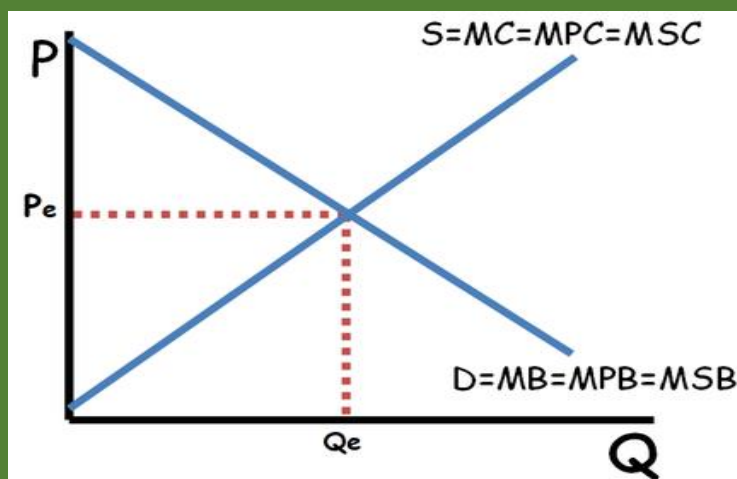
Externalities The price system works efficiently because market prices convey information to both producers and consumers. Sometimes, however, market prices do not reflect the activities of either producers or consumers. There is an externality when a consumption or production activity has an indirect effect on other consumption or production activities that is not reflected directly in market prices. An externality is a cost or benefit to someone other than the producer or consumer. Negative externalities are costs and positive externalities are benefits. Some examples of negative externalities include second hand smoke (from cigarettes), air pollution (from gasoline), and noise pollution (from concerts). These are all costs that fall on people other than the producer and consumer of that product. Some examples of positive externalities include nice smell (from a neighborhood cookie factory), herd immunity (from immunizations), and fruit and vegetable production (from bees in the production of honey).

Public Goods Market failure arises when the market fails to supply goods that many consumers value. A public good can be made available cheaply to many consumers, but once it is provided to some consumers, it is very difficult to prevent others from consuming it. For example, suppose a firm is considering whether to undertake research on a new technology for which it cannot obtain a patent. Once the invention is made public, others can duplicate it. As long as it is difficult to exclude other firms from selling the product, the research will be unprofitable. Markets, therefore, undersupply public goods. Government can sometimes resolve this problem either by supplying a good itself or by altering the incentives for private firms to produce it.

Market Failure and Externalities

In a market without any externalities, the benefits of a product are received by consumers so the demand curve is equal to the marginal benefit (MB) of the product. In this case, since there is no externality, the marginal benefit to consumers (called the marginal private benefit or MPB) is equal to the marginal benefit to society as a whole (called the marginal social benefit or MSB). So the MB, MPB, MSB, and Demand are all equal when there are no externalities. All of the costs of a product, when there are no externalities, fall on the producers so the supply curve is equal to the marginal cost (MC) of the product. In this case, since there is no externality, the marginal cost to producers (called the marginal private cost or MPC) is equal to the marginal cost to society as a whole (called the marginal social cost or MSC) so the MC, MPC, MSC, and Supply are all equal when there are no externalities.

Figure E1: Demand and Supply with No Externalities

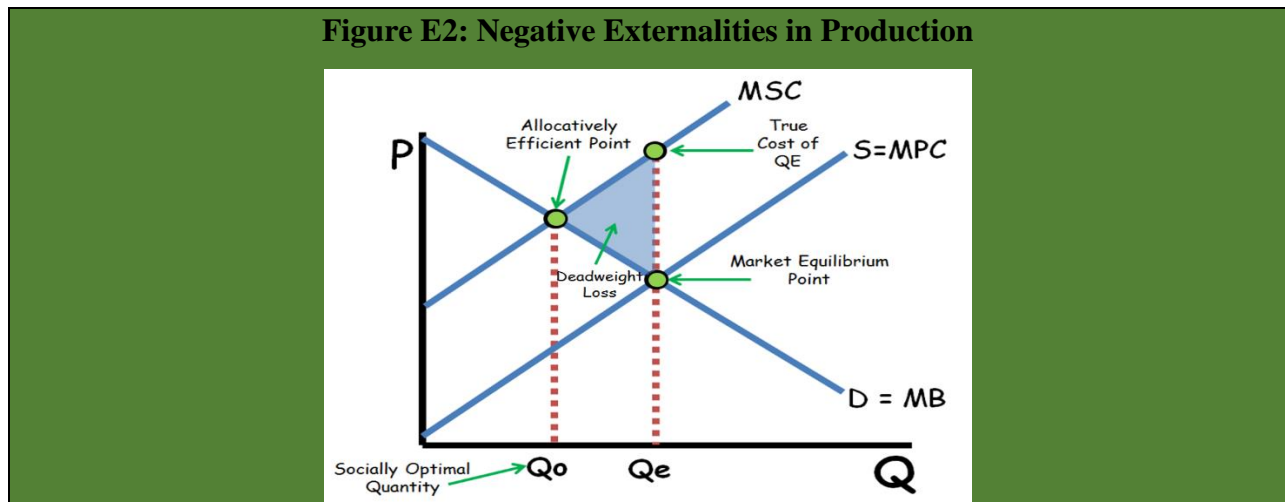


There are two sources of externalities, externalities in production and externalities in consumption. Externalities in production are external costs or benefits created by the suppliers of a product. When a factory pollutes the environment, the pollution is a negative externality in production.

When bees owned by honey producers pollinate a nearby orchard, the fruit that comes from the pollination is a positive externality in production. Externalities in consumption, on the other hand, are external costs or benefits created by the consumers of a product. Secondhand smoke is a negative externality in consumption from cigarette smokers, while herd immunity is a positive externality in consumption for vaccines.

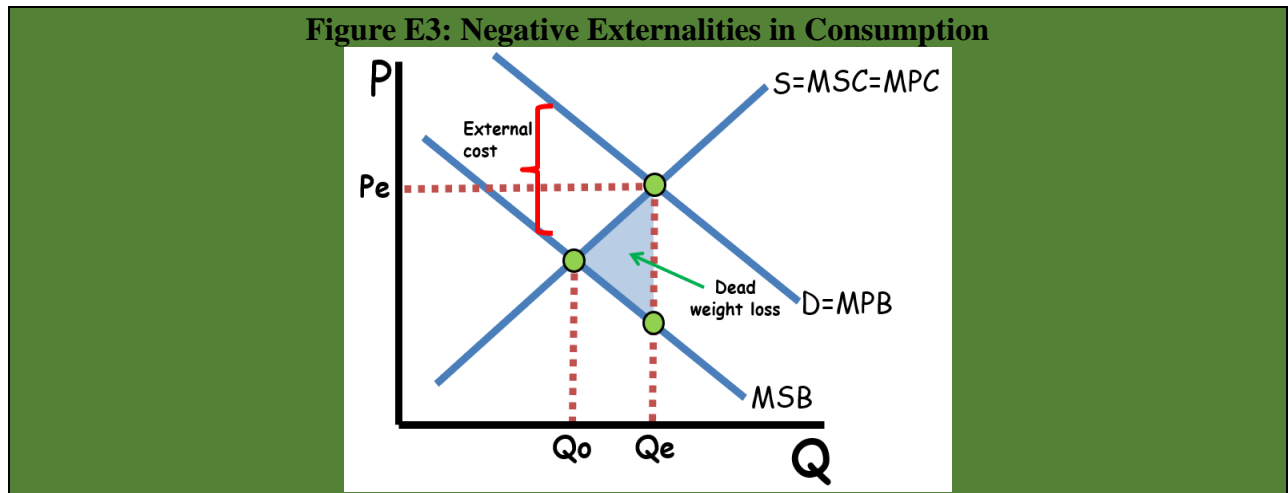
Market with Negative Externalities

Negative Externalities in Production: In a market with negative externalities in production, the external cost to society must be added to the marginal private cost to get the marginal social cost. As a result, the MSC is higher than the MPC and Supply. The allocative efficient quantity (what is best for society) is where the Marginal Social Cost equals the Marginal Social Benefit ($MSB=MSC$). Unfortunately, the unregulated market will produce the quantity where $MPC=MPB$. Since the market is not allocative efficient, there is deadweight loss. The deadweight loss is found by making a point at the allocative efficient point, then finding the true cost and benefit of the unregulated market quantity. Those three points form a triangle of deadweight loss. If you wanted to calculate the deadweight loss, find the area of the triangle using the price and quantity axes ($1/2$ base x height). Goods with negative externalities in production cause a market failure because they are generally overproduced and create deadweight loss. If not otherwise specified, you can assume negative externalities are negative externalities in production.

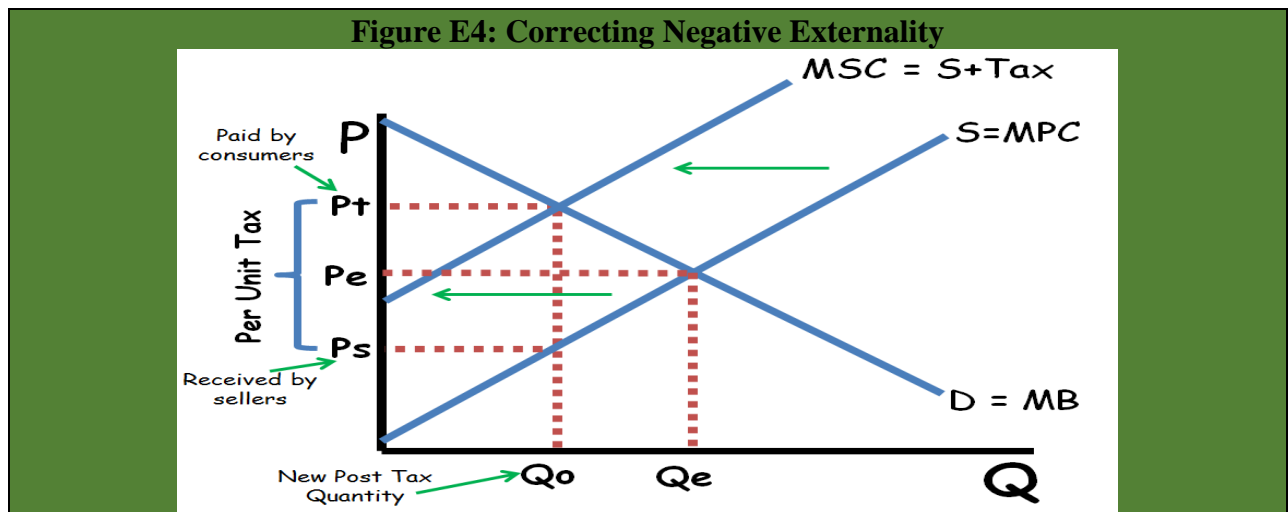


Negative Externalities in Consumption When a good produces a negative externality in consumption, that spillover cost will be subtracted from the marginal private benefit curve to create a lower marginal social benefit curve (or net marginal social benefit). The unregulated market will produce where supply equals demand (Q_e below). The allocative efficient quantity is found where

MSC=MSB (Q_0 below). Since the market is over producing, there is a triangle of dead weight loss that points to the allocative efficient, or socially optimal, quantity.

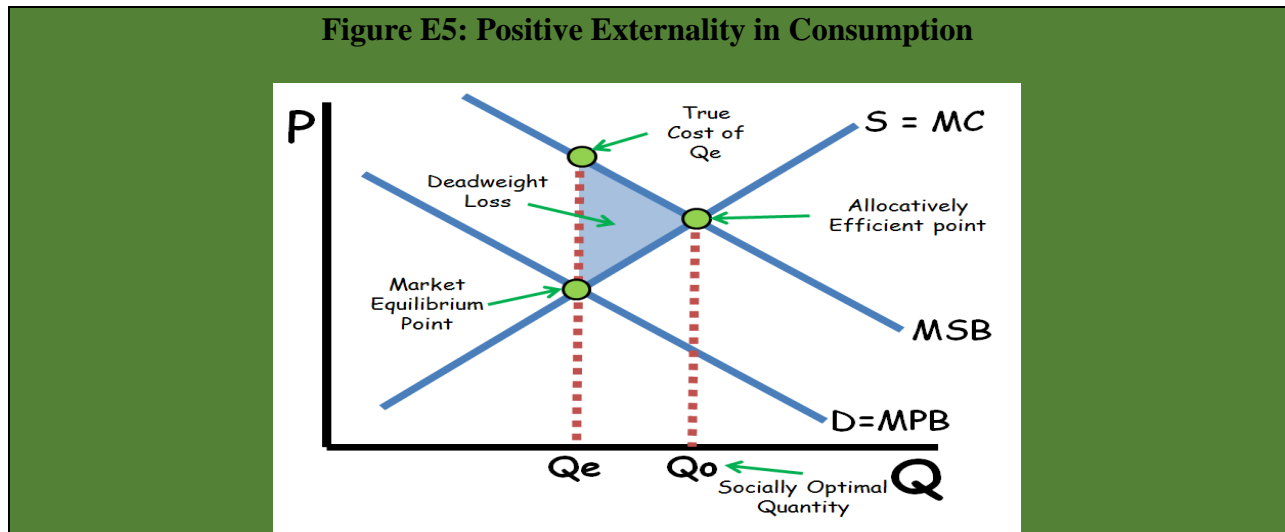


Correcting a Negative Externality If the government were to impose a per-unit tax (not lump-sum) equal to the external cost of the product, it would shift the supply curve to the left until it equals the MSC curve. The tax would correct for the market failure and the market would now produce the allocative efficient quantity. So if there is a negative externality, a per-unit tax will reduce deadweight loss. If the government granted a per-unit subsidy, it would decrease quantity, increase deadweight loss, and be less efficient.



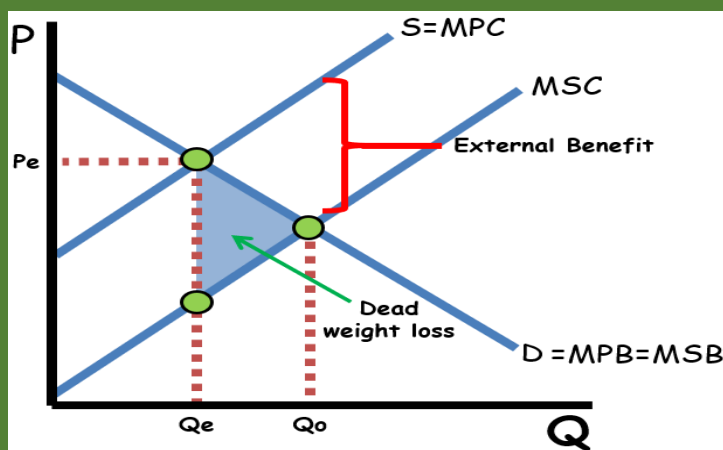
Market with Positive Externalities

Positive Externality in Consumption In a market with positive externalities in consumption, the external benefit to society must be added to the marginal private benefit to get the marginal social benefit. As a result, the MSB is higher than the MPB and Demand. The allocative efficient quantity (what is best for society) is where the Marginal Social Benefit equals the Marginal Social Cost ($MSB=MSC$). Unfortunately, the unregulated market will produce the quantity where $MPC=MPB$. Since the market is not allocative efficient, there is deadweight loss. The deadweight loss is found by making a point at the allocative efficient point, then finding the true cost and benefit of the unregulated market quantity. Those three points form a triangle of deadweight loss. If you wanted to calculate the deadweight loss, find the area of the triangle using the price and quantity axes ($1/2$ base x height). Goods with positive externalities cause a market failure because they are underproduced and create deadweight loss. If not otherwise specified, you can assume positive externalities are positive externalities in consumption.



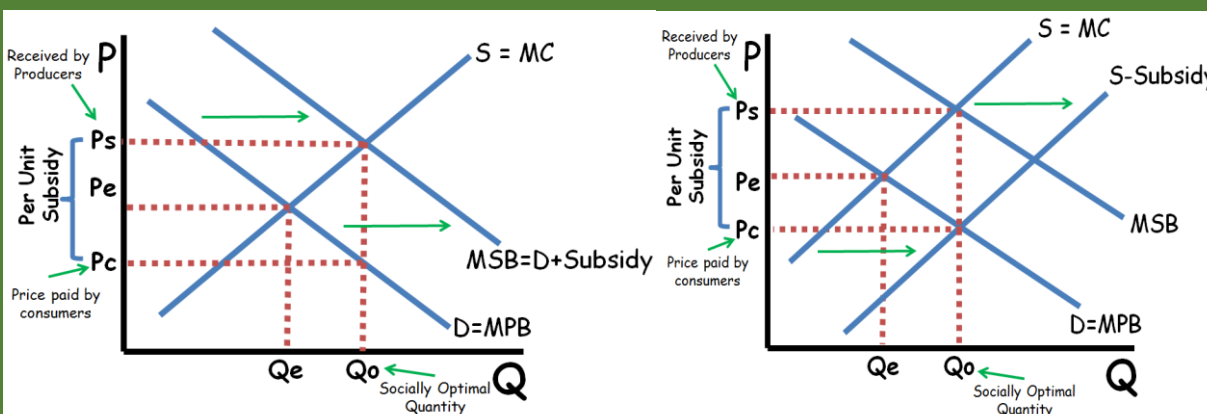
Positive Externality in Production When a good produces a positive externality in production, that spillover benefit will be subtracted from the marginal private cost curve to create a lower marginal social cost curve (or net marginal social cost). The unregulated market will produce where supply equals demand (Q_e below). The allocative efficient quantity is found where $MSC=MSB$ (Q_o below). Since the market is under producing, there is a triangle of deadweight loss that points to the allocative efficient, or socially optimal, quantity.

Figure E5: Positive Externality in Production



Correcting for a positive externality When it comes to correcting for a positive externality market failure, there are two common ways to do it; a per-unit (not lump sum) subsidy to the consumer, or a per-unit subsidy to the producer. A per-unit subsidy to the consumer has the effect of shifting the demand curve to the right. If the subsidy is equal to the external benefit, the demand curve will shift right until it equals the MSB curve.

Figure E6: Internalizing Positive Externality



A per-unit subsidy to the producer has the effect of shifting the supply curve to the right. If the subsidy is equal to the external benefit, the supply curve will shift right until it intersects the demand curve at the allocative efficient quantity. Either way, a subsidy would correct for the market failure and the market would now produce the allocative efficient quantity. So if there is a positive externality, a per-unit subsidy will reduce deadweight loss. If the government imposed a per-unit tax, it would decrease quantity, increase deadweight loss, and be less efficient.

Market Failure and Asymmetric Information

Unfortunately, buyers' lack of information or information gap prevents this mutually beneficial trade from occurring. An outcome of asymmetric information is adverse selection. Adverse selection arises when products of different qualities are sold at a single price because buyers or sellers are not sufficiently informed to determine the true quality at the time of purchase. As a result, too much of the low-quality products and too little of the high-quality product are sold in the marketplace. Adverse selection challenges may create serious difficulty in the insurance and credit market.

Why do people over age 65 have difficulty buying medical insurance at almost any price? Older people do have a much higher risk of serious illness, but why doesn't the price of insurance rise to reflect that higher risk? Again, the reason is asymmetric information. People who buy insurance know much more about their general health than any insurance company can hope to know, even if it insists on a medical examination. As a result, adverse selection arises. Because unhealthy people are more likely to want insurance, the proportion of unhealthy people in the pool of insured people increases. This forces the price of insurance to rise, so that more healthy people, aware of their low risks, elect not to be insured. This further increases the proportion of unhealthy people among the insured, thus forcing the price of insurance up more. The process continues until most people who want to buy insurance are unhealthy. At that point, insurance becomes very expensive, or—in the extreme—insurance companies stop selling the insurance. Adverse selection can make the operation of insurance markets problematic in other ways. Suppose an insurance company wants to offer a policy for a particular event, such as an auto accident that results in property damage. It selects a target population—say, men under age 25—to whom it plans to market this policy, and it estimates that the probability of an accident for people in this group is .01. However, for some of these people, the probability of having an accident is much less than .01; for others, it is much higher than .01. If the insurance company cannot distinguish between high- and low-risk men, it will base the premium on the average accident probability of .01. What will happen? Those people with low probability of having an accident will choose not to insure, while those with high probability of an accident will purchase the insurance. This in turn raises the accident probability among those who choose to be insured above .01, forcing the insurance company to raise its premium. In the extreme, only those who are likely to be in an accident will choose to insure, making it impractical to sell insurance. One solution to the problem of adverse selection is to pool risks. For health insurance, the government might take on this role, as it does with the Medicare program. By providing insurance for all people over age 65, the government eliminates the problem of adverse selection. Likewise, insurance companies will try to avoid or at least reduce the adverse selection problem by offering group health insurance policies at places of employment. By covering all workers in a firm, whether healthy or sick, the insurance company spreads risks and thereby reduces the likelihood that large numbers of high-risk individuals will purchase insurance.

In the context of the credit market, by using a credit card, many of us borrow money without providing any collateral. Most credit cards allow the holder to run a debt of several thousand dollars, and many people hold several credit cards. Credit card companies earn money by charging interest on the debit balance. But how can a credit card company or bank distinguish high-quality borrowers (who pay their debts) from low-quality borrowers (who don't)? Clearly, borrowers have better information-i.e., they know more about whether they will pay than the lender does. Again, the lemons problem arises. Low-quality borrowers are more likely than high-quality borrowers to want credit, which forces the interest rate up, which increases the number of low-quality borrowers, which forces the interest rate up further, and so on. In fact, credit card companies and banks can, to some extent, use computerized credit histories, which they often share with one another, to distinguish low-quality from high-quality borrowers. Many people, however, think that computerized credit histories invade their privacy. Should companies be allowed to keep these credit histories and share them with other lenders? We can point out that credit histories perform an important function: They eliminate, or at least greatly reduce, the problem of asymmetric information and adverse selection-a problem that might otherwise prevent credit markets from operating. Without these histories, even the creditworthy would find it extremely costly to borrow money.

Public Goods

Sometimes market inefficiencies warrant government regulation. In response to this, sometimes governments replace private firms as a producer of goods and services. Public goods have two characteristics: non-rival and nonexclusive. A good is non-rival if for any given level of production, the marginal cost of providing it to an additional consumer is zero. For most goods that are provided privately, the marginal cost of producing more of the good is positive. But for some goods, additional consumers do not add to cost. Consider the use of a highway during a period of low traffic volume. Because the highway already exists and there is no congestion, the additional cost of driving on it is zero. Or consider the use of a lighthouse by a ship. Once the lighthouse is built and functioning, its use by an additional ship adds nothing to its running costs. Finally, consider public television. Clearly, the cost of one more viewer is zero. Most goods are rival in consumption. For example, when you buy furniture, you have ruled out the possibility that someone else can buy it. Goods that are rival must be allocated among individuals. Goods that are non-rival can be made available to everyone without affecting any individual's opportunity for consuming them.

A good is nonexclusive if people cannot be excluded from consuming it. As a consequence, it is difficult or impossible to charge people for using nonexclusive goods; the goods can be enjoyed without direct payment. One example of a nonexclusive good is national defense. Once a nation has provided for its national defense, all citizens enjoy its benefits. A lighthouse and public television are also examples of nonexclusive goods. Nonexclusive goods need not be national in character. If a state or city eradicates an agricultural pest, all farmers and consumers benefit. It

would be virtually impossible to exclude a particular farmer from the benefits of the program. Automobiles are exclusive (as well as rival). If a dealer sells a new car to one consumer, then the dealer has excluded other individuals from buying it.

The efficient level of provision of a private good is determined by comparing the marginal benefit of an additional unit to the marginal cost of producing it. Efficiency is achieved when the marginal benefit and the marginal cost are equal. The same principle applies to public goods, but the analysis is different. With private goods, the marginal benefit is measured by the benefit that the consumer receives. With a public good, we must ask how much each person values an additional unit of output. The marginal benefit is obtained by adding these values for all people who enjoy the good. To determine the efficient level of provision of a public good, we must then equate the sum of these marginal benefits to the marginal cost of production.

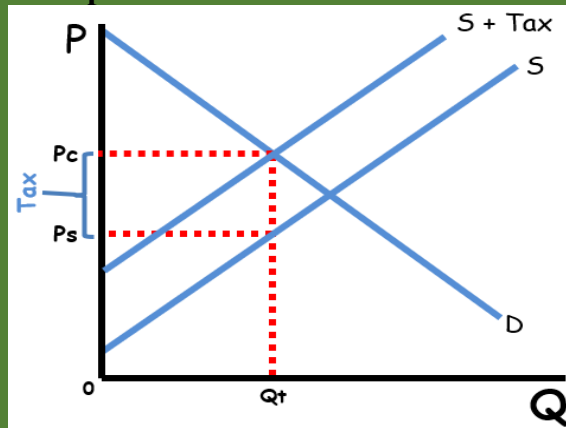
The list of public goods is much smaller than the list of goods that governments provide. Many publicly provided goods are either rival in consumption, exclusive, or both. For example, high school education is rival in consumption. Because other children get less attention as class sizes increase, there is a positive marginal cost of providing education to one more child. Likewise, charging tuition can exclude some children from enjoying education. Public education is provided by local government because it entails positive externalities, not because it is a public good.

Finally, consider the management of a national park. Part of the public can be excluded from using the park by raising entrance and camping fees. Use of the park is also rival: because of crowded conditions, the entrance of an additional car into a park can reduce the benefits that others receive from it.

Market Intervention

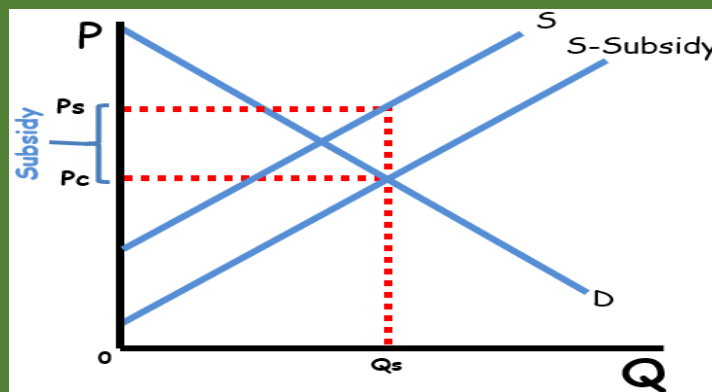
Taxes When the government imposes a tax on a good or service, the supply curve will shift to the left by the vertical distance of the tax. The new equilibrium quantity will decrease, the price consumers pay will increase, and the after-tax price sellers receive will decrease. If the product has no externalities, the tax will create deadweight loss. If the product produces a negative externality, a per-unit tax will reduce deadweight loss. If the product produces a positive externality, a per-unit tax will increase deadweight loss.

Figure E7: Impact of Tax as Market Intervention Measure



Subsidies When the government grants a subsidy to the producers of a good or service, the supply curve will shift to the right by the vertical distance of the subsidy. The new equilibrium quantity will increase, the price consumers pay will decrease and the after-subsidy price sellers receive will increase. If the product has no externalities, the subsidy will create deadweight loss. If the product produces a positive externality, a per-unit subsidy will reduce deadweight loss. If the product produces a negative externality, a per-unit subsidy will increase deadweight loss. The overall impact on quantity, tax burden, and quantity will be impacted by the price elasticity of the supply and demand curves.

Figure E8: Impact of Subsidy as Market Intervention Measure



Price Ceilings on a Natural Monopoly A natural monopoly is an industry which captures economies of scale at the allocative efficient quantity resulting in much lower average costs when there is a large single provider. These businesses usually have extremely high start-up costs but have a very low marginal cost of production. Electricity providers are a prime example of natural monopolies. The most expensive part of providing homes in a city with electricity is putting up wires and cables all over town to carry the electricity. If electric service was not a monopoly and consumers had multiple choices regarding who to purchase electricity from, the costs of production

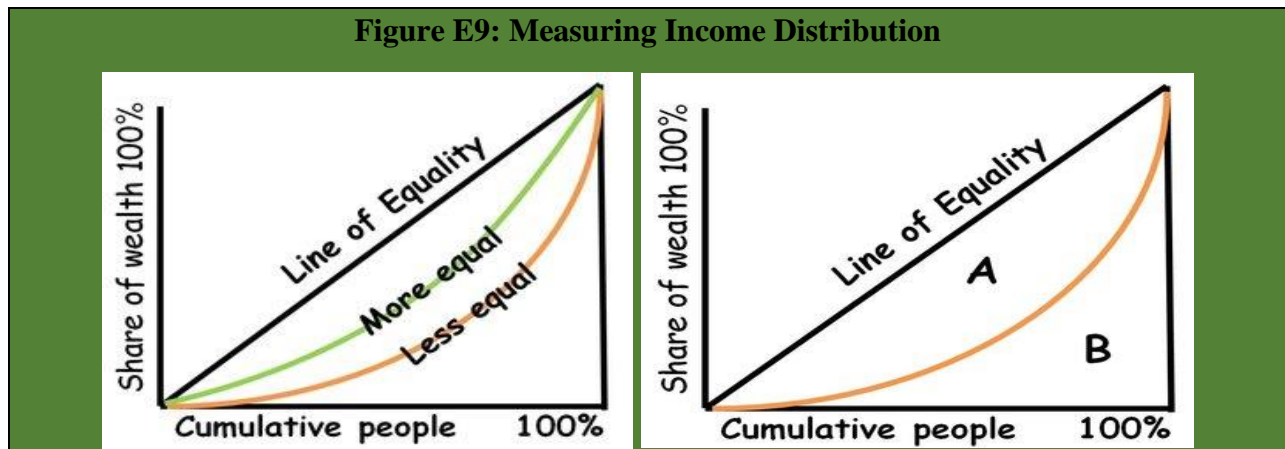
would be dramatically higher (as multiple sets of cables and wires would need to be strung) and price would likely be higher as a result. So, the natural monopoly may actually benefit consumers. Governments will often regulate natural monopolies by imposing price ceilings which may be more efficient than the unregulated price. The socially optimal price is allocative efficient and creates no deadweight loss where price equals marginal cost, but the firm may suffer economic losses at this price. If forced to earn economic losses, the firm will eventually exit the market so the government must provide the firm with a lump sum subsidy (equal to its loss) to eliminate deadweight loss.

A fair return price is one which enforces a price ceiling where economic profits are zero ($P=ATC$). At the fair return price, there is less deadweight loss than an unregulated monopoly and the firm breaks even.

Anti-trust legislation Oligopolies are prone to collusion or the formation of cartels which set production quantities low and prices high. When cartels are successful oligopolies function as monopolies. Governments often regulate oligopolies and attempt to prevent collusion and cartels while encouraging competition through anti-trust laws. These anti-trust policies reduce monopoly power among firms. Fortunately, since there is an incentive to cheat, collusive agreements often break down even without anti-trust laws.

Government Intervention to Address Income Distribution

The Lorenz curve is one way to measure income distribution. This curve is a graph with cumulative percentages of income on the Y axis and cumulative percentages of households on the X axis. If each group earns their share of the national income (bottom 20% earn 20% of national income, bottom 60% earn 60%, etc.), the Lorenz curve will be a straight line at a 45° angle. This is called the line of equality. An economy with an unequal distribution of income (bottom 20% earn 2% of national income, bottom 60% earn 15%, etc.), will create a Lorenz curve that is bowed out from the line of equality.



The Gini ratio (sometimes called Gini coefficient or Gini Index) is a numerical value derived from the Lorenz curve to measure income distribution. Using the areas from the Lorenz curve, the formula for the Gini ratio is: $\text{Gini Ratio} = A/(A+B)$

There are 3 different types of taxes: progressive, regressive, and proportional. Each is based on the percentage of a person's income and will have differential impact on the income of the population.

Progressive Taxes: are taxes where marginal tax rates increase as a person makes more income. A progressive tax system may charge a citizen 10% on the first BDT10,000 of income, 20% on the next BDT30,000 (BDT10,001–BDT40,000) and 30% on marginal income above BDT40,000. That would mean a person earning BDT 5,000 a year would pay BDT500 in taxes while a person earning BDT100,000 a year would pay BDT25,000 in taxes. Progressive income taxes shift the Lorenz curve inward toward the line of equality and lower the Gini ratio.

Regressive Taxes: are taxes where tax rates are higher for those earning less. If a person earning BDT10,000 pays 10% of their income (BDT1000) to the regressive tax, a person earning BDT1,000,000 might pay 5% of their income (BDT50,000). The higher income earner might pay a higher amount, but the person with less income pays a higher percentage. Sales taxes are considered regressive because low income earners pay higher percentages of their income toward those taxes than high income earners. Regressive taxes shift the Lorenz curve outward away from the line of equality and increase the Gini ratio.

Proportional Taxes: are taxes where the marginal tax rate does not change based on income earned. If someone earning BDT10,000 pays 10% of their income, then someone earning BDT1,000,000 would also pay 10% of their income. Proportional taxes do not change the Lorenz curve or Gini ratio.

Transfer Payments: are social programs for people with low income that provide subsidies or direct aid. Social security payments, unemployment compensation, food stamp programs, etc. are all examples of transfer payments. Transfer payments reduce income inequality and shift the Lorenz curve inward toward the line of equality and reduce the Gini ratio.

Market Failure in the Context of the Financial Sector

Financial market failure occurs when banking, equity and bond markets failure to achieve an efficient and/or equitable outcome. This can lead to economic and social costs including macro instability and loss of trust and confidence in financial institutions.

Market failure is a persistent problem in financial markets, which is why it is necessary to have strict regulation of banks and other financial institutions. Reckless lending, mis-selling of financial services and outright fraud are all common problems. The main reasons why market failure occurs in financial markets are as follows:

Asymmetric information A more intractable information problem is to do with quality of goods rather than price. Consumers are often at a disadvantage compared to producers. Economists call this the problem of asymmetric information, where one party to the transaction (usually, but not always the seller) has much better knowledge of the product than the other party. Persuasive and misleading advertising can add to this problem. The problem here is that the agent and principal do not necessarily have the same interests. The advisor may seek to persuade the client to take out a particular mortgage policy because he (the advisor) will earn a large commission from the bank selling it. Again this is a case of asymmetric information (the advisor knows more than the client) and it can lead to market failure and misallocation of resources.

Moral Hazard If an economic agent, whether an individual or a business is able to transfer the risk of their actions onto others moral hazard is said to exist. This can result in an undesirable economic outcome for the economy as a whole. For instance it is often argued that banks believe they are 'too big to fail' and can always rely on the central bank and government bailing them out if they get into difficulties, because the authorities fear the economic consequences of a banking failure. This can result in reckless lending to high risk borrowers who may have little prospect of repaying the loans. Moral hazard not only alters behavior; it also creates economic inefficiency. The inefficiency arises because the individual perceives either the cost or the benefit of the activity differently from the true social cost or benefit. Moral hazard may cause serious difficulty in the insurance and credit market.

Negative Externalities Sometimes the behaviour of banks can result in serious consequences for third parties, such as bank customers, the government and the wider business community and their employees. The financial crisis of 2007/8 led to a massive bailout of the banks, costing many billions of taxpayers' money in many countries. Most of this will never be recovered from the banks as the debt has had to be written off. This means there is less money available for public services, because the bailout led to a huge increase in government borrowing which has to be repaid. It has caused particular hardship to poor and vulnerable people who have experienced cuts in welfare benefits. The financial crisis also resulted in a very severe global recession. Banks

greatly reduced their lending, in what became known as the ‘credit crunch’ starving businesses of funding for investment and reducing overdraft credit, forcing many firms into bankruptcy. The recession resulted in higher unemployment and falling wages.

Speculation and Market Bubble Much of the buying and selling in financial markets is by speculators, who trade primarily to make a profit (or avoid a loss). This can often result in ‘herding’ behaviour; for instance, if the price of gold has been rising, it is taken as an indication that it will go on rising, leading to a ‘self-fulfilling prophecy’, as speculators follow the mood of other traders in the market, so that a frenzy of buying drives up the price further. Speculative ‘bubbles’ eventually burst, as market sentiment suddenly changes as traders realize that the price is unrealistically high and unsustainable. This results in a collapse in prices.

Box E1: Market Failures and Safety and Soundness of the Banking Industry⁶

.....Scandals throughout the world entailing bankers engaged in predatory and discriminatory lending, abusive credit card practices, market manipulation and a host of other misdeeds has led to the view that there is a moral deficiency, a culture of corruption. In each instance, the bankers attempt to claim that there were a few rogue actors; but the pervasiveness and frequency of the problems reinforces the view that there is a systemic problem. While banking may attract those that are more motivated by financial rewards, than say the intrinsic rewards of public service or the pursuit of knowledge, the fact is that my students who went into banking did not seem that different from the others, to have this evident lack of a moral compass. The answer, it would seem, is that there have been incentives and opportunities that have led to this kind of behavior.

We need regulations to oversee the financial sector, to make sure that private incentives are better aligned with social returns. This alignment hasn’t happened on its own, and it won’t happen on its own. It is only when private rewards equal social returns that markets are efficient, that Adam Smith’s “invisible hand” has any chance of working.

The underlying market failure is, of course, that of imperfect information. If depositors could perfectly observe (and evaluate) what the bank was doing with its money, then the moment it did something that might put the depositors’ money at risk, they could and presumably would withdraw their money; and this would exercise effective discipline over bank officers. But bank officers know that they have considerable discretion. Similarly, the ‘agency’ problem that arises from distorted bank manager incentives arises because the bank (and ultimately, the banks depositors, shareholders, and bondholders) can’t perfectly monitor what the bank managers are doing, the riskiness of the loans, etc.

⁶ Joseph E. Stiglitz, Market Failures in the Financial System: Implications for Financial Sector Policies, especially in Developing Countries?

What can be monitored (if only imperfectly) are things like leverage, connected lending, and most importantly, the incentive structures. That is also why it is important to ensure that there are appropriate organizational incentives; for if there are perverse organizational incentives, there is a risk that such incentives will get translated in subtle ways into the behavior of managers. That's why there has to be regulations preventing the growth of too-big-to fail banks.

But there are two further subtle market failures. The first is that because of the implicit guarantee for too big to fail banks, they are subsidized, and they grow at the expense of others not necessarily because they are more efficient or provide better services, but because they are more subsidized. Unless government takes action to offset this implicit subsidy, financial markets will be distorted. The same thing is true, of course, in looking at banks from different countries, as is increasingly becoming apparent in Europe.

A country's banks are backed by its government, but the strength of that implicit guarantee depends on the fiscal strength of the government. American banks are thus the beneficiary of a larger implicit subsidy. Within Europe, German banks are the beneficiary of a differential subsidy. Inevitably, there is no level playing field. If we are to have an efficient financial sector, governments have to "level out" this playing field. This is especially important because there are biases in the patterns of lending of large banks and of foreign banks.

Large banks tend to lend less to small and medium sized enterprises, and more to governments and large enterprises; and so to for foreign banks—except that, in addition, they have a preference for firms from their own country or multi-nationals more generally. Because with banking crises, there will inevitably be bailouts, and markets know this, there is an incentive, as we have noted, for banks to become too intertwined and too correlated to fail. They have an incentive to create systemic risk problems.

Size is easy to observe. 'Intertwining' is more difficult. Correlated behavior is often hard to observe, but even when observed, harder to prevent. While intertwining is difficult to observe, some of the worse forms—those that impose the most systemic risk-- can easily be stopped: the buying and selling of CDS's on each other. Correlated (herd) behavior characterized the stampede into subprime mortgages in the last decade, and into Latin American loans in the 80s, and into East Asia in the 90s. The creation of universal banks has, I believe, made matters worse, as had the increasing prevalence of short term investors. All are pursuing the same short sighted goals and all face the same opportunity set.

Creating a more diverse 'financial eco-system'—with some firms specializing in housing, others in insurance, others in long term investments, others in commerce—has not only benefits from specialization (returns to scale in gathering and processing information), but in creating institutions that have different objectives and face different constraints and opportunities. While there is some

loss of diversity within the institution, there is still full diversification within the economy, and it is that which matters most. Investors who want to diversify their risks still can. While the probability of some firms going bankrupt might increase, the probability of systemic risk would decrease. The system as a whole would become more resilient, especially to large shocks (e.g. macro-economic disturbances.)

But the information market failures are multi-layered. Not only can't regulators monitor banks well, neither can shareholders and depositors. Nor is the record of the credit rating agencies very credible. The notion of capital market discipline is largely a myth. If a regulator who has carefully pored over the banks books and its loan portfolio can say that a bank is in fine health, and a few weeks later, it goes bankrupt, how can shareholders and depositors hope to appraise what is going on. Non-transparent derivatives have made a difficult matter impossible: without knowing not only the holdings of these securities, but also the counterparties, and the balance sheets of the counterparties, there is no way of really assessing the bank's position. Even apart from this, accounting standards in many countries have made matters difficult: in the US, even non-performing mortgages don't have to be marked down, as the US, in an attempt to avoid bank recapitalization, switched from marking to market to marking to hope—hope that perhaps these mortgages would eventually be repaid.

Mark to market accounting has been confused in other ways: a bank that faces a higher risk of bankruptcy receives an uplift to its valuation, because of the decrease in the value of its debt. An accounting system designed to help equity and bond investors appraise the value of these securities has been misused by regulators. There are some important corollaries of these information and agency problems, which I simply list here: 1. Good corporate governance needs to be part of the regulatory regime—ensuring, for instance, that banks are not run just for the interests of managers, and that shareholders have say-in— pay. 2. But regulators can't rely on good corporate governance. There have to be restrictions particularly on the design of incentive pay systems. 3. There is a need for better accounting systems, and more careful thought about the appropriate use of accounting systems and their interaction with the regulatory system. Mark to market accounting can on its own be pro-cyclical, which is why it has to be accompanied by macro prudential regulations.

The objective of safety and soundness is closely related to that of systemic risk and macro-economic stability. When a small bank fails, we may be concerned about the depositors, but the ripple effects will be limited. But when a large bank fails—or a large number of medium sized banks fail—it has macroeconomic effects. The deepest and longest lasting downturns are related to bank failures (though sometimes the causality runs the other way—deep and long downturns will inevitably be reflected in bank failures.) By the same token, if the government has to bail out

a small bank, the costs are easily managed. The costs of systemic crises can be huge, amounting to a significant fraction of a country's annual GDP.

That is why it is especially important for the government to prevent systemic risk. Interestingly, before the crisis, few governments paid attention to this issue, though a few academics had done so. I've already discussed one of the policies that is essential for preventing systemic failures: avoiding too-big-to fail, too-correlated-to fail and too intertwined to fail banks. But macro-prudential regulation is designed to ensure that the financial system does not contribute to cyclical fluctuations, and in so doing, reduces the risk of systemic failure. Credit bubbles have been a major source of economic volatility since the beginning of capitalism. An increase in credit fuels a bubble, which increases the value of collateral, which leads to further credit expansion. Banking regulations, strictly enforced, have often contributed to this credit cycle. When the bubble breaks, bank net worth is greatly reduced, and banks are forced to contract their credit greatly. The contraction of credit contributes to the economic downturn. There is an obvious way to try to tame the credit cycle: when the economy is in a boom, increase capital requirements, which dampens the availability of credit. Tightening mortgage standards directly dampens a housing bubble; increasing margin requirements may dampen a stock market bubble.

The key market failure is that there is an important externality from the collapse of the financial system. Just like toxic wastes pollute the environment, America's toxic mortgages polluted the world's financial system. Obviously, individual banks don't take this into account in deciding how much leverage to undertake, or how intertwined to become with other banks. In fact, they want to maximize the externality—because that increases the likelihood of a bail-out. There are other market failures that are essential to understanding the necessity of government intervention. If equity markets worked well, a bank that lost capital as a result of a bad event (the collapse of the real estate market) could easily recapitalize itself. But, because of information asymmetries, equity markets do not work well. There is what Greenwald and I call “equity rationing.” The cost of raising new equity is so high that banks would rather contract than pay the cost—the dilution of shareholder value—unless they are ordered to do so by the government (and even then, it may not be possible.)

Note: Based on the Lecture of Joseph E. Stiglitz.

Indicative Questions and Exercises

1. What is a Market Failure? What are the key responsible factors for Market Failure?
2. Explain two sources of externalities, externalities in production and externalities in consumption.
3. Give an example of a negative externality and an example of a positive externality.
4. Draw a supply-and-demand diagram to explain the effect of a negative externality that occurs as a result of a firm's production process.
5. Identify dead weight loss due to the presence of negative externality?
6. Explain the concepts of External Social Benefits and External Social Costs in the context of Market Failure due to Externalities.
7. What is External Benefit? How Positive Externalities are internalized using corrective subsidies?
8. Who are the beneficiaries of the presence of Positive Externalities? What are the benefits of internalization of positive externalities?
9. 'Corrective taxes are not price distorting, rather price correcting' -Do you agree? Explain your answer.
10. What are corrective taxes? Why do economists prefer them to regulations as a way to protect the environment from pollution?
11. Explain what is meant by a good being "excludable." Explain what is meant by a good being "rival in consumption." Is a pizza excludable? Is it rival in consumption?
12. Define and give an example of a public good. Can the private market provide this good on its own? Explain.
13. What is cost-benefit analysis of public goods? Why is it important? Why is it hard?
14. 'Progressive taxation contributes in addressing income distribution challenge in an economy' - Explain.
15. What is Gini Coefficient? What are the tools available to measure income distribution in an economy?
16. How Price Ceiling in the case of Natural Monopoly could be beneficial for the common people?
17. How government may intervene to ensure better income distribution in an economy?
18. What is Anti-trust Regulation? What might be the benefits of anti-trust regulation in an economy?
19. What are the key reasons of market failure in the financial sector? Explain market intervention to handle 'Market Failure' in the context of the financial sector.
20. 'Asymmetric information may cause moral hazard problems in the banking industry' - How? Explain your answer.

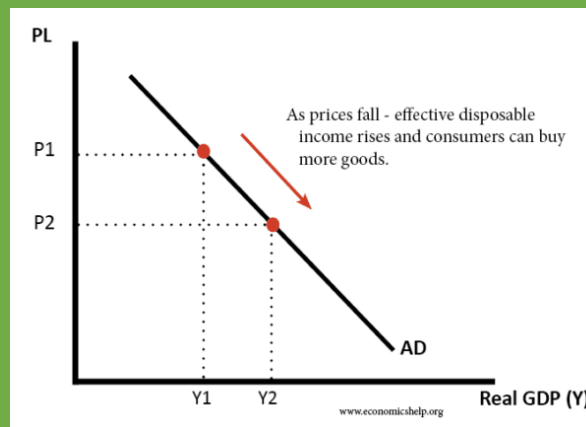
**Module-F:
Basic Macroeconomics**

Module-F: Basic Macroeconomics

Aggregate Demand and Aggregate Supply

Aggregate demand is the amount of total spending on domestic goods and services in an economy. The aggregate demand curve represents the total of consumption, investment, government purchases, and net exports at each price level in any period. It slopes downward because of the wealth effect on consumption, the interest rate effect on investment, and the international trade effect on net exports. The downward-sloping aggregate demand curve shows the relationship between the price level for outputs and the quantity of total spending in the economy.

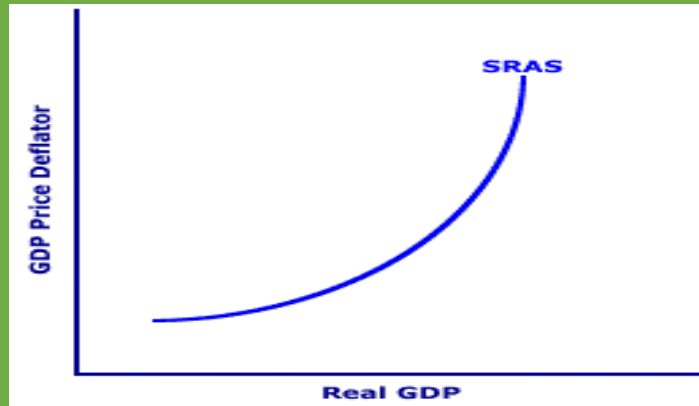
Figure F1: Aggregate Demand Curve



Aggregate supply, or AS, refers to the total quantity of output; in other words, real GDP that the firms produce and sell. The aggregate supply curve shows the total quantity of output i.e. real GDP that firms produce and sell at each price level. For most products and services, as the price increases, so will the supply; this illustrates a positive correlation. Short-run aggregate supply curves illustrate supply in the near future or over a period in which capital is fixed. Long-run aggregate supply curves show supply in the long-term in which all inputs are variable. Aggregate supply is a function of total production within an economy and the price level.

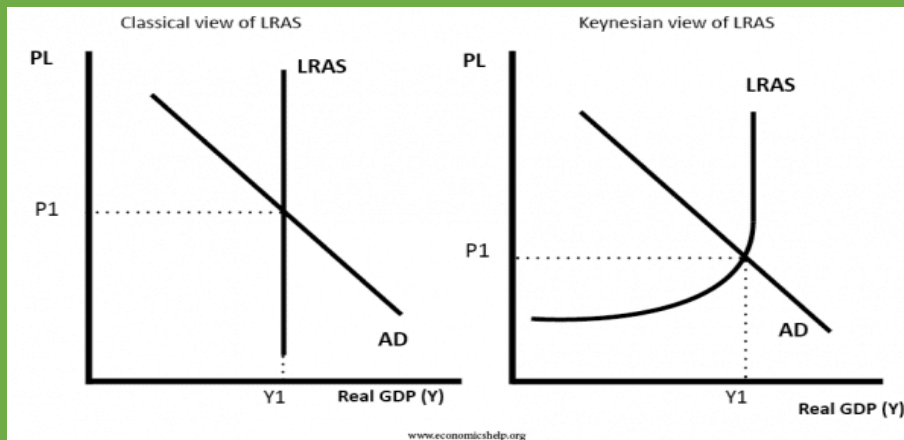
The short-run aggregate supply curve, or SRAS, is an upward-sloping curve. In the short-run, aggregate supply changes in response to changes in demand by increasing or decreasing the amount produced. In the short-run, the company's capital is fixed, meaning that in order to increase the amount of supply, they must use their existing infrastructure, technology, and equipment. It is not possible for a company to quickly construct another factory to meet the demand of this month; that is why the capital is fixed and the curve slopes upward.

Figure F2: Short Run Aggregate Supply Curve



The long-run aggregate supply curve, or LRAS, is vertically graphed with real GDP on the x-axis and price level on the y-axis. In the long-run view of supply, it is not affected by demand and prices. Instead, it is affected by the variability of all business inputs. This includes human capital, equipment, technology, and other large expenditures. The LRAS curve is vertical in contrast to the upward-sloping SRAS curve because the real GDP of an economy is not related to the price level; additionally, prices have time to fully adjust to changes in the economy whereas they do not in the short-run. The curve for long-run aggregate supply is also vertical at the level of full employment because since prices have had time to adjust, the economy will be able to produce at its full potential.

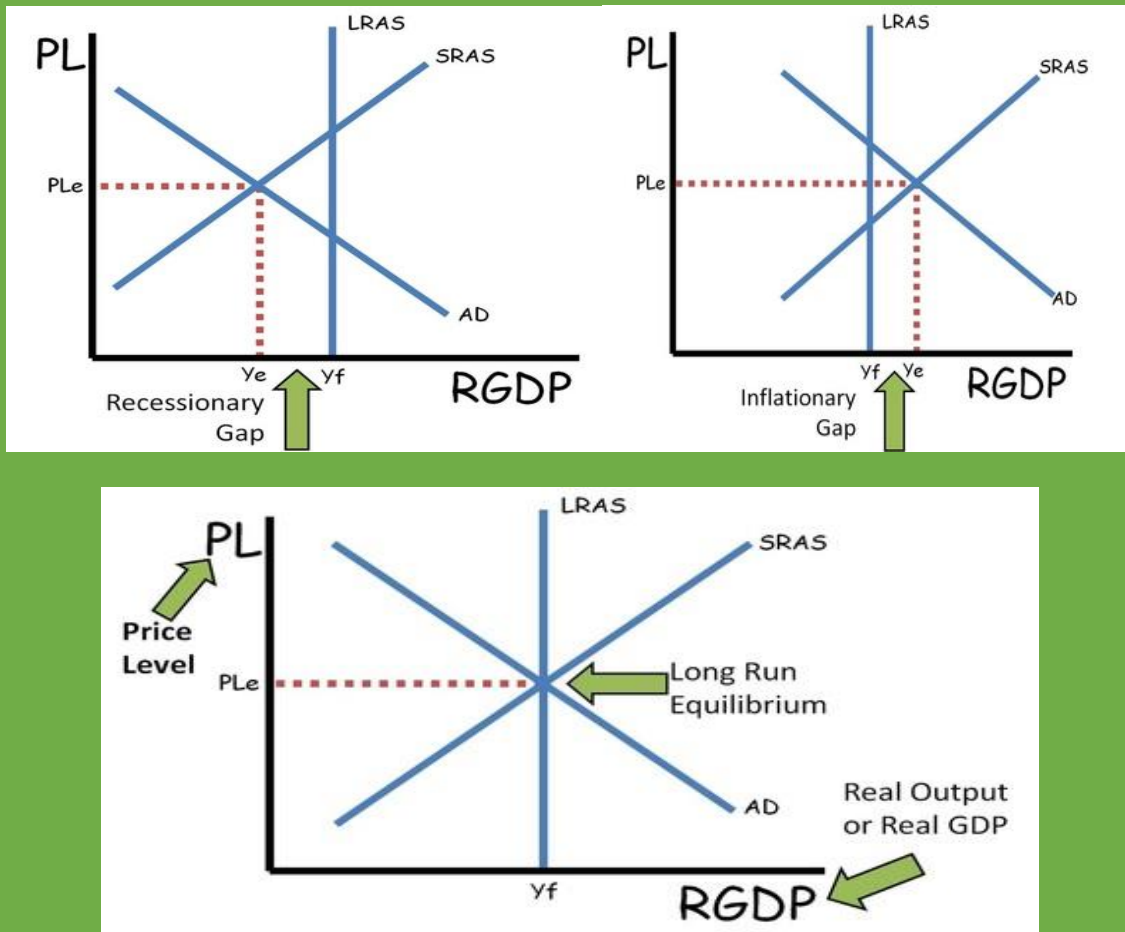
Figure F3: Short Run and Long Run Aggregate Supply Curve



LRAS is equal to the full employment level of output. In the long run the economy will always return to LRAS. In the short run the economy can have an inflationary gap (output above LRAS) or a recessionary gap (output below LRAS). The government can use fiscal policy to shift AD right or left. Government can use Monetary Policy to shift AD right or left. AS can shift because

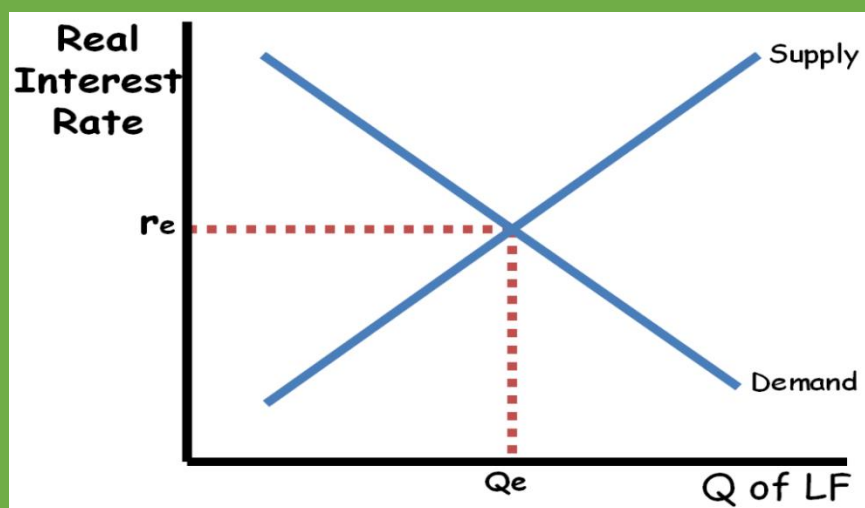
of changes in productivity, costs of inputs, or supply shocks. The LRAS can shift based on anything that would move the production possibilities curve. If the economy is not at long run equilibrium, workers will eventually get lower (Recessionary gap) or higher (Inflationary gap) wages which means a change in input costs causing a shift of the AS towards long-run equilibrium.

Figure F4: Long Run Equilibrium, Recessionary Gap & Inflationary Gap



Aggregate Demand-Supply and Interest Rate Supply of loanable funds is determined by how much money is being saved in the economy. The demand for loanable funds is determined by the amount of investment businesses would like to make. If the government increases spending it causes a decrease in the supply of loanable funds (the government has taken them to deficit spend) creating a higher interest rate. The interest rate affects the quantity of investment in an economy (part of GDP) so a change in the interest rate will cause a shift in the AD curve. The foreign exchange markets can also affect loanable funds. That is, if financial capital is flowing into a country (capital account) there will be an increase in the supply of loanable funds.

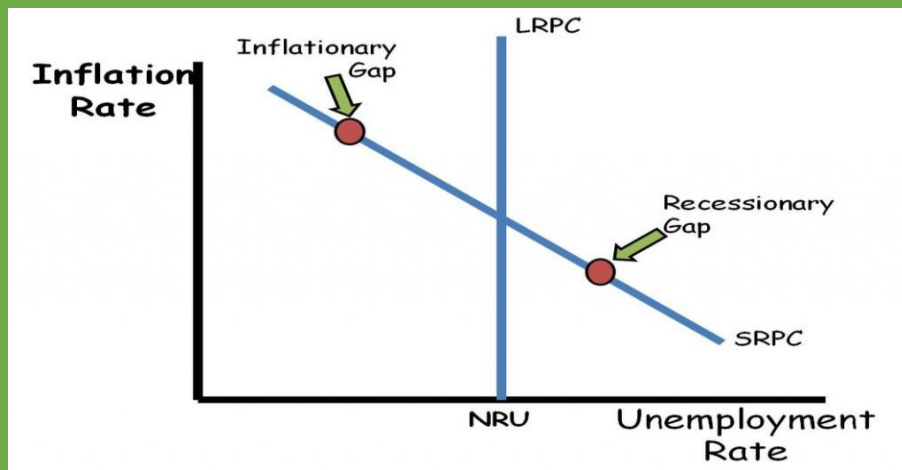
Figure F5: Real Interest Rate and Supply of Loanable Fund



Aggregate Demand-Supply and Employment-Inflation Keynesian economics is based on the belief that aggregate demand and aggregate supply are governed by effective demand. Employment and income depend on effective demand. Aggregate demand function represents the relation between the levels of output produced in an economy to the level of employment in the economy and aggregate demand price where the level of output and level of employment has a direct relationship. When the aggregate demand in an economy strongly outweighs the aggregate supply, prices go up. This is the most common cause of inflation. In Keynesian economic theory, an increase in employment leads to an increase in aggregate demand for consumer goods.

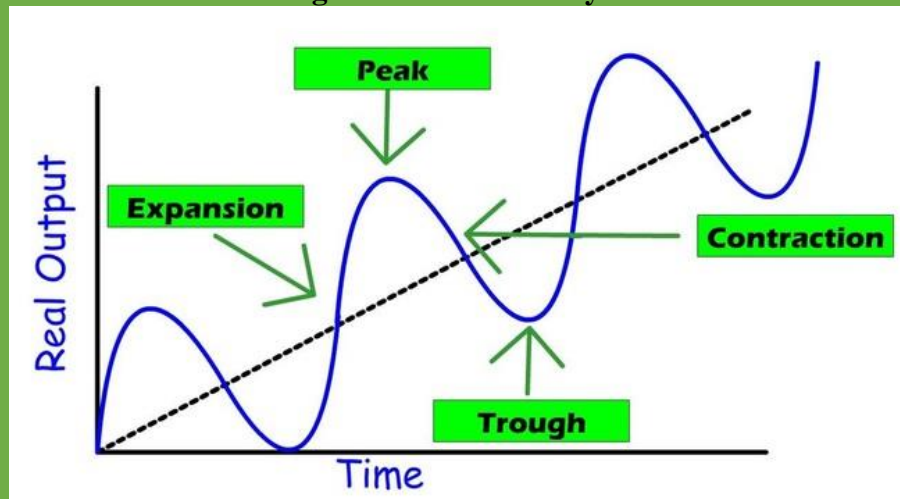
One relevant concept is Phillips Curve that shows the relationship between employment and inflation. Short Run Phillip's Curve (SRPC) shows the inverse relationship between the inflation rate and the unemployment rate. The Long run Phillip's Curve (LRPC) lies at the Natural Rate of Unemployment (full employment). The intersection between the SRPC and the LRPC is the expected rate of inflation. When an economy is in long-run equilibrium the inflation rate will be at the intersection between the LRPC and the SRPC. Changes in AD will cause movement along the SRPC. Changes in AS will shift the SRPC left or right. Changes in inflation expectations will cause SRPC to shift left or right.

Figure F6: Short Run Phillip's Curve



Aggregate Demand-Supply and Business Cycle When actual output is below the potential output, aggregate demand or aggregate supply have fallen, causing a fall in employment and output. When a negative output gap exists, the unemployment rate will be higher than the natural rate of unemployment. Natural fluctuations in economic activity over time. Expansion is also called recovery. Peaks coincide with an inflationary gap and may bring high inflation. Contraction that lasts more than 6 months are generally referred to as recessions. Troughs coincide with a recessionary gap and bring high unemployment and possibly deflation (Figure F7).

Figure F7: Business Cycle



Employment, Inflation and Interest Rate

Employment

Employment means the act of being hired or employed by a company or employer. Unemployment is a key concern to the policymakers of an economy. The unemployment rate is one of the most watched and publicized labor force statistics, but many people are confused about what it actually measures. The unemployment rate is the percentage of people in the labor force who are not working, but are actively looking for work.

The formula for the unemployment rate is:

$$\text{Unemployed/Labor Force} \times 100 = \text{Unemployment Rate}$$

The official unemployment rate does not count people who are not actively looking for work. As a result, there may be some workers who recently lost their jobs and want jobs, but aren't actively looking. These people are considered out of the labor force. There are also some people who lost their jobs a long time ago but have given up looking for work within the last 12 months. These are called discouraged workers and they are also considered out of the labor force so they are not reflected in the official unemployment rate. Also, underemployed members of the labor force who have part-time jobs but are looking for full time jobs are counted as employed. For all of these reasons, the official unemployment rate may not always reflect an accurate picture of the overall labor market.

The labor force generally includes civilian citizens who are at least 15 years of age and are either employed or actively looking for work. To be considered employed, a person must work for pay or profit for one or more hours in the given week, work without pay in a family business for 15 or more hours, or have a job but didn't work due to vacation, illness, labor dispute, etc. After a recession, the unemployment rate may fall if unemployed workers leave the workforce. This lowers the unemployment rate and can give a false sense that the labor market has improved.

The formula for the labor force is:

$$\text{Working} + \text{Looking for Work} = \text{Labor Force}$$

The labor force participation rate is the percentage of the working age population that is either working or looking for work. The formula is:

$$[(\text{Working} + \text{Looking for Work})/\text{Working Age Civilian Population}] \times 100 = \text{Labor Force Participation Rate}$$

Types of Unemployment

Seasonal Unemployment: This type of unemployment is often not discussed on many macroeconomics exams because the official unemployment rate is seasonally adjusted; meaning seasonal unemployment has been deleted from the statistic. Seasonal unemployment occurs when workers lose their jobs due to the time of year. Lifeguards getting laid off in the winter and temporary store retail clerks getting laid off after the holiday shopping season are two examples. Seasonal unemployment is a natural part of a healthy economy.

Frictional Unemployment: This type of unemployment is characterized by movement between jobs. When a college graduate is looking for her first job, a cook quits his restaurant job, or a brick mason is fired from construction company, all three of these people are now frictionally unemployed. Frictional unemployment is a natural part of a healthy economy.

Structural Unemployment: This type of unemployment is most often characterized by a skills mismatch; meaning the skills unemployed workers have do not match the skills needed for the jobs available. These workers must go back to school or be retrained to get the skills they need. This type of unemployment can be caused by technological changes like ATM machines replacing banking tellers. Structural unemployment is also a natural part of a healthy economy as well. As the economy changes, some structural unemployment is inevitable.

Cyclical Unemployment: This is unemployment caused by the business cycle. People unemployed as a result of the great depression of the 1930's and the recent great recession were cyclically unemployed. Cyclical unemployment is characterized by an overall downturn in the economy.

Full Employment Full Employment is defined as zero cyclical unemployment; or when the unemployment rate equals frictional unemployment plus structural unemployment (seasonal unemployment is already deleted from official numbers). When the economy is at full employment the unemployment rate will equal what is called the natural rate of unemployment (NRU).

Concepts of Inflation

Inflation generally means increase in the general level of process. When the word “inflation” was first used in economic contexts in the early- to mid-19th century, it referred to growth of the money supply. In the 1930s, it began to be associated with rising prices, which were attributed to growing money supply. In the macroeconomic contexts, some key issues are the relationship between inflation and relative price changes, the interpretation of different measures of inflation, the appropriate rate of inflation as a policy objective, and the implications of inflation volatility and persistence.

Inflation versus Deflation Inflation is a situation in an economy where prices of goods and services increase and the purchasing power of people decreases. Whereas, in deflation, there is a downward movement of the general price level of goods and services. Deflation occurs when the Inflation rate falls below 0% leading to a negative inflation rate. Inflation leads to a reduction in the purchasing power of money. Deflation leads to an increase in the purchasing power of money. Inflation results in unequal distribution of money. However, certain minimum rate of inflation is desirable in an economy. In several instances, deflation is caused by the economic recession when the low income people are sufferers.

Inflation versus Relative Price Changes Inflation refers to a sustained and broad-based increase in the overall price level. This is distinct from changes in relative prices, which measure the price of one good or service relative to the price of another (or a weighted average of all other goods and services) and signal information about relative surpluses or shortages in different product markets. A rising relative price of a certain good or service indicates that the demand for it outstrips supply and encourages production while discouraging consumption. Hence, in contrast to inflation, relative price movements are critical for the efficient allocation of resources. If goods, services, and factor markets were fully flexible, inflation (which in principle involves no change in relative prices) would not affect the allocation of resources and relative price changes would occur without inflation.

Disinflation versus deflation Deflation refers to negative inflation that is, a decline in price levels whereas disinflation refers to a decline in inflation rates that are still positive. Disinflation has been widespread since the mid-1970s, whereas outright deflation has been rare.

Headline versus Core Inflation Headline inflation usually refers to changes in the prices of all goods and services in a basket of goods and services that is representative of consumer expenditures. Core inflation measures are intended to capture the underlying, common trend in all prices, regardless of relative price changes. In practice, core inflation is often measured by excluding from the calculation movements in the prices of goods and services that are most volatile, in particular food and energy. For example, swings in food and energy prices tend to be

changes in relative prices that shift consumption and production patterns. Alternatively, core inflation is sometimes calculated as the common component of price movements of all goods and services.

Consumer prices, producer prices, and GDP deflators The most common measure of inflation is the percentage change in the headline consumer price index (CPI), which captures the cost of living of the average consumer. The CPI includes domestically produced and imported consumer goods. The producer price index (PPI), in contrast, reflects the prices charged by domestic producers of goods and services.

Domestically produced goods and services can have several purposes, including domestic consumption, domestic investment, and exports. When the composition of consumption differs from that of production, for example, because of large consumer goods imports or extensive production of investment goods, CPI and PPI inflation can diverge materially.

The GDP deflator measures the average price of the economy's output, broadly defined. It differs from the CPI by excluding import prices but including prices of exports, investment, and government consumption. It differs from the PPI by including taxes net of subsidies.

Inflation rates and volatility In the absence of large commodity price or exchange rate shocks, high and accelerating inflation rates signal an economy in which aggregate demand outpaces aggregate supply. High inflation volatility is often associated with macroeconomic instability and uncertainty about the future path of prices. High inflation persistence near target levels—a tendency of inflation to stay near its recent values, absent economic forces that move it away from the current level—indicates that monetary policy has helped anchor inflation expectations and reflects structural features of the economy.

Concepts of Interest Rates

Interest rate is the amount charged over and above the principal amount by the lender from the borrower. In terms of the receiver, a person who deposits money to any bank or financial institution also earns additional income considering the time value of money, termed as interest received by the depositor. Interest is essentially a charge to the borrower for the use of an asset. Assets borrowed can include cash, consumer goods, vehicles, and property. Because of this, an interest rate can be thought of as the "cost of money" - higher interest rates make borrowing the same amount of money more expensive.

Determinants of Interest Rates: The interest rate charged by banks is determined by a number of factors. With the high interest rate the cost of debt rises. When the cost of debt is high, it discourages people from borrowing and slows consumer demand. Also, interest rates tend to rise with inflation. To combat inflation, banks may set higher reserve requirements, tight money supply ensues, or there is greater demand for credit. In a high-interest rate economy, people resort to saving their money since they receive more from the savings rate. The stock market suffers since investors would rather take advantage of the higher rate from savings than invest in the stock market with lower returns. Businesses also have limited access to capital funding through debt, which leads to economic contraction.

Economies are often stimulated during periods of low-interest rates because borrowers have access to loans at inexpensive rates. Since interest rates on savings are low, businesses and individuals are more likely to spend and purchase riskier investment vehicles such as stocks. This spending fuels the economy and provides an injection to capital markets leading to economic expansion. While governments prefer lower interest rates, they eventually lead to market disequilibrium where demand exceeds supply causing inflation.

Nominal and Real Interest Rate Nominal interest rate are laid down in contracts between involved parties. Real interest rates somehow adjust the nominal ones to keep inflation into account. For instance if inflation is 15%, the real interest rate can be said to be $20\% - 10\% = 10\%$, in a simplified way of computation.

Interest rate paid in actual transactions should not be mistaken for the subjective inner computational tool expressing patience or impatience and the balance between present and future flows, which is called "discount rate" in investment decisions, which in turn can be influenced by the cost of capital, both internal and external, but remains rooted in the actor's identity, history, and interpretation of business cycle and long-term trends.

Macroeconomic Policies

Broadly, there are two broad policy tools to help government to attain macroeconomic objectives and to maintain a stable macroeconomic environment: fiscal policy and monetary policy. According to some published literature, are three main types of government macroeconomic policies are fiscal policy, monetary policy and supply-side policies. Other government policies including agricultural, industrial, competition and environmental policies etc.

Fiscal Policy

A government sets out the amount it plans to spend and raise in tax revenue in a budget statement. Fiscal policy refers to the governmental use of taxation and spending to influence the conditions of the economy. A budget deficit is when the government's expenditure is higher than its revenue. In this case, the government will have to borrow to finance some of its expenditure. In contrast, a budget surplus occurs when government revenue is greater than government expenditure. A balanced budget, which occurs less frequently, is when government expenditure and revenue are equal. A government may deliberately alter its expenditure or tax revenue to influence economic activity.

Typically, fiscal policy comes into play during a recession or a period of inflation, where conditions are escalating quickly enough to warrant government intervention. A good application of fiscal policy, in theory, should be able to stabilize a teetering economy and facilitate continued growth. The purpose of fiscal policy is to implement artificial measures to prevent an economic collapse and to promote healthy and steady economic growth. Fiscal policies can be either expansionary or contractionary.

Expansionary Fiscal Policy Fiscal policy aims to increase aggregate demand and shift the AD curve outwards by reducing taxes and raising government spending. With lower taxes, individuals and households have more income at their disposal to spend on goods and services. This increases production and creates new job opportunities. The increased government spending will also boost economic activities which require workers to be hired, contributing to lower employment levels.

Contractionary Fiscal Policy Fiscal policy tries to reduce aggregate demand and shift the AD curve inwards by increasing taxes and decreasing public spending. By increasing taxes the government can reduce the budget deficit, fight inflation, and resolve other balance of payment issues.

Monetary Policy

Monetary policy is the policy of the monetary authority (generally central banks) that deals with money supply, rate of interest, exchange rate, and price level.

If the money supply is increased by printing more money, buying back government bonds or encouraging commercial banks to lend more, the aggregate demand increases. On the other hand, a decrease in the money supply reduces aggregate demand.

A rise in the rate of interest helps to have a deflationary impact. It is likely to reduce aggregate demand by lowering consumption and investment. Households spend less due to availability of less discretionary income, expensive borrowing and greater incentive to save. Firms invest less as they will expect consumption to be lower. Also the opportunity cost of investment rises and borrowing becomes expensive. A higher interest rate may reduce aggregate demand by lowering net exports. On the other hand, a decrease in interest rate may have reverse impact. Monetary policy is commonly used by the central bank to influence macroeconomic factors such as inflation, consumption levels, economic growth, and liquidity.

Monetary policy targets to ensure exchange rate stability. Monetary authority use monetary policy to manage economic fluctuations and achieve price stability, which means that inflation is low and stable. Central banks in many advanced economies set explicit inflation targets.

Similar to fiscal policy, there are two types of monetary policy: expansionary and contractionary.

Expansionary Monetary Policy Expansionary monetary policy aims to boost economic activities by lowering interest rates or increasing the money supply. When the interest rates decrease, the cost of borrowing money is lower. More individuals and firms will be inclined to borrow more money and spend it. This improves the overall production and economic growth.

Contractionary Monetary Policy Contractionary monetary policy tries to reduce inflation and reduce the size of the budget deficit by increasing interest rates. With higher interest rates, the cost of borrowing money will increase. This discourages individuals and firms from borrowing from the central bank and spending it on goods and services.

Supply-side Policies

As a whole, the government can regulate the economy through demand-side and supply-side policies. The main difference is that demand-side policies are designed to affect the aggregate demand, whilst supply-side policies are designed to affect the aggregate supply and productivity. Fiscal and monetary policies are basically demand side policies.

Supply-side policies aim to remove market imperfections to make production more efficient, which can help reduce inflationary pressures. They also aim to encourage the free flow of labour and capital by reducing restrictions in the economy.

Supply-side policies include interventionist supply-side policies such as government provision for private sector firms, training, education, and infrastructure. This policy emphasizes the role of the government more than the role of the market. Non-interventionist supply-side policies such as tax cuts, welfare benefit cuts, privatization, marketization, and deregulation. In this policy, the market plays a more important role than the government.

Macroeconomic Accounts⁷

Macroeconomic statistics provide the basic information used to determine a country's level of economic activity, assess the economy's performance, and forecast future developments. A reliable set of statistics is thus indispensable to policymakers. Typically, four distinct but closely related statistical systems provide the core of the needed information: the national income and product accounts, the balance of payments, the government finance statistics, and consolidated banking system accounts. For countries where the state owns a considerable number of business operations, it is useful to supplement these data with the accounts of the state enterprises in order to determine the influence these enterprises have on the economy, but comprehensive data are not always available.

The four different systems of macroeconomic accounts are based on the same general concepts and are thus interconnected and internally consistent. The fiscal, monetary, and balance of payments accounts provide details of aggregate economic activity measured by the national income and product accounts.

Common Features of Macroeconomic Accounts

The macroeconomic accounts represent a summary record of economic transactions. An economic transaction takes place when ownership of a real or financial asset is transferred between two economic units or when one economic unit provides a service for another. In most cases, economic transactions involve a quid pro quo: goods and services may be exchanged for financial assets (for example, they may be sold for money) or financial assets may be exchanged for other financial assets (for example, a security may be sold for money). However, in some cases, goods, services, and financial assets may be transferred without an exchange taking place. Such transfers occur when emergency food or medical supplies are provided free to the population of an area hit by a natural disaster. To ensure that such transactions are treated uniformly, they are also treated as having two sides: the value of the goods, services, or financial assets, and an offsetting bookkeeping entry (in the form of an unrequited transfer) on the payment side to indicate that the transaction involves a gift and not a sale.

The four sets of macroeconomic accounts record the economic activity of all residents of a geographic territory, usually a country. Residents are those economic units (including individuals) that have a closer tie with the country for which the accounts are being prepared than with any other. The distinction between residents and nonresidents is not based on nationality: a resident of one country may be a national of another.

In the national income accounts, the concept of economic transactions is broadened to include certain transactions within the same economic unit: farmers may produce food for their own

⁷ <https://www.elibrary.imf.org/display/book/9781557755797/ch02.xml>

consumption, and homeowners occupying their own houses may be the recipients of housing services, for instance. Although no money changes hands and consumer and producer are identical, such transactions must be recorded if the national income aggregates for production and consumption are to be comprehensive and comparable across countries. In their capacity as producers, farmers are thus assumed to have sold their production to themselves in their capacity as consumers, and the implicit rent of owner-occupied dwellings is included in both production and consumption.

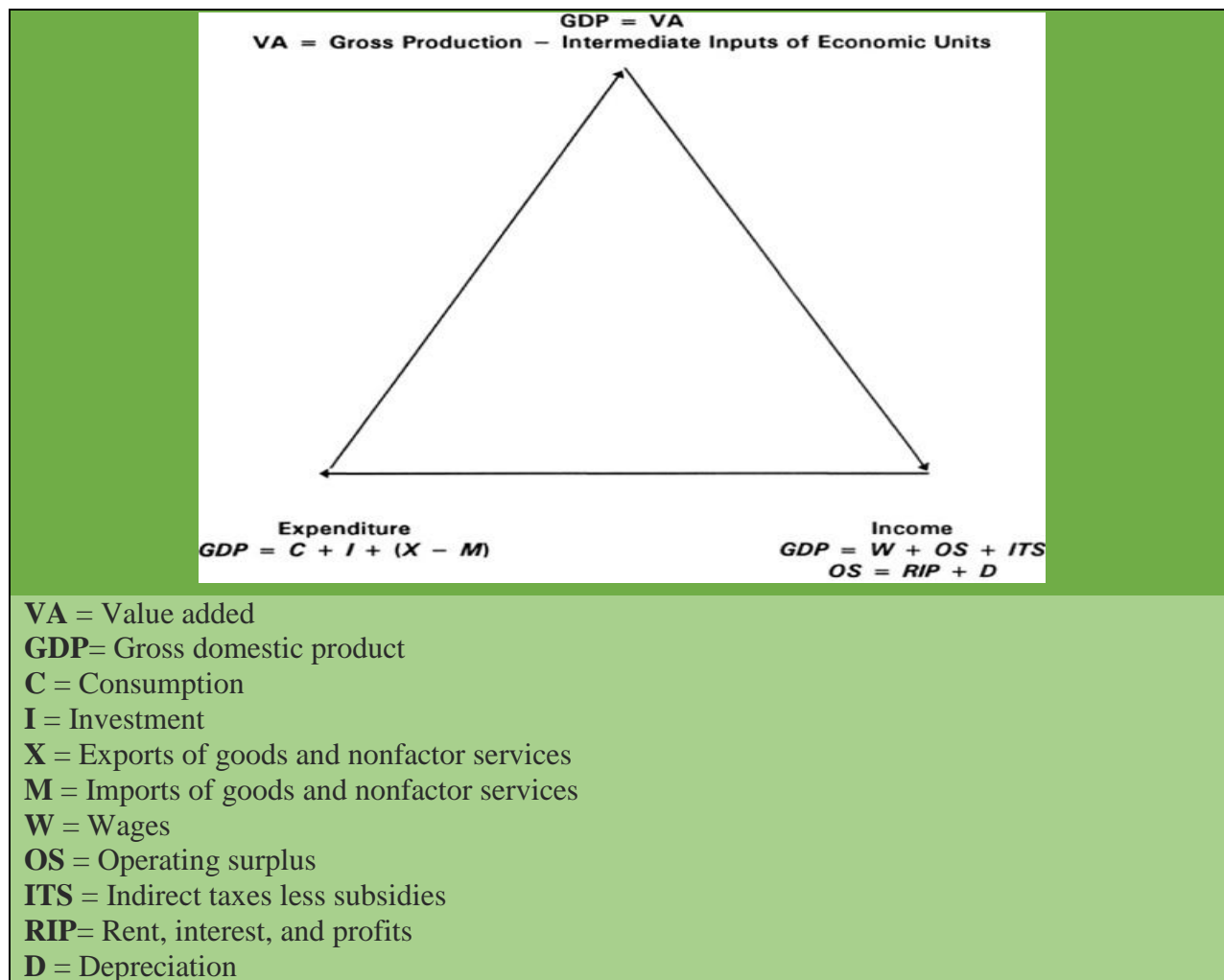
If the transactions of an economic agent or a group of agents for a particular period are added together, the resulting quantity measures a flow, i.e., an amount per unit of time. In contrast to a flow, a stock measures an amount existing at a single point in time. The monthly expenditures of a household constitute a flow, while the checking account balance at a particular moment is a stock. Flows are normally classified as either financial or nonfinancial (real). Financial flows involve changes in holdings of financial assets and liabilities, while nonfinancial flows refer to transactions that occur in the process of producing or acquiring goods and services. Taken together, real and financial flows record all the receipts and expenditures of an economic sector (household, enterprise, or government). For any given sector, the balance of nonfinancial transactions is, apart from statistical errors, equal to the change in its financial claims on and liabilities to the other domestic sectors and the rest of the world. For example, if a household spends more than its income in a particular period, the difference must be matched by dissaving or borrowing, drawing resources from other sectors.

With respect to the timing of transactions, in the national income accounts and balance of payments they are recorded when an obligation is incurred (typically, when the legal ownership of an asset changes) rather than when it is settled; transactions defined in this way are said to be on an accrual basis. Government finance statistics, on the other hand, are generally recorded on a cash basis—that is, when money changes hands. Since monetary statistics are derived from balance sheets constructed in accordance with the rules of business accounting, they are also, in principle, on an accrual basis. However, as most bank transactions are carried out immediately in cash, this distinction is generally of little practical importance.

National Income and Product Accounts

The national income and product accounts attempt to measure the overall level of economic activity undertaken by domestic residents during a given period; thus, these accounts record flows. The economic activity generally takes the form of selling goods and producing services and can be measured in terms of any of the three aspects of the transactions relationship—that is, using data on (i) the production of the sector (such as agriculture or construction); (ii) the income (such as compensation and profits) each factor of production receives; or (iii) the expenditures on that output. Thus, the natural starting point for an analysis of national income and product accounts is the identity between production and the disposition of production. The supply of goods and

services available in a given year in the domestic economy may be viewed as the sum of domestically produced output and imports. The demand for those goods and services is equal to aggregate expenditure by domestic residents on consumption and investment, plus foreign purchases (exports).



Output may be interpreted in several ways. Gross domestic product (GDP) is a measure of the total value added of all resident producing units; it is similar (but not identical) to the output produced in the territory of a given country. The term gross implies that no deduction has been made for the depreciation of building and equipment that occurs as production takes place. Net domestic product (NDP) is GDP less depreciation.

Another measure of output is gross national product (GNP). GNP measures income earned, both domestically and abroad, by resident-owned factors of production. Thus, GNP is equal to GDP plus payments from abroad to residents for the services their factors of production provide outside the reporting country, less payments to foreigners for the services of their factors of production in

the home country. The difference between GDP and GNP is called net factor income from abroad and may be positive or negative.

Payments and receipts of factor income from abroad include investment income (such as returns on direct investment and interest earnings or payments); labor income (including income from migrant workers who have lived abroad for less than one year); and economic rents (income from land and buildings, and royalties for books, films, and computer software).

GNP provides a broader measure of the income available to a country than GDP, particularly if international factor income payments are large and fluctuate widely, and is therefore a more comprehensive measure of national wealth. As with NDP, net national product (NNP) can be derived by deducting depreciation from GNP. GDP at factor cost can also be distinguished from GDP at market prices.

The activities of the government in the economy cause a discrepancy between the sum of all factor payments, or incomes (output valued at “factor cost”), and aggregate expenditure (valued at “market prices”). The final price paid in a transaction differs from the sum of the receipts of the factors of production because of indirect taxes and government subsidies. As a result, in order to move from the concept of GDP measured from the income side at factor cost to the concept of GDP measured from the expenditure side at market prices, analysts must add the amount of indirect taxes (net of any subsidies to business).

A third important measure of aggregate output is gross national disposable income (GDI). GDI-GNP plus the value of net transfer payments from abroad provides the most comprehensive measure of total income available to residents. Net foreign transfers typically include official foreign assistance grants, support from private charities, and the gifts or income transfers of private citizens. Again, net national disposable income (NDI) can be derived by deducting depreciation from GDI.

These three measures of aggregate output (GDP, GNP, and GDI) can be represented by the same equation form, according to the interpretation of external sector coverage in the relationship. If the measure of external sector flows includes only exports and imports of goods and nonfactor services, then the measure of output defined is GDP. If the measure of external flows includes net factor income as well as goods and nonfactor services, the measure of output is GNP. Finally, if the external sector also encompasses net transfers, a concept commonly identified as the current account of the balance of payments, the measure of output is GDI. If these external sector flows are separately identified, the equations can be written as:

$$\begin{aligned} \text{GDP} &= \text{C} + \text{I} + (\text{X} - \text{M}) \\ \text{GNP} &= \text{GDP} + \text{YF} = \text{C} + \text{I} + (\text{X} - \text{M} + \text{YF}) \\ \text{GDI} &= \text{GNP} + \text{TR} = \text{C} + \text{I} + (\text{X} - \text{M} + \text{YF} + \text{TR}) \end{aligned}$$

Where,

C = Consumption expenditure of the private sector and government;

I = Investment expenditure of the private sector and government (including inventory changes);

X = Exports of goods and nonfactor services;

M = Imports of goods and nonfactor services;

YF = Net factor income; and

TR = Net transfers.

This simple relationship can be rearranged to show more clearly the basic interrelationship between economic sectors. Since national saving (S) is defined as gross national disposable income less consumption, then: $S = \text{GDI} - \text{C}$.

GDP at nominal terms and GDP at constant prices are important estimation of national output. GDP in nominal terms is equal to GDP at constant prices (GDPR) multiplied by the GDP deflator. Therefore, the GDP deflator can be calculated as follows: $\text{GDP deflator} = (\text{GDP} / \text{GDPR}) \times 100$. The GDP deflator, also called implicit price deflator, is a measure of inflation. It is the ratio of the value of goods and services an economy produces in a particular year at current prices to that of prices that prevailed during the base year.

Balance of Payment Accounts

The balance of payments reflects transactions only between residents of the reporting country and foreigners. All other transactions, such as those between domestic residents, are excluded. The balance of payments has three components. The external current account balance records transactions between residents and foreigners in goods and services, and unrequited transfers (as discussed in the previous section). The capital account balance provides summary statistics on changes in the net foreign asset position of domestic residents (excluding the banking system) arising from transactions such as external borrowing or repayments, foreign direct investment, and short-term capital movements. The monetary movements relate to changes in net international reserves of the banking system.

The balance of payments is compiled according to the conventions of the double-entry accounting system. Each transaction is reflected in the accounts by both credit and debit entries. By convention, credit or positive entries are used for (i) real resource flows (exports); and (ii) financial flows (a reduction in the economy's foreign assets or an increase in its foreign liabilities).

Conversely, debit or negative entries are recorded for (i) real resource flows (imports); and (ii) financial items (an increase in assets or a decrease in liabilities). For example, an export transaction for which the foreign exchange receipts are deposited abroad is recorded as follows:

Credit: exports of goods (positive)

Debit: short-term capital (negative)

In principle, this method results in a zero balance, since each transaction involves credit and debit entries for the same amount. In practice, however, information on the debit and credit components of a transaction is usually obtained from different statistical sources, so deficiencies in coverage, as well as variations in the time of recording and in the methods used to value transactions, result in a statistical discrepancy. To balance the accounts, an accounting entry usually referred to as net errors and omissions is introduced to reconcile the differences.

Referring again to the three main components of the balance of payments, the accounts may be written in equation form as:

$$CA+F-\Delta R=0 \text{ or } \Delta R=CA+F$$

Where,

CA = Current account;

F = Change in foreign indebtedness of domestic residents plus other capital flows such as direct investment; and

ΔR = Change in Net official reserves.

Because there are limits to the changes in reserve positions that countries are willing or able to accept, an overall imbalance in reserves is an important indicator of the need for a balance of payments adjustment. The standard practice is to place below the line only changes in the short-term assets and liabilities of the monetary authorities, or changes in net official international reserves.

In a typical balance of payments summary, the current account is divided into separate balances for trade, services, and unrequited transfers. From an economic point of view, the distinction between goods and services is not significant; a unit of foreign exchange earned by exporting services strengthens the external balance in exactly the same way as a unit earned by exporting goods. Two pragmatic considerations favor the use of the trade balance concept: first, merchandise trade data from customs reports are available on a timely basis; and second, the compilation of trade statistics normally results in relatively complete and accurate coverage.

Merchandise trade is generally defined on an f.o.b. (free-on-board) basis. According to this definition, the costs of transporting goods (and related services) up to the customs frontier of the

exporting country are included in the value of merchandise, but expenditures incurred beyond that point are treated as services. The other major categories of services include travel (goods and services acquired by travelers outside their country of residence) and investment income (earnings from financial assets, with interest earnings and payments representing major items under this heading). As noted above, unrequited transfers include remittances from workers residing abroad and government grants of goods, financial resources, and technical assistance. However, remittances by migrant workers who have been abroad for less than a year are recorded as labor income under services. Investment and labor income together comprise factor services; all other services are not directly related to factors of production and are classified as nonfactor services.

The capital account classifies flows as short, medium, or long term. Long-term flows include direct investment, portfolio investment (purchases and sales of bonds and equities), and other long-term capital. The sums of the current and capital accounts are traditionally identified as the overall balance, or net external position, which is identical to the economy's financing requirement.

Official international reserves are regarded as below-the-line items. Also, loans extended to support the authorities' gross reserve position are, by convention, considered to be a part of the monetary authorities' net international reserve position.

Fiscal Accounts

The operations of the government—through purchases of goods and services, resource transfers, revenue-raising measures, and financing decisions—influence the level and growth of economic activity, the allocation of resources among different uses, and the distribution of income. An important aspect of fiscal analysis is the assessment of the macroeconomic impact of budgetary operations on output growth, inflation, and the balance of payments. A review of the major budgetary aggregates and an analysis of the various concepts of the budget balance provide a preliminary indication of the fiscal policy stance.

The sum of all budgetary receipts, including financing, must by definition equal the sum of all expenditures. Consequently, as with the balance of payments, for analytical purposes the concept of a budget surplus or deficit involves separating out a subset of total budgetary transactions. The following table provides a summary of the main aggregates that enter a budget statement.

Receipts	Expenditures
A. Current revenue	D. Current expenditure
B. Capital revenue	E. Capital expenditure
C. Grants	F. Net lending
G. Financing Foreign Domestic	
$A + B + C + G = D + E + F$	

An overall surplus or deficit is normally defined as the difference between total revenue and grants (A+B+C) and total expenditure and net lending (D+E+F).

For a variety of reasons, many countries use a modified form of the basic budget balance identified here in their national budgetary presentation. Socialist countries in particular often classified elements of financing in the GFS accounts as revenue, a method that tends to reduce the budgetary deficit.

Because taxes and other government revenues absorb the purchasing power of the private (nongovernment) sector, and government expenditures increase aggregate demand, an overall deficit may indicate an expansionary fiscal stance vis-à-vis the rest of the economy. Similarly, an overall surplus may indicate a contractionary stance. Such an interpretation needs to be qualified by a detailed analysis of the type of financing involved, the structure of receipts and expenditures, and the exogenous factors (such as commodity prices for major exports) that may be causing the surplus or deficit. Nevertheless, sharp changes in the government's overall balance, particularly when measured as a proportion of output, provide an important signal that the impact of government operations on the economy needs to be carefully reviewed.

A further concept that is often used in fiscal analysis is the current account balance, which can be in the form of a surplus or deficit. The current account balance is defined as current revenue plus grants minus the sum of current expenditure and capital transfers and is a measure of government sector saving. A high level of government saving is sometimes interpreted as a contribution to development, since it generates financing for a substantial amount of capital formation. Such an assessment should be tempered, however, by the recognition that it is difficult to distinguish between the developmental impact of current and capital outlays and that the very concepts of current and capital accounts can overlap. For instance, current expenditures on education and health maintenance and improve human capital.

Several additional budgetary measures have been developed to emphasize other aspects of fiscal operations.

The operational deficit excludes the effects of inflation on interest payments from the budget. In a hyperinflationary environment, these payments are often seen as necessary to induce creditors to hold government debt and thus should be classified below the line as amortization of existing debt.

This approach is taken one step further in the concept of the primary deficit, which excludes all interest payments and thereby attempts to eliminate the effect of previous budgets in assessing the current fiscal position.

In countries that are major oil exporters, for example, where external transactions represent a significant contribution to domestic wealth and the relationship between domestic supply and demand is particularly important, it may be useful to employ the concept of the domestic deficit, which compares domestic revenues with outlays in order to assess the budget's impact on the economy.

For analytical purposes, many countries attempt to remove the effects of fluctuations in economic activity on budgetary performance in order to eliminate temporal disturbances and better assess long-term fiscal performance. The full employment deficit adjusts revenues to reflect their likely performance if the economy achieves its full potential output and assesses the fiscal stance by comparing expenditures to adjusted revenues. The cyclically adjusted or trend deficit assesses both revenues and expenditures in the context of long-term average output.

Government transactions (as recorded in the different categories of the national accounts) can be linked directly to the fiscal accounts, although important conceptual differences exist between the two accounting systems. The fiscal accounts include as current expenditure all government outlays on goods and services, including wages and salaries, as well as subsidies, transfers, and interest on public debt. The national accounts definition of government consumption is much narrower than the fiscal accounts definition of current expenditure in that it includes only spending on goods and services, since subsidies and transfer payments are not classified as final consumption of the government.

The impact of a given overall surplus or deficit on aggregate demand depends on its financing as well as its magnitude. Financing can involve changes in the public sector's holdings of currency, bank deposits, and government liabilities (including advances from the banking sector and government securities), as well as in any financial assets held by the government for the purpose of maintaining liquidity rather than pursuing public policy. The financing of government operations is usually divided into external and domestic borrowing; domestic borrowing is further divided into nonbank and bank financing.

External financing is defined on a net basis and comprises disbursements by nonresidents of new loans less amortization payments on outstanding debt. External interest payments are recorded above the line in current expenditure. In principle, each external financing transaction of the

government has a corresponding entry in the capital account of the balance of payments, classified according to the maturity and type of instrument used.

Domestic sources of financing are typically divided into two parts: bank and nonbank borrowing. Nonbank borrowing includes the sale of government debt instruments, such as bonds and treasury bills, to the nonbank sector of the economy. Information on such borrowing is obtained directly from government sources. In some countries, this type of borrowing, which includes loans from pension funds, is substantial and can exceed bank borrowing.

Bank borrowing, as recorded in the fiscal accounts, should correspond to lending identified by the monetary survey. However, in many countries differences in coverage and in the time when transactions between the relevant fiscal authorities and the central bank are recorded may prevent an exact reconciliation of the fiscal and monetary accounts. Bank borrowing is defined as equal to the change in banking system credit extended to the government less any change in government deposits. Borrowing from the banking system is frequently a major source of budgetary financing and thus influences monetary developments significantly. In these circumstances, monetary and fiscal policy are closely linked, and any attempt to control monetary expansion is unlikely to succeed unless it is supported by an appropriate fiscal policy.

Monetary Accounts

The institutions in the financial system can be divided into three subsectors: the monetary authorities; depository institutions, or commercial banks; and other financial institutions, such as development banks. Most analyses of the monetary accounts exclude other financial institutions, which generally play a minor role in monetary creation. The term monetary authorities usually denotes the central bank in its capacity as issuer of currency, holder of national external reserves, borrower for balance of payments purposes, and head of the banking system.¹³ Commercial banks are distinct from other financial institutions, because they create liabilities that can be used as a means of payment. Typically, commercial banks obtain their funds from deposits that can be transferred by checks or similar instruments and are used to settle the obligations of deposit holders. Funds may also be obtained from the central bank and from external credits.

Monetary statistics are consolidated at three different levels: the monetary authorities' and commercial banks' accounts; the monetary survey, which consolidates the accounts of the monetary authorities and the commercial banks; and the financial survey, which consolidates the monetary survey with the accounts of financial institutions outside the commercial banking system. The financial survey is particularly relevant in those countries where the operations of nonbank financial institutions account for a significant share of financial transactions. In each case, the consolidations- which are based on both the T-accounts of the relevant institutions and monetary sector accounts- are derived from the accounting identity between assets and liabilities. In most countries, the monetary survey is the broadest commonly available measure of the banking system. The survey is a summary presentation of the consolidated

balance sheets of the monetary authorities and the commercial banks that “nets out” all interbank transactions.

A major purpose of the monetary survey is to facilitate analysis of the monetary aggregates that are most influenced by the monetary authorities and that play the most important role in determining output, prices, and the balance of payments. The monetary survey demonstrates that the liabilities of the banking system to the private sector (broad money, or M2) are the counterpart of banking sector assets, which are held as net foreign assets (valued in local currency) and as net domestic credit from the banking system. In equation form:

$$M2 = NFA + NDC$$

Where,

M2 = liabilities of the banking system (broad money);

NFA = net foreign assets of the banking system, including net official international reserves, R;
and

NDC = net domestic credit extended by the banking system, including other items (net).

It is important to stress that the equation in the box is an accounting identity, not a behavioral equation. It merely states that for the economy as a whole, an increase in money balances must be the result of an increase in the banking system’s net foreign assets, an increase in bank credit, or both. Clearly, the way in which changes in banking sector assets affect the supply of broad money (M2) and the purchasing power it represents is an important policy issue. A subordinate issue is the composition of broad money, which consists of narrow money, or M1 (currency in circulation outside the banks plus demand deposits); time and savings deposits (quasi-money); and other less liquid liabilities, such as paper issued by banks in the form of certificates of deposit.

In the monetary survey, domestic credit is usually divided into three components: loans to the government, loans to nonfinancial public enterprises, and loans to the private sector. Bank claims on the public sector can be held in the form of loans or securities. Banking system credit to the government nets out the deposits of the central and local governments.

For each foreign asset transaction of the banking system, there should be a corresponding entry in the balance of payments that is reflected either in the overall balance or above the line in the capital account. Specifically, the change in net foreign assets of the banking system should be equal to the change in net official international reserves, as reflected in the overall balance, and the change in net foreign assets of the banking system not included in the definition of official reserves, as reflected in the capital account. It should be noted that the change in international reserves, as defined in the balance of payments, should also be reflected in the monetary survey. The flow of net international reserves is calculated as the difference in stocks (valued in a major foreign currency or in SDRs at end-of-year exchange rates). The difference between the average exchange rate at which the foreign exchange entered the accounts during the year and the rate at the end of

the year is entered as a valuation adjustment in “other items (net).” The formulae for valuation adjustments are as follows:

$$NFA_t = NFA_{t-1} + (\Delta NFA^*_t) \times (ER_{AVG_t}) + V_t$$

$$V_t = (ER_t / ER_{t-1} - 1) NFA_{t-1} + \Delta NFA^*_t (ER_t - ER_{AVG_t})$$

Where,

V_t = Valuation adjustment for period t ;

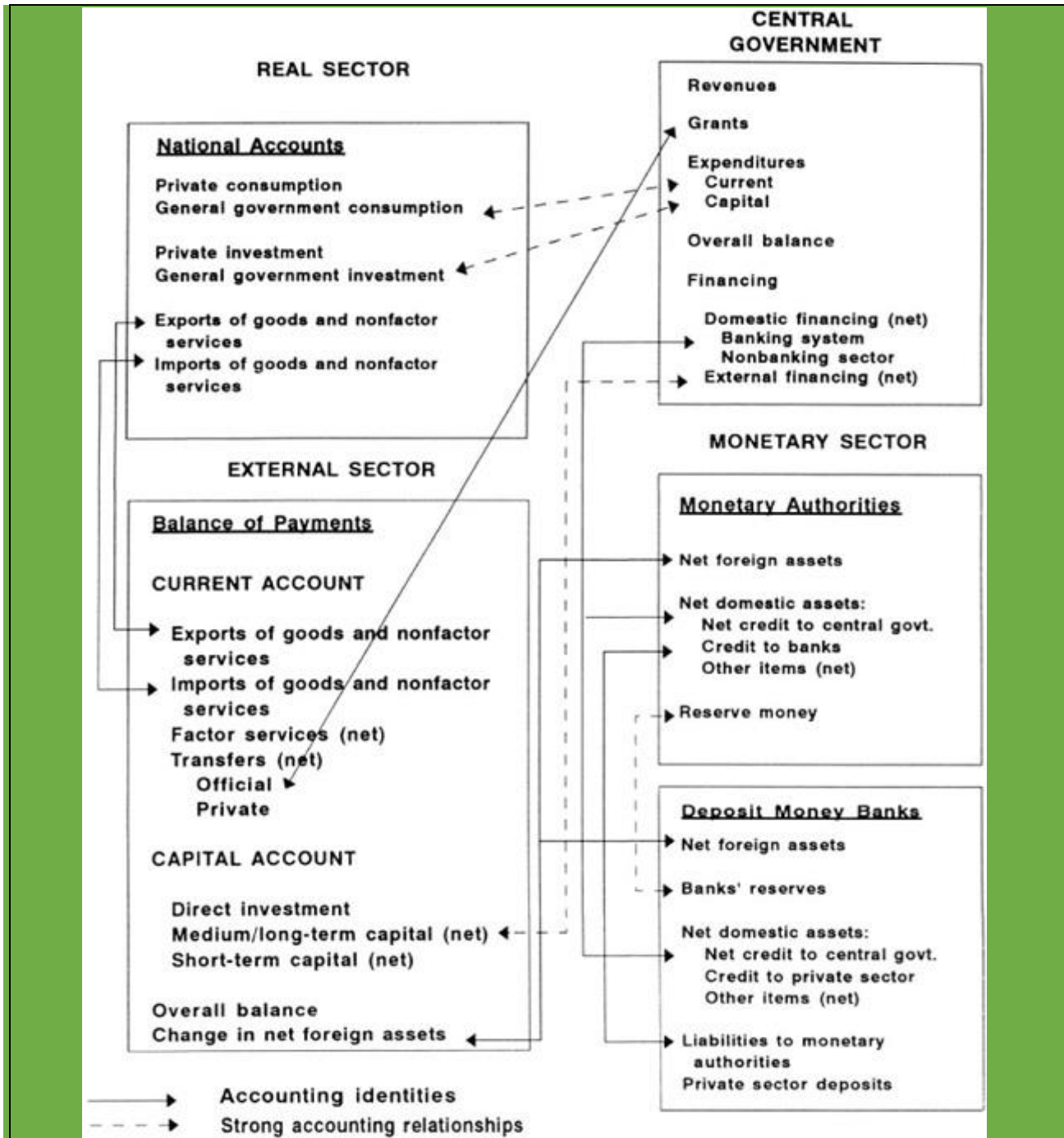
NFA_t = Net foreign assets in local currency at the end of period t ;

ER_t and ER_{AVG_t} = the end period and period average exchange rates for period t ; and

ΔNFA^*_t = Change in net foreign assets during period t , expressed in terms of foreign currency.

Interrelations among the Macroeconomic Accounts

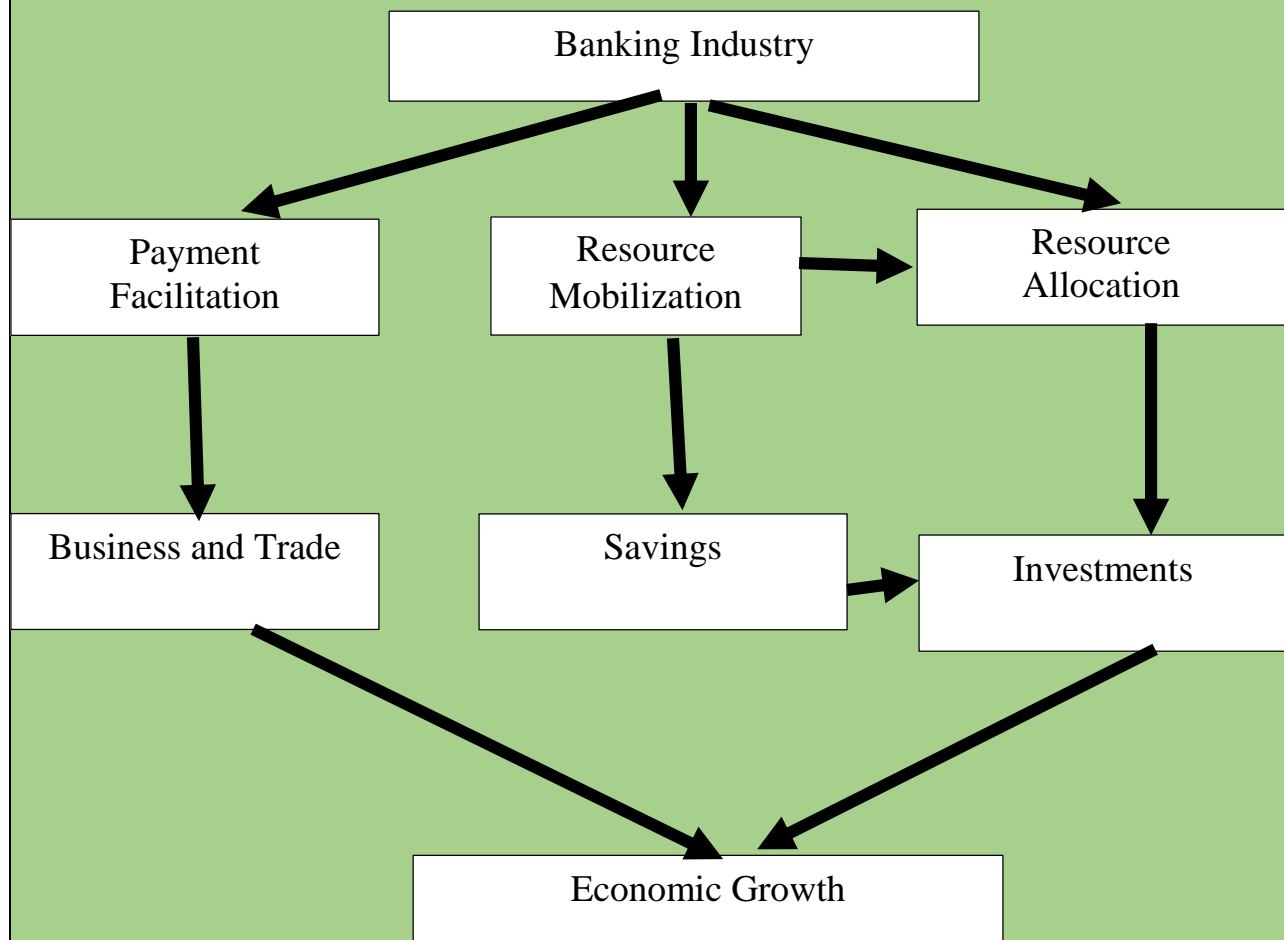
All four macroeconomic accounts are interrelated. The figure shows the three supporting accounts (balance of payments, fiscal, and monetary) and their relationship with both the national income and product accounts and intersectoral linkages. Transactions appearing in more than one sector are highlighted. Bank financing of the government, for example, while a source of financing for budgetary expenditures, is also a banking sector asset and external financing for the budget enters the balance of payments as a capital account transaction.



While conceptually identical, in practice, the entries in the different accounts differ for several reasons. First, the transactions are recorded at different times. Government accounts record payments when they are made, but payments made by checks do not enter the banking sector statistics until the checks are cashed, which may be weeks or even months later. The national income and product accounts record transactions on an accrual basis, so that resource flows that are not financial transactions, such as consumption of fixed capital, are included in these accounts but not in the government accounts.

Box E1: Banking Industry and Macroeconomic Growth

The contribution of the banking and financial sector is considered one of the key economic sectors while computing GDP or GNP. In addition to that, the banking and financial industry plays role by creating employment opportunities, and several other economic activities are linked with banking and financial services. However, the true contribution of a banking industry is measured by its role in facilitating payment, deposit, and credit services to other economic sectors of an economy. The banking industry contributes to economic growth by promoting business and trade activities through payment services, mobilizing resources (savings), and allocating resources (investments).



Indicative Questions and Exercises

1. What is aggregate demand? How is the shape of the aggregate demand curve? What does an aggregate demand curve reflect?
2. What is aggregate supply? What are the shapes of Short Run and Long Run Aggregate Supply curves? What are the rationales?
3. 'Long-run Aggregate Supply Curve (LRAS) is equal to the full employment level of output'- How? Explain your answer.
4. Explain the concepts of the Recessionary Gap and Inflationary Gap in the Aggregate Demand-Supply analyses?
5. What is Inflation? What is the impact of Deflation in an economy? How Headline and Core Inflation are different?
6. What is Employment? Explain different types of unemployment in an economy.
7. What is Real Interest Rate? How Interest Rate contributes to ensuring demand and supply of loanable funds in an economy?
8. What are the major macroeconomic policies in an economy? Distinguish between demand-side policies and supply-side policies.
9. What is Fiscal Policy? What is the purpose of Fiscal Policy? What are the two main types of Fiscal Policy?
10. What are the key coverage of monetary policy? How expansionary and contractionary monetary policies are different?
11. What are the key macroeconomic accounts? Explain key components of the National Income Accounts.
12. How GDP and GNP are different in the context of an economy? What is Gross National Disposable Income?
13. 'GDP at nominal terms and GDP at constant prices are important estimations of National Output'- How to estimate these?
14. What are the key components of Monetary and Fiscal Accounts? What are the purposes of maintaining Monetary and Fiscal Accounts in an economy?
15. What are the different sources of financing for the deficit in the Fiscal Account? What are the impacts of the different types of financing?
16. What is the Balance of Payment (BOP)? How Balance of Payment is different from Balance of Trade?
17. What are the key components of BOP? What is the interpretation of the Deficit Balance of Trade in an economy?
18. What is Current Account Balance? What is the relationship between BOP Surplus or Deficit and Change in Foreign Exchange Reserves?
19. 'All four macroeconomic accounts are interrelated'. Explain the interrelationships between different macroeconomic accounts.
20. What are the channels of contribution of banking industry to the economic growth?

Module-G:
Macroeconomic Performance of Bangladesh

Module-G:

Macroeconomic Performance of Bangladesh

Growth with equity and social justice remains the overarching goal of Bangladesh's development strategy. Development planning and strategy have been important forces to attain the economic and social goals of Bangladesh. Bangladesh achieved several landmarks through its economic performers since its independence under different planning periods. Currently, the country is under Eighth Five Year Plan (2020-2025). The economic performance of the earlier planning period may be summarized as follows (Table G-1).

Planning Title	Planning Period	GDP Target [Average %]	Actual GDP [Average %]	Per Capital GDP Growth [%]	Per Capita GNI [USD]
First	1973-1978	5.5	4.0	1.3	111
Second	1980-1985	5.4	3.8	1.5	145
Third	1985-1990	5.4	3.8	1.6	204
Fourth	1990-1995	5.0	4.2	2.4	253
Fifth	1997-2002	7.1	7.5	3.5	431
Sixth	2011-2015	7.3	6.3	4.9	1314
Seventh	2015-2020	7.4	7.1	5.7	2064

Source: Eighth Five Year Plan, Planning Commission, GoB.

The Eighth Plan (2020-2025) sets to hit the target of 8.51 percent GDP growth by FY 2025. To accommodate this growth target, the gross investment needs to be raised to 36.59 percent of GDP by FY 2025 in which private investment will capture the lion's share (27.35 percent of GDP). Service and manufacturing growth will be the major drivers of GDP growth in this journey. During the Eighth Plan period, the government targets to strengthen its initiatives to ensure inclusive growth that brings down the incidence of poverty to 15.6 percent and extreme poverty to 7.4 percent. The proper implementation of any plan needs efficient monitoring and evaluation.

Following the successful management of the Covid-19 pandemic, and returning to high growth trajectory, the economy grew by 6.94 percent in FY 2020- 21. And while Bangladesh's projected growth rate of 5.2 percent for 2023 is 1.5 points less than what was forecast last June, it is expected that, in 2024, the growth rate will accelerate to 6.2 percent – one of the highest among South Asian countries. According to the provisional estimates of BBS, the GDP growth stood 7.25 percent in FY 2021-22, 0.05 percent higher than the target rate and 0.31 percent higher than the previous fiscal year. Medium-term forecasts for GDP growth rates are 7.5 percent in FY 2022-23, 7.8 percent in FY 2023-24 and 8.0 percent in FY 2024-25.

GDP, Per Capita GDP and GNI

Over the last decade, notable achievements have taken place in terms of GDP growth (Table G-2), GDP Per Capita (G-3), and GNP Growth and Per Capita (G-4). According to the final estimate (Bangladesh Economic Review), the volume of GDP at current market prices reached Tk. 35,30,184.8 crore in FY 2020-21, which was Tk. 31, 70,469.4 crore in FY 2019-20. In nominal term GDP growth was 11.35 percent. GDP is provisionally estimated Tk. 39,76,462 crore in FY 2021-22, Tk. 4,46,278 crore higher than the previous fiscal year. Per capita GDP is estimated to be USD 2,723 in FY 2021-22. Medium-term GDP forecasts are Tk. 44,12,849 crore in FY 2022-23, Tk. 49.49,712 crore in FY 2023-24, and Tk. 55,59,517 crore in FY 2024-25. As per the final estimate, per capita GDP in FY 2020-21 was USD 2,462, US\$ 228 up from the previous fiscal year. Per capita gross national income increased to USD 2,591 in FY 2020-21, USD 265 up from FY 2019- 20. The per capita gross national income is provisionally estimated to USD2,824 in FY 2021- 22, USD 233 higher than the previous fiscal year.

Table G2: Bangladesh's GDP Growth Rate		
Year	GDP Growth (%)	Annual Change
2021	6.94%	3.49%
2020	3.45%	-4.43%
2019	7.88%	0.56%
2018	7.32%	0.73%
2017	6.59%	-0.52%
2016	7.11%	0.56%
2015	6.55%	0.49%
2014	6.06%	0.05%
2013	6.01%	-0.51%
2012	6.52%	0.06%
2011	6.46%	0.89%
2010	5.57%	0.53%

Source: <https://www.macrotrends.net/countries/BGD/bangladesh/gdp-growth-rate>

Table G3: Bangladesh's GDP Growth Rate [%]		
Year	GDP Per Capita	Growth Rate
2021	\$2,458	10.06%
2020	\$2,233	5.24%
2019	\$2,122	8.08%
2018	\$1,963	8.14%
2017	\$1,816	9.38%
2016	\$1,660	34.30%
2015	\$1,236	11.50%
2014	\$1,109	13.84%
2013	\$974	11.06%
2012	\$877	2.39%
2011	\$856	10.24%
2010	\$777	11.21%

Source: <https://www.macrotrends.net/countries/BGD/bangladesh/gdp-growth-rate>

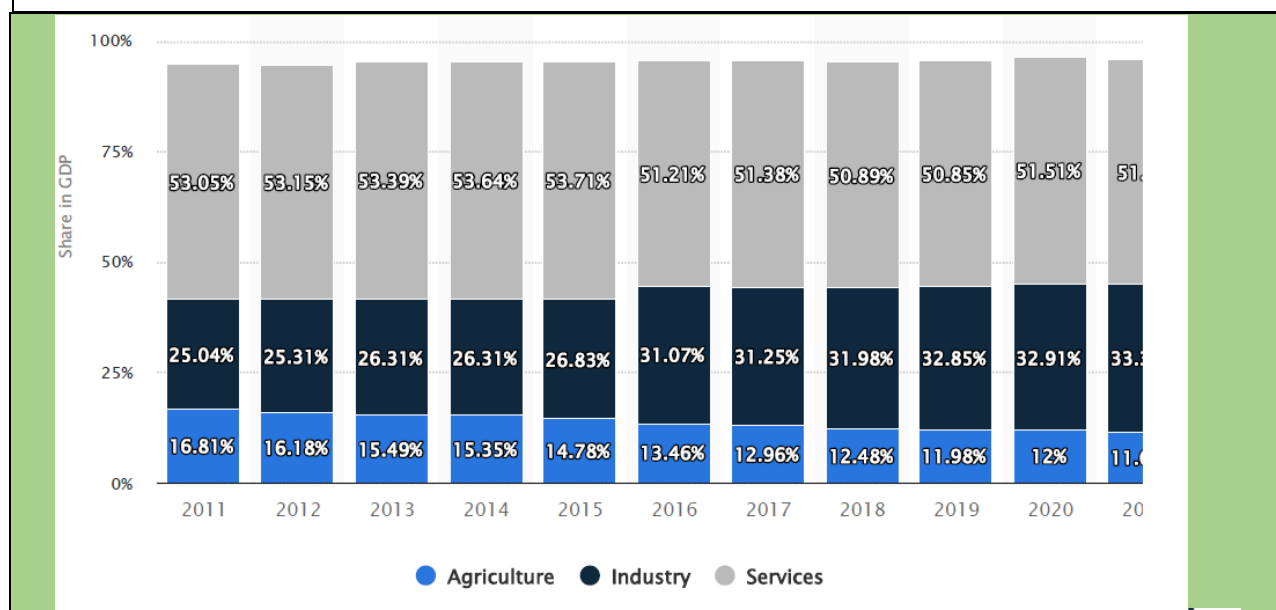
Table G4: Bangladesh's GNP and GNP Per Capita [USD]			
Year	GNP	Per Capita	Growth Rate
2021	\$435.53B	\$2,570	8.07%
2020	\$385.22B	\$2,300	3.52%
2019	\$366.49B	\$2,210	7.91%
2018	\$329.87B	\$2,020	7.93%
2017	\$266.71B	\$1,650	5.32%
2016	\$225.57B	\$1,410	5.40%
2015	\$191.31B	\$1,210	6.35%

2014	\$171.25B	\$1,100	4.69%
2013	\$158.83B	\$1,030	5.60%
2012	\$146.86B	\$970	6.98%
2011	\$133.34B	\$890	6.24%
2010	\$118.31B	\$800	5.78%
Source: https://www.macrotrends.net/countries/BGD/bangladesh/gdp-growth-rate			

Sectoral Growth and Distribution

According to the estimate of BBS, the growth of the agriculture sector increased to 3.17 percent in FY 2020-21, slightly lower than 0.25 percentage point from FY 2019-20. During the same period, industry sector grew by 10.29 percent, which was 3.16 percent in the previous fiscal year. The service sector grew by 5.73 percent in FY 2020-21, 1.8 percentage point up from the previous fiscal year. According to the provisional estimate of BBS, the growth rate of agriculture sector stood 2.20 percent in FY 2021-22, 0.97 percentage point lower than the previous fiscal year. Within the agriculture sector, the growth rate of forests and related services estimated highest growth rate of 5.37 percent in FY 2021-22. The contribution of the broad agricultural sector to the GDP stood at 11.50 percent in FY 2021-22, 0.57 percentage point lower than the previous fiscal year. Industrial sector is estimated to have 10.44 percent growth in FY 2021-22, 0.15 percentage point higher than the previous fiscal year. The contribution of industries to GDP became 37.07 percent, which is 1.06 percentage points higher than the previous fiscal year. Services sector is estimated to have 6.31 percent growth in FY 2021-22, 0.58 percentage point higher than FY 2020-21. Human health and social work activities are estimated to experience the highest growth rate of 9.78 percent followed by wholesale and retail trade, transportation and storage, accommodation and food services activities; financial and insurance activities; professional, scientific and technical activities; education and other service sectors would grow significantly over FY 2020-21. The contribution of the broad service sector to the GDP stood at 51.44 percent in FY 2021-22, 0.29 percentage points lower than the previous fiscal year.

Figure G1: Sectoral Contributions of Agriculture, Industry and Services



Source: <https://tradingeconomics.com/bangladesh/gross-savings-percent-of-gdp-wb-data.html>

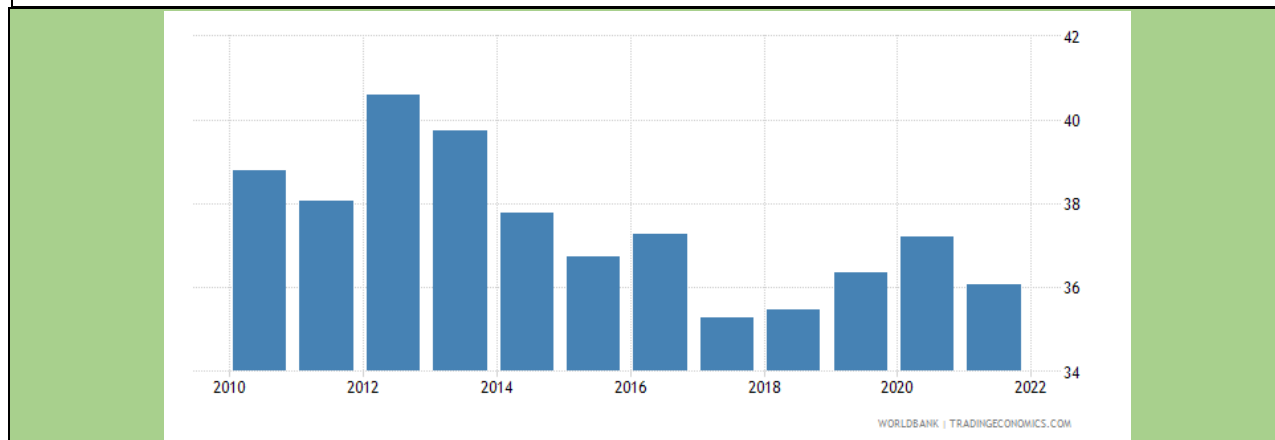
Consumption, Savings and Investment

In GDP measured by expenditure method, consumption expenditure especially private consumption occupies the major share. Over more than a decade, consumption as domestic demand has been over 70 percent of GDP. As per the final estimate of BBS the contribution of consumption expenditure to GDP is 74.66 percent in FY 2020-21 of which private consumption is 68.78 percent and government consumption is 5.88 percent. BBS provisionally estimated that the contribution of consumption expenditure to the GDP will be 78.44 percent of which private consumption 72.77 percent and general government consumption 5.67 percent in FY 2021-22, 3.78 percentage points higher than the previous fiscal year.

During FY 2020-21, domestic savings decreased to 25.34 percent of GDP, 1.74 percentage point lower than the previous year. Likewise, national savings as percent of GDP decreased to 30.79 percent in FY 2020-21, 0.63 percentage point lower than FY 2019-20. Gross domestic savings is provisionally estimated to be 21.56 percent of GDP in FY 2021-22, 3.78 percentage point lower than previous fiscal year. Gross national savings is estimated to be 25.45 percent of GDP, 5.34 percentage point lower than previous fiscal year. The contribution of investment to GDP decreased to 31.02 percent in FY 2020-21, 0.29 percentage point lower than the previous fiscal year. Of 31.02 percent contribution to GDP, private investment is 23.70 percent while public investment is 7.32 percent. Public investment as a percentage of GDP has slightly increased and private investment as a percentage of GDP has slightly decreased compared to the previous fiscal year. Investment is

estimated to be 31.68 percent of GDP of which private investment is 24.06 percent and public investment is 7.62 percent in FY 2021-22. Overall investment is 0.66 percentage point higher than last fiscal year.

Figure G2: Gross Savings of Bangladesh [% of GDP]



Source: <https://tradingeconomics.com/bangladesh/gross-savings-percent-of-gdp-wb-data.html>

Inflation

Inflation in FY 2020-21 stood at 5.56 percent, 0.09 percentage point lower than FY 2019-20, which is slightly higher than the target rate of inflation. As the economic damages created by the Covid-19 pandemic are triggered by the war in Ukraine, like all other countries of the world an upward trend in price level is being observed in Bangladesh. The inflation rate is targeted to be 5.8 percent for FY 2021-22.

Year	Inflation Rate (%)	Annual Change
2021	5.55%	-0.15%
2020	5.69%	0.10%
2019	5.59%	0.05%
2018	5.54%	-0.16%
2017	5.70%	0.19%
2016	5.51%	-0.68%
2015	6.19%	-0.80%
2014	6.99%	-0.54%
2013	7.53%	1.31%
2012	6.22%	-5.18%
2011	11.40%	3.27%
2010	8.13%	2.70%

Source: <https://www.macrotrends.net/countries/BGD/bangladesh/gdp-growth-rate>

Revenue Mobilization, Government Expenditure and Balance Budget

In FY 2020-21, Tk. 3,28,984 crore (9.3 % of GDP) revenue was collected of which NBR tax revenue is Tk. 2,63,226 crore, non-NBR tax revenue is Tk. 6,066 crore and non-tax revenue is Tk. 59,192 crore. The revised revenue mobilisation target is set Tk.3,89,000 crore in FY 2021-22, which is 9.9 percent of the estimated GDP. Of them, revenue to be collected from NBR sources is Tk.3,30,000 crore (8.4% of GDP), and tax revenue from non-NBR sources is Tk. 16,000 crore (0.4% of GDP) and non-tax revenue is Tk. 43,000 crore (1.1% of GDP). Revenue received during July-March of FY 2021-22 is Tk.2,74,381 (70.53 % of target) crore of which NBR revenue is Tk. 2,42,930 crore and Non-NBR revenue is Tk. 31,451 crore.

The total expenditure target for FY 2021-22 has been set Tk. 5,93,500 crore, which is 15.1 percent of GDP. Of this, operating expenditure is Tk. 3,85,950 crore (9.8% of GDP) and development expenditure is Tk. 2,07,550 crore (5.3% of GDP). As per the provisional estimates, the total expenditure up to March 2022 in FY 2021- 22 was Tk. 2,62,041 crore, of which operating expenditure was Tk. 1,94,336 crore and development expenditure was Tk. 63,411 crore.

Government is conscious to keep the budget deficit within 5 percent of GDP. But in the revised budget of FY 2021-22, due to Covid-19 pandemic budget deficit crossed 5 percent of GDP. According to the revised budget for FY 2021-22, budget deficit has been estimated Tk.2,04,500 crore which is 5.1 percent of GDP. Of this deficit, Tk. 80,212 crore (2.0% of GDP) to be financed from external sources (including foreign grant) and Tk.1,24,288 crore (3.2% of GDP) to be financed by domestic sources. Out of the deficit in the domestic sector, Tk. 87,288 crore would be sourced from the banking system and the remaining Tk. 37,000 crore would be sourced from the non-bank sector.

Monetary Policy and Monetary Management

Monetary policy stance and the monetary and credit programmes have been announced with key objective to continue on-going recovery process disrupted by Covid-19 pandemic through expansionary tools while maintaining stability in general price level. The FY 2021-22 monetary programme is primarily set to support 7.2 percent real GDP growth and containment of average inflation at 5.3 percent. The Bank Rate which remained unchanged for the last 17 years (since 2003) has also been slashed down by 100 basis points to 4.00 percent to rationalize it with the current interest rate regime. CRR has been reduced from 5.5 percent to 4.0 percent for domestic banking operations, from 5.5 percent to 2.0 percent for offshore banking operations, and from 2.5 percent to 1.5 percent for financial institutions (FIs).

At the end of February of FY 2021-22, the year-on-year, broad money (M2) increased by 9.4 percent and reserve money decreased by 7.41 percent. During the period, 30.36 percent growth of net foreign assets has contributed in the year-on-year growth of M2. Domestic credit increased (year-on-year) by 13.3 percent in February 2022 of FY 2021-22, which is higher than 9.06 percent growth in the same period of the previous fiscal year. Of which private sector credit growth stood at 10.87 percent at the end of February 2022 against 8.93 percent in the same period of the previous fiscal year. The net credit to the government increased by 28.94 at the end of February 2022 which was increased by 10.64 percent in the same period of the previous year. At the end of February 2022, credit to the other public sector increased by 10.09 percent compared to 4.82 percent during the same period of the last year. According to a recent publication, Bangladesh's Weighted Average Interest Rate: Schedule Banks: Advances data was reported at 7.240 % pa in Jan 2023. This records an increase from the previous number of 7.220 % pa for Dec 2022.

Employment

The International Labour Organisation has projected that Bangladesh's unemployment will stand at 3.6 million in 2022, surpassing the pre-pandemic level by 0.5 million as the labour market recovery in low and middle-income countries has remained slow and uncertain due to lower vaccination rates and tighter fiscal. The unemployment rate in Bangladesh remained in the range of 4-5% for the years (Table G6).

Table G6: Bangladesh Unemployment Rate		
Year	Unemployment Rate (%)	Annual Change
2021	5.23%	-0.18%
2020	5.41%	0.98%
2019	4.44%	0.02%
2018	4.41%	0.04%
2017	4.37%	0.02%
2016	4.35%	-0.02%
2015	4.37%	-0.02%
2014	4.38%	-0.05%
2013	4.43%	0.31%
2012	4.12%	0.35%
2011	3.77%	0.39%
2010	3.38%	-1.62%

Source: <https://www.macrotrends.net/countries/BGD/bangladesh/gdp-growth-rate>

External Sector

In FY 2020-21 total export earnings increased by 12.77 percent to USD 40.11 billion over the previous fiscal year. During July to March of FY 2021-22, export earnings stood USD 43.7 billion, which is 32.43 percent higher than the export earnings of the same period in the previous fiscal year. Exports receipt is estimated to cross USD 50 billion in the fiscal year 2021-22. During this period, commodity-wise growth of export earnings shows that export earnings from almost all the products have increased compared to the last fiscal year except jute and building materials.

Table G7: Bangladesh's Exports		
Year	Billions of US \$	% of GDP
2021	\$44.39B	10.66%
2020	\$39.05B	10.44%
2019	\$45.99B	13.09%
2018	\$40.73B	12.67%
2017	\$37.66B	12.82%
2016	\$36.92B	13.92%
2015	\$33.82B	17.34%
2014	\$32.83B	18.99%
2013	\$29.30B	19.54%
2012	\$26.89B	20.16%
2011	\$25.63B	19.92%
2010	\$18.47B	16.02%

Source: <https://www.macrotrends.net/countries/BGD/bangladesh/gdp-growth-rate>

The total import payments in FY 2020-21 stood at USD 61.7 billion, 10.74 percent higher than the previous fiscal year. Up to March of FY 2021-22, total import payments stood USD 71.41 billion, 42.24 percent higher than the same period of the previous fiscal year. Imports payments is estimated to be around US\$ 80 billion in the fiscal year 2021-22.

Table G8: Bangladesh's Imports		
Year	Billions of US \$	% of GDP
2021	\$71.02B	17.06%
2020	\$59.18B	15.83%
2019	\$64.92B	18.48%
2018	\$63.76B	19.84%
2017	\$50.47B	17.18%
2016	\$46.19B	17.41%
2015	\$48.28B	24.75%
2014	\$44.13B	25.52%
2013	\$40.14B	26.76%
2012	\$37.27B	27.95%
2011	\$35.37B	27.50%
2010	\$25.11B	21.78%
Source: https://www.macrotrends.net/countries/BGD/bangladesh/gdp-growth-rate		

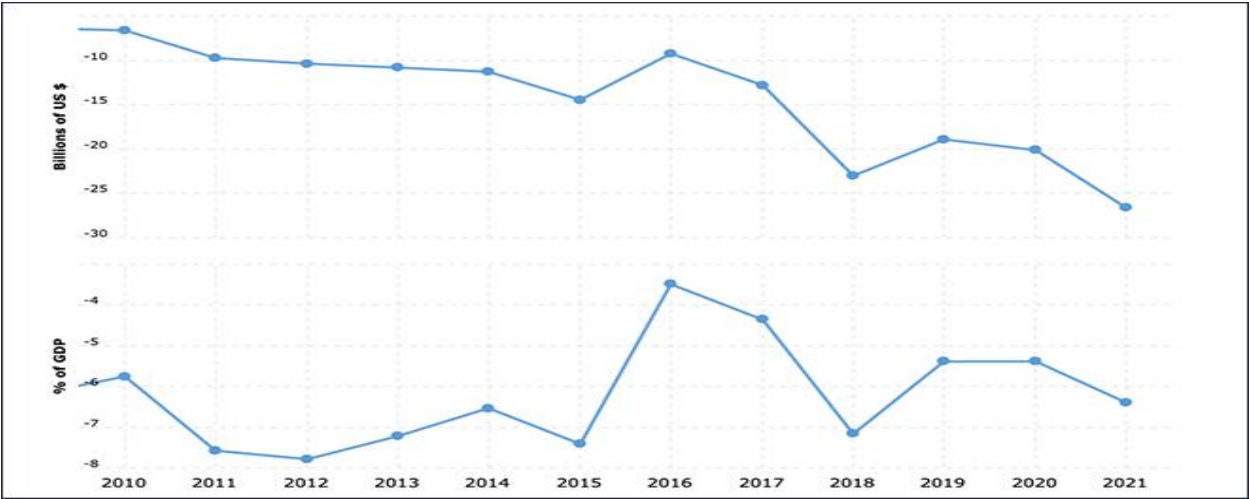
Overseas employment significantly increased to 6.17 lakh in 2021 and reached 3.23 lakh by March 2022. Considering worldwide mass vaccination programmes and the improvement of Covid-19 situation it is expected that overseas employment will cross the pre-pandemic trend in 2022. In FY 2019-20, remittance inflows increased by 10.87 percent over the previous fiscal year to US\$ 18.21 billion. In FY 2020-21, Bangladeshi expatriates' remittance stood at US\$ 24.78 billion which was significantly higher (36.10%) than the previous fiscal year. During July-April of FY 2021-22 remittance earnings recorded USD 17.31 billion. The major portion of remittance has been received from Middle East countries. During July to March 2022 the highest amount of remittance was earned from Kingdom of Saudi Arabia (21%) followed by the USA (16%), the UK (11%), UAE (9%), Kuwait (8%), Qatar (6%), Malaysia (5%), Italy (5%) and so on.

Trade deficit of Bangladesh stood USD 22.8 billion in FY 2020-21 compared to US\$ 17.9 billion in FY 2019-20. Trade deficit rose by 27.67 percent in FY 2020-21, largely due to the higher import payments largely resulted from high commodity prices worldwide. During that time, current account balance deficit stood at US\$ 3.8 billion on the back of robust remittance inflows compared to US\$ 4.7 billion deficit in the previous fiscal year. Trade deficit during July-February of FY 2021-22 has become USD22.3 billion compared to USD 12.4 billion during the same period of the last fiscal year.

Table G9: Bangladesh's Trade Balance		
Year	Billions of US \$	% of GDP
2021	\$-26.63B	-6.40%
2020	\$-20.14B	-5.39%
2019	\$-18.93B	-5.39%
2018	\$-23.03B	-7.17%
2017	\$-12.81B	-4.36%
2016	\$-9.26B	-3.49%
2015	\$-14.46B	-7.41%
2014	\$-11.30B	-6.53%
2013	\$-10.83B	-7.22%
2012	\$-10.39B	-7.79%
2011	\$-9.75B	-7.58%
2010	\$-6.63B	-5.75%

Source: <https://www.macrotrends.net/countries/BGD/bangladesh/gdp-growth-rate>

Figure G3: Bangladesh's Balance of Trade (in USD billion and percentage of GDP) in Bangladesh (2010 – 2021)



Source: <https://www.orfonline.org>

Foreign Exchange Reserves and BOP are associated. According to BB (www.bb.org.bd), foreign exchange reserves of Bangladesh was over USD 33 billion as of end December 2022. Bangladesh Foreign Exchange Reserves equaled 5.7 Months of Import in Dec 2022. Foreign exchange reserve of Bangladesh reached a record height of USD 48 billion on 24 August 2021 largely due to huge inward remittances and export earnings. However, as the import keeps increasing the volume of foreign exchange reserves decreased by about USD 4 billion since 24 August 2021. At the end of April of FY 2021-22 the foreign exchange reserve stood USD 44.1 billion

Exchange rate of BDT came under pressure in response to the global foreign exchange market instability mainly following 2020, and as of early 2023, it has crossed Taka 100 mark. Bangladeshi currency Taka experienced an overall 1.9 percent depreciation against USD in July-April FY 2021-22 compared to that of the FY 2020-21. The weighted average inter-bank rate stood at Taka 86.45 per USD on 30 April, 2022, which was Taka 84.80 per USD on 30 April, 2021.

Medium-term Prospects of Bangladesh Economy

According to Bangladesh's Medium-term Macroeconomic Framework (MTMF), 2021-22 to 2024-25, has been formulated taking into account the recent dynamics of the global economy and the impacts on the domestic sector. While the global economy was recovering from Covid-19 impairment, the war in Ukraine is triggering the loss of lives and livelihood in the war zone and supply bottlenecks in the rest of the world. In the medium term, the government puts emphasis on full economic recovery from the fallout of Covid-19, addresses the issues arisen from war in Ukraine, implements 8th Five Year Plan, the 2030 agenda-SDGs, second perspective plan (2021-2041), 'Delta Plan 2100', and 'Blue Economy' strategies. Government is keen to restore the pre-pandemic economic high growth trajectory. As per the MTMF, the estimated revenue mobilization for FY 2021-22 will be 9.8 percent of GDP and projection is made that the revenue is expected to lie between 9.8 percent to 10.6 percent of GDP between FY 2022-23 to FY 2024-25. The budget deficit is projected to be 5.5 to 5 percent of GDP in FY 2022-23 to FY 2024-25. Considering strong domestic demand, fiscal expansion, rebound of export, improved Covid-19 situation, restoration of lives and livelihood, full resumption of economic activities, and completion of a few mega projects, it is expected the economy of Bangladesh will fully continue to grow at the pace of pre-pandemic growth path.

Indicative Questions

1. Write a note on the 'macroeconomic performance of Bangladesh under different Five Year Planning Periods.'
2. Explain the Changing trends of growth indicators in the context of Bangladesh's economy.
3. What is the interpretation of the negative balance of trade in the context of Bangladesh? Examine the performance of the external sector of Bangladesh.
4. Examine the sectoral contributions i.e. service, manufacturing, and agriculture sectors to the macroeconomic growth of Bangladesh.
5. Examine the trends of revenue collection and deficit budget financing in the context of Bangladesh.

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Glossary

Macroeconomics studies the economy as system in which feedback among sectors determine national output, employment and prices.

Microeconomics is the study of individual behaviour in the context of scarcity.

Mixed economy: goods and services are supplied both by private suppliers and government.

Economic Model is a formalization of theory that facilitates scientific inquiry of economic behaviour.

Economic Theory is a logical view of how things work, and is frequently formulated on the basis of observation in the field of economics.

Opportunity cost of a choice is what must be sacrificed when a choice is made.

Production possibility curve (PPC) defines the combination of goods that can be produced using all of the resources available.

Economy-wide PPC is the set of goods combinations that can be produced in the economy when all available productive resources are in use.

Capital stock: the buildings, machinery, equipment and software used in producing goods and services.

Recession: when output falls below the economy's capacity output.

Boom: a period of high growth that raises output above normal capacity output

'Positive economics' studies objective or scientific explanations of how the economy functions.

'Normative economics' offers recommendations that incorporate value judgments.

Demand is the quantity of a good or service that buyers wish to purchase at each possible price, with all other influences on demand remaining unchanged.

Supply is the quantity of a good or service that sellers are willing to sell at each possible price, with all other influences on supply remaining unchanged.

Quantity demanded defines the amount purchased at a particular price.

Quantity supplied refers to the amount supplied at a particular price.

Equilibrium price: equilibrates the market. It is the price at which quantity demanded equals the quantity supplied.

Excess supply exists when the quantity supplied exceeds the quantity demanded at the going price.

Excess demand exists when the quantity demanded exceeds quantity supplied at the going price.

Demand curve is a graphical expression of the relationship between price and quantity demanded, with other influences remaining unchanged.

Supply curve is a graphical expression of the relationship between price and quantity supplied, with other influences remaining unchanged.

Substitute goods: when a price reduction (rise) for a related product reduces (increases) the demand for a primary product, it is a substitute for the primary product.

Complementary goods: when a price reduction (rise) for a related product increases (reduces) the demand for a primary product, it is a complement for the primary product.

Inferior good is one whose demand falls in response to higher incomes.

Normal good is one whose demand increases in response to higher incomes.

Market demand: the horizontal sum of individual demands.

Price elasticity of demand is measured as the percentage change in quantity demanded, divided by the percentage change in price.

Demand is elastic if the price elasticity is greater than unity. It is inelastic if the value lies between unity and 0. It is unit elastic if the value is exactly one.

Cross-price elasticity of demand is the percentage change in the quantity demanded of a product divided by the percentage change in the price of another.

Income elasticity of demand is the percentage change in quantity demanded divided by a percentage change in income.

Luxury good or service is one whose income elasticity equals or exceeds unity.

Necessity good is one whose income elasticity is greater than zero and is less than unity. Inferior goods have a negative income elasticity.

Elasticity of supply is defined as the percentage change in quantity supplied divided by the percentage change in price.

Tax Incidence describes how the burden of a tax is shared between buyer and seller.

Welfare economics assesses how well the economy allocates its scarce resources in accordance with the goals of efficiency and equity.

Consumer surplus is the excess of consumer willingness to pay over the market price.

Supplier or producer surplus is the excess of market price over the reservation price of the supplier.

Efficient market: maximizes the sum of producer and consumer surpluses.

Deadweight loss of a tax is the component of consumer and producer surpluses forming a net loss to the whole economy.

Externality is a benefit or cost falling on people other than those involved in the activity's market. It can create a difference between private costs or values and social costs or values.

Corrective tax seeks to direct the market towards a more efficient output.

Cardinal utility is a measurable concept of satisfaction.

Total utility is a measure of the total satisfaction derived from consuming a given amount of goods and services.

Marginal utility is the addition to total utility created when one more unit of a good or service is consumed.

Diminishing marginal utility implies that the addition to total utility from each extra unit of a good or service consumed is declining.

Consumer equilibrium occurs when marginal utility per dollar spent on the last unit of each good is equal.

Law of demand states that, other things being equal, more of a good is demanded the lower is its price.

Ordinal utility assumes that individuals can rank commodity bundles in accordance with the level of satisfaction associated with each bundle.

Indifference curve defines combinations of goods and services that yield the same level of satisfaction to the consumer.

Indifference map is a set of indifference curves, where curves further from the origin denote a higher level of satisfaction.

Marginal rate of substitution is the slope of the indifference curve. It defines the amount of one good the consumer is willing to sacrifice in order to obtain a given increment of the other, while maintaining utility unchanged.

Diminishing marginal rate of substitution reflects a higher marginal value being associated with smaller quantities of any good consumed.

Accounting profit is the difference between revenues and explicit costs.

Economic profit is the difference between revenue and the sum of explicit and implicit costs.

Explicit costs are the measured financial costs.

Implicit costs represent the opportunity cost of the resources used in production.

Production function: a technological relationship that specifies how much output can be produced with specific amounts of inputs.

Technological efficiency means that the maximum output is produced with the given set of inputs.

Economic efficiency defines a production structure that produces output at least cost.

Short run: a period during which at least one factor of production is fixed. If capital is fixed, then more output is produced by using additional labour.

Long run: a period of time that is sufficient to enable all factors of production to be adjusted.

Total product is the relationship between total output produced and the number of workers employed, for a given amount of capital.

Marginal product of labour is the addition to output produced by each additional worker. It is also the slope of the total product curve.

Law of diminishing returns: when increments of a variable factor (labour) are added to a fixed amount of another factor (capital), the marginal product of the variable factor must eventually decline.

Average product of labour is the number of units of output produced per unit of labour at different levels of employment.

Fixed costs are costs that are independent of the level of output.

Variable costs are related to the output produced.

Total cost is the sum of fixed cost and variable cost.

Average fixed cost is the total fixed cost per unit of output.

Average variable cost is the total variable cost per unit of output.

Average total cost is the sum of all costs per unit of output.

Marginal cost of production is the cost of producing each additional unit of output.

Sunk cost is a fixed cost that has already been incurred and cannot be recovered, even by producing a zero output.

Increasing returns to scale implies that, when all inputs are increased by a given proportion, output increases more than proportionately.

Constant returns to scale implies that output increases in direct proportion to an equal proportionate increase in all inputs.

Decreasing returns to scale implies that an equal proportionate increase in all inputs leads to a less than proportionate increase in output.

Long-run average total cost is the lower envelope of all the short-run ATC curves.

Minimum efficient scale defines a threshold size of operation such that scale economies are almost exhausted.

Long-run marginal cost is the increment in cost associated with producing one more unit of output when all inputs are adjusted in a cost minimizing manner.

Perfect competition: an industry in which many suppliers, producing an identical product, face many buyers, and no one participant can influence the market.

Profit maximization is the goal of competitive suppliers – they seek to maximize the difference between revenues and costs.

Marginal revenue is the additional revenue accruing to the firm resulting from the sale of one more unit of output.

Shut-down price corresponds to the minimum value of the AVC curve.

Break-even price corresponds to the minimum of the ATC curve.

Short-run supply curve for perfect competitor: the portion of the MC curve above the minimum of the AVC.

Industry supply (short run) in perfect competition is the horizontal sum of all firms' supply curves.

Short-run equilibrium in perfect competition occurs when each firm maximizes profit by producing a quantity where $P = MC$.

Economic (supernormal) profits are those profits above normal profits that induce firms to enter an industry. Economic profits are based on the opportunity cost of the resources used in production.

Long-run equilibrium in a competitive industry requires a price equal to the minimum point of a firm's ATC. At this point, only normal profits exist, and there is no incentive for firms to enter or exit.

Industry supply in the long run in perfect competition is horizontal at a price corresponding to the minimum of the representative firm's long-run ATC curve.

Increasing (decreasing) cost industry is one where costs rise (fall) for each firm because of the scale of industry operation.

Monopolist: is the sole supplier of an industry's output, and therefore the industry and the firm are one and the same.

Natural monopoly: one where the ATC of producing any output declines with the scale of operation.

Marginal revenue is the change in total revenue due to selling one more unit of the good.

Average revenue is the price per unit sold.

Allocative inefficiency arises when resources are not appropriately allocated and result in deadweight losses.

Price discrimination involves charging different prices to different consumers in order to increase profit.

A **cartel** is a group of suppliers that colludes to operate like a monopolist.

Patent laws grant inventors a legal monopoly on use for a fixed period of time.

Imperfectly competitive firms face a downward-sloping demand curve, and their output price reflects the quantity sold.

Oligopoly defines an industry with a small number of suppliers.

Monopolistic competition defines a market with many sellers of products that have similar characteristics.

Monopolistically competitive firms can exert only a small influence on the whole market.

Duopoly defines a market or sector with just two firms.

Concentration ratio: N-firm concentration ratio is the sales share of the largest N firms in that sector of the economy.

Differentiated product is one that differs slightly from other products in the same market.

The monopolistically competitive equilibrium in the long run requires the firm's demand curve to be tangent to the ATC curve at the output where $MR = MC$.

Collusion is an explicit or implicit agreement to avoid competition with a view to increasing profit.

Demand for labour: a derived demand, reflecting the demand for the output of final goods and services.

Value of the marginal product is the marginal product multiplied by the price of the good produced.

Marginal revenue product of labour is the additional revenue generated by hiring one more unit of labour where the marginal revenue declines.

Monopsonist is the sole buyer of a good or service and faces an upward-sloping supply curve.

The labour force is that part of the population either employed or seeking employment.

Unemployment rate: the fraction of the labour force actively seeking employment that is not employed.

Discrimination implies an earnings differential that is attributable to a trait other than human capital.

Lorenz curve describes the cumulative percentage of the income distribution going to different quantiles of the population.

Gini index: a measure of how far the Lorenz curve lies from the line of equality. Its maximum value is one; its minimum value is zero.

Market failure defines outcomes in which the allocation of resources is not efficient.

Public goods are non-rivalrous, in that they can be consumed simultaneously by more than one individual; additionally they may have a non-excludability characteristic.

Efficient supply of public goods is where the marginal cost equals the sum of individual marginal valuations, and each individual consumes the same quantity.

Asymmetric information is where at least one party in an economic relationship has less than full information and has a different amount of information from another party.

Adverse selection occurs when incomplete or asymmetric information describes an economic relationship.

Moral hazard may characterize behaviour where the costs of certain activities are not incurred by those undertaking them.

Preparation and Compilation Team

Dr. Shah Md. Ahsan Habib [finbislesh.com] is a Professor Selection Grade of Bangladesh Institute of Bank Management [BIBM]. He obtained his PhD from Banaras Hindu University on International Business and Finance from India under BHU Research Scholarship; and accomplished Post-Doctoral Fellowship on Green Banking from Syracuse University, USA under Senior Fulbright Scholarship.

Dr. Ahsan has over 200 research papers/studies/publications/chapters in different national and international journals/books. He worked as a research consultant with several national and international organizations like World Bank, GIZ, ADB, OXFUM GB, CPD, InM, Bangladesh Bank, EU, DFID, CPD etc. Very recently Dr. Ahsan served as ADB consultant to serve Bangladesh Bank in the areas of digital Payment System, and National Financial Inclusion Strategy. He is a columnist of the national dailies and published over 200 newspaper features in the national daily newspapers the Chairmen of the Executive Committee of D.Net; a Member of the ICC Bangladesh Banking Commission; and a Member of the Global Editorial Board of the Asia-Pacific Risk Professional Association (ARPA). He is a Board Member of the Green Tech Foundation, Bangladesh and a Trustee of the 'Valor of Bangladesh'. He is an Independent Director of IPDC Finance limited, the first non-bank financial institution of the country.

Dr. Toufic Ahmad Choudhury, former Director General of Bangladesh Institute of Bank Management during 2010-2019, did his Phd in 1990 from Himachal Pradesh University, Shimla, India, under Indian Govt. Commonwealth Scholarship. Currently, he is serving as the Director General of Bangladesh Academy for Securities Markets, the academic wing of Bangladesh Securities and Exchange Commission. He is an independent Director of Eastern Bank Limited and a Board member of Palli Karma-Sahayak Foundation (PKSF) and Institute for Inclusive Finance and Development (InM).

He received numerous professional trainings organized by IMF Training Institute, Toronto Centre, Standard Chartered Bank, USAID and World Bank. An expert in financial institution management, risk management, international trade payment and finance, he has over fifty publications in national and international journals.