



**Global Shiksha institute in Collaboration with  
Singhania University**

## **ECONOMICS ANALYSIS FOR BUSINESS DECISIONS**

**COURSE: MBA COMMON PAPER  
FIRST SEMESTER**



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# **LESSON**

## **1**

# **Role of Managerial Economics in Decision Making**

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## **1.0 Aims and Objectives**

In this lesson we shall understand the basic concepts and functional role of Economics in Managerial Decision Making Process. After studying this, you will be able to:

1. Discuss the Meaning, Evolution, scope, purpose and functions of Managerial Economics.
2. Analyse the significance of Managerial Economics in Decision Making Process.

## 1.1 Introduction

### **Definition:**

Economics is the social science that analyzes the production, distribution, and consumption of goods and services. The term economics comes from the Ancient Greek οἰκονομία (oikonomia, "management of a household, administration") from οἶκος (oikos, "house") + νόμος (nomos, "custom" or "law"), hence "rules of the house (hold)". Current economic models emerged from the broader field of political economy in the late 19th century. A primary stimulus for the development of modern economics was the desire to use an empirical approach more akin to the physical sciences.

## 1.2 Managerial Economics Meaning

Managerial economics is the science of directing scarce resources to manage cost effectively. Wherever resources are scarce, manager can make more effective decisions by applying the discipline of managerial economics. These may be decisions with regard to customers, suppliers, competitors, or the internal workings of the organization. It does not matter whether the setting is a business, nonprofit organization, or home. In all of these settings, managers must make the best of scarce resources.

Economics aims to explain how economies work and how economic agents interact. Economic analysis is applied throughout society, in business, finance and government, but also in crime, education, the family, health, law, politics, religion, social institutions, war, and science. The expanding domain of economics in the social sciences has been described as economic imperialism. Common distinctions are drawn between various dimensions of economics. The primary textbook distinction is between microeconomics, which examines the behavior of basic elements in the economy, including individual markets and agents (such as consumers and firms, buyers and sellers), and macroeconomics, which addresses issues affecting an entire economy, including unemployment, inflation, economic growth, and monetary and fiscal policy. Other distinctions include: between positive economics (describing "what is") and normative economics (advocating "what ought to be"); between economic theory and applied economics; between mainstream economics (more "orthodox" dealing with the "rationality-individualism-equilibrium nexus") and heterodox economics (more "radical" dealing with the "institutions-history-social structure nexus"); and between rational and behavioral economics.

### **Managerial economics**

Managerial economics is a branch of economics that applies microeconomic analysis to decision methods of businesses or other management units. As such, it bridges economic theory and economics in practice. It draws heavily from quantitative techniques such as regression analysis and correlation, Lagrangian calculus (linear). If there is a unifying theme that runs through most of managerial economics it is the attempt to optimize business decisions given the firm's objectives and given constraints imposed by scarcity, for example through the use of operations research and programming.

## 1.3 School of Economics

### Classical economics

Publication of Adam Smith's *The Wealth of Nations* in 1776, has been described as "the effective birth of economics as a separate discipline." The book identified land, labor, and capital as the three factors of production and the major contributors to a nation's wealth.

Adam Smith wrote *The Wealth of Nations* Smith discusses the benefits of the specialization by division of labour. His "theorem" that "the division of labor is limited by the extent of the market" has been described as the "core of a theory of the functions of firm and industry" and a "fundamental principle of economic organization." To Smith has also been ascribed "the most important substantive proposition in all of economics" and foundation of resource-allocation theory — that, under competition, owners of resources (labor, land, and capital) will use them most profitably, resulting in an equal rate of return in equilibrium for all uses (adjusted for apparent differences arising from such factors as training and unemployment).

In Smith's view, the ideal economy is a self-regulating market system that automatically satisfies the economic needs of the populace. He described the market mechanism as an "invisible hand" that leads all individuals, in pursuit of their own self-interests, to produce the greatest benefit for society as a whole. Smith incorporated some of the Physiocrats' ideas, including *laissez-faire*, into his own economic theories, but rejected the idea that only agriculture was productive.

In his famous invisible-hand analogy, Smith argued for the seemingly paradoxical notion that competitive markets tended to advance broader social interests, although driven by narrower self-interest. The general approach that Smith helped initiate was called political economy and later classical economics. It included such notables as Thomas Malthus, David Ricardo, and John Stuart Mill writing from about 1770 to 1870. The period from 1815 to 1845 was one of the richest in the history of economic thought.

While Adam Smith emphasized the production of income, David Ricardo focused on the distribution of income among landowners, workers, and capitalists. Ricardo saw an inherent conflict between landowners on the one hand and labor and capital on the other. He posited that the growth of population and capital, pressing against a fixed supply of land, pushes up rents and holds down wages and profits.

Malthus cautioned law makers on the effects of poverty reduction policies Thomas Robert Malthus used the idea of diminishing returns to explain low living standards. Human population, he argued, tended to increase geometrically, outstripping the production of food, which increased arithmetically. The force of a rapidly growing population against a limited amount of land meant diminishing returns to labor. The result, he claimed, was chronically low wages, which prevented the standard of living for most of the population from rising above the subsistence level.

Malthus also questioned the automatic tendency of a market economy to produce full employment. He blamed unemployment upon the economy's tendency to limit its spending by saving too much, a theme that lay forgotten until John Maynard Keynes revived it in the 1930s.

Coming at the end of the Classical tradition, John Stuart Mill parted company with the earlier classical economists on the inevitability of the distribution of income produced by the market system. Mill pointed to a distinct difference between the market's two roles: allocation of resources and distribution of income. The market might be efficient in allocating resources but not in

distributing income, he wrote, making it necessary for society to intervene.

Value theory was important in classical theory. Smith wrote that the "real price of every thing is the toil and trouble of acquiring it" as influenced by its scarcity. Smith maintained that, with rent and profit, other costs besides wages also enter the price of a commodity. Other classical economists presented variations on Smith, termed the 'labour theory of value'. Classical economics focused on the tendency of markets to move to long-run equilibrium.

### **Marxian economics**

The Marxist school of economic thought comes from the work of German economist Karl Marx. Marxist (later, Marxian) economics descends from classical economics. It derives from the work of Karl Marx. The first volume of Marx's major work, *Das Kapital*, was published in German in 1867. In it, Marx focused on the labour theory of value and what he considered to be the exploitation of labour by capital. The labour theory of value held that the value of an exchanged commodity was determined by the labor that went into its production.

### **Neoclassical economics**

A body of theory later termed 'neoclassical economics' or 'marginalism' formed from about 1870 to 1910. The term 'economics' was popularized by such neoclassical economists as Alfred Marshall as a concise synonym for 'economic science' and a substitute for the earlier, broader term 'political economy'. This corresponded to the influence on the subject of mathematical methods used in the natural sciences.

Neoclassical economics systematized supply and demand as joint determinants of price and quantity in market equilibrium, affecting both the allocation of output and the distribution of income. It dispensed with the labour theory of value inherited from classical economics in favor of a marginal utility theory of value on the demand side and a more general theory of costs on the supply side. In the 20th century, neoclassical theorists moved away from an earlier notion suggesting that total utility for a society could be measured in favor of ordinal utility, which hypothesizes merely behavior-based relations across persons.

In microeconomics, neoclassical economics represents incentives and costs as playing a pervasive role in shaping decision making. An immediate example of this is the consumer theory of individual demand, which isolates how prices (as costs) and income affect quantity demanded. In macroeconomics it is reflected in an early and lasting neoclassical synthesis with Keynesian macroeconomic.

Neoclassical economics is occasionally referred as orthodox economics whether by its critics or sympathizers. Modern mainstream economics builds on neoclassical economics but with many refinements that either supplement or generalize earlier analysis, such as econometrics, game theory, analysis of market failure and imperfect competition, and the neoclassical model of economic growth for analyzing long-run variables affecting national income.

### **Keynesian economics**

John Maynard Keynes (right), was a key theorist in economics. Keynesian economics derives from John Maynard Keynes, in particular his book *The General Theory of Employment, Interest and Money* (1936), which ushered in contemporary macroeconomics as a distinct field. The book focused on determinants of national income in the short run when prices are relatively inflexible. Keynes attempted to explain in broad theoretical detail why high labour-market unemployment

might not be self-correcting due to low "effective demand" and why even price flexibility and monetary policy might be unavailing. Such terms as "revolutionary" have been applied to the book in its impact on economic analysis.

Keynesian economics has two successors. Post-Keynesian economics also concentrates on macroeconomic rigidities and adjustment processes. Research on micro foundations for their models is represented as based on real-life practices rather than simple optimizing models. It is generally associated with the University of Cambridge and the work of Joan Robinson.

New-Keynesian economics is also associated with developments in the Keynesian fashion. Within this group researchers tend to share with other economists the emphasis on models employing micro foundations and optimizing behavior but with a narrower focus on standard Keynesian themes such as price and wage rigidity. These are usually made to be endogenous features of the models, rather than simply assumed as in older Keynesian-style ones.

### **Chicago School of economics**

The Chicago School of economics is best known for its free market advocacy and monetarist ideas. According to Milton Friedman and monetarists, market economies are inherently stable if left to themselves and depressions result only from government intervention. Friedman, for example, argued that the Great Depression was result of a contraction of the money supply, controlled by the Federal Reserve, and not by the lack of investment as Keynes had argued. Ben Bernanke, current Chairman of the Federal Reserve, is among the economists today generally accepting Friedman's analysis of the causes of the Great Depression.

Milton Friedman effectively took many of the basic principles set forth by Adam Smith and the classical economists and modernized them. One example of this is his article in the September 1970 issue of The New York Times Magazine, where he claims that the social responsibility of business should be "to use its resources and engage in activities designed to increase its profits...(through) open and free competition without deception or fraud."

### **Other schools and approaches**

Other well-known schools or trends of thought referring to a particular style of economics practiced at and disseminated from well-defined groups of academicians that have become known worldwide, include the Austrian School, the Freiburg School, the School of Lausanne, post-Keynesian economics and the Stockholm school. Contemporary mainstream economics is sometimes separated into the Saltwater approach of those universities along the Eastern and Western coasts of the US, and the Freshwater, or Chicago-school approach.

Within macroeconomics there is, in general order of their appearance in the literature; classical economics, Keynesian economics, the neoclassical synthesis, post-Keynesian economics, monetarism, new classical economics, and supply-side economics. Alternative developments include ecological economics, institutional economics, evolutionary economics, dependency theory, structuralist economics, world systems theory, econophysics, and biophysical economics.

## **1.4 Scope**

Managerial Economics has winged its techniques for various Business applications, Almost any business decision can be analyzed with managerial economics techniques, but it is most commonly applied to:

**1. Risk analysis** - various models are used to quantify risk and asymmetric information and to employ them in decision rules to manage risk.

**2. Production analysis** - microeconomic techniques are used to analyze production efficiency, optimum factor allocation, costs, and economies of scale and to estimate the firm's cost function.

**3. Pricing analysis** - microeconomic techniques are used to analyze various pricing decisions including transfer pricing, joint product pricing, price discrimination, price elasticity estimations, and choosing the optimum pricing method.

**4. Capital budgeting** - Investment theory is used to examine a firm's capital purchasing decisions.

At the core of economics is the notion that there are valuable gains from trades between individuals and between firms, and between firms and individuals. Value is created when the exchange of goods and services brings more in total to each party than each would obtain if the exchange did not take place. However, to facilitate trade, an appropriate price must be negotiated so that each party benefits from trade relative to their alternative opportunities.

To work out whether value can be created between a buyer and a seller, the buyer's willingness-to-pay for a product is compared with the seller's willingness-to-sell. These calculations rely on an appropriate economic formulation of the choices facing each party, which depends upon each party's other trading opportunities. This establishes a clear relationship between potential competition and what each party actually receives from trade.

Having established that there is a value-creating trading opportunity, the next key issue is the terms of that trade. In particular, what price should the buyer and seller agree on? This price depends both on the value created and on what would occur if trade did not take place.

## 1.5 Branches Of Economics

The two main branches of economics are microeconomics and macroeconomics. **Macroeconomics** is about the economy in general and the study of aggregate economic variables. For example, if a country's wealth goes up or if millions of people become unemployed, those are things that macroeconomists study. **Microeconomics** is about smaller and more specific things and about individual economic behavior where resources are costly. Such as how families and households spend their money.

Microeconomics is the study of individual economic behavior where resources are costly. It addresses issues such as how consumers respond to changes in prices and income and how businesses decide on employment and sales. Microeconomics also extends to such issues as how voters choose between political parties and how governments should set taxes. Managerial economics has a more limited scope – it is the application of microeconomics to managerial issues. By contrast with microeconomics, the field of macroeconomics focuses on aggregate economic variables. Macroeconomics addresses such issues as how a cut in interest rates will affect the inflation rate and how a depreciation of the U.S. dollar will affect unemployment, exports, and imports. While it is certainly true that the whole economy is made up of individual consumers and businesses, the study of macroeconomics often considers economic aggregates directly rather than as the aggregation of individual consumers and businesses. This is the key distinction between the Fields of



macroeconomics and microeconomics.

Some issues span both macroeconomics and microeconomics. For instance, energy is such an important part of the economy that changes in the price of energy have both macroeconomic and microeconomic effects. If the price of oil were to rise by 10%, it would trigger increases in other prices and hence generate price inflation, which is a macroeconomic effect. The increase in the price of oil would also have microeconomic effects; for instance, power stations might switch to other fuels, drivers might cut back on using their cars, and oil producers might open up new fields.

## **1.6 Micro Economics**

Microeconomics, like macroeconomics, is a fundamental method for analyzing the economy as a system. It treats households and firms interacting through individual markets as irreducible elements of the economy, given scarcity and government regulation. A market might be for a product, say fresh corn, or the services of a factor of production, say bricklaying. The theory considers aggregates of quantity demanded by buyers and quantity supplied by sellers at each possible price per unit. It weaves these together to describe how the market may reach equilibrium as to price and quantity or respond to market changes over time.

Such analysis includes the theory of supply and demand. It also examines market structures, such as perfect competition and monopoly for implications as to behavior and economic efficiency. Analysis of change in a single market often precedes from the simplifying assumption that relations in other markets remain unchanged, that is, partial-equilibrium analysis. General-equilibrium theory allows for changes in different markets and aggregates across all markets, including their movements and interactions toward equilibrium.

## **1.7 Economic Decision Making**

At the core of economics is the notion that there are valuable gains from trades between individuals and between firms, and between firms and individuals. Value is created when the exchange of goods and services brings more in total to each party than each would obtain if the exchange did not take place. However, to facilitate trade, an appropriate price must be negotiated so that each party benefits from trade relative to their alternative opportunities.

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Businesses, such as General Motors, IBM or Time-Warner, are able to earn money for their shareholders by receiving payments from their customers that exceed payments made to their suppliers. Their ability to do this depends critically on the presence of “money on the table”. That is, customers will not pay more for a product than the benefits they derive from it, and suppliers will not accept payments that do not cover their own costs. So ultimately, for there to be something left for the business, a customer’s actual benefits must exceed the suppliers’ actual costs.

By bringing customers and suppliers together, businesses can create value, and can ensure that they appropriate some of this value for themselves as profit. For this reason, the first important set of tools of economic analysis is concerned with identifying value and its sources so as to understand the role of a business in value creation.

Value is not often a readily quantifiable concept. It cannot simply be reduced to monetary terms. A natural question to ask is how profit, which is a distinctly monetary measure, can arise from value, with elements that are often not monetary? The answer lies in the way in which money, something people and businesses prefer to have more than less of, can assist in guiding the decisions of rational agents.

The benefits a person derives from consuming an ice cream cannot be readily quantified; however, that same person can be asked to name the highest price that they would be *willing to pay* for an ice cream. This would give a monetary equivalent for the benefit that that person places on ice cream. Moreover, it can be related back to the payment that an ice-cream supplier would need to receive in order to cover supply costs.

By stepping into the shoes of key decision-makers, one can potentially determine the monetary equivalents of different actions. This exercise allows one to analyse whether there is an opportunity to create value. In this topic, one will learn how to put one self in the place of decision-makers to establish the existence of value-creating opportunities for business.

We begin our study of decision-making with the simple case of *non-strategic* decisions. A decision is *strategic* if it requires one to take into account how others will react to one’s decision. For instance, if a firm raises the price of its product, it has to consider how one’s competitors may react. Strategic decisions are the focus of segment 5. In a *non-strategic* environment, on the other hand, either there are no other competitors or their response can be predicted. Tools such as decision analysis are aimed at decision-making in the non-strategic environment. Some of the concepts presented in this chapter will therefore be familiar to those who have a background in decision analysis. The advantage of economics, and more specifically of Game Theory, is the ability to expand decision-making into strategic environments.

## **Decision Trees**

A common way of representing decisions is to use a tree-like structure called a decision tree. Decision trees are made up of nodes and branches, which are used to represent the sequence of moves and the actions, respectively.

Here is a decision tree for a landlord who is choosing between leasing a property or using it as a base for their own business.



### Decision nodes

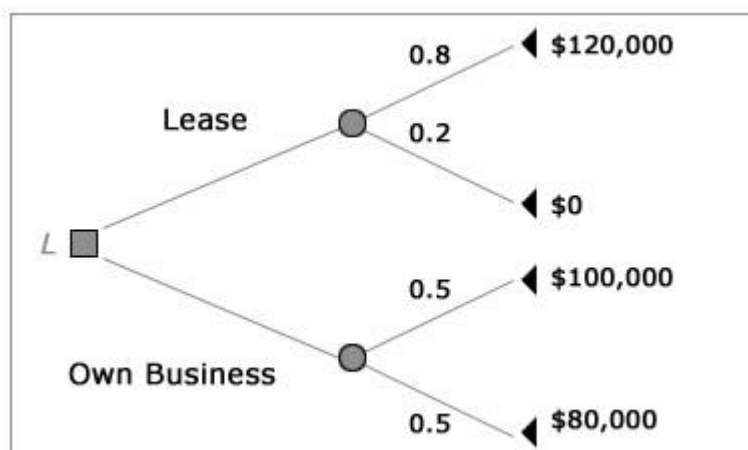
In this subject, decisions are represented by square nodes. Node *L* is the decision node where the landlord chooses between leasing or using the property themselves. Node *L* is the first node and is known as the initial node. The triangle-shaped ending nodes on the right are the terminal nodes, which also have the payoffs to *L* associated with each outcome listed beside them.

Notice that the landlord earns more by leasing the property (\$120,000) than by using it for their own business (\$100,000). Consequently, the landlord should choose to lease the property.

### Chance nodes

In addition to decision nodes, a decision tree can include chance nodes. These are represented in this subject by circles.

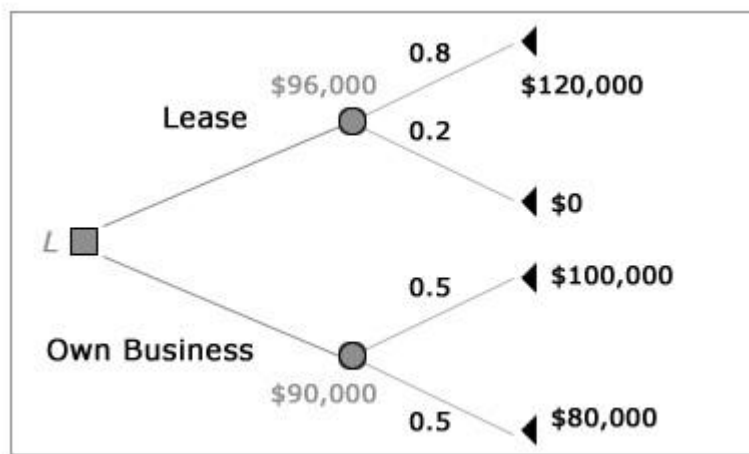
To see this, suppose that each of the choices the landlord faces involves some risk. The tenant may become bankrupt and will be unable to pay the rent. The landlord's own business might not be as profitable as was forecasted. Decision trees can incorporate this type of uncertainty over payoffs.



This decision tree incorporates uncertainty over the returns to leasing or using the property for the

landlord's own business. If the landlord leases, there is a 20 percent probability that the tenant might go bankrupt and not pay rent. This is depicted by the 0.8 and 0.2 numbers on each of the branches emanating from the chance node. If the landlord uses the property for their own business, there is an equal chance it will earn profits of \$100,000 or \$80,000. This is reflected by the 0.5 numbers on each branch.

In order to evaluate the lease decision, the landlord needs to look forward and work backwards. This involves first calculating the expected payoff from each decision. For the lease, this is  $(0.8 \times 120,000) + (0.2 \times 0) = 96,000$ . For the own business, this is  $(0.5 \times 100,000) + (0.5 \times 80,000) = 90,000$ . Taking this into account reduces the decision tree back to a tree when there is no uncertainty.



Thus, taking into account the uncertainty over payoffs, we can reduce the landlord's problem to a choice between leasing and obtaining an expected profit of \$96,000 and using it for her own business and obtaining an expected profit of \$90,000. Faced with these choices, the landlord should still choose to lease.

When deciding whether to undertake an advanced degree such as an MBA, students need to make similar judgements regarding options available and the likely outcomes to their income and career if they obtain an MBA or not. Before one see an example of how one prospective student made her career decision.

### Common Decision-Making Pitfalls

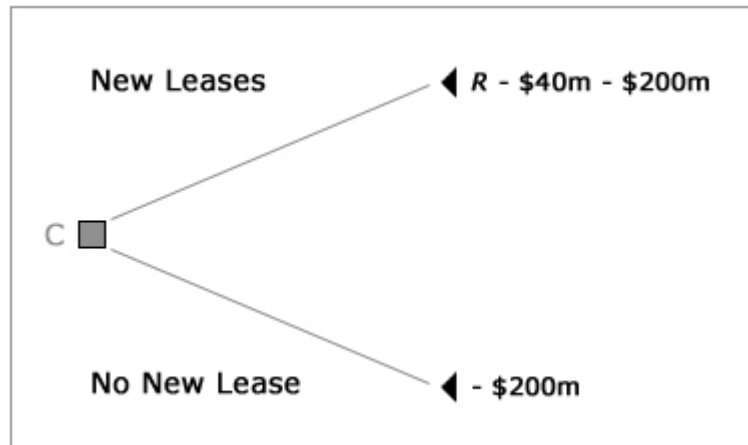
Decision trees are useful in that they can assist in identifying some common pitfalls in business decision-making. Here we illustrate four of these.

#### 1. Sunk costs

Costs that have already been incurred and cannot be recovered are known as sunk costs. When making decisions, managers should ignore these costs; otherwise, they risk making poor decisions. The following example demonstrates this point:

A Texan oil company is considering investing US\$40 million in new leases of land in the Gulf of Mexico for oil drilling. Its geologists favour the plan, saying that the company has already spent US\$200 million on oil exploration in that area and that the company needs to see the project through or the money will have been wasted.

The company's chief financial officer tells the geologists that their logic is flawed. He points out that because the company spent the money to acquire the exploration information, there is no way to recover it. He demonstrates this logic by constructing the relevant decision tree.



If the company (C) spends \$40 million on new leases and has an expected return from this of  $R$ , its total payoff from this activity is  $R - 40$  million  $- 200$  million. If it does not invest, it still faces a loss of \$200 million. Comparing these two activities, the company chooses to invest in the lease if  $R - 40$  million  $- 200$  million  $> -200$  million or  $R > 40$  million. Thus, the decision is independent of the total amount spent on exploration to date.

The money spent on previous exploration is a sunk cost. Whether the oil company continues to drill in the area or uses the \$40 million for another project, the \$200 million they have already invested cannot be recovered. Using this sunk cost to justify continued investment could lead to greater losses. Investment should only continue if the expected return exceeds the investment costs from this time onwards (\$40 million).

This suggests a useful principle.

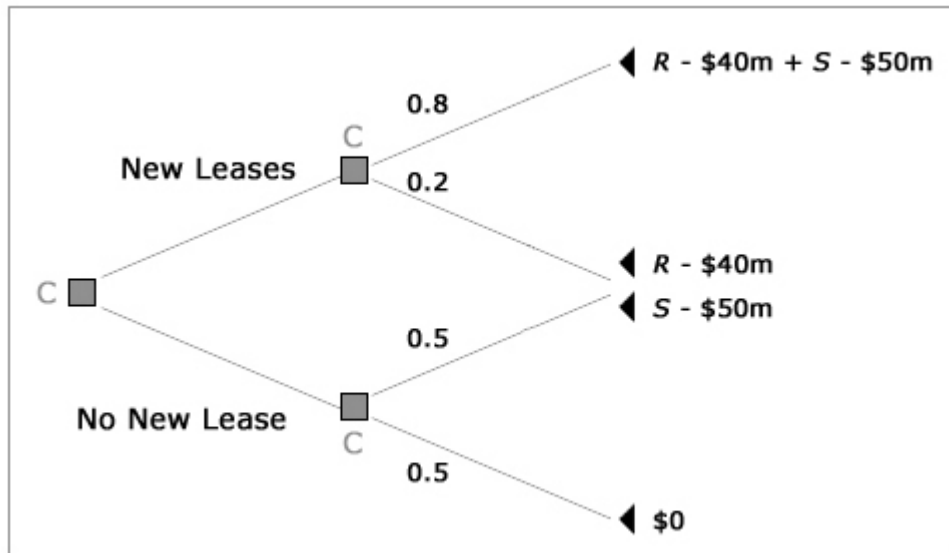
***When making decisions, managers need to be forward-looking and thus should ignore sunk costs.***

## **2. Irrelevant options**

Firms usually are making several decisions at the same time. It is critical, therefore, that a decision whose outcome is independent of another decision is recognised as such and not driven by those decisions.

To see this, let's return to our oil-drilling example. Suppose that the refining operation of the oil company leaps into the debate and argues that new leases should not be purchased because the company needs to make an investment of US\$50 million in upgrading the efficiency of its existing refining operations.

In this instance, the chief financial officer sides with the engineers in the debate. He points out that the decision tree looks like the following (where we ignore past exploration costs because they are sunk):



Here  $S$  is the level of cost savings that is expected to be achieved by the plant upgrade. In choosing whether to upgrade or not, if a new lease has been purchased, the company compares payoffs of  $R - 40m + S - 50m$  to  $R - 40m$  and will upgrade if  $S > 50m$ . On the other hand, if the new lease is not purchased, the company compares  $S - 50m$  to  $0$  and upgrades if  $S > 50m$ . Regardless of the decision on new leases, the decision to upgrade or not rests on the same factors. That is, the company should upgrade if  $S > 50m$  regardless of whether it purchases new leases or not. The upgrade decision is, therefore, irrelevant to the decision as to whether to purchase the new leases or not and should not be factored into the debate.

This suggests a useful principle:

***When making decisions, ignore other decisions: the outcome of which does not impact upon the decision at hand.***

Care must be taken, however, in applying this principle. One need to work out if a decision is truly independent. For example, if the refining plant was considering an expansion in capacity, it may be relevant whether new oil reserves were available or not. In this case, the decisions to upgrade and continue exploration would be interdependent.

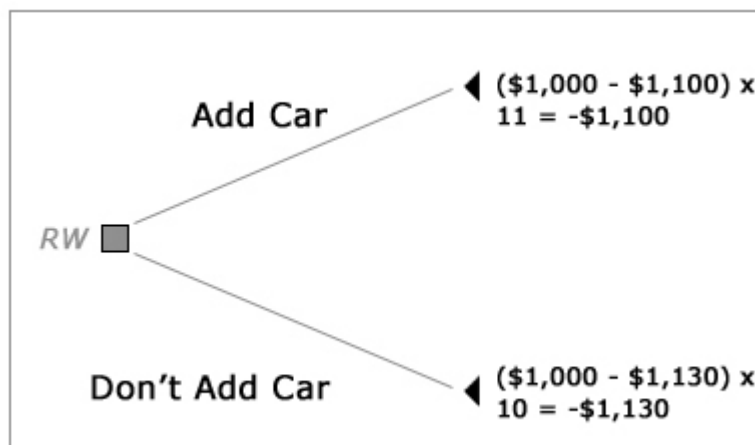
### 3. Margins versus averages

When considering increasing or decreasing their production levels, firms should base their decisions on marginal cost (MC) rather than average cost. MC accurately reflects the cost of producing an additional unit of output or the savings from producing one unit less. To see how mistakes can be made by not considering marginal costs, consider the following:

A railway owner notices that their engines have the capacity to haul more cars and is considering putting on an additional car. At present, they receive \$1,000 per carload and operate 10 of these and this would not change if an 11th car was added. A look at the accounts of the company confirms that the cost per carload consists of \$600 for the rental value of the car, \$300 for the allocated cost of the

rail (that is, \$3,300 divided by 11) and \$200 for physical loading and unloading. Therefore the average cost of each carload is  $600 + 300 + 200 = \$1,100$  per load.

If one were to compare this to the price per carload, one might be tempted to consider an expansion unprofitable. However, framing the decision in a tree reveals a different picture.



Notice that the company makes a loss regardless of whether it uses 10 or 11 cars. However, comparing those losses indicates that the company makes \$100 more if it adds a car than if it does not. This happens even though on average carloads are unprofitable.

A closer examination reveals what is going on here. Notice that adding another car only adds car rental and loading costs, ie, MC is \$800, but does not change the rail cost. The rail costs are fixed cost that would be unchanged if more cars were hauled. Hence, they are not part of the relevant decision here to add another car or not.

Average cost plays a role in some analyses, but in most cases, it is useful to follow this rule:

***The proper cost to consider when trying to maximise profits is the firm's MC.***

#### **4. Economic versus accounting costs**

When economists talk about a good's cost, they refer to its opportunity cost, a measure not only of explicit costs like labour and materials used in production, ie, the items that are included in a firm's income statement, but also of implicit costs, such as revenues that the inputs could have generated through some other use. Consider the following example:

For the past year, a couple has owned a speciality bookstore in a major metropolitan area. The bookstore is operated in a space of a building the couple owns. In that year, the store had revenues of \$559,135. One of them has calculated that total cost, including labour, the wholesale costs of books, equipment costs and marketing costs, are \$431,296. He reports to his partner that the bookstore is very successful, with profits of \$127,839 for the year.

His partner is unconvinced. She notes that they did not take into account the rent that the two could have earned on the space they used, as much as \$8,000 per month. They also did not consider the wages of \$54,000 per year he gave up by choosing to manage the bookstore. The sum of these two implicit costs, \$150,000, needs to be added to the original estimate of the bookstore's costs to get the total economic cost.

Because the implicit costs together are greater than the original estimate of the bookstore's profits, in an economic sense, the bookstore is losing money.

The bookstore example suggests an important principle:

***When making decisions, economic agents should take into account the opportunity costs of actions, not merely their explicit costs.***

The key point here is that when contemplating a decision, it is important to use only relevant costs in weighing up alternative options. If additional costs are brought in, then profitable decisions may be mistakenly held to be unprofitable and value-creating opportunities would be lost.

Another cost related to accounting costs is historical costs.

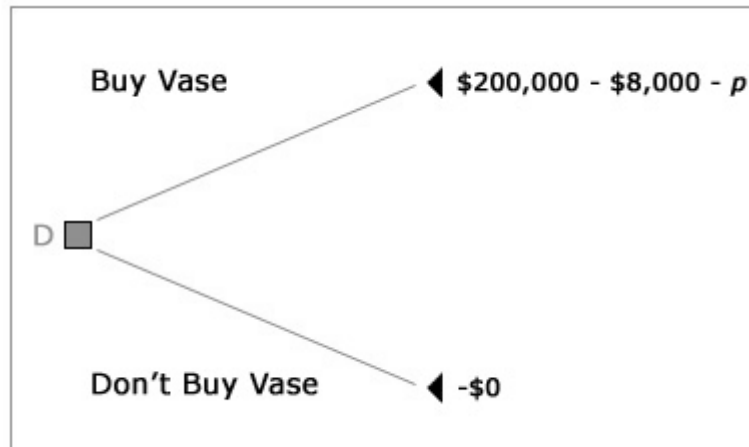
### **Willingness-to-Pay**

Two critical decisions in economics are a customer's decision to purchase a good or service and a supplier's decision to produce that good or service. Before considering the value customers and suppliers might generate from trade, it is useful to consider these two decisions in more detail.

A monetary measure of the desire customers have for a product is their willingness-to-pay. A customer's willingness-to-pay is the maximum price he or she would pay and still choose to purchase a product.

This can be easily depicted in a decision tree. Suppose an antique dealer sees a Ming vase for sale in China. There will be \$8,000 of costs associated with bringing the vase to his home country and selling it. The trader has a certain buyer he knows will purchase the vase for \$200,000. The price the vase sells for in China is  $p$ . The dealer's decision tree is as follows:



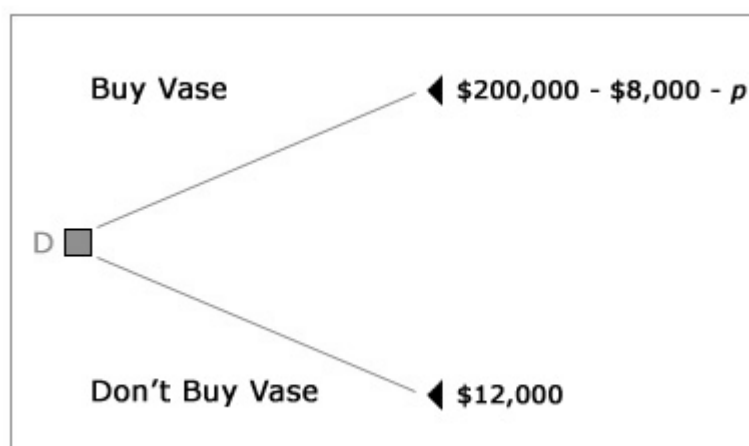


Notice that the dealer (D) will choose to buy the vase if  $\$192,000 - p > \$0$  or  $p < \$192,000$ . Thus, so long as the price of the vase is less than \$192,000, the dealer will purchase it. In this example, \$192,000 represents the dealer's willingness-to-pay for the vase.

In general, a customer's willingness-to-pay for a product is determined by many factors. These include the subjective benefit or utility a customer may derive from a product's consumption, eg, a vacation package, or the increased profits that result from utilisation of a product, eg, a more modern production technology. Consumers may be willing to pay more for a product when their incomes rise, when a complementary product becomes cheaper, such as CDs and lower priced CD players, or when they are located closer to a particular firm or that firm provides a more favourable brand image. All of these factors -- often the domain of marketing subjects -- are involved in forming a customer's willingness-to-pay.

Willingness-to-pay, however, is not an absolute notion. It often depends on the alternative outcome customers face if they choose not to purchase a particular product. Thus, one need to examine the overall decision customers are facing as they evaluate purchasing and not purchasing the product.

For instance, suppose that the dealer can only carry one item back from China and has identified another piece that could be shipped. The dealer expects that he will earn \$12,000 for that piece. Now the dealer's decision tree is:



So in this situation the dealer will buy the vase if

$$\$200,000 - \$8,000 - p > \$12,000$$

$$p < \$200,000 - \$8,000 - \$12,000$$

$$p < \$180,000$$

The dealer's willingness-to-pay has fallen to \$180,000 because of the alternative profitable opportunity that would have to be sacrificed if the vase were purchased.

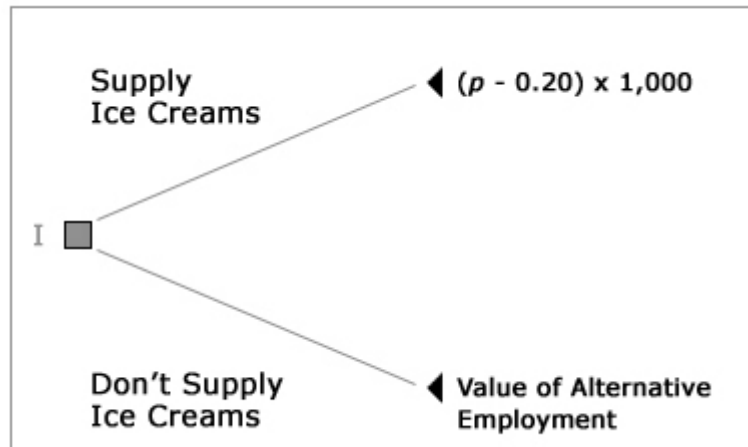
In summary, willingness-to-pay is a concept that relates to the situation a customer is facing. It not only depends on the direct benefits from a product, such as consumption utility, but it also depends on the alternatives that face the customer. These include the prices of related products and the customer-specific costs in consuming those products. As we will see in later segments, such interactions between different business products in a customer's decision problem play a critical role in determining the intensity of competition among those businesses.

### **Willingness-to-Sell**

Similar to willingness-to-pay, determining willingness-to-sell involves considering the decision faced by an agent; in this case, suppliers. When suppliers choose to supply resources or inputs to a business, they are unable to supply those resources elsewhere. Therefore, suppliers essentially give up the returns they might have earned had they not supplied the business. This lost opportunity for alternative earnings is the opportunity cost incurred by suppliers. A supplier's willingness-to-sell is the minimum price they would accept and still choose to supply the resource. It is equal to their opportunity cost of supplying the resource.

To see how willingness-to-sell is determined, suppose one own and operate an ice-cream stand on weekends. One need to determine on a month-by-month basis whether or not one should continue to keep the stand open. In a typical month, one can sell 1,000 ice-cream cones on weekends. The cost of ice-cream materials is \$0.20 per cone, and imagines the stand involves no cost to one. Thus, if the price per cone is  $p$ , one expect to earn  $(p - 0.20) \times 1,000$  per month. Does this mean one should stay open so long as  $p$  exceeds 0.20? If one do, one will earn some money.

The following decision tree represents oner decision:

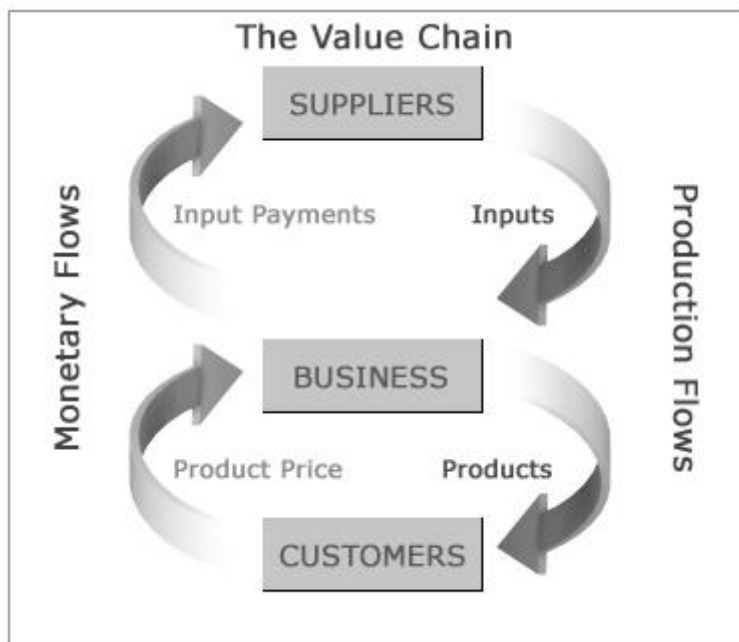


Notice that the decision tree highlights a missing variable: what does the vendor do if the stand shuts down. The vendor could work for someone else; perhaps another stand. Suppose that this employment would give \$500 in wages. In this case, the vendor would be better off keeping the stand open only if  $(p - 0.20) \times 1,000 > 500$  or  $p > 0.70$ . Thus, the vendor's willingness-to-sell is \$0.70 per ice cream. It is driven by the vendor's explicit costs of materials as well as their implicit cost of labour.

## 1.8 Determinants Of Value in Trade

The value that is created by activities in a business is potentially complex and diverse. It results from relationships with other players in the economy including its customers, suppliers and other businesses that deal with those same players, ie, competitors and complementors. Given this, it is useful to consider a stylised representation of the process of value creation in order to state a definition of value that is readily applicable to realistic situations.

A very simple way of defining value is to track a particular activity of a business. Recall that a business utilises inputs from suppliers and turns them into products that it's the customers desire. The flow of product from suppliers, through the business, to the customers is referred to as the value chain of production, which is depicted in the figure below. It shows the vertical flow of goods and services and also money between customers, oner business and suppliers.



These flows will only occur if the relevant decision-makers - customers and suppliers are willing to engage in their respective transactions. Customers must be willing to exchange money (the product price) for the business' product and suppliers must be willing to accept money (input payments) for the provision of inputs. Finally the business will only be willing to participate in the value chain if there is a positive gap between product price and input payments, ie, some "money on the table". It is only when there is such a gap that value is created.

#### Creating Value Through Exchange

There will only be value created if the highest possible price exceeds the lowest possible input payments. The highest possible price is, by definition, the customer's willingness-to-pay for a product while the lowest possible price is defined by the supplier's willingness-to-sell. Therefore, additional surplus will only be created if a customer's willingness-to-pay exceeds suppliers' willingness-to-sell. Thus, the total surplus is the difference between the customers' willingness-to-pay for a product and the suppliers' willingness-to-sell that product (this is the additional value created through exchange).

As an example, suppose that a customer's willingness-to-pay for an ice cream at a sports stadium was \$3. An ice-cream vendor at that stadium has a willingness-to-sell of \$1 he sells an ice cream to that customer. Therefore, if an exchange or transaction were to occur, the total surplus would be \$2; equal to the difference between the customer's willingness-to-pay of \$3 and the vendor's willingness-to-sell of \$1. So long as one can determine the willingness-to-pay and willingness-to-sell associated with a particular transaction, one can easily quantify that transaction's total surplus.

Businesses can appropriate some of the value created by bringing customers and suppliers together in completing the value chain. However, it will not usually appropriate all additional value because price will often be less than a customer's willingness-to-pay, and input prices may exceed suppliers' willingness-to-sell. So it is the difference between price and input price that will determine a business' profitability. The first step for business is, therefore, to ensure that it assists in creating value.

## Value Creation with Many Agents

The above discussion considered trade between a customer and a supplier. However, many trading situations involve more than two agents. Here we briefly review two of the most important of these (i) when there are many customers and sellers and (ii) when there are several providers of complementary goods.

### Many customers and sellers

In addition to building the building blocks of value, willingness-to-pay and opportunity cost are directly related to the economic concepts of demand and supply, respectively. Indeed, by definition

For each unit price of a product, the quantity demanded for a product is the quantity of output for which a customer's willingness-to-pay for a unit of output exceeds price.

For each unit price of a product, the quantity supplied of a product is the quantity of output for which suppliers' willingness-to-sell for a unit of output exceeds price.

Notice that, given this definition, as the price falls, quantity demanded for a product will rise, as more customers are willing to pay for more units of output. On the other hand, as price falls, quantity supplied is likely to fall if suppliers face diminishing returns

Not only are the concepts of demand and supply related to the underlying sources of value, they are also useful concepts in determining what level of output would maximise the total value created. To see this, suppose that a market for a product consists of four customers, with willingnesses-to-pay of \$1,000, \$800, \$600 and \$400 for a single unit of the product, and four suppliers who are able to produce one unit of output each at willingnesses-to-sell of \$900, \$700, \$500 and \$300. Recall that there is value created when the willingness-to-pay of a customer exceeds the willingness-to-sell of a supplier. So it would be tempting to think that supplier 1 could supply customer 1, supplier 2 could supply customer 2, etc. In this case, the total value created in the market would be \$400 as each customer's willingness-to-pay exceeds their supplier's willingness-to-sell by \$100.

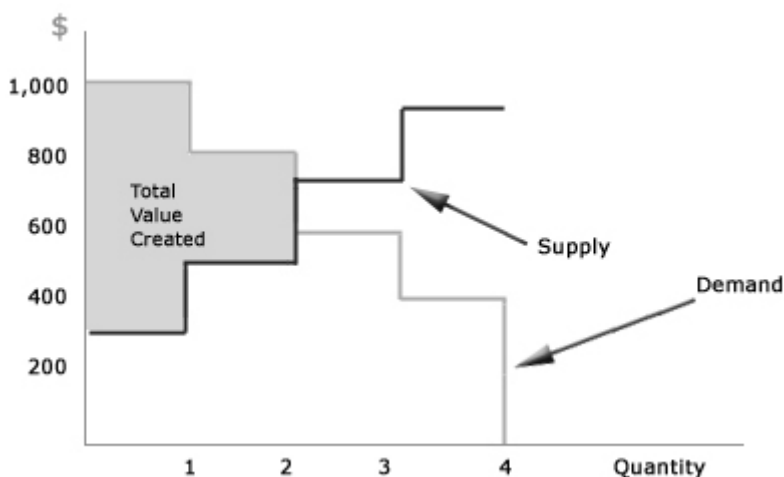
This matching of customers and suppliers would not maximise the total value created. Consider an alternative matching whereby customer 1 is matched with supplier 4, customer 2 is matched with supplier 3 and the remaining two customers and suppliers do not trade at all. In this case, the total value created is \$1,000 ( $= 1,000 - 300 + 800 - 500$ ), which is higher than the situation where all four customers are supplied. Moreover, notice that, given this, if either of the other customers were supplied, value created would be lower as those customers' willingnesses-to-pay would be below the suppliers' willingnesses-to-sell. So to maximise the value created, customers 1 and 2 must be supplied with suppliers 1 and 2 and no other trades should take place.

This example illustrates a more general principle: in order to maximise the total value created, the customer with the highest willingness-to-pay should be matched with the supplier with the lowest

opportunity cost, the customer with the next highest willingness-to-pay should be matched with the supplier with the next lowest opportunity cost and so on. Moreover, trades should not take place beyond the point where the willingness-to-pay of the next customer is less than the willingness-to-sell of the next supplier.

It is important that the matching exercise is used to order customers and suppliers to form demand and supply curves and find their intersection. In our example, so long as two units are sold from suppliers 3 and 4 to customers 1 and 2, the total value created is maximised. Thus, customer 1 could purchase from supplier 3 and customer 2 from supplier 4; generating the same level of value.

This situation can be depicted graphically where we rank customers from highest to lowest willingness-to-pay and suppliers from lowest to highest willingness-to-sell. This is done in the following figure. The line of customers' willingnesses-to-pay is what is called the market demand curve for the product while the line of suppliers' willingnesses-to-sell is the market supply curve. Notice that the value created is maximised where the two curves intersect: that is, where demand effectively equals supply.



By considering willingness-to-pay and willingness-to-sell in terms of demand and supply, it becomes easier to see what quantity will the greatest value. As we will see in segment 4, market forces, whereby prices change in response to shortages and surpluses, can ensure that demand equals supply and hence, the total value created is maximised.

To see a commentary of how demand and supply might assist in understanding whether or not to invest in new products to save time.

### Co-Operating with Complementors

A more subtle form of value creation comes from dealing with complementors.

An agent is oner complementor if customers value oner product more when they have the other agent's product than when they have oner product alone.

Interdependent industries often co-operate to achieve greater profitability. Such co-operation is

called “coopetition”.

This is perhaps easiest to see with complementary products. The existence of and demand for complementary products can improve industry profitability. After all, complementary products stimulate demand for an industry's products. For example, a customer is willing to pay more for shaving cream and razors when they are both available than razors and shaving cream separately.

Coopetition occurs in the computer software and microprocessor industries. The demand for the processing power supplied by microprocessors results in part from the development of complex computer software. In addition, the introduction of complex computer software necessitates microprocessor advancements that can execute software commands. As a result of their interdependence, these industries co-operate with open exchanges of information, which benefits both industries.

Another way of viewing complementarity is on the supply-side.

A player is one's complementor if it is more attractive for a supplier to provide resources to one when it is also supplying the other player, than when it is supplying one alone.

If a particular supplier has a greater willingness-to-sell to one and another customer together than to each separately, then one and the other customer are complementors in supply. For instance, some customers might use a broadband Internet connection during the day while others might use it at night. If both types of customers are available, an Internet provider can provide the service to each at a lower price than it could if only one type were available.

## 1.9 Summary

This lesson explains the fundamentals on Economics, scope and their branches. Thus Economics is the social science that analyzes the production, distribution, and consumption of goods and services. It has two main branches and they are, Macroeconomics is about the economy in general. Microeconomics is about smaller and more specific things such as how families and households spend their money.

Managerial economics is the science of directing scarce resources to manage cost effectively. Wherever resources are scarce, manager can make more effective decisions by applying the discipline of managerial economics. These may be decisions with regard to customers, suppliers, competitors, or the internal workings of the organization. It does not matter whether the setting is a business, nonprofit organization, or home. In all of these settings, managers must make the best of scarce resources.

Something people and businesses prefer to have more than less of can assist in guiding the decisions of rational agents. identify value-creating trading opportunities in a vertical chain by comparing a customer's willingness-to-pay to a seller's willingness-to-sell relate willingness-to-pay, willingness-

to-sell and value created to the demand and supply in a market.

Identify the potential for value creating co-operation between complementors. Hence Managerial Decision making is highly essential. When making decisions, economic agents should take into account the opportunity costs of actions, not merely their explicit costs and ignore sunk Cost.

## 1.10 Key Words

Micro Economics, Macro Economics, Sunk cost, Risk Analysis, Implicit Cost, Explicit Cost, Opportunity cost

## 1.11 Questions for Discussion

1. Define the term, “Economics” and mention its importance.
2. Explain the branches of Economics with relevant Examples.
3. Illustrate the role of Managerial Economics in Decision Making Process.
4. Discuss the determinants of Value in Trade.

## 1.12 Suggested Reading

1. G.S. Gupta – Managerial Economics Tata Mc Graw Hill.
2. Varshney and Maheswari - Managerial Economics, Sultan Chand & Sons.
3. Mehta P.L. - Managerial Economics Sultan Chand & Sons.
4. Joel Dean – Managerial Economics Prentice Hall.
5. Rengarajan L – Principles of Macro Economics, Tata McGraw Hill.

# LESSON

## 2

# Concepts of Managerial Economics

## Contents

### 2.0 Aims and Objectives



## **2.1 Introduction**

## **2.2 Dividing Value**

## **2.3 Economic Model**

## **2.4 Fundamental concepts of Managerial Economics**

## **2.5 Managerial Economics in Current Scenario**

## **2.6 Summary**

## **2.7 Key Words**

## **2.8 Questions for Discussion**

## **2.9 Suggested Reading**

# **2.0 Aims and Objectives**

In this lesson we shall understand the concepts of Managerial Economics. After studying this, you will be able to:

1. Describe the functions of Dividing value and fundamental concepts of Managerial Economics.
2. Portray the contemporary issues in Managerial Economics.

## **2.1 Introduction**

Economics aims to explain how economies work and how economic agents interact. Economic analysis is applied throughout society, in business, finance and government, but also in crime, education, the family, health, law, politics, religion, social institutions, war, and science. The expanding domain of economics in the social sciences has been described as economic imperialism. Common distinctions are drawn between various dimensions of economics. The primary textbook

## **2.2 Dividing Value**

distinction is between microeconomics, which examines the behavior of basic elements

By trading or co-operating, economic agents can create value. In a trading context, value is created when a customer's willingness-to-pay exceeds a seller's willingness-to-sell. Value is created by co-operation when more total value is created by engaging in the co-operative activity than by not engaging in it.

Having identified a potential value-creating trade or co-operative activity, agents then need to

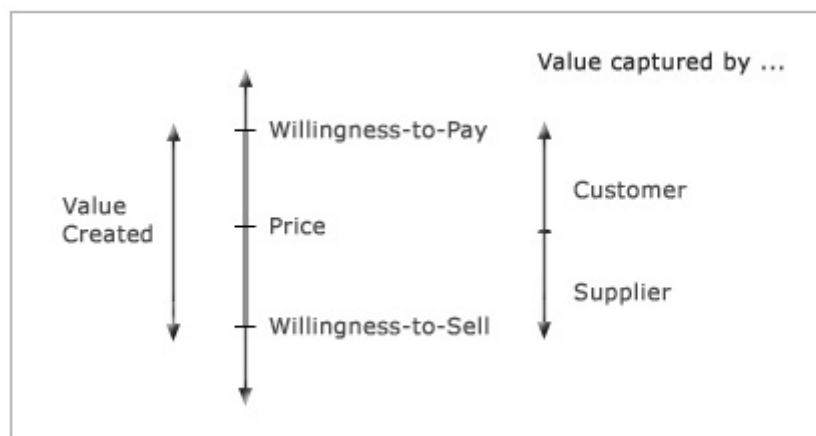
negotiate over how that value is divided between them. In many situations, negotiations will focus on the price that must be paid from one agent to another. Suppose a customer values a good at \$100 and it costs a supplier \$40 to produce. So \$100 is the customer's willingness-to-pay and \$40 is the supplier's willingness-to-sell. If willingness-to-pay is WTP, willingness-to-sell is WTS and the price paid by the customer to the seller is  $p$ , then the customer receives  $WTP - p$  while the supplier receives  $p - WTS$ . The amount  $WTP - p$  is called the consumer surplus while the amount  $p - WTS$  is the supplier surplus. The total surplus is the sum of consumer and supplier surplus. Trade will be valuable if the total surplus when trade occurs exceeds \$0. In this case

$$\text{Total Surplus} = \underbrace{WTP - p}_{\text{Consumer Surplus}} + \underbrace{p - WTS}_{\text{Supplier Surplus}} = WTP - WTS$$

In this case,  $WTP - WTS = 100 - 40 = 60$ . Thus, a value of \$60 is created by producing the good for the customer's use. Notice that trade is desirable here regardless of what the price,  $p$ , is. In principle, even if  $p$  were very low (close to \$0) or very high (greater than \$100), it would still create value for trade to take place.

However, in practice, not only must value be created by trade but the customer and supplier must individually prefer trading to not trading; that is, both consumer and supplier surplus must be greater than \$0. For the customer, this means that  $p$  must be lower than their willingness-to-pay of \$100 while for the supplier,  $p$ , must be greater than their willingness-to-sell of \$40. So long as  $p$  lies between \$40 and \$100, both consumer and supplier surplus will be positive.

The following figure summarises this situation:



### Added Value

You have now seen how, in trading situations, for trade to occur, not only must value be created but it must be divided in a way that leaves all agents that are parties to trade with more surplus as well. In the above trading example, we saw that for trade to occur, price must lie below the customer's willingness-to-pay and above the supplier's willingness-to-sell.

An alternative and more generally applicable way of looking at the outcomes of negotiations is to use the notion of added value. Adam Brandenburger and Barry Nalebuff define added value as

*Added Value = The size of the pie when you are in the game*

*Minus*

*The size of the pie when you are out of the game*

When they talk about the “size of the pie”, they are talking about the total surplus and when they talk of being “in the game”, they are talking about being a party to the trade or co-operative venture. Thus, another way of defining added value in a trading context is

*Added Value = Total surplus when you are engaged in the trade*

*Minus*

*Total surplus when you are not engaged in the trade*

Added value is a measure of what an individual agent is bringing to a trading situation; that is, how much additional surplus or value is being created when one participate in the transaction. It is a useful concept because it defines the most that an individual agent can obtain from a trade in terms of their own surplus.

When there is only a single customer and a single seller, each agent’s added value is very easy to derive. In that situation, an agent’s added value is equal to the total value created by the potential exchange. The reason is simple: in this case, if either the supplier refuses to sell or the customer refuses to buy, no trade takes place and no value is realised.

Economists have a term for this type of trading relationship: bilateral monopoly. Recall that a monopoly is a situation where there is only a single seller of a product. A bilateral monopoly refers to a situation where there is a single buyer and a single seller. This ties the buyer and seller to each other.

In our earlier trading example, we can calculate the range of possible prices that could be negotiated by calculating the customer and supplier’s respective added values.

- Customer’s added value: If the customer were not to engage in trade, ie, refuse to purchase the service from the supplier, it would lose \$100 and the supplier would save \$40. In effect, there would be no surplus. Therefore the customer’s added value is \$60 (= 60 - 0).
- Supplier’s added value: If the supplier were not to engage in trade, ie, refuse to provide the service to the customer, it would save costs of \$40. Therefore the supplier’s added value is also \$60 (= 60 - 0).

In this trading example, the customer and the supplier have the same added value. This is because each is *essential* to the value being created from trade. If either party did not participate, a valuable trade would not be made. We can state this result as a basic principle:

***When every player is essential to a value-creating activity, each player's added value is identical and equal to the total value created.***

How does this determination of added values translate into a price range? The customer cannot pay a price that would allow them to obtain a consumer surplus greater than their added value. Thus,  $p$  must be such that  $\$100 - p < \$60$  or  $p > \$40$ . This makes sense as a price less than \$40 would leave the supplier with a negative surplus from trade and they would not participate in it.

Similarly, the supplier cannot be paid a price that would allow them to obtain a supplier surplus greater than their added value. Thus,  $p$  must be such that  $p - \$40 < \$60$  or  $p < \$100$ . Again, if the supplier was to earn a price that gave them more than their added value, ie, a price greater than \$100, the customer would have a negative surplus from trade and would refuse to participate in it.

Thus, the added value approach gives the same outcome in terms of a price range as willingness-to-pay and willingness-to-sell. One will see, however, that in other situations, added value will be easier to apply; especially when there are more than two parties to the transaction.

### **Specific Price Predictions**

Added value analysis can determine the range of possible prices in a trading situation. To make our pricing predictions more precise, we need to impose additional assumptions on the relative negotiating abilities of the customer and supplier.

To see this, suppose that the customer had far superior negotiating abilities than the supplier. This might occur, for instance, when the customer can make a take-it-or-leave-it offer to the supplier. The customer names a price that the supplier can either take, in which case, trade takes place at the price, or leave, in which case, no trade will take place. In choosing a price, the customer first puts itself in the position of the supplier and asks: what is the lowest price the supplier will accept? In our example, the supplier will not accept a price lower than its willingness-to-sell of \$40, so the lowest price is \$40. The customer will then announce this price (or a cent more than it). The supplier, faced with a choice of a very small amount of surplus or no surplus, chooses to accept the price. Because the customer ends up appropriating all of the value created in this case, we can refer to this situation as one where the customer has all of the bargaining power.

On the other hand, it is conceivable that the supplier has all of the bargaining power. This may occur if the supplier can make a take-it-or-leave-it offer to the customer. This time, the supplier considers the customer's decision and asks what is the highest price she can demand and still have the customer agree to purchase the service? By definition of willingness-to-pay, this price must be \$100 (or a cent less than it). Therefore when the supplier has all of the bargaining power, her surplus is equal to the total value created.

In reality, such extremes are not likely. Counter offers are possible and, in many situations, both customer and supplier will be equally sophisticated. In this case, an *equal bargaining power* solution would be a reasonable outcome. This would leave the customer's consumer surplus equal to the supplier's surplus or producer surplus.

In an equal bargaining power solution,  $p$  is such that

$$\underbrace{WTP - p}_{\text{Consumer Surplus}} = \underbrace{p - WTS}_{\text{Supplier Surplus}}$$

Or

$$\text{Consumer surplus} = WTP - p = \frac{WTP - WTS}{2} = p - WTS = \text{Supplier surplus}$$

In the example,  $WTP + WTS$  is \$140 and a price of \$70 would be likely.

### Sharing Costs

Some important economic transactions involve two or more players who each wish to share an asset, good or service in order to realise some value. Indeed, sometimes it is possible for one or both players to realise sufficient value to cover the costs of the asset, good or service on their own. However, at other times, one or both players will not be able to generate sufficient value on their own and are forced to enter into a sharing arrangement. This will be possible so long as sharing is feasible, ie, both players can use the asset or consume the good or service without a diminution in the quality of its use. We refer to these types of transactions as *cost-sharing arrangements*. Here, negotiations are focused upon how much each player contributes to the costs involved.

### Examples of cost-sharing arrangements

People share costs all of the time. Sometimes, this is explicitly recognised while other times it is implicit. An excellent example of an implicit cost-sharing decision is the decision of couples to have and raise a child. It is obvious that, by biological necessity, some costs will be vested with just one person. Nonetheless, each partner derives benefits from child rearing and without explicitly identifying all of the costs, they arrive at some allocation of them by assigning different tasks to each other.

Here we will concentrate on explicit cost-sharing arrangements that potentially involve monetary transfers. Nonetheless, one should keep in mind that the considerations involved will often apply to implicit arrangements as well.

There are many examples of explicit cost-sharing arrangements.

- Research and development costs can often be large but nonetheless, research outcomes can benefit more than a single company. Moreover, even when duplicate research effort can be individually profitable, two companies (even if they compete elsewhere) might benefit from forming a joint venture to avoid resource waste. Such joint ventures might be a separate company funded by the firms involved or a jointly owned and operated lab. In either case, the parties must agree upon what share each will contribute to the costs of the joint venture.
- Some companies have come to recognise that certain back office functions can be shared. Typically, these involve processing and information technology resources. These companies have moved to integrate those back office functions while retaining separate downstream or retailing arms. Once again, while each company could have its own separate back office, each recognises that they could economise on these resources by integrating these functions and sharing the costs involved.

These examples have in common that the costs involved do not rise considerably when more than one player is involved. The players are, therefore, *complementors on the supply side*. The sum of opportunity costs of supplying the resource to each player individually is greater than the opportunity cost of joint supply. In research and development and back office integration, costs were lower because the duplication of certain resources and effort would be avoided by a joint venture or integration arrangement.

### **Cost-sharing agreements**

In cost-sharing arrangements, the basic principles of how value is divided remain the same as in a trading situation, except that the calculations become more difficult. This is because, in many situations, the underlying basis for the total value created can change dramatically depending on the particular situation. While agents may jointly benefit from sharing costs, it may be possible for some agents to go it alone and bear their own costs. Hence, value created may, in some situations, involve an avoidance of cost duplication while in others a joint relationship may be the only way in which one or more players can earn value.

### **Asset Costs**

As in the trading situation, we will demonstrate the application using a simple example. Suppose there are two agents A and B. If they have access to an asset, each agent can earn some revenue. For A, this revenue is \$100 and for B it is \$200. The asset is, however, costly to acquire. It may cost \$50, \$150 or \$250. Nonetheless, for each level of costs, the asset can be easily used by both A and B. Hence, it would not be efficient for the asset to be duplicated.

The key issue in any negotiation is: how much of the asset's cost should A and B pay respectively? Their respective shares of the asset's cost will be determined by their added value. However, before calculating these, we have to consider what the total value created by the relationship is. This is not a trivial matter because, for some level of costs, without a joint acquisition, it may be still worthwhile for one or both players to go it alone. In this case, the total value created by the relationship is the avoidance of duplication in the investment costs.

### **High asset costs**

Nonetheless, to build intuition, we will begin with the case where investment costs are high, equal to \$250. Notice that here, neither A nor B can go it alone. Individually, the costs of acquiring the asset exceed the revenue they might earn. In this case, the only way to make a positive profit is to agree to a joint acquisition of the asset. That is, their joint revenues of \$300 will exceed the asset's cost of \$250. Total value created by the relationship in this case is \$50 because neither player would earn a positive profit outside of the game.

The high costs mean that both A and B are essential to the relationship. No profits will be earned if either decides not to participate. We know from the trading situation that when players are essential, their respective added values are identical and equal to the total value. Given the revenues each expects to earn, the highest contribution A could make would be \$100 (leaving B with \$150 to contribute) and the highest B could make would be \$200 (leaving A with \$50 to contribute). So the range of cost allocations for A would be \$50 to \$100 and \$150 to \$200 for B.

### **Medium asset costs**

Turning now to the case where the asset cost is \$150, while A would still not find it profitable to go it alone, B would. So if either A or B were to decide not to enter into a joint relationship, B would earn a value of \$50. Hence, given that the total profits of a joint acquisition would be \$150 ( $= 100 + 200 - 150$ ), A and B's added value would each be \$100 ( $= 150 - 50$ ).

Another way of looking at the total value created is from a buyer-seller perspective. We can do this because B would acquire the asset regardless of whether A is involved or not. Hence, we can consider the relationship from the point of view of B selling access to the asset to A. Note that such access has the potential to allow A to earn \$100 in revenue. In this light, \$100 represents A's willingness-to-pay for access to the asset. If B owns the asset, it faces no opportunity cost in allowing A access to it, hence, the total value created is \$100. As this is akin to a buyer-seller exchange and both A and B are essential to the creation of the \$100, their respective added values will be identical and equal to the total value created.

In either case, the focus on A's revenues mean that the maximum it can contribute to the asset's costs is \$100 and the minimum is \$0. Thus, B's contribution will lie from \$50 to \$150.

### **Low asset costs**

When the asset costs are low ( $= \$50$ ), then it becomes profitable for both A and B to go it alone in the absence of a joint relationship. If they do not use the asset jointly, then A will earn \$50 and B will earn \$150. The profits from a joint relationship, however, would be \$250. This exceeds the sum of profits each would earn on their own, ie, \$200. Hence, a joint relationship is valuable. If either player left the relationship, the total value would fall by \$50 as a duplication of the asset's costs would occur. Hence, both A and B's respective added values is \$50.

Once again, A and B are both essential to the creation of value from a joint relationship. As such, each has identical added values equal to the total value created. Given this, each would end up contributing between \$0 and \$50 depending on their respective bargaining power.

The difference between the three cases lies in the source of the value from a joint relationship. Here, when asset costs are low, that value is in the avoidance of a duplication of those costs. On the other hand, for medium levels of asset costs, the value of a joint relationship was in the ability it afforded for A to earn revenue of \$100. Finally for high asset costs, a joint relationship was the only way for both A and B to earn their respective revenues.

### **Equal Bargaining Power Cost-Sharing Rules**

In many situations, people choose cost-sharing rules that are fair, ie, each person contributes an equal amount to the costs involved. For A and B, this would mean splitting an asset's costs evenly. This would be fine if the asset's cost were less than \$200 but when it is higher than this, say, \$250, A would not find it worthwhile to enter into the arrangement as 50 percent of \$250 exceeds A's revenue of \$100. Without A to share costs, B would not find it profitable to go it alone as the cost of \$250 exceeds B's revenue of \$200. So to insist upon fairness would lead to no value created at all.

In other situations, cost-sharing rules are proposed that are "equi-proportional" to each person's relative benefit. This would mean that B would contribute two-third's of the asset's cost since it would receive 50 percent more value than A. As such, both A and B would earn some positive value from the project. However, this rule still might not be the best solution for A. Regardless of the asset's cost, its surplus is always less than that earned by B.

These rules do not reflect the economics of a cost-sharing situation. Therefore, while they might be desirable for fairness reasons, such rules are unlikely to be good predictors of actual bargaining outcomes. Such rules can also lead to poor decisions.

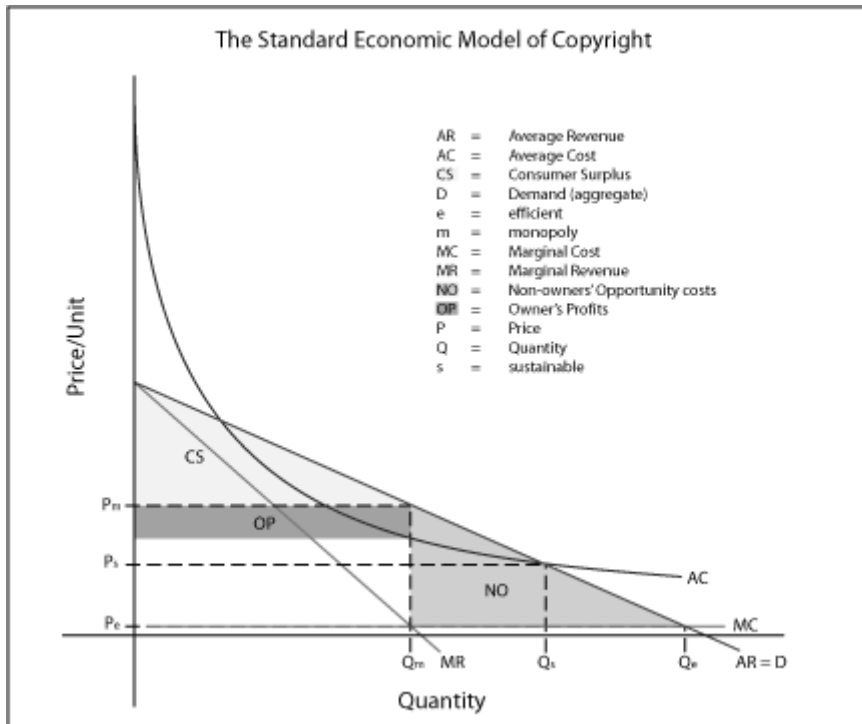
Economic analysis suggests that the shares of costs paid will be determined by each player's relative bargaining power, ie, their relative sophistication as negotiators. If they have equal bargaining power, then this will lead to cost-sharing rules that equate the surplus each player earns from a joint relationship. As such, A would expect to come away with the same surplus as B, not less. The table below summarises the contributions we would expect A and B to make if they had equal negotiating abilities.

Cost	A's Contribution	B's Contribution
50	25	25
150	50	100
250	75	175

Notice that when costs are low, A and B share equally in their contributions. This is because the value created by their relationship is an avoidance of the duplication of those costs. When costs are at a medium level, the bargaining solution mirrors an equi-proportional rule. Finally when costs are high, the sharing rule does not reflect equality or equi-proportional outcomes. In that case, B contributes relatively more because A can prevent it from earning its high revenues if A walks away from the joint arrangement.



## 2.3 Economic Model



In economics, a model is a theoretical construct that represents economic processes by a set of variables and a set of logical and/or quantitative relationships between them. The economic model is a simplified framework designed to illustrate complex processes, often but not always using mathematical techniques. Frequently, economic models use structural parameters. Structural parameters are underlying parameters in a model or class of models. A model may have various parameters and those parameters may change to create various properties.

In general terms, economic models have two functions: first as a simplification of an abstraction from observed data, and second as a means of selection of data based on a paradigm of econometric study.

Simplification is particularly important for economics given the enormous complexity of economic processes. This complexity can be attributed to the diversity of factors that determine economic activity; these factors include: individual and cooperative decision processes, resource limitations, environmental and geographical constraints, institutional and legal requirements and purely random fluctuations. Economists therefore must make a reasoned choice of which variables and which relationships between these variables are relevant and which ways of analyzing and presenting this information are useful.

Selection is important because the nature of an economic model will often determine what facts will be looked at, and how they will be compiled. For example inflation is a general economic concept, but to measure inflation requires a model of behavior, so that an economist can differentiate between real changes in price, and changes in price which are to be attributed to inflation.

In addition to their professional academic interest, the use of models includes:

Forecasting economic activity in a way in which conclusions are logically related to assumptions;

Proposing economic policy to modify future economic activity;

Presenting reasoned arguments to politically justify economic policy at the national level, to explain and influence company strategy at the level of the firm, or to provide intelligent advice for household economic decisions at the level of households.

Planning and allocation, in the case of centrally planned economies, and on a smaller scale in logistics and management of businesses.

In finance predictive models have been used since the 1980s for trading (investment, and speculation), for example emerging market bonds were often traded based on economic models predicting the growth of the developing nation issuing them. Since the 1990s many long-term risk management models have incorporated economic relationships between simulated variables in an attempt to detect high-exposure future scenarios (often through a Monte Carlo method).

Obviously any kind of reasoning about anything uses representations by variables and logical relationships. A model however establishes an argumentative framework for applying logic and mathematics that can be independently discussed and tested and that can be applied in various instances. Policies and arguments that rely on economic models have a clear basis for soundness, namely the validity of the supporting model.

Economic models in current use do not pretend to be theories of everything economic; any such pretensions would immediately be thwarted by computational infeasibility and the paucity of theories for most types of economic behavior. Therefore conclusions drawn from models will be approximate representations of economic facts. However, properly constructed models can remove extraneous information and isolate useful approximations of key relationships. In this way more can be understood about the relationships in question than by trying to understand the entire economic process.

The details of model construction vary with type of model and its application, but a generic process can be identified. Generally any modeling process has two steps: generating a model, then checking the model for accuracy (sometimes called diagnostics). The diagnostic step is important because a model is only useful to the extent that it accurately mirrors the relationships that it purports to describe. Creating and diagnosing a model is frequently an iterative process in which the model is modified (and hopefully improved) with each iteration of diagnosis and respecification. Once a satisfactory model is found, it should be double checked by applying it to a different data set.

### **Types of models**

When we do any kind of classification/categorization, we need an "according to" or "by" clause. So according to whether all the model variables are deterministic, economic models can be classified as stochastic or non-stochastic models; according to whether all the variables are quantitative, economic models are classified as discrete or continuous choice model; according to the model's intended purpose/function, it can be classified as quantitative or qualitative; according to the model's ambit, it can be classified as a general equilibrium model, a partial equilibrium model, or even non-equilibrium model; according to the economic agent's characteristics, models can be classified as rational agent models, representative agent models etc.

**Stochastic models** are formulated using stochastic processes. They model economically observable values over time. Most of econometrics is based on statistics to formulate and test hypotheses about these processes or estimate parameters for them. A widely used class of econometric models popularized by Tinbergen and later are autoregressive models, in which the stochastic process satisfies some relation between current and past values. Examples of these are autoregressive moving average models and related ones such as autoregressive conditional heteroskedasticity

(ARCH) and GARCH models for the modeling of heteroskedasticity.

**Non-stochastic mathematical models** may be purely qualitative (for example, models involved in some aspect of social choice theory) or quantitative (involving rationalization of financial variables, for example with hyperbolic coordinates, and/or specific forms of functional relationships between variables). In some cases economic predictions of a model merely assert the direction of movement of economic variables, and so the functional relationships are used only in a qualitative sense: for example, if the price of an item increases, then the demand for that item will decrease. For such models, economists often use two-dimensional graphs instead of functions.

**Qualitative models:** - Although almost all economic models involve some form of mathematical or quantitative analysis, qualitative models are occasionally used. One example is qualitative scenario planning in which possible future events are played out. Another example is non-numerical decision tree analysis. Qualitative models often suffer from lack of precision.

**Aggregate models:**-Macroeconomics needs to deal with aggregate quantities such as output, the price level, the interest rate and so on. Now real output is actually a vector of goods and services, such as cars, passenger airplanes, computers, food items, secretarial services, home repair services etc. Similarly price is the vector of individual prices of goods and services. Models in which the vector nature of the quantities is maintained are used in practice, for example Leontief input-output models are of this kind. However, for the most part, these models are computationally much harder to deal with and harder to use as tools for qualitative analysis. For this reason, macroeconomic models usually lump together different variables into a single quantity such as output or price. Moreover, quantitative relationships between these aggregate variables are often parts of important macroeconomic theories. This process of aggregation and functional dependency between various aggregates usually is interpreted statistically and validated by econometrics. For instance, one ingredient of the Keynesian model is a functional relationship between consumption and national income:  $C = C(Y)$ . This relationship plays an important role in Keynesian analysis.

#### **Quantitative vs. Qualitative models**

A quantitative model is designed to produce accurate predictions, without elucidating the underlying dynamics. On the other hand, a qualitative model aims to explain these dynamics without necessarily fitting empirical data or informing accurate predictions. Interest rate parity can be deemed a qualitative model in this sense: though it generally fails to fit exchange rate data as well as higher-powered statistical forecasting models, it offers an intuitive interpretation of the exchange rate and its relation to foreign and domestic interest and inflation rates. Views on the relative merits of qualitative and quantitative models vary across the profession: Milton Friedman can be viewed as having advocated a qualitative approach, while Ronald Coase worried that "if one torture the data long enough, it will confess;" Prospect theory as proposed by Daniel Kahneman (a Nobel prize winner) is more quantitative, while rational agent models are more qualitative.

## **2.4 Fundamental Concepts of Economics**

**1. Utility.**—In economics the words utility and value are given an exact definite meaning which must be clearly understood, since in everyday speech they are used in different senses. Briefly, utility is want-satisfying power. Any-thing which men want is said to possess utility. If only one man desires it, then it possesses utility to him, but not to others. If a thing is intensely desired it is said to possess great utility; the less intense the desire, the less the utility. Potatoes, for example, are

greatly desired for food and thus possess great utility. Diamonds are greatly desired because of their beauty and on that account possess utility.

Utility and usefulness are not synonyms. American Beauty roses can scarcely be said to be useful, yet they are greatly desired and therefore possess great utility. No one doubts that the potato is a useful vegetable. Yet a peck of comparatively use-less diamonds could possess greater utility than several million bushels of potatoes, since men are willing to give much more for a single diamond than they are for many bushels of potatoes. The word usefulness implies the attainment of some practical and desired end. A crutch under the arm of a lame man is properly called useful; to him also it possesses utility. The slender canes which oneng men sometimes carry nobody would call useful, yet to the oneng man they may possess perhaps as much utility as the crutch does to the lame man.

Sometimes economists use the word utility in a substantive sense. For example, if a thing possesses utility they sometimes speak of it as being a utility, by which they merely mean that it is something desired by man, something capable of gratifying a human want. It is well to note at the outset that the economist sometimes thinks of commodities as being a mass of utilities.

**2. Kinds of utility.**—For convenience economists classify utilities in relation to time, form and place. Ice, for example, possesses greater value in summer than in winter. Hence we may say that an ice house serves to increase the time utility of ice. Cold storage houses preserve utilities from decay, besides keeping them until they possess greater time utility. Manufacturers in general increase the value of raw materials by increasing their form utility, wood being more valuable in the form of a chair than in the form of a board. Merchants of all classes increase the place utilities of the goods they handle, and hence are the joint producers of their value along with the farmers and manufacturers.

**3. Value.**—some objects possessing utility are sup-plied by nature so generously that man has to make no effort ordinarily to get all he wants. Air and water, except in cities; are utilities of this sort. So often in many country districts are apples and berries. Economists are not concerned about things of this kind. They are interested only in those articles which are not freely available for those who want them and for the production of which a certain amount of labor is necessary. Articles of this kind are said to possess value or exchange power because they combine utility and scarcity. Of course, utility is the first pre-requisite of value, for nobody will give anything in exchange for what nobody wants. An article can possess value only on condition that it possesses utility and exists in a quantity insufficient to satisfy the de-sires of those who want it.

Value and income are probably the two most important words in political economy. Men toil in order that they may get things possessing value, for from the possession of such things they derive the psychic income or mental satisfaction which each regards as most desirable.

Popularly the word value is used in many different senses. Men speak of the value of a good name, for example. A business concern values its reputation and good will. A fine singer will think of his voice as having great value. If Paderewski thru the negligence of a corporation should lose one of his fingers a court would be called on to pass on its value, yet he could not sell one of his fingers. Most economists use the word in the sense of purchasing power, ex-change power.

**4. Economic goods, or wealth.**—In. order to escape from the confusion of thought into which the English classical economists fell thru the use of the word "wealth," modern economists employ it sparingly and use in its stead the phrase "economic goods," meaning thereby any commodity or

material thing which possesses value. Desirable things that possess no value are called "free goods," because they are supplied by nature gratuitously. The great mass of goods which are bought and sold in the market are economic goods and these are the things in which the economist is especially interested. He wants to know why they differ in value, why they fluctuate in value, what their costs of production are, how they are marketed, and why they are wanted.

**Welfare.**—Again the word wealth is often used as if it were related to, if not synonymous with, welfare. A man of wealth is often spoken of as "well-to-do," yet wealth and welfare are independent of each other. The word welfare implies happiness and contentment. Great wealth may bring neither of these to a man or to a nation. Indeed, it is quite possible that a social census, if one could be taken, would find more misery and discontent among the rich than among those people who are obliged to work every day for their living.

**6. The producer.**—The economist thinks of the human family as producers and consumers. All are consumers, for otherwise they would perish, and the vast majority of them are also producers, for by their daily labor they must earn their income. Since the problems of production and consumption are entirely different, the economist studies them separately, sometimes to such an extent that the unwary reader gets an idea that in economics certain classes of society are consumers and others are almost exclusively producers. This is of course an erroneous conception. In a civilized country, like the United States or Canada, there are very few people who are not both producers and consumers. The so-called idle rich are numerically almost negligible. So are the other non-producing classes, such as the sick, the defectives, the aged and such criminals as are not given employment.

A producer is a person who creates utility or helps bring it into existence. The earliest producers known in the history of the human race were herders and farmers, and in the popular mind the farmer is still thought of as being the greatest of all producers, for he coaxes from the soil the grains and fruits and vegetables which support human life. He also supplies us with most of the meat we eat. The earth is, of course, the real producer. The farmer by his labor merely manipulates and directs natural forces. Economically he is in no greater degree a producer than the conductor of the freight train who hauls his crop to market or any one of the wholesalers and retailers who pass it on to consumers.

**7. Intangible utilities.**—we have been considering thus far only the producers of tangible goods, that is, economic goods. How about the producers of intangible utility? Is there such a thing as an intangible utility, one not embodied in a material commodity? If not, we certainly cannot call lawyers, doctors, teachers, preachers, actors and artists producers unless we can show that their services are somehow helpful in the production of material goods. This can easily be done, as the reader will see later in this volume, in the case of bankers, teachers and physicians, and a pretty strong argument could be made in the preachers' favor, but we will not stop now to discuss this phase of the question.

From the economic point of view all these classes of men are producers of utility, for their services give positive satisfaction to the persons from whom they get their income. When one is sick the services of a physician possess greater utility to one than almost any material good. When one is well and has the means and necessary leisure, one may wish to hear Caruso sing or see Sarah Bernhardt on the stage. One artist thru the ear, the other thru the eye as well, appeals to one's esthetic sense and gives one greater satisfaction than one could possibly get from a farmer's potatoes and cabbages. To many devout people the services of the clergyman possess greater utility than the services of any other single class of workers; they would gladly turn farmers and produce their own food and clothing rather than see the church disappear.

We may sum up, then, as follows: In an economic sense every man or woman is a producer whose labor tends to the gratification of human wants or to the increase of utilities, whether thru a service which increases the supply of economic goods or thru a service which in itself gives pleasure to the consumer.

**8. The consumer.**—we consume a utility when we get pleasure or gratification from it. In many cases the consumption Of a utility means the destruction of the commodity in which it is embodied. This is true of all kinds of food and beverages, as is illustrated in the old adage, "We cannot eat our cake and have it too." In the ease of clothing the period of consumption is much longer, depending upon the habits and occupation of the wearer. Many people consume a straw hat in one summer, yet a certain city editor in Chicago was distinguished, among other things, be-cause of his attachment to an old straw hat, which he wore for twenty summers and constantly in the office during the winter months.

A period of consumption is popularly known as the "life" of the commodity. In New York City, for instance, the life of a house is commonly estimated at twenty years, it being assumed that its utility in its existing form will disappear at the end of that period and that a new house will be wanted on the site. The life of a steel rail depends upon the amount of traffic hauled over it. The life of a book depends upon the care given it and the charm of its content. We consume an oil painting when we get pleasure from contemplating it. The life of the canvas depends upon the care given it. Marbles and bronzes, humanly speaking, last forever. They may be daily consumed but never destroyed.

**9. Exchange.**—No exposition is necessary to make the reader understand the necessity for the exchange of economic goods. Nothing in business is more obvious than the fact that few people produce the goods which they consume. At the present time nearly every man is a specialist. In the production of some articles the labor of thousands of men is employed; each receives his compensation in the form of money and then buys the articles which he desires to consume. Thus exchange has become the most conspicuous feature of our modern civilization. Nearly all producers expect to market their product.

**10. Barter.**—It is fair to assume that in prehistoric times, as is the case today in some savage tribes, there was little division of labor, each family being able to produce enough to satisfy its own needs. The first exchange was doubtless in the form of barter, a fortunate fisherman being perhaps glad to give up part of his catch in return for berries and goat's milk. This exchange of goods for goods is known as barter and is obviously awkward and inconvenient.

**11. Money.**—Not until money appeared was it possible for men to specialize in their labor and to begin the development of an exchange civilization, each man devoting himself to the task which gave him the greatest pleasure or in which he was most proficient. Money is the medium which made this advance possible. It is a thing wanted not for itself but because with it one can buy what one wants. In a sense it may be called a third commodity, standing between the thing we have and wish to sell and the thing we wish to get in exchange.

Money may be defined as an economic good which is universally desired in any community and which is universally acceptable as a means of payment for goods or services.

**12. Credit.**—As modern business is conducted in most civilized countries, actual money is very little used. Men are satisfied to accept in lieu of it a mere promise to pay money. This promise is known as credit and it is founded on the rock of confidence.

If business men of the United States should lose confidence in one another, or in the government, or in the courts of law, the great credit system by which gigantic totals of wealth are daily exchanged

would collapse, business would be at a standstill and great distress would ensue, the rich suffering as well as the poor. Just how money and credit do their work we shall discuss in later chapters.

**13. Price.**—The universal use of money and credit in modern business gives great importance to the word price. Popularly this word is confused with value. Yet they have different meanings. The price of a thing is the amount of money it exchanges for or that is asked for it. The price of wheat shows the value of a bushel of wheat with respect to money. It gives us no idea of the value of wheat unless we know the prices of many other articles and thus can make comparison.

**14. Distribution of income.**—The subject matter to be touched on in this section is usually called "distribution of wealth," but that phrase is misleading, for the problem before us relates, not to the distribution of all of the country's wealth, but solely to the distribution or sharing of the new wealth daily created.

Into a nation's markets there is constantly pouring a stream of new commodities and out of the proceeds of their sale various people who have aided in their production must get their compensation, the laborer his wage, the landlord his rent, the capitalist his interest, the business man or entrepreneur his profit. Roughly speaking the total of new wealth produced in the country in any year, sometimes called the national income, is divided among those four classes of society.

**15. Scarcity**—there exist only a finite amount of resources—human and non-human. Nature does not freely provide as much of everything as people want.

**16. Resources**—(or Factors of Production) Are Scarce

Inputs used in the production of goods and services

1. Land—original fertility and mineral deposits, topography, climate, water, and vegetation
2. Labor—contributions of humans who work (thinking and doing)
3. Capital—all manufactured resources including buildings, equipment, machines, and improvements to land
4. Entrepreneurship—human activity of raising capital, organizing, managing, assembling other factors of production, and making basic business policy decisions.

## 2.5 Managerial Economics in Current Scenario

In Virtual Markets, buyer and seller are not present and trade via intermediates and electronic information. One of the assumptions of perfectly competitive markets is that there are many producers, none of which can influence prices or act independently of market forces. In reality, however, people do not simply trade on markets, they work and produce through firms. The most obvious kinds of firms are corporations, partnerships and trusts. According to Ronald Coase people begin to organize their production in firms when the costs of doing business becomes lower than doing it on the market. Firms combine labour and capital, and can achieve far greater economies of scale (when producing two or more things is cheaper than one thing) than individual market trading.

Financial economics, often simply referred to as finance, is concerned with the allocation of financial resources in an uncertain (or risky) environment. Thus, its focus is on the operation of

financial markets, the pricing of financial instruments, and the financial structure of companies. Managerial economics applies microeconomic analysis to specific decisions in business firms or other management units. It draws heavily from quantitative methods such as operations research and programming and from statistical methods such as regression analysis in the absence of certainty and perfect knowledge. A unifying theme is the attempt to optimize business decisions, including unit-cost minimization and profit maximization, given the firm's objectives and constraints imposed by technology and market conditions.

## 2.6 Summary

This lesson explores the important concepts of Managerial Economics and dividing Value. In this topic, one have learnt how to

1. Determine the range of prices in a trading situation by examining willingness-to-pay and willingness-to-sell and by looking at a customer and supplier's respective added values
2. Establish the equal bargaining strength price that might be agreed to in a trading situation
3. Determine an agent's added value in a cost-sharing situation
4. Determine an agent's equal bargaining strength contribution to costs

## 2.7 Key Words

Utility, Value, Credit, Barter, cost, Exchange, Price, Resources, Scarcity

## 2.8 Questions for Discussion

1. Explain the concept involved in Dividing the Value..
2. Draw and Explain an Economic model with their classifications.
4. Discuss the Fundamental concepts of Managerial Economics.

## 2.9 Suggested Reading

1. G.S. Gupta – Managerial Economics Tata Mc Graw Hill.
2. Varshney and Maheswari - Managerial Economics, Sultan Chand & Sons.
- 3.Mehta P.L.- Managerial Economics Sultan Chand & Sons.
4. Joel Dean – Managerial Economics Prentice Hall.
- 5.Rengarajan L – Principles of Macro Economics, Tata McGra Hill.



# **LESSON**

## **3**

### **Supply Determinants**

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**3.8 Elasticity of Supply**

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**3.10 Key words**

**3.11 Questions for Discussion**

**3.12 Suggested Reading**

### **3.0 Aim and Objective**

In this lesson we shall understand the basic concepts of Demand and supply. After studying this, you will be able to:

1. Discuss the Meaning, concepts, Determinants of Demand and supply.
2. Analyze the Elasticity of Demand and supply and price system

## 3.1 Introduction

**Utility** refers to the level of satisfaction that an individual receives from consuming goods and services. Consumers buy combinations of goods to maximize their utility, given a budget constraint. **Marginal utility** is the additional utility that a consumer receives from consuming an additional unit of the good. The marginal utility that a consumer receives from consuming additional units of the good declines as the consumer consumes more units: this is the **Law of Diminishing Marginal Utility**. Marginal utility is calculated as the change in total utility divided by the change in the number of goods being consumed.

$$MU = \frac{\Delta TU}{\Delta Q}$$

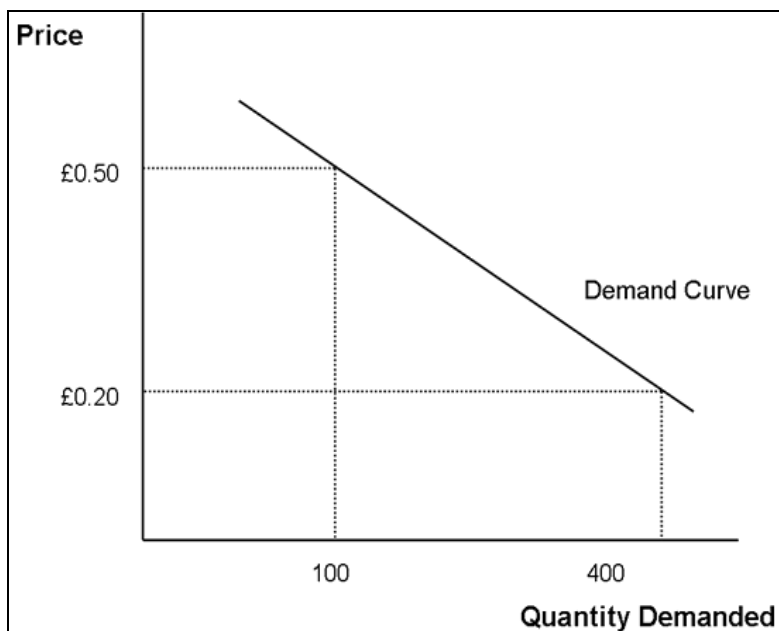
**Demand** refers to the quantities of a good that consumers will buy at alternative prices, all else held constant. For most goods, demand curves are downward sloping: consumers will buy higher quantities at lower prices. Consumers pay less as they buy higher quantities because of the law of diminishing marginal utility -- the satisfaction they receive from additional units is decreasing. An individual's demand curve for a good or service is unique because each person derives different levels of utility from the same goods and services.

**Supply**-A fundamental economic concept that describes the total amount of a specific good or service that is available to consumers. Supply can relate to the amount available at a specific price or the amount available across a range of prices if displayed on a graph. This relates closely to the demand for a good or service at a specific price; all else being equal, the supply provided by producers will rise if the price rises because all firms look to maximize profits.

Supply and demand trends form the basis of the modern economy. Each specific good or service will have its own supply and demand patterns based on price, utility and personal preference. If people demand a good and are willing to pay more for it, producers will add to the supply. As the supply increases, the price will fall given the same level of demand. Ideally, markets will reach a point of equilibrium where the supply equals the demand (no excess supply and no shortages) for a given price point; at this point, consumer utility and producer profits are maximized.

## 3.2 Demand and Supply Concepts

### *Demand*



**Figure 1-Demand curve**

Figure 1, Demand curve represents for every increase in price Quantity demanded got decreased hence for increase in price from £0.20 to £0.50 demand got decreased from 400 units to 100 units respectively.

**Law of demand:** At higher prices, a lower quantity will be demanded than at lower prices, other things being equal. Alternatively, at lower prices, a higher quantity will be demanded, other things being equal.

Reasons why observe law of demand:

1. Substitution effect: tendency of people to substitute in favor of cheaper commodities
2. Real-income effect: change in purchasing power that occurs when the price of a good changes

### **Determinants of Demand**

The major nonprice determinants of demand are: (1) income, (2) tastes and preferences, (3) the price of related goods, (4) changes in expectations of future relative prices, and (5) population (i.e., market size). The major nonprice determinants of supply are: (1) input costs, (2) technology, (3) taxes and subsidies, (4) expectations of future relative prices, and (5) the number of firms in the industry.

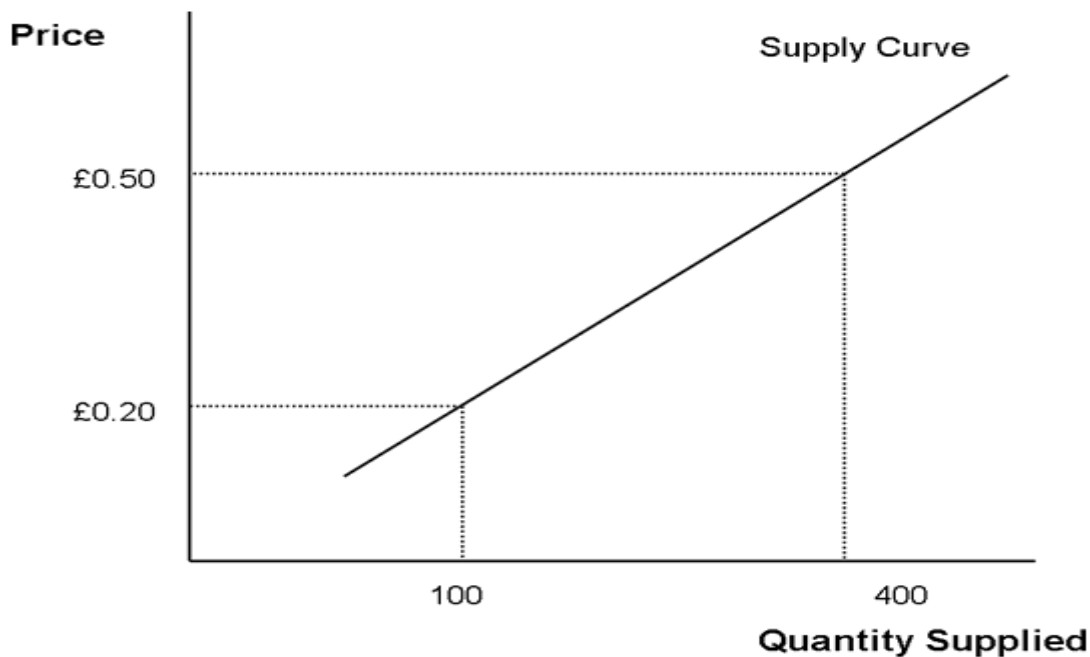
**Substitutes:** a change in the price of one causes a shift in demand for the other in the same direction (e.g. butter and margarine)

**Complements:** a change in the price of one good causes a shift in demand for the other in the opposite direction (e.g., stereo amplifiers and speakers, nuts and bolts)

**Change in Demand**—results from change in a non-price determinant of demand (curve moves)

**Change in Quantity demanded**—results from change in price (move along curve)

## Supply:-



**Figure 2 -Supply Curve**

Figure2, Supply curve denotes, when price stands at £0.20 only 100 units supplied and when price increases to £0.50 then 400 units supplied.

**Law of Supply:** At higher prices, a larger quantity will generally be supplied than at lower prices, all other things being equal.

Reasons why observe supply law:

1. higher prices increase incentives for increasing production
2. the law of increasing costs

### **Non-Price Determinants of Supply**

1. The prices of inputs used to produce the product (lower prices, curve shifts right)
2. Technology (improvements shift curve right)
3. Taxes and subsidies (taxes behave as a cost, shift left, subsidies reduce costs, shift right)
4. Price Expectations (e.g., farmers withhold crops in expectation of higher prices)
5. Number of Firms (more firms shift to the right)

**Change in Supply**—results from change in a non-price determinant of supply (curve moves)

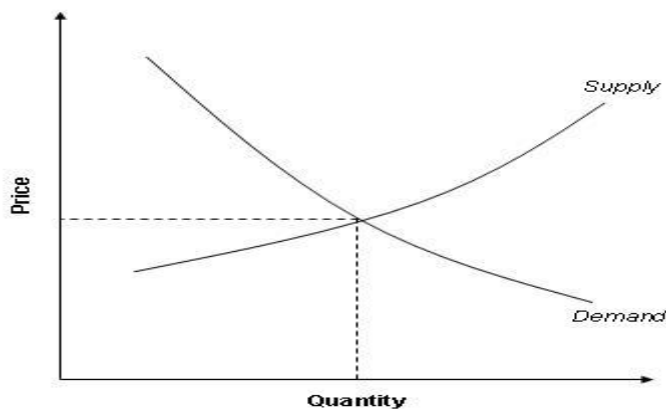
**Change in Quantity Supplied**—results from change in price (move along curve)

## Supply and Demand Together

Equilibrium – a situation in which the plans of the buyers and sellers coincide so that there is neither excess quantity supplied or demanded (also called market clearing price)

Figure 3-Equilibrium

Here Curve shows equilibrium state where demand is equal to the supply.



**Stable equilibrium** – a situation in which a shock disturbs the prevailing equilibrium between supply and demand, there will normally be self-corrective forces that automatically cause the disequilibrium to return eventually to equilibrium.

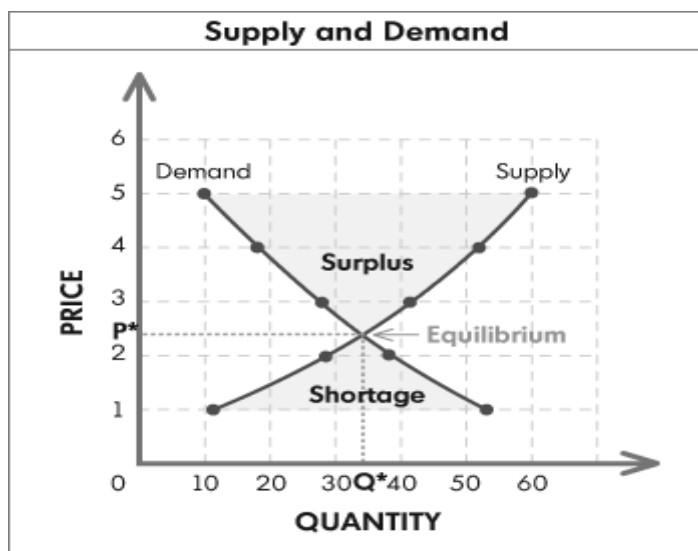


Figure 4 -Shortage and Surplus

**Shortage**—excess quantity demanded or insufficient quantity supplied. Difference between the quantity demanded and supplied at a specific price below the market clearing price.

**Surplus**—excess quantity supplied or insufficient quantity demanded. Difference between the quantity supplied and demanded at a price above the market clearing price.

### 3.3 The Market System and Efficiency

Scarcity requires that decisions be made about how resources are to be allocated. Resource allocation is solved by economic system:

1. What and how much will be produced?
2. How will it be produced?
3. From whom will it be produced?

Market—abstract concept concerning all the arrangements that individuals have exchanging with one another (e.g., labor market, fisheries market, credit market) in a price or market system, supply and demand determine the prices at which exchanges will take place.

Transaction costs—all the costs associated with exchanging, including the informational costs of finding out price and quality, service record, durability, etc. of a product, plus the cost of contracting and enforcing that contract.

#### Concepts

1. Specialization results in higher outputs
2. Individuals and nations specialize in their comparative advantages in order to reap benefits of specialization
3. Comparative advantages are found by determining which activities have lowest opportunity cost or alternatively stated, the activities that yield the highest return for the time and resources used.
4. Individuals respond to changes in *relative* prices, not *absolute* prices, therefore, changes in the general price level must be purged from the analysis
5. In a market economy, businesses seek profits. In seeking profits, businesses move resources out of declining industries into expanding industries
6. Consumers are sovereign—they vote with their dollars.

#### Efficiency concepts

**Technical**—the utilization of the cheapest production technique for any given output rate; no outputs are willfully wasted.

**Economic**—the use of resources that generate the highest possible value of output as determined in the market economy by consumers.

The market or price system leads to technical and economic efficiency ,maximizes individual or personal freedom and can lead to economic growth because the rewards (profits).

#### **Characteristics of Perfect Competition**

1. The product that is sold by the firms is homogeneous
2. Any firm can enter or exit the industry without serious impediments
3. There must be large number of buyers and sellers—they act independently and no one buyer or seller has any influence on price
4. Must be adequate information about prices, qualities, sources of supply

### **3.4 Price Elasticity of Demand**

The elasticity of demand ( $e_d$ ) is a measure of the price responsiveness to the quantity demanded and is equal to the percentage change in quantity demanded divided by the percentage change in price. Because the elasticity of demand can vary depending on whether one moves up or down the demand curve, elasticities of demand are often calculated by taking an average the prices and quantities given by the following formula:

$$e_d = \frac{\text{change in } Q}{\text{change in } P}$$

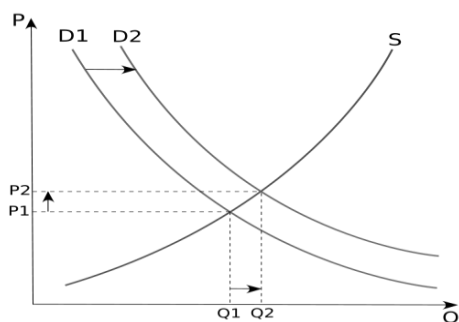
$$(Q_1 + Q_2)/2 \div (P_1 + P_2)/2$$

Determinants of price elasticity of demand

1. Existence of substitutes—the closer the substitutes for a particular commodity, the greater will be its price elasticity of demand
2. Importance of the commodity in the consumers budget—the greater the percentage of a total budget spent on the commodity, the greater the person's price elasticity of demand for that commodity
3. Time for adjustment in rate of purchase—the longer any price change persists, the greater the price elasticity of demand

Must distinguish between the short run and the long run (long run is the time necessary for consumers to make a relatively full adjustment to a given price change)

### **3.5 Supply and Demand Model**



**Figure 5-Supply and Demand Model**

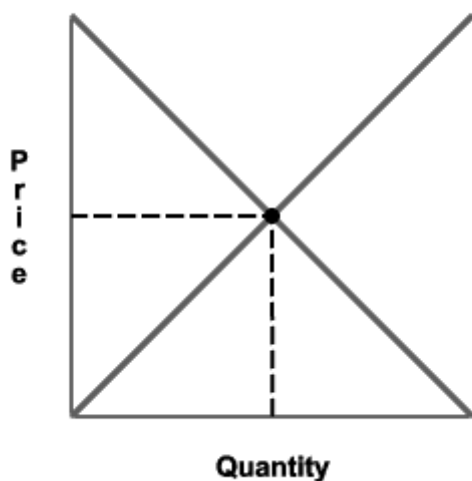
The supply and demand model describes how prices vary as a result of a balance between product availability and demand. The graph depicts an increase (that is, right-shift) in demand from D1 to D2 along with the consequent increase in price and quantity required to reach a new equilibrium point on the supply curve (S). Prices and quantities have been described as the most directly observable attributes of goods produced and exchanged in a market economy. The theory of supply and demand is an organizing principle for explaining how prices coordinate the amounts produced and consumed. In microeconomics, it applies to price and output determination for a market with perfect competition, which includes the condition of no buyers or sellers large enough to have price-setting power.

For a given market of a commodity, demand is the relation of the quantity that all buyers would be prepared to purchase at each unit price of the good. Demand is often represented by a table or a graph showing price and quantity demanded (as in the figure). Demand theory describes individual consumers as rationally choosing the most preferred quantity of each good, given income, prices, tastes, etc. A term for this is 'constrained utility maximization' (with income and wealth as the constraints on demand). Here, utility refers to the hypothesized relation of each individual consumer for ranking different commodity bundles as more or less preferred.

The law of demand states that, in general, price and quantity demanded in a given market are inversely related. That is, the higher the price of a product, the less of it people would be prepared to buy of it (other things unchanged). As the price of a commodity falls, consumers move toward it from relatively more expensive goods (the substitution effect). In addition, purchasing power from the price decline increases ability to buy (the income effect). Other factors can change demand; for example an increase in income will shift the demand curve for a normal good outward relative to the origin, as in the figure.

Supply is the relation between the price of a good and the quantity available for sale at that price. It may be represented as a table or graph relating price and quantity supplied. Producers, for example business firms, are hypothesized to be profit-maximizers, meaning that they attempt to produce and supply the amount of goods that will bring them the highest profit. Supply is typically represented as a directly-proportional relation between price and quantity supplied (other things unchanged). That is, the higher the price at which the good can be sold, the more of it producers will supply, as in the figure. The higher price makes it profitable to increase production. Just as on the demand side, the position of the supply can shift, say from a change in the price of a productive input or a technical improvement.





**Figure 6-Market Equilibrium**

Market equilibrium occurs where quantity supplied equals quantity demanded, the intersection of the supply and demand curves in the figure above. At a price below equilibrium, there is a shortage of quantity supplied compared to quantity demanded.

This is posited to bid the price up. At a price above equilibrium, there is a surplus of quantity supplied compared to quantity demanded. This pushes the price down. The model of supply and demand predicts that for given supply and demand curves, price and quantity will stabilize at the price that makes quantity supplied equal to quantity demanded. Similarly, demand-and-supply theory predicts a new price-quantity combination from a shift in demand (as to the figure), or in supply.

For a given quantity of a consumer good, the point on the demand curve indicates the value, or marginal utility, to consumers for that unit. It measures what the consumer would be prepared to pay for that unit. The corresponding point on the supply curve measures marginal cost, the increase in total cost to the supplier for the corresponding unit of the good. The price in equilibrium is determined by supply and demand. In a perfectly competitive market, supply and demand equate marginal cost and marginal utility at equilibrium.

On the supply side of the market, some factors of production are described as (relatively) variable in the short run, which affects the cost of changing output levels. Their usage rates can be changed easily, such as electrical power, raw-material inputs, and over-time and temp work. Other inputs are relatively fixed, such as plant and equipment and key personnel. In the long run, all inputs may be adjusted by management. These distinctions translate to differences in the elasticity (responsiveness) of the supply curve in the short and long runs and corresponding differences in the price-quantity change from a shift on the supply or demand side of the market.

Marginalist theory, such as above, describes the consumers as attempting to reach most-preferred positions, subject to income and wealth constraints while producers attempt to maximize profits subject to their own constraints, including demand for goods produced, technology, and the price of inputs. For the consumer, that point comes where marginal utility of a good, net of price, reaches zero, leaving no net gain from further consumption increases. Analogously, the producer compares

marginal revenue (identical to price for the perfect competitor) against the marginal cost of a good, with marginal profit the difference. At the point where marginal profit reaches zero, further increases in production of the good stop. For movement to market equilibrium and for changes in equilibrium, price and quantity also change "at the margin": more-or-less of something, rather than necessarily all-or-nothing.

Other applications of demand and supply include the distribution of income among the factors of production, including labour and capital, through factor markets. In a competitive labour market for example the quantity of labour employed and the price of labour (the wage rate) depends on the demand for labour (from employers for production) and supply of labour (from potential workers). Labour economics examines the interaction of workers and employers through such markets to explain patterns and changes of wages and other labour income, labour mobility, and (un)employment, productivity through human capital, and related public-policy issues.

Demand-and-supply analysis is used to explain the behavior of perfectly competitive markets, but as a standard of comparison it can be extended to any type of market. It can also be generalized to explain variables across the economy, for example, total output (estimated as real GDP) and the general price level, as studied in macroeconomics. Tracing the qualitative and quantitative effects of variables that change supply and demand, whether in the short or long run, is a standard exercise in applied economics. Economic theory may also specify conditions such that supply and demand through the market is an efficient mechanism for allocating resources.

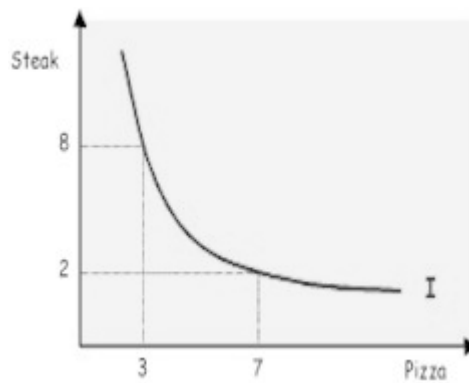
## 3.6 Formal Derivation Of Demand Curve

We all face a variety of potential goods and services to consume. The choice of how much and which goods/services to consume can be thought of as consisting of two parts:

- Our **preferences** (what we like and dislike) *and*
- Our **budget** (constraints on our preferences -- we can't buy everything we want).

**Indifference curves** represent an individual's preferences. For simplicity, assume that the consumer has the choice of consuming just two goods. An indifference curve shows all combinations of the two goods that yield the same level of utility. Utility is constant along the indifference curve. All points along the curve are equally satisfying. The consumer does not prefer one combination of goods to any other along the curve.

The indifference curve below represents a consumer's monthly preference for steak and pizza. The indifference curve shows that 8 steaks and 3 pizzas per month yield the same level of satisfaction as 2 steaks and 7 pizzas per month.

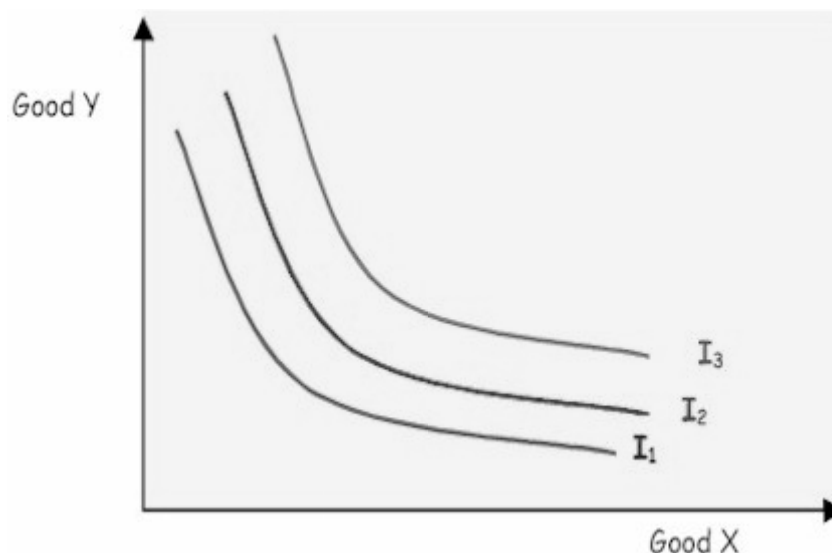


**Figure 7- Indifference curve**

### ***Indifference Map***

Note that an indifference curve shows various combinations of goods that yield the same utility, but different indifference curves show different levels of utility. For instance, the green indifference curve on the graph below indicates a higher level of utility than the red or the blue indifference curves. Economists assume that people want to attain the highest level of utility possible ( $I_3$  is better than  $I_2$  which is better than  $I_1$ )

There are an infinite number of indifference curves in the indifference map, and each person's indifference map is unique to that person.



**Figure 8-Indifference Curves**

### ***Characteristics of Indifference Curves***

- Downward sloping to the right: if a consumer gives up a unit of one good, he/she must have more of the other good to maintain the same level of utility
- Convex to the origin (bowed inward)
- Cannot intersect

As one moves along the indifference curve (from left to right), each additional x-axis good will replace fewer y-axis goods than the previous one to maintain the same level of utility. This is the ***diminishing marginal rate of substitution*** (MRS). MRS is the rate at which one good can be substituted for another without changing the consumer's total utility. Goods substitute for one another at a diminishing marginal rate because of diminishing marginal utility for each.

To see the diminishing marginal rate of substitution, start with consuming 8 units of good Y and 3 units of good X. To increase consumption of good X by one unit, this consumer is willing to trade-off (decrease) consumption of good Y by 3 units (8 – 5) in order to maintain a constant level of utility. But notice what happens when more of good X is consumed, say increasing consumption of good X from 6 to 7. Now this consumer is only willing to sacrifice one unit of good Y to get one more unit of good X (remaining at the same level of satisfaction). The rate at which people are willing to trade-off good Y for X diminishes as additional units of X is consumed (The good Y is becoming more dear as we consumer more and more of good X)

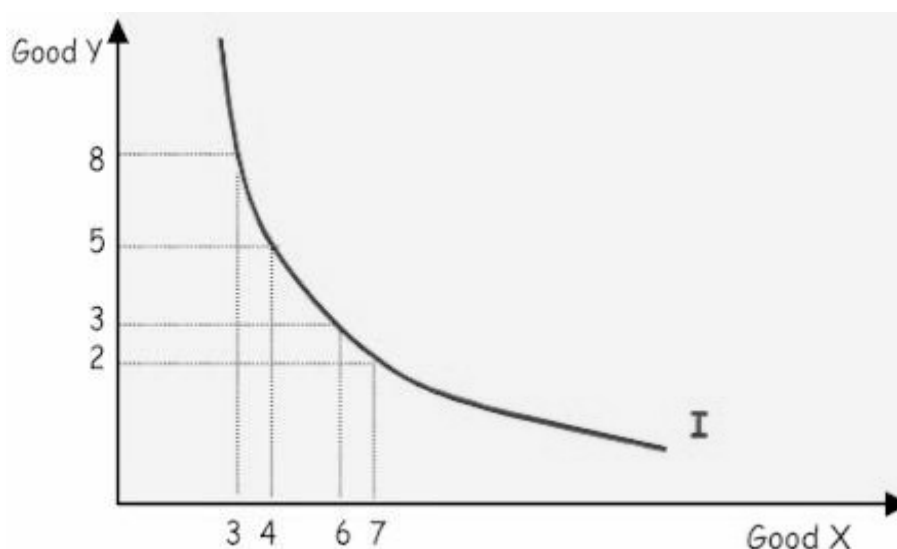


Figure 9-Marginal Rate of Substitution

MRS is the slope of the indifference curve, and can be measured as the ratio of marginal utilities of the two goods.

$$MRS_{x,y} = MU_x / MU_y$$

### ***The Budget Constraint***

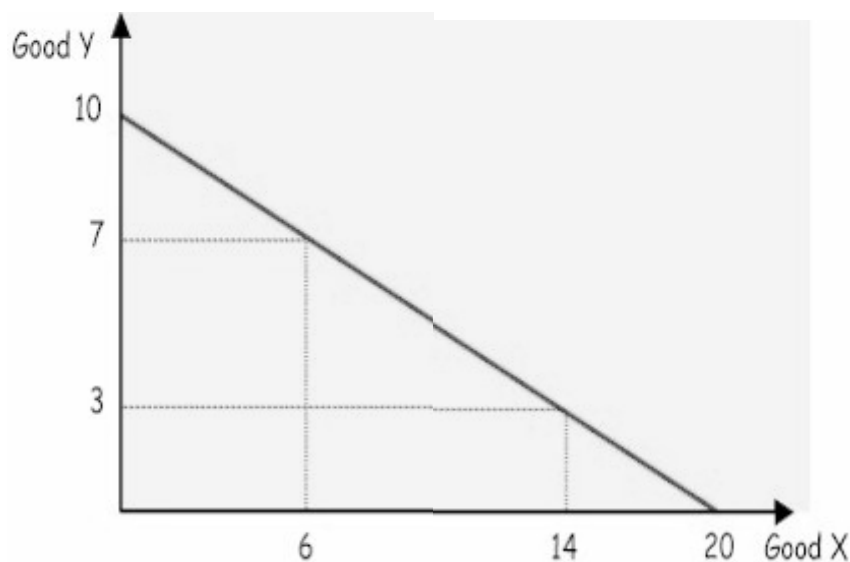
Consumers have a limited amount of money (income, I) to spend on the two goods (X and Y). Each good has a price ( $P_x$  and  $P_y$ ). The budget line shows (if spending entire income only on some

combination of the two goods, X and Y) all combinations of the goods that the consumer could afford. The slope of the budget line is the ratio of the prices.

$$\text{Slope} = (I / P_y) / (I / P_x) = (P_x / P_y)$$

Good Y costs \$10 per unit. If Jan spent all of her income on X, she could purchase 20 units ( $100 / 5$ ) of X. If she spent all of her income on Y, she could purchase 10 units ( $100 / 10$ ) of Y. She could also afford to buy different combinations of the two goods. For example, she could buy 6 units of X and 7 units of Y, or 10 units of X and 5 units of Y, or 14 units of X and 3 units of Y. The budget line shows all combinations of the goods that Jan can afford. The slope of Jan's budget line is 0.5 ( $P_x / P_y = 5/10$ ).

Jan's budget line is shown below: Figure 10



### ***Consumer Choice***

Equilibrium is determined by combining the consumer's preferences with the consumer's budget line. To maximize utility, the consumer tries to achieve the highest indifference curve (highest utility), given the budget constraint. Therefore, the consumer should maximize utility subject to the budget constraint, or

$$\text{Max } U \text{ s.t. } BC$$

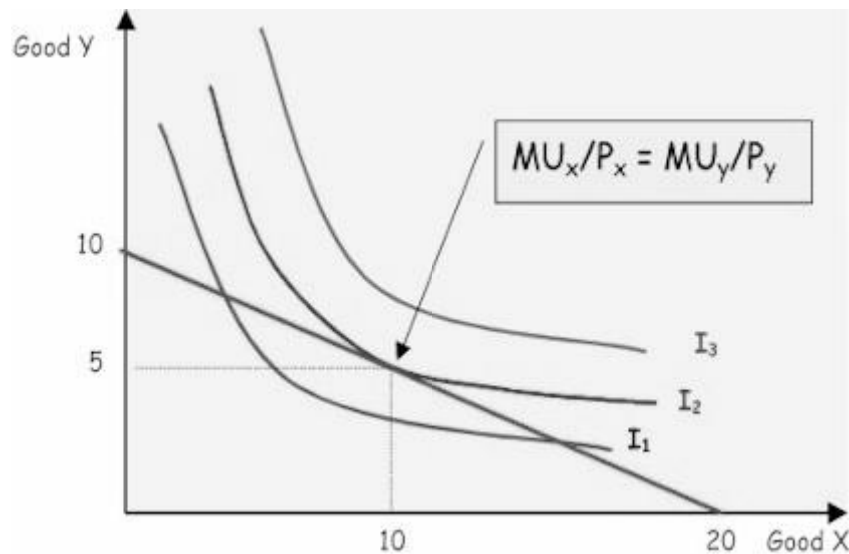
Utility maximization occurs where the marginal rate of substitution (the slope of the indifference curve) equals the price ratio (the slope of the budget line).

$$MU_x / MU_y = P_x / P_y$$

At the point of utility maximization, the marginal utility per dollar spent on each good is equal.

$$MU_x / P_x = MU_y / P_y$$

Utility maximization occurs where the budget line is tangent to the indifference curve. Suppose the graph below represented Jan's budget line and preferences. According to the information shown on the graph, Jan would consume 5 units of good Y and 10 units of good X. Given her budget constraint (purple line), the highest level of utility she can achieve is the red indifference curve (she cannot afford any combination of goods X and Y represented on the green (a higher indifference curve)).



**Figure 11-Utility Maximisation**

### ***Effect of Price Changes***

Assume Jan's income remains the same (\$100), but the price of good X increases from \$5 to \$10 per unit. Note how the budget line changes. The increase in price of good X reduces Jan's purchasing power, so she can no longer achieve a utility level associated with the red indifference curve. The highest level of utility Jan can now achieve is associated with the blue indifference curve. With the higher price of good X, Jan now consumes only 6 units of good X and 4 units of good Y.

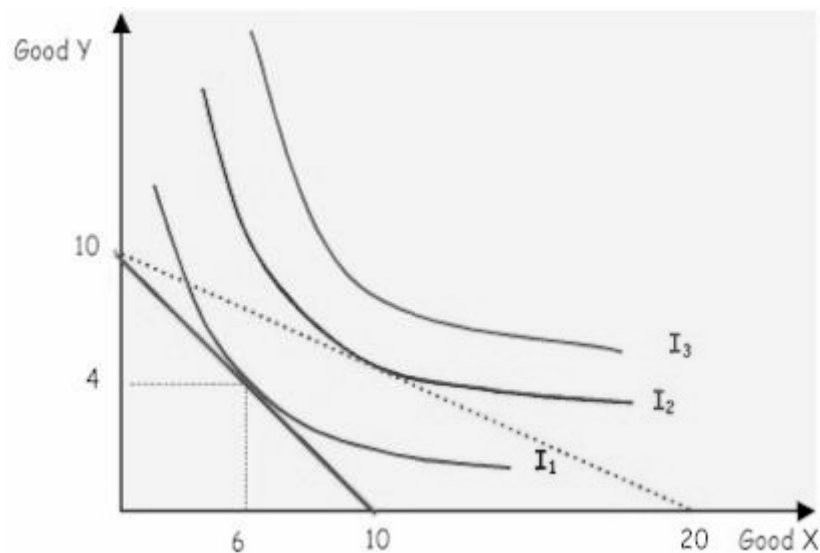


Figure 12-Effect of Price change

The **demand curve** for a good can be derived by determining how consumer choices change when the price of that good changes, all else held constant. Returning to the Jan example, we now have two points on Jan's demand curve for good X. The price of good X was originally \$5 and Jan consumed 10 units of X. When the price increased to \$10, Jan's consumption fell to 6 units of X (see graph below).

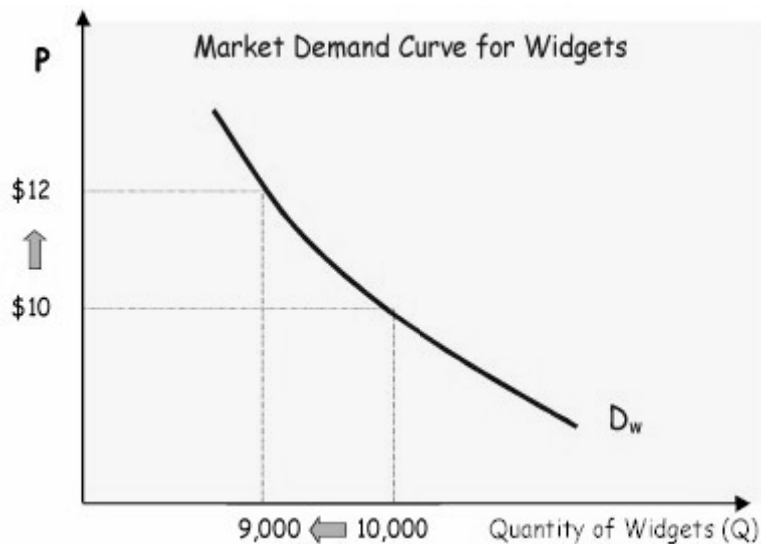
### **Market Demand**

Market demand is the horizontal summation of all individual demand curves for the good. The market demand shows the quantity of a good that all consumers are willing to purchase at different prices (for that good).



## 3.7 Shifts in the Demand Curve

A demand curve shows how consumers change their purchases given a change in the price of the good. The graph below shows that, if the price of widgets increased from \$10 to \$12 per widget, the quantity demanded in the market would decrease from 10,000 to 9,000. The price change is said to cause a "change in the quantity demanded" (movement along a demand curve).



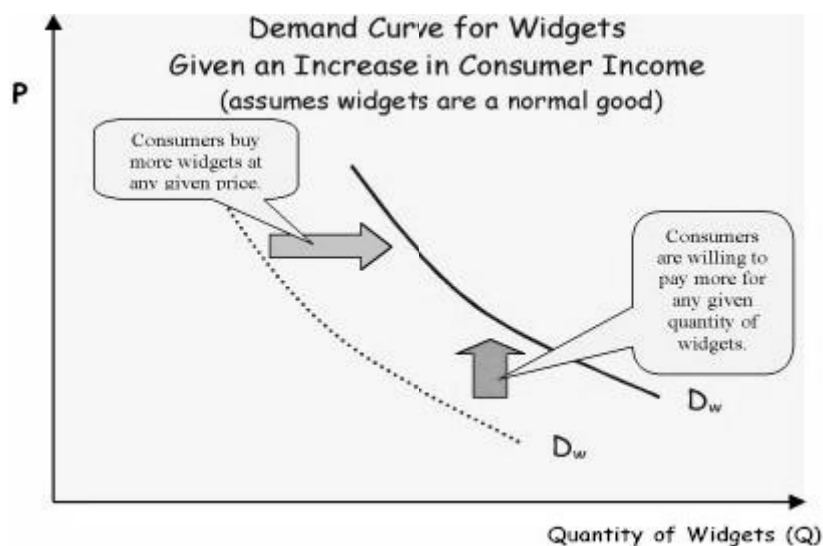
Other factors besides price, however, can influence the amount of widgets demanded in the market. These other factors are represented graphically as a shift in the demand curve and are said to represent a "change in demand". Four of the most important factors that can result in a change in demand are:

1. Change in Consumer Income
2. Change in Consumer Preferences
3. Change in the Price of Related Goods
4. Change in Expectations

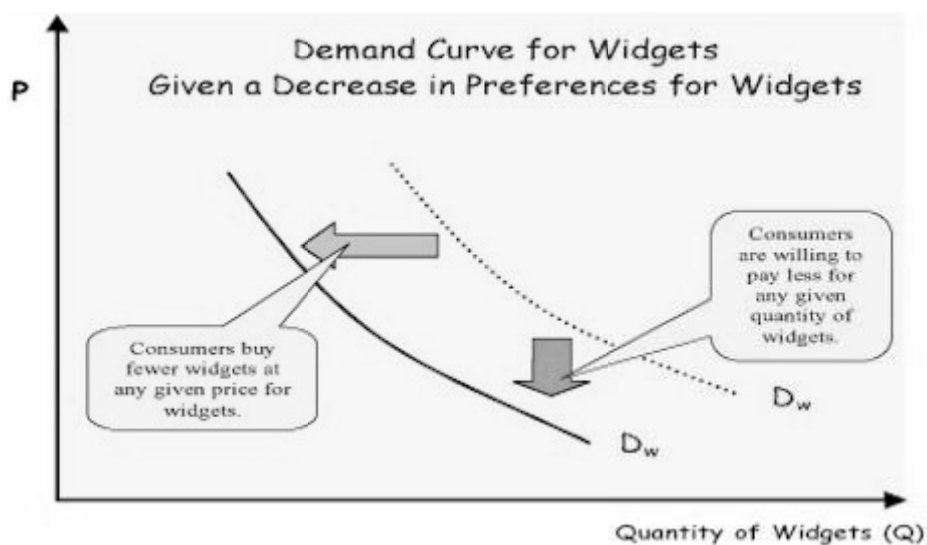
If an increase in *consumer income* stimulates additional purchases of widgets, the demand curve shifts upward and to the right (an increase in demand shown on the graph below). If this occurs, widgets are called "normal goods."

An increase in consumer income, however, may cause a decrease in demand for some goods (represented as a downward shift in the demand curve). These types of goods are called "inferior goods."



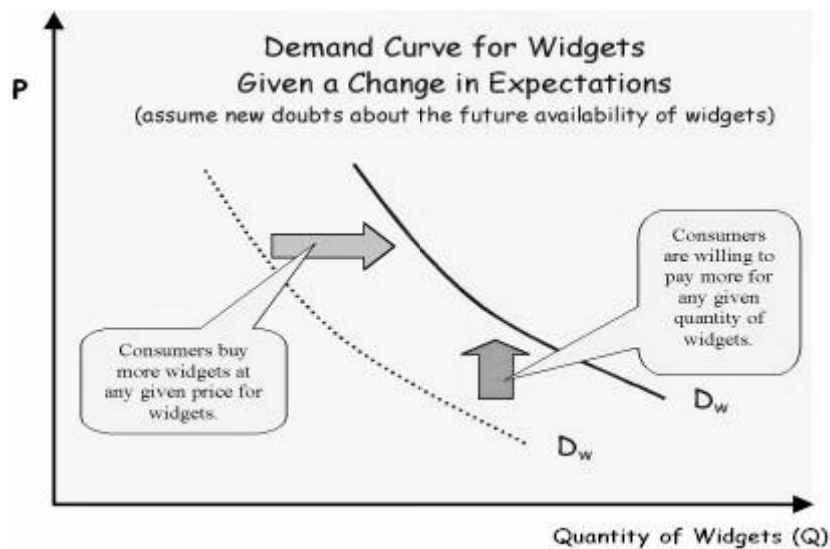
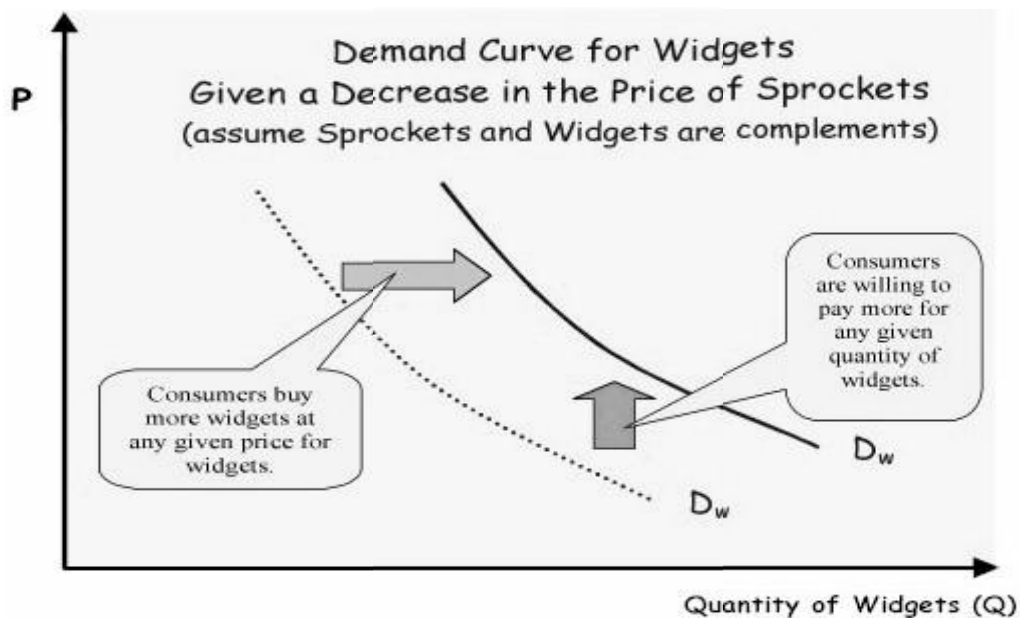


A change in consumers' *tastes and preferences* for widgets will cause a change in the demand for widgets. A decrease in consumer preferences for widgets will shift the demand curve for widgets downward and to the left.



Suppose consumers tend to buy sprockets when they buy widgets (*sprockets and widgets are related goods*). A change in the price of sprockets will shift the demand curve for widgets. If the price of sprockets decreased and consumers bought more sprockets *and* widgets, widgets and sprockets are called **complements**. Due to the price decrease in sprockets, the widget demand curve now shifts upward and to the right (shown on graph below). If sprockets and widgets were *substitutes*, a decrease in the price of sprockets would decrease the demand for widgets.

A change in consumer *expectations* can also shift the demand curve for widgets. Suppose a potential labor strike against the major widget manufacturers raises concerns among consumers about the future price and availability of widgets. Consumers might rush out to buy more widgets while they can, increasing the current demand for widgets (represented by a shift in the demand curve upward and to the right). Nothing else has changed except consumer's expectations of the future.



### Own-Price Elasticity

Own-price elasticity measures the responsiveness of quantity demanded to a change in price, all else held constant. It is the percentage change in quantity demanded divided by the percentage change in price.

$$E_D = \frac{(Q_1 - Q_2) / (Q_1 + Q_2)}{(P_1 - P_2) / (P_1 + P_2)}$$

Since demand curves are downward sloping, elasticity of demand is always negative.

If the absolute value of the elasticity is less than one, demand is inelastic. For a one percent increase in price, quantity demanded will decrease by less than one percent...it is not very responsive.

**Inelastic:  $|E_D| < 1$**

If the absolute value of the elasticity is greater than one, demand is elastic. For a one percent increase in price, quantity demanded will decrease by more than one percent...it is very responsive.

$$\text{Elastic: } |E_D| > 1$$

If the absolute value of the elasticity of demand is exactly equal to one, demand is unitary elastic. For a one percent increase in price, quantity demanded will decrease by one percent.

$$\text{Unitary elastic: } |E_D| = 1$$

### **Impacts of a Price Decrease on Total Revenue**

$$\text{Total Revenue} = \text{Price} * \text{Quantity}$$

$$TR = P * Q$$

Inelastic: When P decreases and demand is inelastic, Q increases by less than the decrease in price, so total revenue decreases.

Elastic: When P decreases and demand is elastic, Q increases by more than the decrease in price, so total revenue increases.

Unitary elastic: When P decreases and demand is unitary elastic, Q increases by the same amount as the decrease in price, so total revenue does not change

### **Income Elasticity of Demand**

Income elasticity of demand measures the responsiveness of quantity demanded to a change in income. It is the percent change in quantity demanded divided by a percent change in income.

$$E_I = \frac{(Q_1 - Q_2) / (Q_1 + Q_2)}{(I_1 - I_2) / (I_1 + I_2)}$$

A normal good has positive income elasticity.

An inferior good has negative income elasticity.

### **Cross-Price Elasticity of Demand**

The cross-price elasticity of demand measures the responsiveness of quantity demanded of good X to a change in the price of good Y.

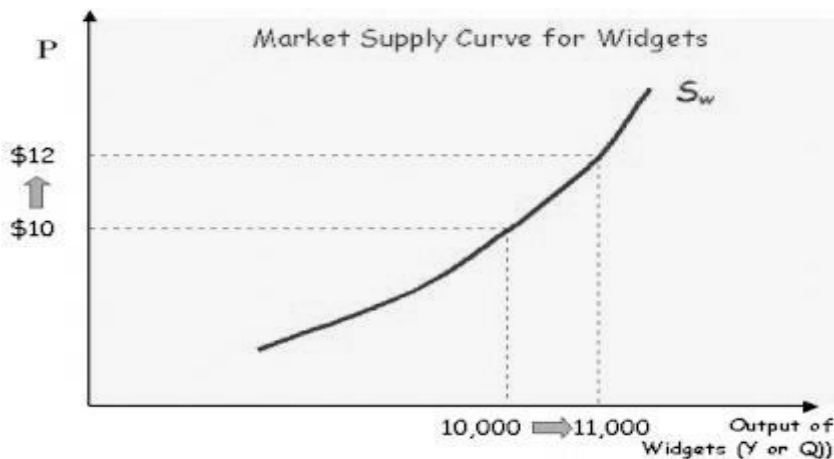
$$E_{C-P} = \frac{(Q_{x1} - Q_{x2}) / (Q_{x1} + Q_{x2})}{(P_{y1} - P_{y2}) / (P_{y1} + P_{y2})}$$

Substitutes have positive cross-price elasticity.

Complements have negative cross-price elasticity.

### **Shifts in the Supply Curve:-**

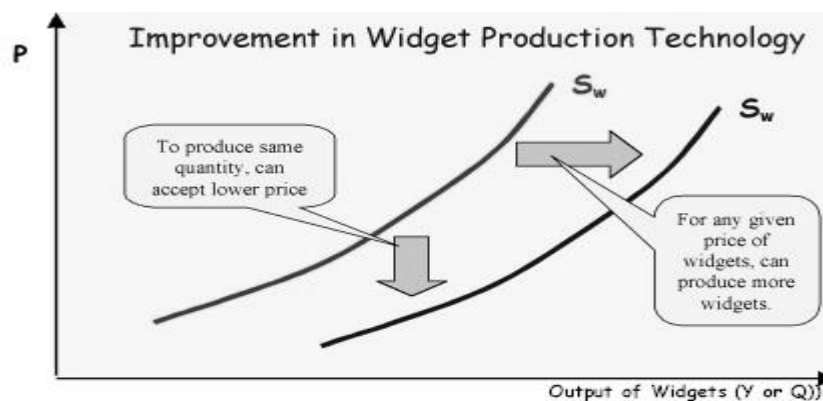
A supply curve shows how total industry output changes due to a change in the price of output. The graph below shows that if the price of widgets increased from \$10 to \$12 per widget, the quantity supplied in the market would increase from 10,000 to 11,000. The price change is said to cause a "change in the quantity supplied" (movement along a supply curve).



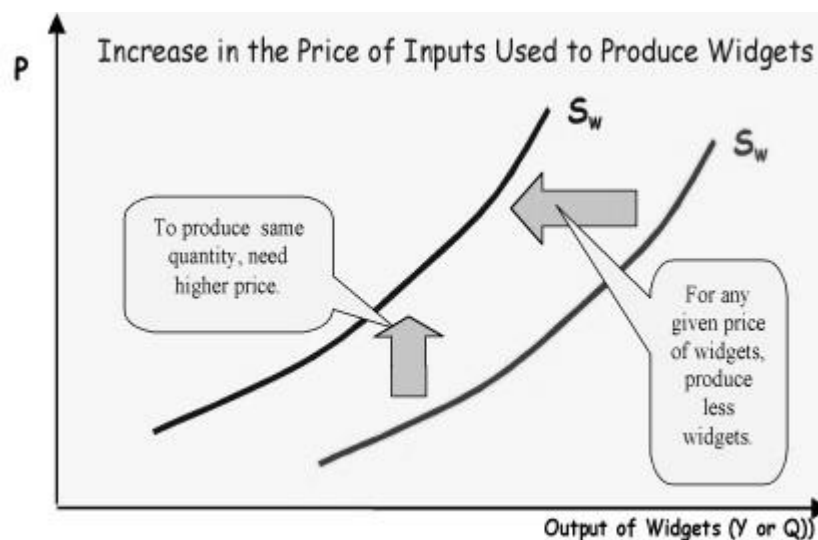
Other factors besides price, however, can influence the amount of widgets supplied in the market. These other factors are represented graphically as a shift in the supply curve and are said to represent a "change in supply". Three of the most important factors that can result in a change in supply are:

1. Change in Technology (i.e. a shift in production function)
2. Change in input prices
3. Change in the price of related goods

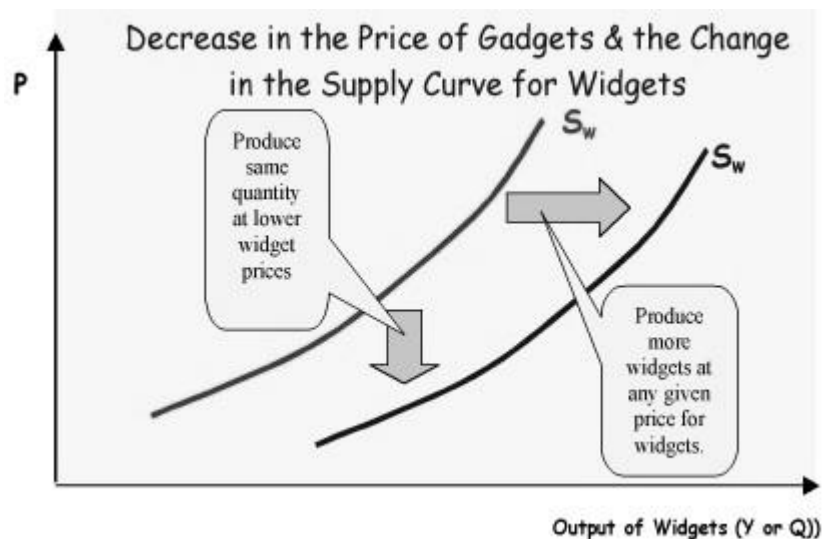
An improvement in technology (shifting the production function up) reduces per unit costs. The supply curve shifts downward and to the right.



An increase in the price of inputs (e.g. labor, energy, etc) increases per unit costs. An increase in input prices shifts the supply curve upward and to the left.



Suppose firms can produce both *widgets* and *gadgets*. A change in the price of gadgets will shift the supply curve for widgets. For example, if the price of gadgets decreased, firms will now produce fewer gadgets and move more resources into the production of widgets (widgets and gadgets are **substitutes** in production). The widget supply curve now shifts downward and to the right.



### 3.8 Elasticity of Supply

The supply curve shows that the quantity of output supplied will increase as price of the output increases. Elasticity quantifies by *how much* the quantity of output supplied will change given a change in price. Elasticity of supply is defined as the ratio of the percentage change in quantity supplied over the percentage change in price.

$$E_s = \frac{\text{Percentage Change in Quantity Supplied}}{\text{Percentage Change in Price}}$$

For example, elasticity tells us how corn production will respond to a 20 percent increase in the price of corn. If the price of corn increases in May after planting has begun, farmers have limited options to increase production. The Farmers' only option to increase production this year may be to increase fertilizer use. In this case, the output response will be fairly insensitive to a price change and the quantity of corn supplied in the market may increase only 2 percent. In this case elasticity is equal to 0.1 (+2% divided by +20%). When the relative change in quantity is less than the relative change in price, elasticity is less than 1 and is called *inelastic*.

If the price of corn remains high throughout the year and into next year, expect to see more production given the same price increase. Farmers will increase corn production by using fertilizer, more capital and more land. Thus, over a longer period of time, the ability of farmers to respond to a price change increases. Over time, the output response to a price increase becomes more elastic. If quantity supplied increased 30 percent next year (and price increase holds), elasticity would be 1.5 (+30 % divided by +20%) and is called *elastic*. The elasticity of supply range is shown in the table 1, below.

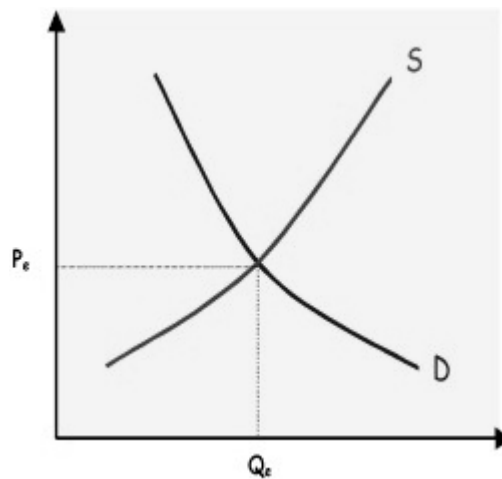
<b>E<sub>s</sub> Value</b>	<b>Identification</b>
0	Perfectly Inelastic
Greater than 0 but less than 1	Inelastic
1	Unitary Elastic
Greater than 1	Elastic

*Arc Elasticity* is one way to calculate elasticity of supply. The formula is:

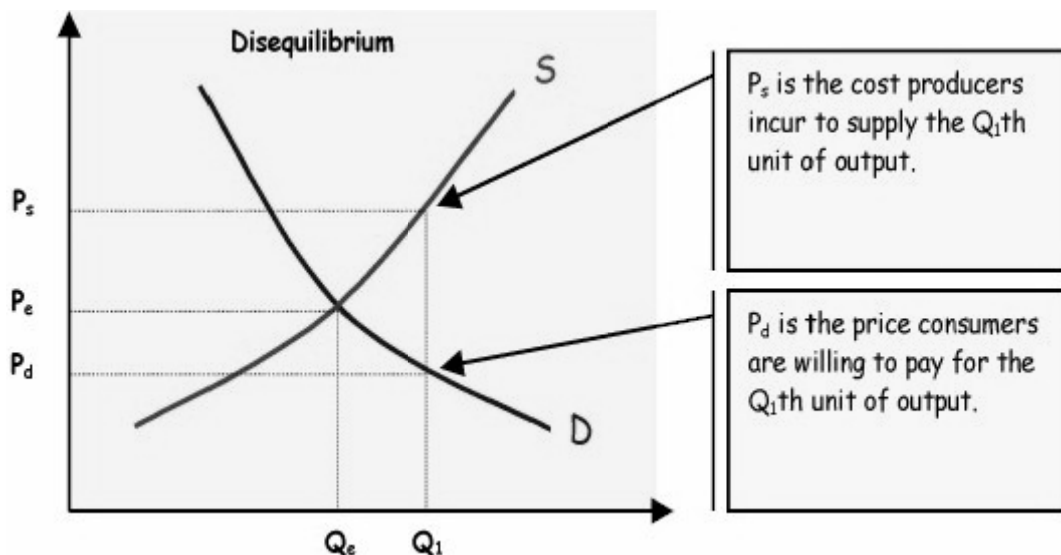
$$E_s = \frac{\frac{Q_1 - Q_2}{(Q_1 + Q_2)/2}}{\frac{P_1 - P_2}{(P_1 + P_2)/2}}$$

## CONCEPT OF EQUILIBRIUM

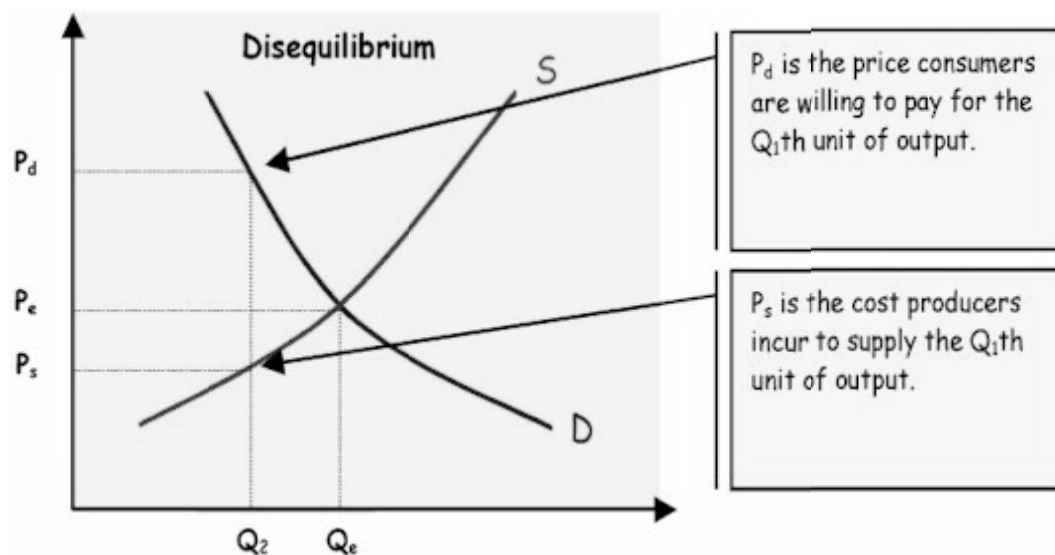
The intersection of the supply and demand curve establishes equilibrium. Equilibrium prices are prices that equate buyers' willingness to pay for the last units of output (prices along demand curve) with sellers' willingness to sell (cost represented by the supply curve) the last units of output. Thus, prices are said to represent marginal evaluations of goods and services. At this equilibrium price, there is neither a shortage or surplus in the market. Furthermore, the autonomous actions of buyers and sellers tend to move markets toward equilibrium.



To better understand the concept of market equilibrium, suppose sellers produced  $Q_1$ . To produce this level of output, sellers would have to receive a price equal to  $P_s$ . Sellers must receive  $P_s$  to cover the cost to produce the last units of output (remember the supply curve is an aggregate marginal cost curve). Buyers, however, are willing to pay only  $P_d$  for  $Q_1$ . The sellers will accumulate a surplus of output unless prices (and output) are reduced.



What if sellers produced  $Q_2$ ? To produce this level of output, sellers would only need to charge a price equal to  $P_s$ . Buyers, however, are willing to pay up to  $P_d$  for  $Q_2$ . When consumers are willing to pay higher prices for additional output, but cannot buy the output, a shortage exists. Realizing a profit opportunity, sellers will supply more goods to the market, but prices will increase to cover the higher costs.



### 3.9 Summary

Thus Demand is the willingness of the consumer or it explains the utility factor and supply represents the quantity of goods delivered as per the requirement. Law of Demand focuses on increase in demand due to decrease in price factor by assuming certain factors as constant. Elasticity represents the change caused by price on Demand and supply.

### 3.10 Key words

Demand, supply, Equilibrium, Dis-Equilibrium, Elasticity ,Inelasticity. Market System

### 3.11 Questions for Discussion

1. Explain the concept of Demand and Supply.
2. Define Law of Demand and explain the demand curve.
3. What is market Equilibrium?
4. Describe Elasticity of Supply and Demand.
5. Elaborate price Elasticity.
6. Mention the impact of Shift in Demand Curves.



## 3.12 Suggested Reading

1. G.S. Gupta – Managerial Economics Tata Mc Graw Hill.
2. Varshney and Maheswari - Managerial Economics, Sultan Chand & Sons.
3. Mehta P.L. - Managerial Economics Sultan Chand & Sons.
4. Joel Dean – Managerial Economics Prentice Hall.
5. Rengarajan L – Principles of Macro Economics, Tata McGraw Hill.

# **LESSON**

## **4**

### **Production Decisions**

#### **Contents**

**4.0 Aim and Objective**

**4.1 Introduction**

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**4.3 Production Possibilities Curve**

**4.4 Input Determination**

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#### **4.0 Aim and Objectives**

In this lesson we shall understand the basic concepts of Production Decisions. After studying this, you will be able to:

1. Discuss the Meaning, concepts, Production Decisions.
2. Describe the Production Possibilities curve and to understand the Input determination along with the three stages of production.

## 4.1 Introduction

**Opportunity Cost**—the highest valued alternative that must be sacrificed to attain something or satisfy a want and does not depend on who might use the resource but is the resource's highest value in any of the alternative uses not chosen

**Production Possibilities Curve**—a curve representing all possible combinations of total output that could be produced assuming (a) a fixed amount of productive resources and (b) the efficient use of those resources

### Assumptions:

1. referring to output possible over a specified time period
2. resources are fixed over the time period

\*No significant changes in labor or productivity

Curve is bowed outward because of *law of increasing relative cost*

The opportunity cost of additional units of a good generally increases as society attempts to produce more of that good. In microeconomics, production is the conversion of inputs into outputs. It is an economic process that uses inputs to create a commodity for exchange or direct use. Production is a flow and thus a rate of output per period of time.

Distinctions include such production alternatives as for consumption (food, haircuts, etc.) vs. investment goods (new tractors, buildings, roads, etc.), public goods (national defense, small-pox vaccinations, etc.) or private goods (new computers, bananas, etc.), and "guns" vs. "butter".

Opportunity cost refers to the economic cost of production: the value of the next best opportunity foregone. Choices must be made between desirable yet mutually exclusive actions. It has been described as expressing "the basic relationship between scarcity and choice." The opportunity cost of an activity is an element in ensuring that scarce resources are used efficiently, such that the cost is weighed against the value of that activity in deciding on more or less of it. Opportunity costs are not restricted to monetary or financial costs but could be measured by the real cost of output forgone, leisure, or anything else that provides the alternative benefit (utility).

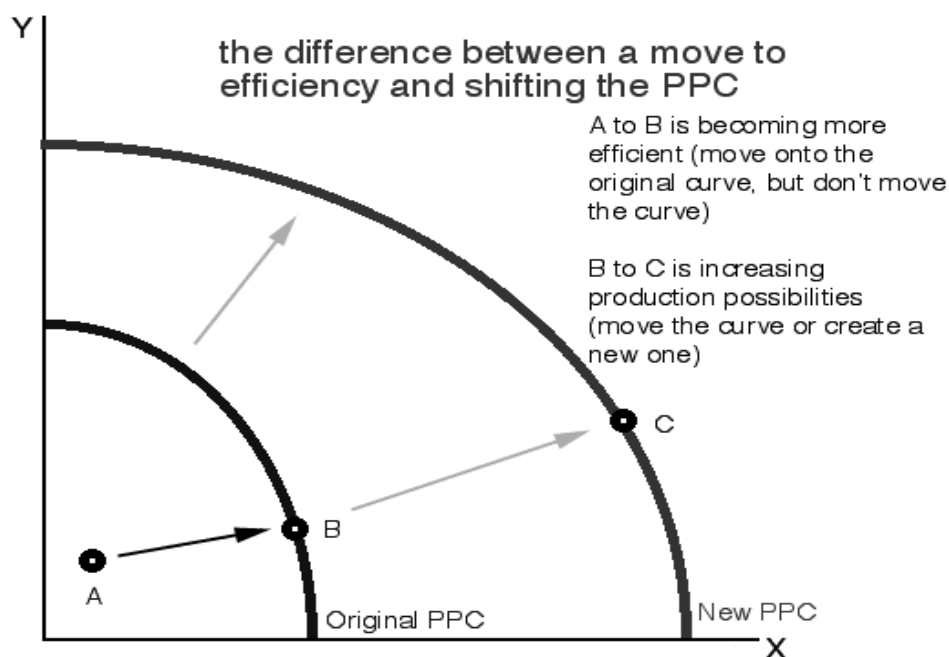
Inputs used in the production process include such primary factors of production as labour services, capital (durable produced goods used in production, such as an existing factory), and land (including natural resources). Other inputs may include intermediate goods used in production of final goods, such as the steel in a new car.

Economic efficiency describes how well a system generates desired output with a given set of inputs and available technology. Efficiency is improved if more output is generated without changing inputs, or in other words, the amount of "waste" is reduced. A widely-accepted general

standard is Pareto efficiency, which is reached when no further change can make someone better off without making someone else worse off.

An example PPF with illustrative points marked, the production-possibility frontier (PPF) is an expository figure for representing scarcity, cost, and efficiency. In the simplest case an economy can produce just two goods (say "guns" and "butter"). The PPF is a table or graph (as at the right) showing the different quantity combinations of the two goods producible with a given technology and total factor inputs, which limit feasible total output. Each point on the curve shows potential total output for the economy, which is the maximum feasible output of one good, given a feasible output quantity of the other good.

Scarcity is represented in the figure by people being willing but unable in the aggregate to consume beyond the PPF (such as at X) and by the negative slope of the curve. If production of one good increases along the curve, production of the other good decreases, an inverse relationship. This is because increasing output of one good requires transferring inputs to it from production of the other good, decreasing the latter.



**Figure 8-Production possibilities Curve**

The slope of the curve at a point on it gives the trade-off between the two goods. It measures what an additional unit of one good costs in units forgone of the other good, an example of a real opportunity cost. Thus, if one more Gun costs 100 units of butter, the opportunity cost of one Gun is 100 Butter. Along the PPF, scarcity implies that choosing more of one good in the aggregate entails doing with less of the other good. Still, in a market economy, movement along the curve may indicate that the choice of the increased output is anticipated to be worth the cost to the agents.

By construction, each point on the curve shows productive efficiency in maximizing output for given total inputs. A point inside the curve (as at A), is feasible but represents production inefficiency (wasteful use of inputs), in that output of one or both goods could increase by moving in a northeast direction to a point on the curve. Examples cited of such inefficiency include high unemployment during a business-cycle recession or economic organization of a country that

discourages full use of resources. Being on the curve might still not fully satisfy allocative efficiency (also called Pareto efficiency) if it does not produce a mix of goods that consumers prefer over other points.

Much applied economics in public policy is concerned with determining how the efficiency of an economy can be improved. Recognizing the reality of scarcity and then figuring out how to organize society for the most efficient use of resources has been described as the "essence of economics," where the subject "makes its unique contribution."

## 4.2 Division Of Labour

### **Division of labour, Comparative advantage, and Gains from trade:-**

Specialization is considered key to economic efficiency based on theoretical and empirical considerations. Different individuals or nations may have different real opportunity costs of production, say from differences in stocks of human capital per worker or capital/labour ratios. According to theory, this may give a comparative advantage in production of goods that make more intensive use of the relatively more abundant, thus relatively cheaper, input. Even if one region has an absolute advantage as to the ratio of its outputs to inputs in every type of output, it may still specialize in the output in which it has a comparative advantage and thereby gain from trading with a region that lacks any absolute advantage but has a comparative advantage in producing something else.

It has been observed that a high volume of trade occurs among regions even with access to a similar technology and mix of factor inputs, including high-income countries. This has led to investigation of economies of scale and agglomeration to explain specialization in similar but differentiated product lines, to the overall benefit of respective trading parties or regions.

The general theory of specialization applies to trade among individuals, farms, manufacturers, service providers, and economies. Among each of these production systems, there may be a corresponding division of labour with different work groups specializing, or correspondingly different types of capital equipment and differentiated land uses.

An example that combines features above is a country that specializes in the production of high-tech knowledge products, as developed countries do, and trades with developing nations for goods produced in factories where labor is relatively cheap and plentiful, resulting in different opportunity costs of production. More total output and utility thereby results from specializing in production and trading than if each country produced its own high-tech and low-tech products.

Theory and observation set out the conditions such that market prices of outputs and productive inputs select an allocation of factor inputs by comparative advantage, so that (relatively) low-cost inputs go to producing low-cost outputs. In the process, aggregate output may increase as a by-product or by design. Such specialization of production creates opportunities for gains from trade whereby resource owners benefit from trade in the sale of one type of output for other, more highly valued goods. A measure of gains from trade is the increased income levels that trade may facilitate.

## 4.3 Production Function

A **production function** describes how much output can be produced using different amounts of inputs, assuming current technology.

A **production function** can be represented symbolically as

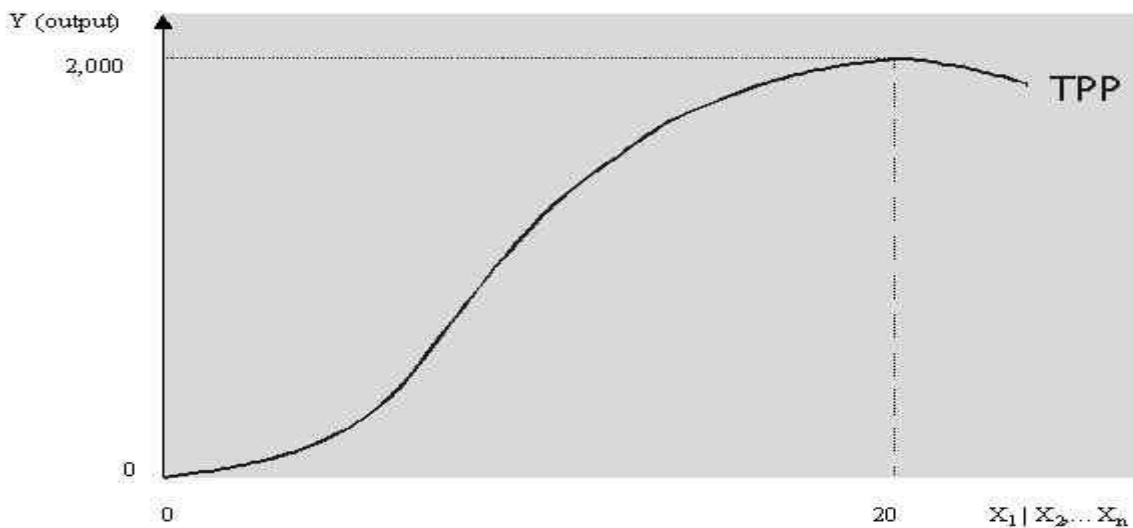
$$Y = f(X_1 | X_2, X_3, \dots, X_n)$$

Where: Y stands for quantity of output.

$X_1$  is a **variable input**. A variable input can be changed in order to increase or decrease total output

$X_2, X_3, \dots, X_n$  are **fixed inputs**. A fixed input cannot be changed during the production period to change total output.

The production function is sometimes referred to as the total physical product (TPP curve). A graphical representation of a production function (TPP) is shown below. Output increases as a variable input ( $X_1$ ), say labor, increases. According to this production function, if no labor is used, no output can be produced. The maximum amount of output that can be produced is 2,000 (using 20 workers). Adding more workers beyond 20 cannot increase production and, according to this production function, decreases total output.



**Figure 9 -Production Function**

A typical production function exhibits **increasing, decreasing and negative marginal returns** (see graph below). The sequence from increasing marginal returns to negative marginal returns is called the **law of diminishing marginal returns**. This economic "law" states that, as additional inputs are added to fixed inputs, output increases but eventually the rate of increase will decline.

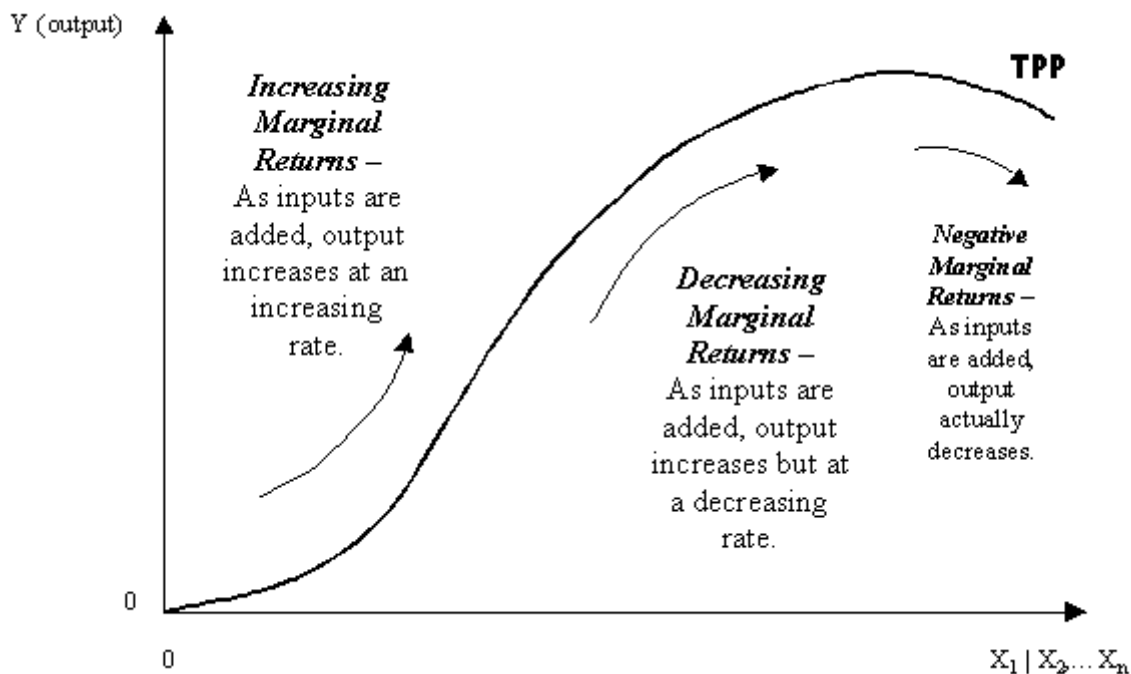


Figure 10-Law of Diminishing Returns

From this relationship between inputs and output, other useful concepts such as marginal and average physical product can be defined.

**Marginal physical product (MPP)** is defined as the change in output caused by a change in the variable input ( $X_1$ ).

**MPP** is calculated as:

$$MPP = \text{Change in Output} / \text{Change in Input}$$

**Average physical product (APP)** is defined as output produced per unit of the variable input. APP is calculated as:

$$APP = \text{Total Output} / \text{Total Input}$$

The relationship of the production function to MPP and APP is shown on the graphs below.

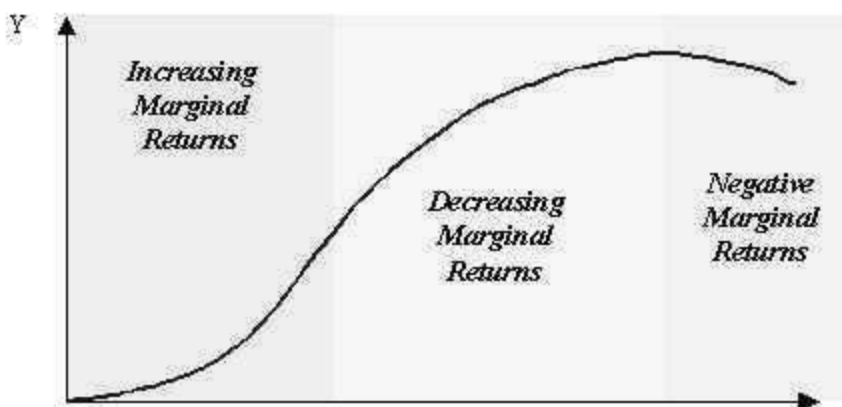
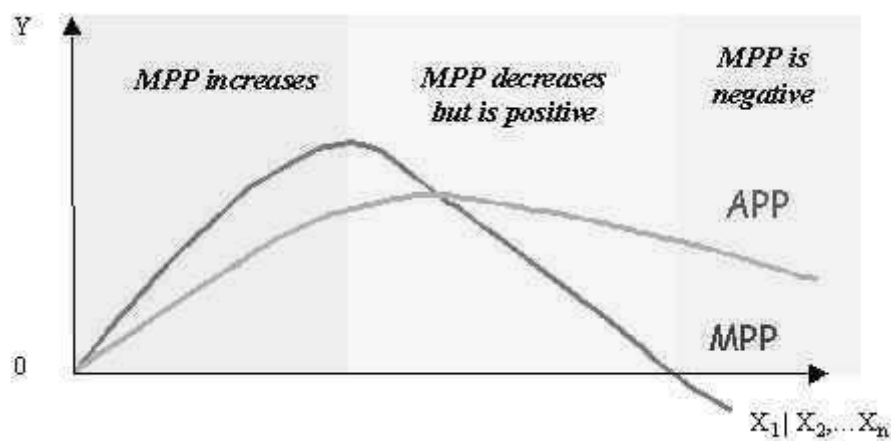
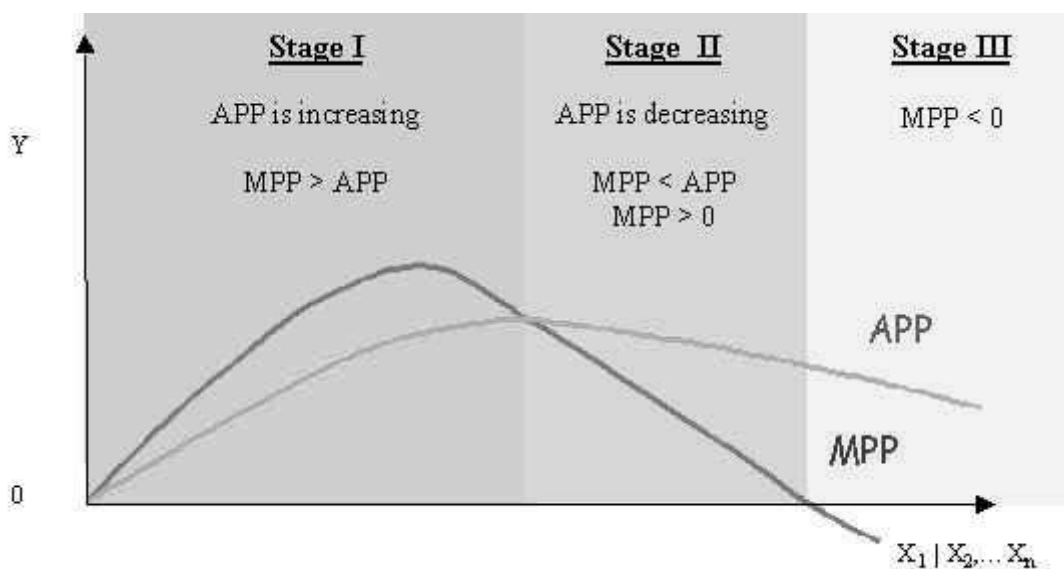


Figure 11-MPP



**Figure 12-APP**

In a typical production function, *three stages of the production* can be identified.



**Figure 13-Three Stages Of Production**

**Stage I:** If it pays to employ any variable inputs ( $X_1$ ), the firm should not stop hiring inputs as long as output per unit of input (APP) is increasing.

**Stage II** is the *only* economically rational range of input use

**Stage III:** A firm should never employ an input in this stage. Adding input causes output to decrease!



## 4.4 Input Determination

The production function identified how output changed when variable input use changed. The firm, however, is ultimately interested in the dollar value of the output. The following terms translate physical output measures into dollar terms.

**Total Value Product (TVP)** – Dollar value of the output produced. This is another term for total revenue. TVP is calculated as

- Output x price of output per unit

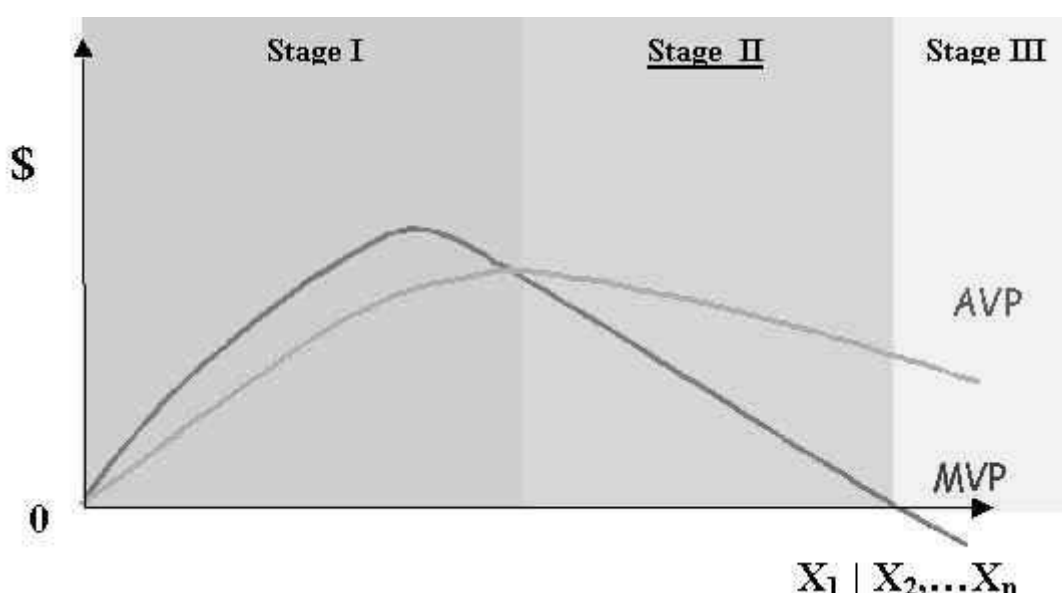
**Marginal Value Product (MVP)** – Dollar value of the output produced by the last unit of the variable input. MVP is the dollar value of MPP and is calculated in two ways:

- MPP x price of output per unit
- Change in TVP / Change in the quantity of variable input used

**Average Value Product (AVP)** – The dollar value of the output produced per unit of input. AVP is the dollar value of APP and is calculated in two ways.

- APP x price of output per unit
- TVP / Quantity of the variable input used.

The MVP and AVP curves are the MPP and APP curves scaled in dollar values



**Figure 14-Input Determination**

The MVP and AVP curves demonstrate how value is added by employing more inputs. Firms must balance these gains by the costs incurred by employing those inputs.

**Marginal Factor Cost (MFC)** is defined as the cost to employ another unit of the variable input. If the firm's input decision does not impact the price of variable input (competitive input markets), then MFC is equal to the per unit price of the variable input.

Firms find it in their financial best interest to keep employing variable inputs as long as an additional input creates more value (in terms of additional output) than it costs to employ that additional input.

Thus, for optimal input use a firm should employ additional inputs as long as:

$$MVP \geq MFC$$

Graphically, this can be show as:

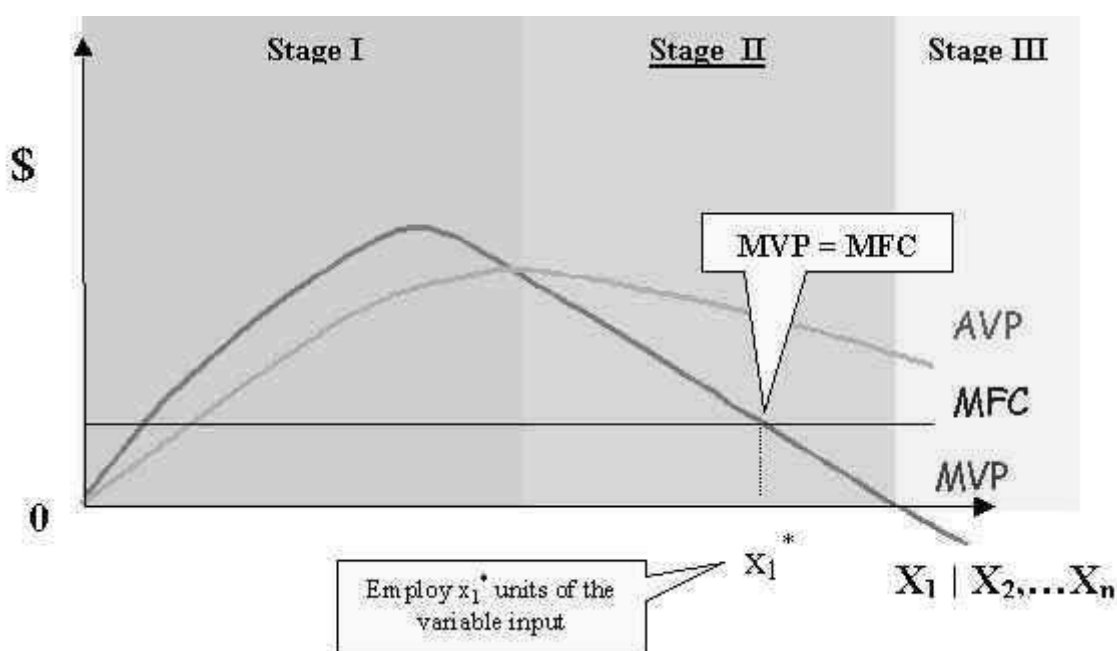


Figure 15- MVP and AVP

## 4.5 Summary

Thus Production function, describes how much output can be produced using different amounts of inputs, assuming current technology. Production function exhibits **increasing, decreasing and negative marginal returns**. The sequence from increasing marginal returns to negative marginal returns is called the **law of diminishing marginal return**. **Marginal Factor Cost (MFC)** is defined as the cost to employ another unit of the variable input. If the firm's input decision does not impact the price of variable input (competitive input markets), then MFC is equal to the per unit price of the variable input.

## 4.6 Keywords

Opportunity cost, Marginal Physical Product, Average Variable cost, Production Possibility curve, Production Function, Marginal Factor cost

## 4.7 Questions for Discussion

1. Describe the importance of Production function.
2. Explain the division of labours with suitable example.
3. Discuss the stages of Production.
4. Elucidate the concept of Input Determination.

## 4.8 Suggested Reading

1. G.S. Gupta – Managerial Economics Tata Mc Graw Hill.
2. Varshney and Maheswari - Managerial Economics, Sultan Chand & Sons.
3. Mehta P.L.- Managerial Economics Sultan Chand & Sons.
4. Joel Dean – Managerial Economics Prentice Hall.
5. Rengarajan L – Principles of Macro Economics, Tata McGra Hill.

# LESSON

## 5

### Cost Functions

#### Contents

**5.0 Aim and Objective**

**5.1 Introduction**

**5.2 General Relationship between Cost Curves**

**5.3 Determining Optimum Output Levels**

**5.4 Cost Curves**

**5.5 Long Run cost curves**

**5.6 Marginal Cost**

**5.7 Summary**

**5.8 Key Words**

**5.9 Questions for Discussion**

**5.10 Suggested Reading**

## 5.0 Aim and Objective

In this lesson we shall understand the basic concepts of cost functions of Production. After studying this, you will be able to:

1. Discuss the Meaning, definition of various Production costs.
2. Describe the Short run and long run average cost curves and to understand the concepts involved

in diseconomies of curve along with U shaped curve.

## 5.1 Introduction

The following concepts provide information on how costs change to produce *different levels of output*.

### **Definitions:**

**Opportunity cost** is equal to the value of other opportunities given up in order to produce any good.

**Total Variable Cost (TVC)** – total cost to employ variable inputs to produce a given level of output. Variable costs change as output levels change.

**Total Fixed Cost (TFC)**– total cost to employ fixed inputs. Fixed costs do not change as output levels change.

**Total Cost (TC)** – total cost of producing a given level of output including both variable and fixed costs. TC is calculated as:

$$TC = TFC + TVC$$

**Average Variable Cost (AVC)** – the variable costs *per unit* of output when producing a certain amount of output. AVC is calculated as:

$$\text{Total Variable Cost} / \text{Output} = TVC / Y$$

**Average Fixed Cost (AFC)** – total fixed costs per unit of output when producing a certain amount of output. AFC is calculated as:

$$\text{Total Fixed Cost} / \text{Output} = TFC / Y$$

**Average Total Cost (ATC)** – total costs per unit of output when producing a certain amount of output. ATC is calculated as:

$$\text{Total Cost} / \text{Output} = TC / Y = AVC + AFC$$

**Marginal Cost (MC)** – change in the cost to produce an additional unit of output. MC is calculated as:

$$\text{Change in TC} / \text{Change in Output or } Y$$

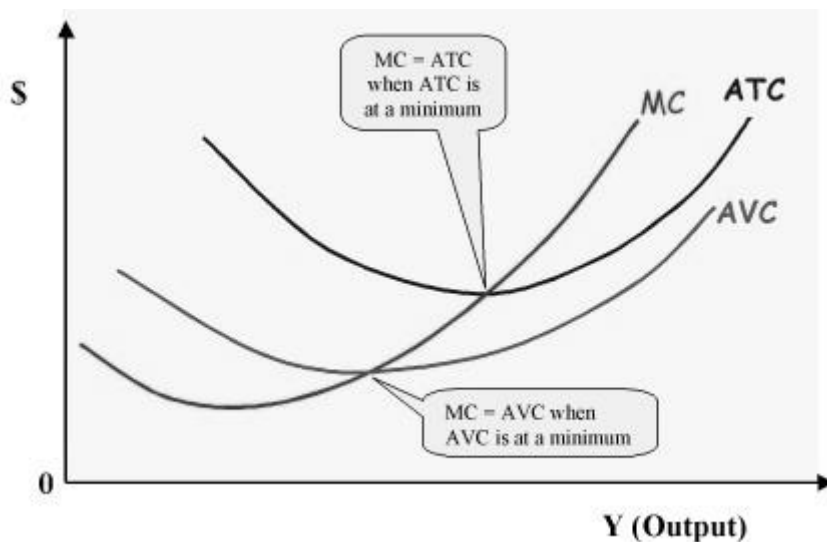
Or

$$\text{Change in TVC} / \text{Change in Output or } Y$$

## 5.2 General Relationship between Cost Curves

The relationship between ATC, AVC, and MC is shown on the graph below (note that output is now on the horizontal axis)

Note the general relationships between the cost curves



**Figure 16 -General Relationship between cost curves**

The relationships of the cost curves to the physical product curves are important. A few general observations are:

- The MC curve is a mirror reflection of the MPP curve. When MPP is increasing, MC is decreasing. When MPP is decreasing, MC is increasing
- The AVC curve is a mirror reflection of the APP curve. When APP is increasing, AVC is decreasing. When APP is decreasing, AVC is increasing.
- Given the relationships above, since MPP intersects APP when APP is at a maximum, MC intersects AVC when AVC is at a minimum.
- Since stage II of production begins when APP is at a maximum, stage II can be identified on a cost curve when AVC is at a minimum.
- AVC and MC are both increasing in Stage II.

The relationship between the cost curves to the physical product curves are shown below:

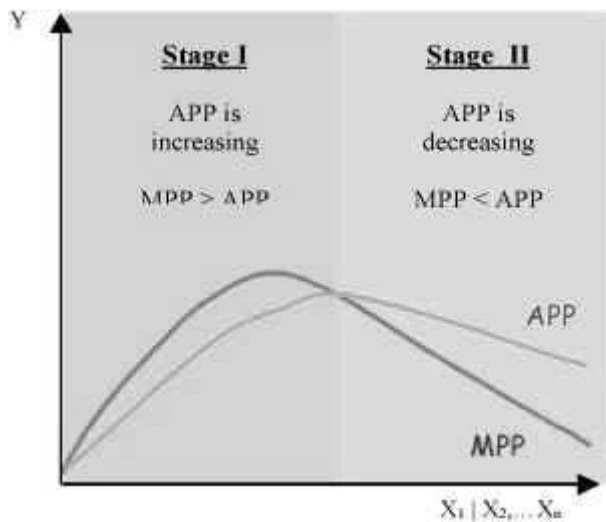


Figure 17-Physical Product1

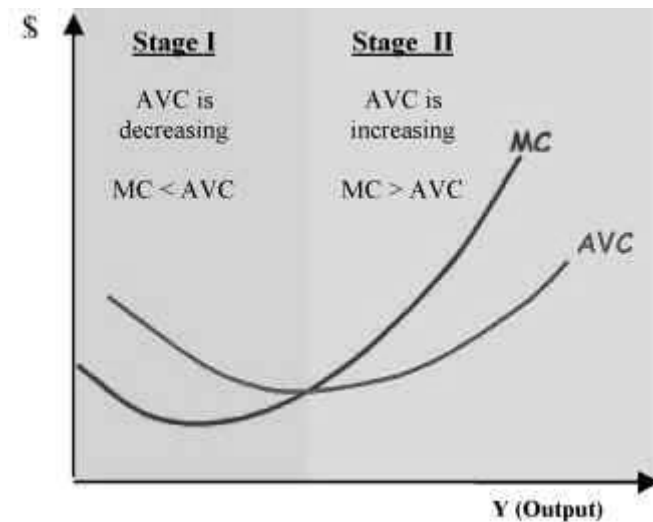


Figure 18-Physical Product2

## 5.3 Determining Optimum Output Levels

The **AVC**, **ATC**, and **MC** concepts provide information about production costs at various output levels. Two additional concepts can be used to describe revenues.

**Total Revenue (TR)** is the total value of the output produced and is calculated as:

Total output x Per unit price of the output =  $Y \times P$

**Marginal Revenue(MR)** is the revenue received from selling one more unit of output. If the firm's decision to sell output will not impact the price of output in the market (i.e. competitive market), the marginal revenue is equal to the per unit price of the output.

$$MR = P_y$$

The firm's objective is to maximize the difference between revenues and costs, or economic profit.

**Economic profit** (sometimes called **economic rent**) is calculated as:

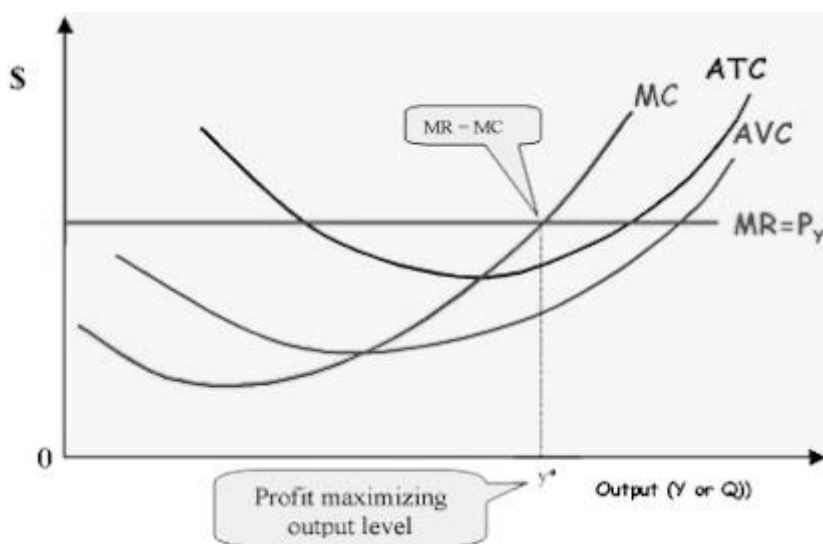
$$\text{Total Revenue} - \text{Total Cost} = TR - TC$$

To accomplish the objective of maximizing profits, firms should balance the costs to produce the output against the revenues received from the sale of output. Conceptually, a firm will continue to increase production as long as the cost of producing one more unit of output is less than or equal to the revenue the firm receives from the sale of that unit.

Thus the profit maximizing output rule can be stated as:

$$MR \geq MC$$

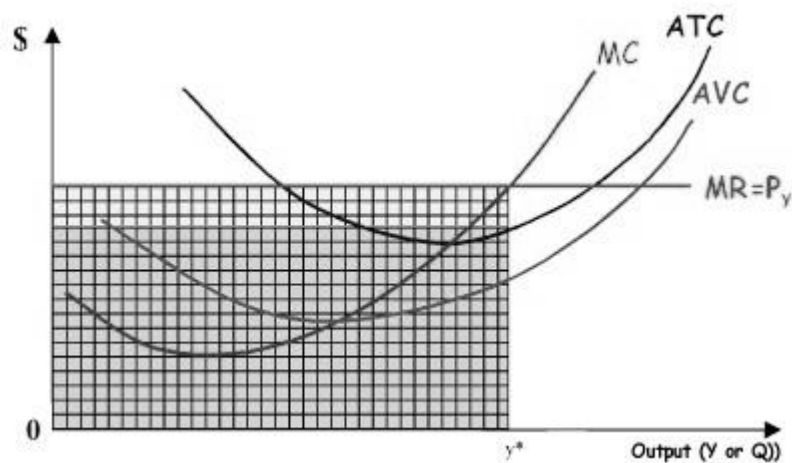
This rule and the optimum output level is shown on the graph below:



**Figure 19-Optimum output Level**

According to these cost and revenue curves, this firm is making an economic profit.





**Figure 20-Cost and Revenue Curve**

■ The *tan* area represents the total cost to produce  $y^*$ . TC is calculated as the per unit cost to produce  $y^*$  (the distance between the horizontal axis and the ATC curve at  $y^*$ ) multiplied by the number of units produced ( $y^*$ ).

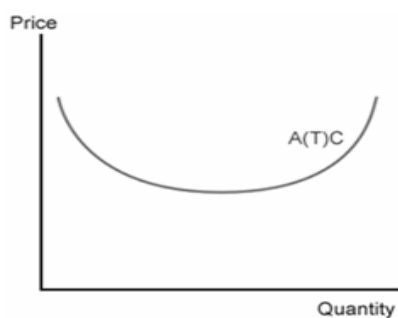


The *cross-hatched* area represents total revenue received from the sale of  $y^*$  units of output. TR is the price of the output ( $P_y$ ) times the number of units produced ( $y^*$ ).

■ The *grey* area represents total profit ( $TR - TC$ ). Graphically, profit (economic rent) is the difference between TR (cross-hatched area) and TC (the orange area).

## 5.4 Cost Curves

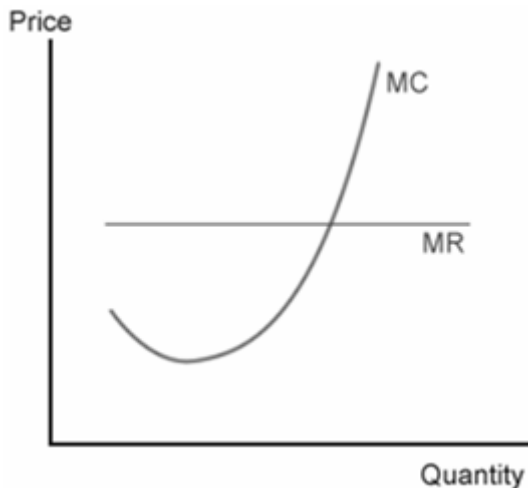
*The average total cost curve* is constructed to capture the relation between average total cost and the level of output. A productively efficient firm organizes its factors of production in such a way that the average cost of production is at lowest point.



**Figure 21-Average total cost Curve**

### A marginal cost Curve:

A marginal cost Curve graphically represents the relation between marginal costs incurred by a firm and the quantity of output produced. This curve is constructed to capture the relation between marginal cost and the level of output, the marginal cost curve is U-shaped. Marginal cost is relatively high at small quantities of output, then as production increases, declines, reaches a minimum value, then rises.



**Figure 22-Marginal cost curve**

### Duality:

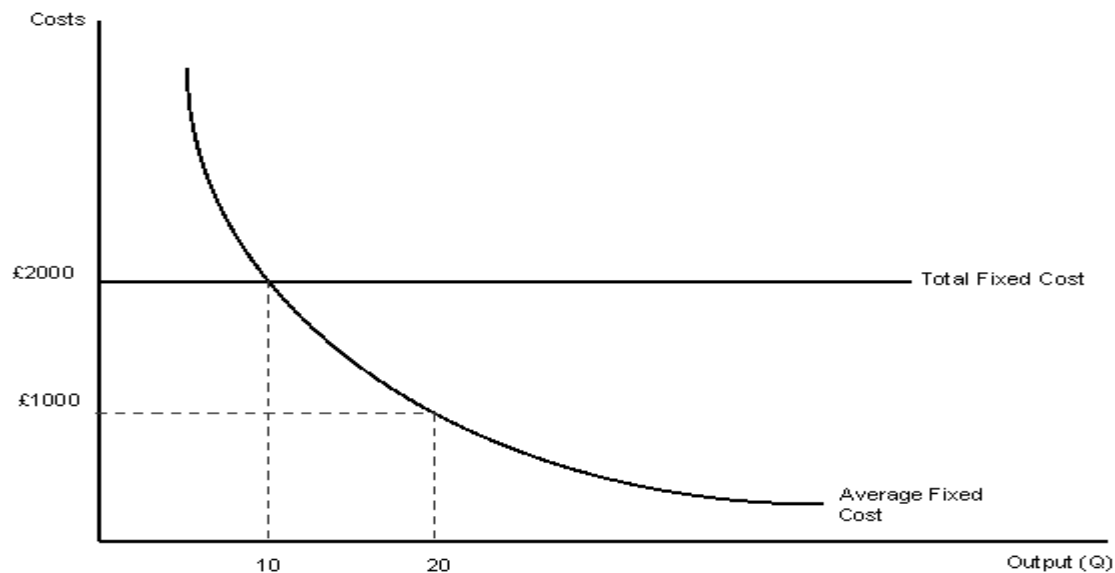
Given a cost function we can "solve for" a technology that could have generated that cost function. This means that the cost function contains essentially the same information that the production function contains. Any concept defined in terms of the properties of the production function has a "dual" definition in terms of the properties of the cost function and vice versa. This general observation is known as the principle of duality.

### Fixed costs :-

Fixed costs are business expenses that do not vary directly with the level of output i.e. they are treated as **independent** of the level of production.

Examples of fixed costs include the rental costs of buildings; the costs of leasing or purchasing capital equipment such as plant and machinery; the annual business rate charged by local authorities; the costs of full-time contracted salaried staff; the costs of meeting interest payments on loans; the depreciation of fixed capital (due solely to age) and also the costs of business insurance.

Fixed costs (FC) are independent of output and must be paid out even if the production stops. Capital intensive industries with a high ratio of fixed to variable costs offer scope for economies of scale.  $AFC = \text{Fixed Costs (FC)} / \text{Output (Q)}$ .



**Figure 23-Fixed cost**

Fixed costs are the **overhead costs** of a business. They are important in markets where the fixed costs are high but the variable costs associated with making a small increase in output are relatively low. We will come back to this when we consider **economies of scale**.

- Total fixed costs (TFC) remain constant as output increases
- Average fixed cost (AFC) = total fixed costs divided by output

**Average fixed costs must fall continuously as output increases** because total fixed costs are being spread over a higher level of production. In industries where the ratio of fixed to variable costs is extremely high, there is great scope for a business to exploit lower fixed costs per unit if it can produce at a big enough size. Consider the new Sony portable play station. The fixed costs of developing the product are enormous, but these costs can be divided by millions of individual units sold across the world.

A change in fixed costs has no effect on marginal costs. Marginal costs relate only to variable costs.

### Variable Costs

Variable costs are costs that **vary directly with output**. Examples of variable costs include the costs of **intermediate raw materials** and other components, the wages of part-time staff or employees paid by the hour, the costs of electricity and gas and the depreciation of capital inputs due to wear and tear.  $\text{Average variable cost (AVC)} = \text{total variable costs (TVC)} / \text{output (Q)}$

### Average Total Cost (ATC or AC)

Average total cost is simply the cost per unit produced

$\text{Average total cost (ATC)} = \text{total cost (TC)} / \text{output (Q)}$

### Marginal Cost

Marginal cost is the **change in total costs from increasing output by one extra unit**.

The marginal cost of supplying an extra unit of output is linked with the **marginal productivity of labour**. The **law of diminishing returns** implies that the marginal cost of production will rise as output increases. Eventually, rising marginal cost will lead to a rise in average total cost. This happens when the rise in AVC is greater than the fall in AFC as output (Q) increases.

### Worked example of short run production costs

A simple numerical example of short run costs is shown in the table below. Fixed costs are assumed to be constant at £200. Variable costs increase as more output is produced.

Output (Q)	Total Fixed Costs (TFC)	Total Variable Costs (TVC)	Total Cost	Average Cost Per Unit	Marginal Cost (the change in total cost from a one unit change in output)
			(TC= TFC + TVC)	(AC = TC/Q)	
0	200	0	200		
50	200	100	300	6	2
100	200	180	400	4	2
150	200	230	450	3	1
200	200	260	460	2.3	0.2
250	200	280	465	1.86	0.1
300	200	290	480	1.6	0.3
350	200	325	525	1.5	0.9
400	200	400	600	1.5	1.5
450	200	610	810	1.8	4.2
500	200	750	1050	2.1	4.8

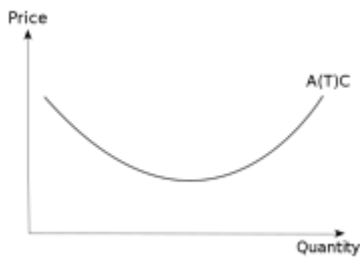
In our example, average cost per unit is minimised at a range of output between 350 and 400 units. Thereafter, because the marginal cost of production exceeds the previous average, so the average cost rises (for example the marginal cost of each extra unit between 450 and 500 is 4.8 and this increase in output has the effect of raising the cost per unit from 1.8 to 2.1).

### Short Run Cost Curves

#### Short-run average variable cost curve (SRAVC)

Average variable cost (which is a short-run concept) is the variable cost (typically labor cost) per unit of output:  $SRAVC = wL / Q$  where  $w$  is the wage rate,  $L$  is the quantity of labor used, and  $Q$  is the quantity of output produced. The SRAVC curve plots the short-run average variable cost against the level of output, and is typically U-shaped.

### Short-run average total cost curve (SRATC or SRAC)



**Figure 24-Short Run Average cost curve**

Typical short run average cost curve

The average total cost curve is constructed to capture the relation between cost per unit of output and the level of output. A perfectly competitive and productively efficient firm organizes its factors of production in such a way that the average cost of production is at the lowest point. In the short run, when at least one factor of production is fixed, this occurs at the output level where it has enjoyed all possible average cost gains from increasing production. This is at the minimum point in the diagram on the right.

Short-run total cost is given by

$$STC = P_K K + P_L L,$$

where  $P_K$  is the unit price of using physical capital per unit time,  $P_L$  is the unit price of labor per unit time (the wage rate),  $K$  is the quantity of physical capital used, and  $L$  is the quantity of labor used. From this we obtain short-run average cost, denoted either SATC or SAC, as  $STC / Q$ :

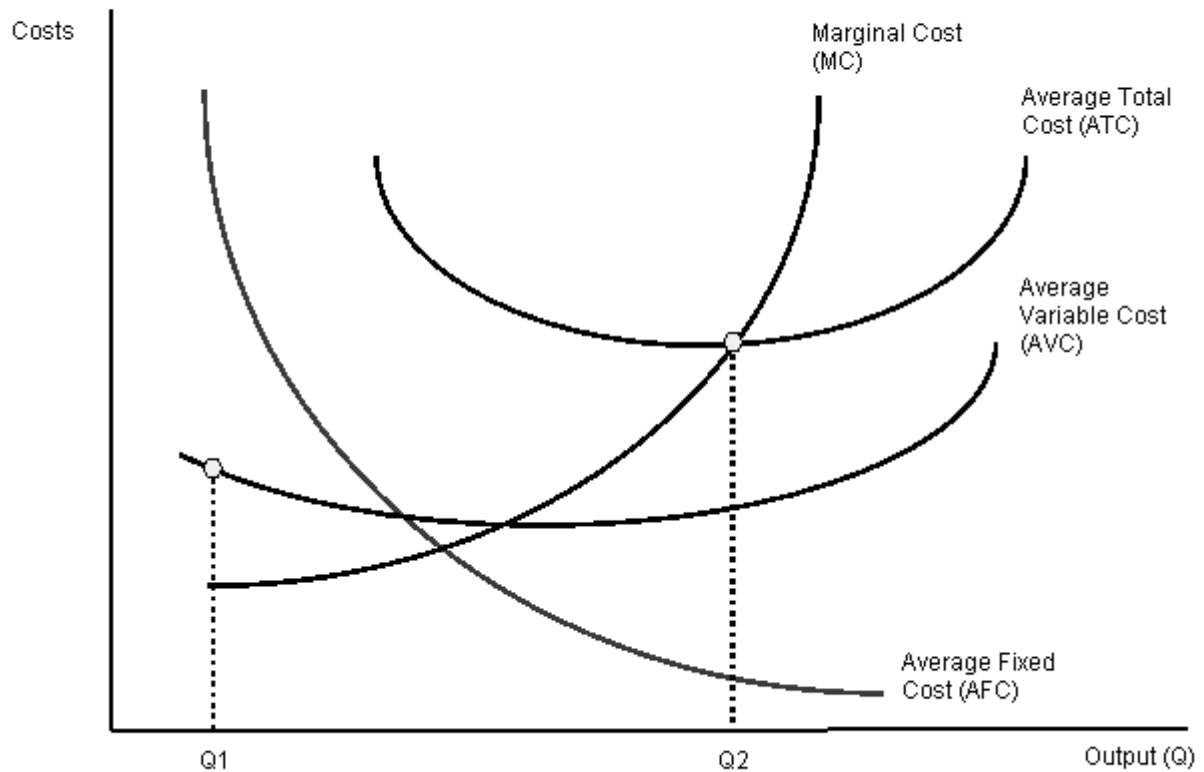
$$SRATC \text{ or } SRAC = P_K K / Q + P_L L / Q = P_K / AP_K + P_L / AP_L,$$

where  $AP_K = Q/K$  is the average product of capital and  $AP_L = Q/L$  is the average product of labor.

Short run average cost equals average fixed costs plus average variable costs. Average fixed cost continuously falls as production increases in the short run, because  $K$  is fixed in the short run. The shape of the average variable cost curve is directly determined by increasing and then diminishing marginal returns to the variable input (conventionally labor).

When diminishing returns set in (beyond output  $Q_1$ ) the marginal cost curve starts to rise. Average total cost continues to fall until output  $Q_2$  where the rise in average variable cost equates with the fall in average fixed cost. Output  $Q_2$  is the lowest point of the ATC curve for this business in the short run. This is known as the output of **productive efficiency**.

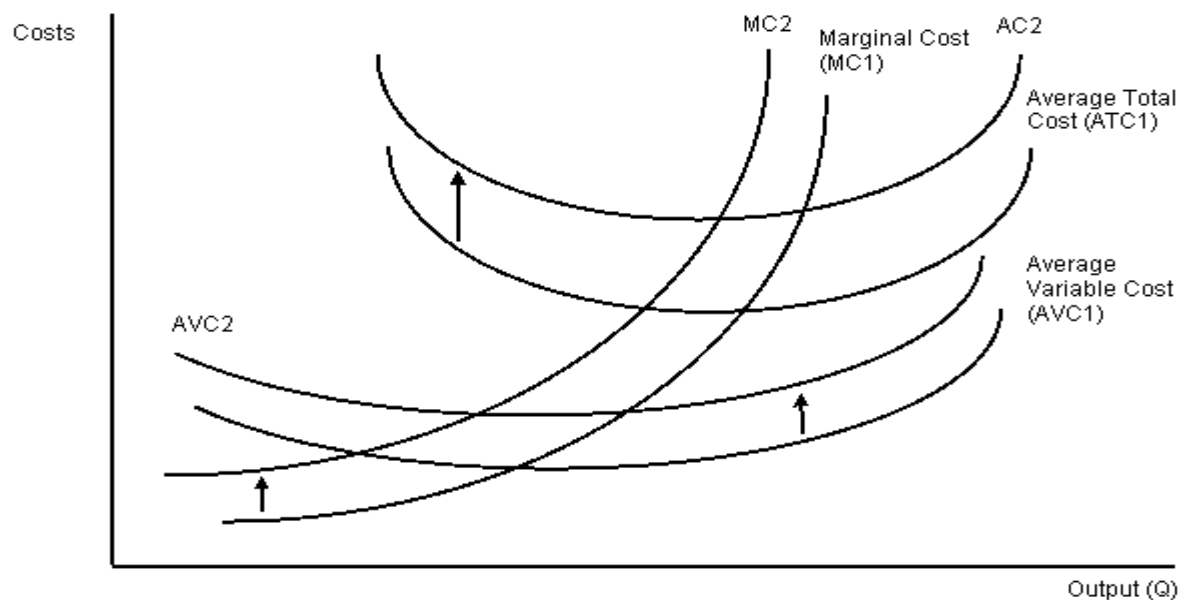
Short run costs of production - If a marginal cost is below average cost then average must be falling. Even if MC is rising, AC falls if  $MC < AC$ . For this reason, MC curve intersects the AC curve at the lowest point of the AC curve



**Figure 25-Cost curves**

### A change in variable costs

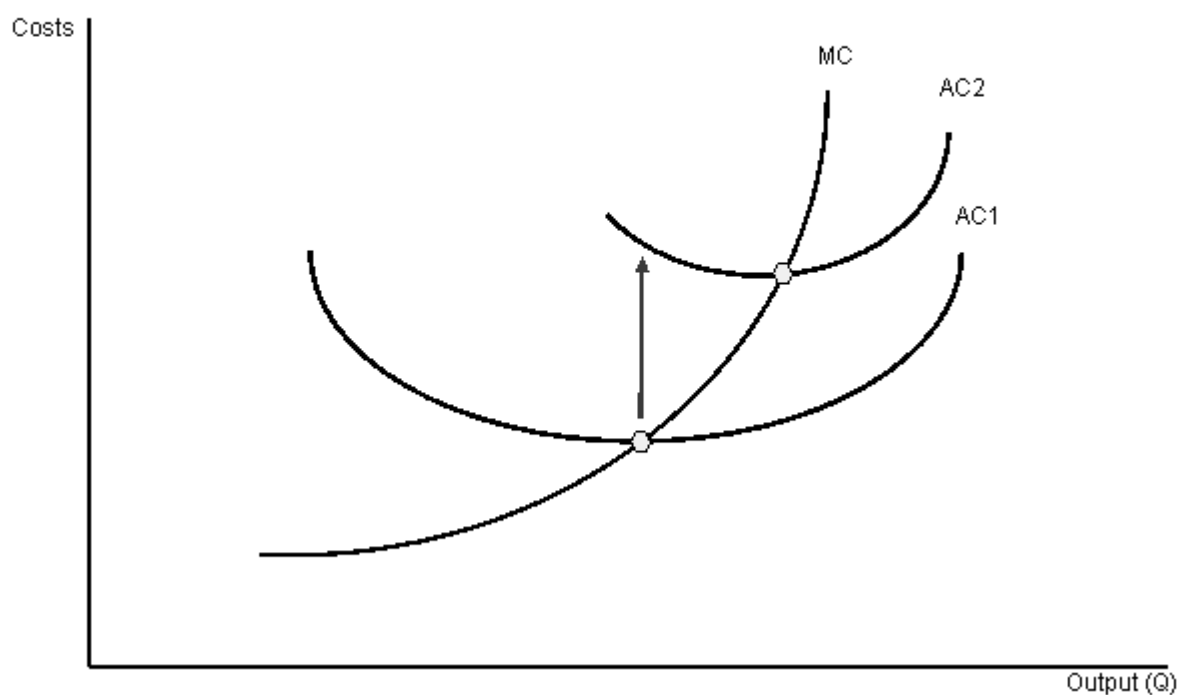
A rise in the variable costs of production leads to an upward shift both in marginal and average total cost. The firm is not able to supply as much output at the same price. The effect is that of an inward shift in the supply curve of a business in a competitive market.



**Figure 26-Change in Variable Cost**

An increase in fixed costs has no effect at all on variable costs of production. This means that only the average total cost curve shifts. There is no change at all on the marginal cost curve leading to no change in the profit maximising price and output of a business. The effects of an increase in the fixed or overhead costs of a business are shown in the diagram below.

Important: A rise in fixed costs has no effect on marginal cost – it simply causes an upward shift in the average cost curve



**Figure 27-Increase in Fixed cost**

The short run total cost can be explained as follows :

**Fixed cost:** The fixed cost is also called overhead cost, supplementary cost. The cost incurred in fixed factors is called fixed cost. The fixed cost cannot be changed in the short run. The fixed cost will have to be incurred even if the production is stopped for some time. The expenditure made on machinery, land, building and so on is the example of fixed cost. The curve representing these costs is called fixed curve cost curve. The sum of implicit fixed costs is called total fixed cost. The curve representing this is called total fixed cost curve.

**Variable cost:** The variable cost is also the prime cost, special cost and direct cost. The expenditures made on variable factors is called variable cost. The variable cost varies with output. The expenditure made on raw materials, wages, fuel are the examples of variable cost.

The sum of the expenditures made on variable factors is the total variable cost. The curve representing this is called total variable cost curve.

**Total cost:** The sum of total fixed cost and total variable cost is total cost. Hence,  $TC = TFC + TVC$ . The total cost directly varies with output. Hence, the total cost is expressed as,  $TC = f(q)$ , where  $q$  = quantity of output. The curve representing total cost is called total cost curve.

#### **Fixed cost**

The costs that do not with output are defined as fixed costs. These costs will exist even if no output is produced. For example, interest on borrowed capital, rental expenses on leased plant or building, depreciation charges associated with the passage of time, salaries of employees who cannot be laid off during periods of reduced output are fixed costs. On the other hand, costs that vary with changes in output are known as variable costs. They are function of the of output level. For example, expense on raw materials, wages, depreciation associated with the use of equipment, sales commissions, and the costs of all inputs that vary with output are variable costs. Since all the factors are variable in the long run, so are all costs.

Such a sharp distinction between fixed and variable costs is not always realistic. For example, a salesman's salary might be fixed within a certain range of output, but below a lower limit he might be laid off, while above the upper limit additional salesman would be hired. This problem led to the development of semi-variable cost concept. The semi-variable costs are fixed if incremental output does not exceed certain limits, but are variable outside these bounds.

The distinction between these cost concepts is useful in decision making. For example, in the short run a profit maximizing firm will continue its operation so long as its total variable cost is covered but in the long run all costs must be covered.

#### **Actual and opportunity cost**

The costs that are generally recorded in the books of account is called the actual costs. They consist of actual expenses of hiring land, labour, capital and management.



The opportunity cost is the alternative that has been foregone. The opportunity cost of any good is the next best alternative good that is sacrificed. For example, the factors which are used for the manufacture of car may also be used for the production of military equipment. Therefore, the opportunity cost of the production of car is the output of the military equipment foregone.

The returns which the entrepreneur could have earned in an alternative use of his services and capital is called opportunity or alternative cost. Since the opportunity cost is a national cost, they are not recorded in a book of account. But they are useful for the purpose of decision making. The opportunity cost concept applies to all situation where a thing can have alternative uses. If there are no alternative, the opportunity cost will be zero. If alternative uses are many, the earning in the next best use will be the opportunity cost. According to Pappas and Brigham-"The alternative cost concept, then, reflects the fact that all decisions are based on choices between alternative actions. The cost of resource is determined by its value in its best alternative use."

### Concept of cost

It is proper to examine the different cost concepts which are useful in managerial decision making :

**Accounting costs economics costs:** The entrepreneur pays for the factors employed in production in the form of wages, interest, rent, and prices for raw materials, fuel and power. All these are included in cost of production. An accounting will take into account only the payments and charges made by the entrepreneur to the suppliers of various productive services. The economist's view of cost is different. The entrepreneur invests his own capital, time, managerial talent in business. In the absence of his own business, he would have employed his resources in others business and benefited. The economist, therefore, includes in his cost of production the normal return on money capital invested by the entrepreneur himself and the wages or salary he could have earned if he worked for others. Likewise, money rewards for the factors owned and employed in his own business are also included by the economists in the cost of production. Thus, accounting cost is the costs that cash payments. Economic costs consist of not only all accounting costs but also money on capital, service and other factors the entrepreneur could have earned if he had invested in next best alternative uses.

The accounting costs which is on contractual cash payment made by the firm to factor owners is also called the explicit cost. On the other hand, the payments made for own service and factors is called implicit or imputed costs. The managerial decision making should be based on economic costs since the economic costs show the real cost of production of a project.



## 5.5 Long Run Cost Curves

The long run is a period of time when firms have sufficient time to change size of the plant and scale of operation. Since there are no fixed factors and fixed in the long run, there are no fixed cost curves. All the factors are variable in the long run. Hence, we need to examine only long run average and marginal cost curves. The calculation of both these costs is the same as in the short run. It should be noted that the concept of long run cost is only hypothetical. Because, there can be no change in plant every now and then.

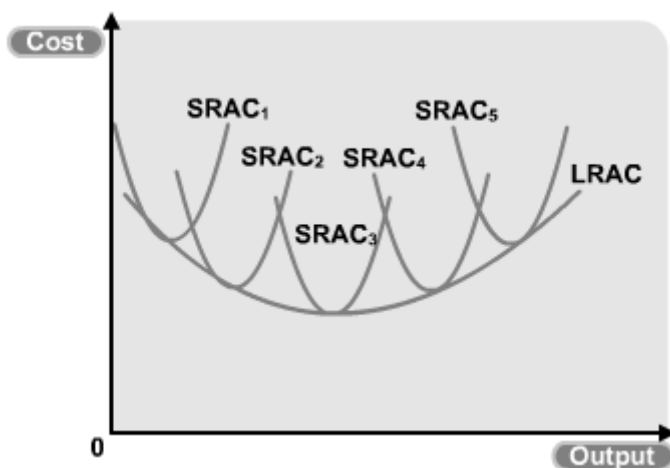
**Derivation of long run average cost curve:** In the short run, firm is tied to given plant. So there is only one average cost curve. But in the long run, the firm can change plant size. The large plant is used to

produce more and the small plant is used to produce less. Hence, in the long run there may be many average cost curves. The firm produces at lowest average cost in long run than in the short run. The long run average cost curve is derived from short run average cost curves as shown in the diagram. Suppose, there are three plants available—small, medium and large represented by  $SAC_1$ ,  $SAC_2$  and  $SAC_3$ .

If a firm begins from small plant  $SAC_1$  and the demand for the product increases. It can produce output up to  $ox_1$  at lower cost. After this the cost increases. If demand reaches  $ox_2$ , the firm can either continue production small plant or install medium plant represented by  $SAC_2$ .

If demand exceeds  $ox_2$ , the firm installs medium plant. Because, the output more than  $ox_2$  can be produced at lower cost by medium plant than by small plant.

Similarly, the demand exceeds  $ox_3$ ; the firm installs large plant. Because, the output greater than  $ox_3$  can be produced at lower cost by large plant. The thick portion of each  $SAC$  curve thus shows the lowest long run average cost curve of producing particular level of output. Hence, the scallop shaped thick part of the short run average cost curves is long run average cost curve of the firm.



**Figure 28—Long Run Cost Curves**

The long run cost curves are U-shaped for different reasons. It is due to economies and diseconomies of scale. If a firm has high fixed costs, increasing output will lead to lower average costs. However, after a certain output a firm may experience diseconomies of scale. Where increased output leads to higher average costs. For example, in a big firm it is more difficult to communicate and coordinate workers.

#### **Typical long run average cost curve**

The long-run average cost curve depicts the cost per unit of output in the long run—that is, when all productive inputs' usage levels can be varied. All points on the line represent least-cost factor combinations; points above the line are attainable but unwise, points below unattainable given present factors of production. The behavioral assumption underlying the curve is that the producer will select the combination of inputs that will produce a given output at the lowest possible cost.

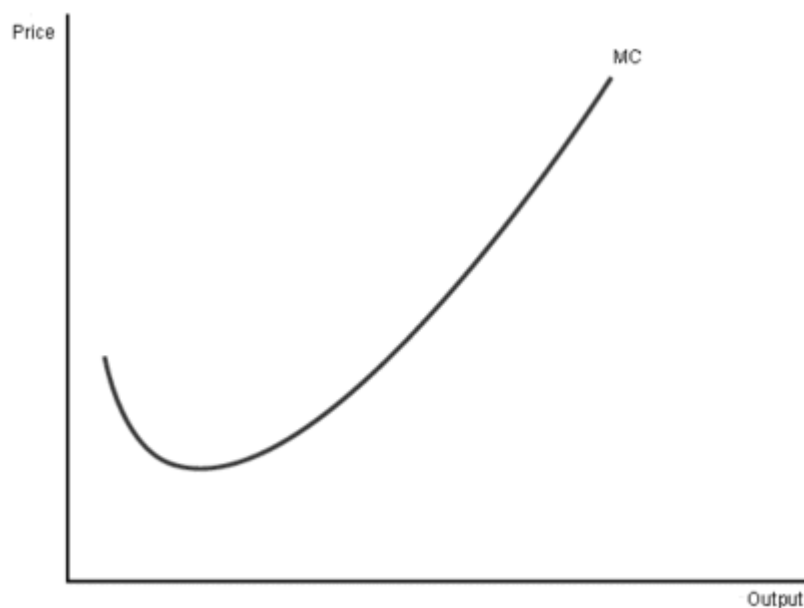
Given that LRAC is an average quantity, one must not confuse it with the long-run marginal cost curve, which is the cost of one more unit. The LRAC curve is created as an envelope of an infinite number of short-run average total cost curves, each based on a particular fixed level of capital usage. The typical LRAC curve is U-shaped, reflecting increasing returns of scale where negatively-sloped, constant returns to scale where horizontal and decreasing returns (due to increases in factor prices) where positively sloped.

In a long-run perfectly competitive environment, the equilibrium level of output corresponds to the minimum efficient scale,. This is due to the zero-profit requirement of a perfectly competitive equilibrium. This result, which implies production is at a level corresponding to the lowest possible average cost, does not imply that production levels other than that at the minimum point are not efficient. All points along the LRAC are productively efficient, by definition, but not all are equilibrium points in a long-run perfectly competitive environment.

In some industries, the bottom of the LRAC curve is large in comparison to market size (that is to say, for all intents and purposes, it is always declining and economies of scale exist indefinitely). This means that the largest firm tends to have a cost advantage, and the industry tends naturally to become a monopoly, and hence is called a natural monopoly. Natural monopolies tend to exist in industries with high capital costs in relation to variable costs, such as water supply and electricity supply.

## 5.6 Marginal Cost

**Diagram of Marginal Cost**



Because the short run Marginal cost curve is sloped like this, mathematically the average cost curve will be U shaped. You could give examples and work out the average cost.

## **Short-run marginal cost curve (SRMC)**

Typical marginal cost curve

A short-run marginal cost curve graphically represents the relation between marginal (i.e., incremental) cost incurred by a firm in the short-run production of a good or service and the quantity of output produced. This curve is constructed to capture the relation between marginal cost and the level of output, holding other variables, like technology and resource prices, constant. The marginal cost curve is U-shaped. Marginal cost is relatively high at small quantities of output; then as production increases, marginal cost declines, reaches a minimum value, then rises. The marginal cost is shown in relation to marginal revenue, the incremental amount of sales revenue that an additional unit of the product or service will bring to the firm. This shape of the marginal cost curve is directly attributable to increasing, then decreasing marginal returns (and the law of diminishing marginal returns. Marginal cost equals  $w/MP_L$ .<sup>1</sup> For most production processes the marginal product of labor initially rises, reaches a maximum value and then continuously falls as production increases. Thus marginal cost initially falls, reaches a minimum value and then increases. The marginal cost curve intersects both the average variable cost curve and (short-run) average total cost curve at their minimum points. When the marginal cost curve is above an average cost curve the average curve is rising. When the marginal costs curve is below an average curve the average curve is falling. This relation holds regardless of whether the marginal curve is rising or falling. .

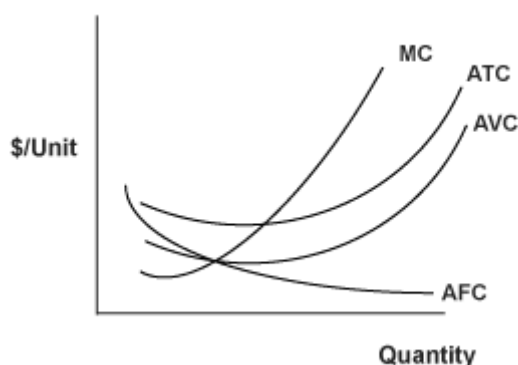
## **Long-run marginal cost curve (LRMC)**

The long-run marginal cost curve shows for each unit of output the added total cost incurred in the long run, that is, the conceptual period when all factors of production are variable so as minimize long-run average total cost. Stated otherwise, LRMC is the minimum increase in total cost associated with an increase of one unit of output when all inputs are variable.

The long-run marginal cost curve is shaped by economies and diseconomies of scale, a long-run concept, rather than the law of diminishing marginal returns, which is a short-run concept. The long-run marginal cost curve tends to be flatter than its short-run counterpart due to increased input flexibility as to cost minimization. The long-run marginal cost curve intersects the long-run average cost curve at the minimum point of the latter. When long-run marginal costs are below long-run average costs, long-run average costs are falling (as to additional units of output).

When long-run marginal costs are above long run average costs, average costs are rising. Long-run marginal cost equals short run marginal-cost at the least-long-run-average-cost level of production. LRMC is the slope of the LR total-cost function.

## Graphing cost curves together



**Figure 29-cost curves together**

Cost curves in perfect competition compared to marginal revenue

Cost curves can be combined to provide information about firms. In this diagram for example, firms are assumed to be in a perfectly competitive market. In a perfectly competitive market the price that firms are faced with would be the price at which the marginal cost curve cuts the average cost curve.

## Cost curves and production functions

Assuming that factor prices are constant, the production function determines all cost functions. The variable cost curve is the inverted short-run production function or total product curve and its behavior and properties are determined by the production function. Because the production function determines the variable cost function it necessarily determines the shape and properties of marginal cost curve and the average cost curves.

If the firm is a perfect competitor in all input markets, and thus the per-unit prices of all its inputs are unaffected by how much of the inputs the firm purchases, then it can be shown that at a particular level of output, the firm has economies of scale (i.e., is operating in a downward sloping region of the long-run average cost curve) if and only if it has increasing returns to scale. Likewise, it has diseconomies of scale (is operating in an upward sloping region of the long-run average cost curve) if and only if it has decreasing returns to scale, and has neither economies nor diseconomies of scale if it has constant returns to scale.

In this case, with perfect competition in the output market the long-run market equilibrium will involve all firms operating at the minimum point of their long-run average cost curves (i.e., at the borderline between economies and diseconomies of scale).

If, however, the firm is not a perfect competitor in the input markets, then the above conclusions are modified. For example, if there are increasing returns to scale in some range of output levels, but the firm is so big in one or more input markets that increasing its purchases of an input drives up the input's per-unit cost, then the firm could have diseconomies of scale in that range of output levels. Conversely, if the firm is able to get bulk discounts of an input, then it could have economies of scale in some range of output levels even if it has decreasing returns in production .

## U-shaped curves

Both the SRAC and LRAC curves are typically expressed as U-shaped. However, the shapes of the curves are not due to the same factors. For the short run curve the initial downward slope is largely due to declining average fixed costs. Increasing returns to the variable input at low levels of production also play a role, while the upward slope is due to diminishing marginal returns to the variable input.<sup>1</sup> With the long run curve the shape by definition reflects economies and diseconomies of scale.<sup>1</sup> At low levels of production long run production functions generally exhibit increasing returns to scale, which, for firms that are perfect competitors in input markets, means that the long run average cost is falling,<sup>1</sup> the upward slope of the long run average cost function at higher levels of output is due to decreasing returns to scale at those output levels.<sup>1</sup>

Short Run Cost curves are U shaped because of diminishing returns. In the short run capital is fixed. After a certain point, increasing extra workers leads to declining productivity. Therefore, as you employ more workers the MC increases. The average cost curve of a firm in the short-run is 'U' shaped. The reasons for the 'U' shape of the short average cost curves are as follows :

1. Simple reason: The short run average cost curve is 'U' shaped due to nature of AFC and AVC curves as explained below.
- Fixed cost: The fixed cost is a constant quantity. The firm will have incur fixed cost even if the output is zero. Hence, the average fixed cost continuously fall as the output rises. On account of this, the average cost falls when output rises.
  - Variable cost: The average variable cost varies with quantity output. In the beginning the average variable cost declines when the output increases. But beyond normal capacity, the average variable cost increase sharply. More output can be produced with more variable cost. With increase in output there are problems of overcrowding, frequent breakdown of machinery. Consequently, average cost curve rises upwards as shown in the figure.

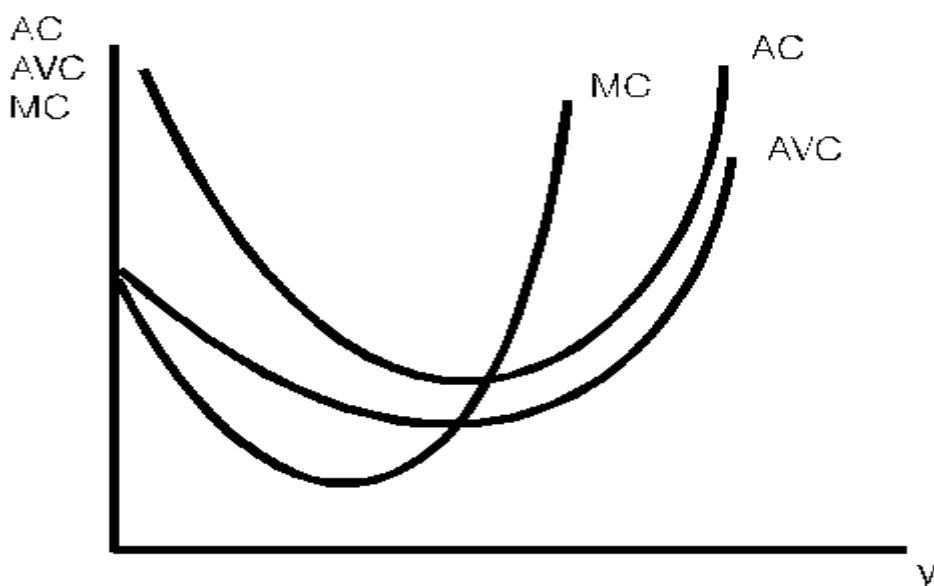


Figure 30-U shaped curves

The derivation of short-run average and marginal cost curves can be explained by following elements:

1. **Average fixed cost:** The average fixed cost can be obtained from the fixed cost curve. It slopes downwards to the right. As the output increases, the ratio of fixed cost to output decreases. Because the fixed cost is a fixed quantity, the AFC curve is a rectangular hyperbola. The AFC approaches both the axes but does not touch them.

2. **Average variable cost:** The variable cost per unit of output is called average variable cost. The average variable cost declines up to the normal capacity.

The decrease in AVC in the beginning is due to the operations of law of diminishing returns. After normal capacity, the AVC increases rapidly. The AVC curve in figure represents average variable cost. It slopes downward in the beginning, reaches the minimum point and rises upward thereafter. In general, the AVC curve is 'U' shaped.

3. **Average total cost:** The average total cost is, in fact, only average cost. It is the cost per unit of output. The average total cost is obtained by dividing total cost by quantity of output. Alternatively, it may be obtained by adding average fixed cost and average variable cost. ATC is the average total cost. In the beginning, both AFC and AVC fall. So ATC falls rapidly. So ATC continues to fall. But if production is further increased, AVC increases rapidly. Hence, ATC rises after a point. In this way, ATC first falls, reaches minimum point and rises thereafter. Thus the ATC is almost 'U' shaped.

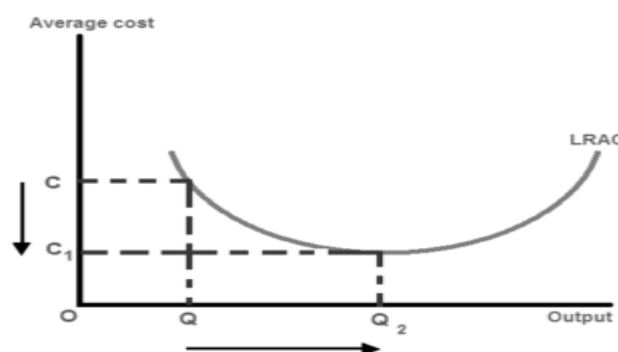
4. **Marginal cost:** The marginal cost is the addition made to total cost when one more unit is produced. The marginal cost of 2 units of output is obtained by subtracting the total cost of one unit of output from two units of output produced. The marginal cost is the change in total cost due to the change in output. Hence, it is also calculated as :

$$MC = \frac{TC}{Q}$$

5. The marginal cost is independent of the fixed cost. Because the fixed cost does not change with output. The total cost changes due to change in the variable cost. Hence, the marginal cost is also calculated as:

$$MC = VC_2 - VC_1$$

### Diagram for Economies and Diseconomies of Scale



Note however, not all firms will experience diseconomies of scale. It is possible the LRAC could just be downward sloping

## 5.7 Summary

The cost function measures the minimum cost of producing a given level of output for some fixed factor prices. As such it summarizes information about the technological choices available to the firms. It turns out that the behavior of the cost function can tell us a lot about the nature of the firm's technology. The fixed cost is a constant quantity.

The firm will have incurred fixed cost even if the output is zero. Hence, the average fixed cost continuously fall as the output rises. On account of this, the average cost falls when output rises. The average variable cost varies with quantity output. In the beginning the average variable cost declines when the output increases. But beyond normal capacity, the average variable cost increase sharply. More output can be produced with more variable cost.

## 5.8 Keywords

Fixed cost, Variable cost, cost function, average fixed cost, Average variable cost, marginal cost, short run and long run average variable cost, opportunity cost, actual cost, Ushaped curve.

## 5.9 Questions for Discussion

1. Draw various cost curves and explain the respective details.
2. Explain the method of determining maximum output levels.
3. Discuss the general relationship between the cost curves.

## 5.10 Suggested Reading

1. G.S. Gupta – Managerial Economics Tata Mc Graw Hill.
2. Varshney and Maheswari - Managerial Economics, Sultan Chand & Sons.
3. Mehta P.L. - Managerial Economics Sultan Chand & Sons.
4. Joel Dean – Managerial Economics Prentice Hall.
5. Rengarajan L – Principles of Macro Economics, Tata McGraw Hill.



# LESSON

## 6

### Market Structure

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**6.5 Monopolist's Marginal Revenue**

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**6.9 Suggested Reading**

#### 6.0 Aim and Objective

In this lesson we shall understand the basic concepts of cost functions of Market Structure. After studying this, you will be able to:

1. Discuss the Meaning, definition of market structure.
2. Describe the concept of perfect competition ,Imperfect competition and monopolistic marginal revenue.

## 6.1 Introduction

In economics, market structure ,Monopolistic competition, also called competitive market, where there are a large number of firms, each having a small proportion of the market share and slightly differentiated products. Oligopoly, in which a market is dominated by a small number of firms that together control the majority of the market share. Duopoly, a special case of an oligopoly with two firms. Oligopsony, a market, where many sellers can be present but meet only a few buyers. Monopoly, where there is only one provider of a product or service. Natural monopoly, a monopoly in which economies of scale cause efficiency to increase continuously with the size of the firm. A firm is a natural monopoly if it is able to serve the entire market demand at a lower cost than any combination of two or more smaller, more specialized firms. Monopsony, when there is only one buyer in a market.

Perfect competition is a theoretical market structure that features unlimited contestability (or no barriers to entry), an unlimited number of producers and consumers, and a perfectly elastic demand curve.

The imperfectly competitive structure is quite identical to the realistic market conditions where some monopolistic competitors, monopolists, oligopolists, and duopolists exist and dominate the market conditions. The elements of Market Structure include the number and size distribution of firms, entry conditions, and the extent of differentiation.

These somewhat abstract concerns tend to determine some but not all details of a specific concrete market system where buyers and sellers actually meet and commit to trade.

## 6.2 Basic Market Structure

Competition is useful because it reveals actual customer demand and induces the seller (operator) to provide service quality levels and price levels that buyers (customers) want, typically subject to the seller's financial need to cover its costs. In other words, competition can align the seller's interests with the buyer's interests and can cause the seller to reveal his true costs and other private information. In the absence of perfect competition, three basic approaches can be adopted to deal with problems related to the control of market power and an asymmetry between the government and the operator with respect to objectives and information:

- (a) Subjecting the operator to competitive pressures,
- (b) Gathering information on the operator and the market, and
- (c) Applying incentive regulation.

The correct sequence of the market structure from most to least competitive is perfect competition, imperfect competition, oligopoly, and pure monopoly. The correct sequence of the market structure from most to least competitive is perfect competition, imperfect competition, oligopoly, and pure monopoly.

### Basic Market structure

Market Structure	Seller Entry Barriers	Seller Number	Buyer Entry Barriers	Buyer Number
Perfect Competition	No	Many	No	Many
Monopolistic competition	No	Many	No	Many
Oligopoly	Yes	Few	No	Many
Oligopsony	No	Many	Yes	Few
Monopoly	Yes	One	No	Many
Monopsony	No	Many	Yes	One

The main criteria by which one can distinguish between different market structures are: the number and size of producers and consumers in the market, the type of goods and services being traded, and the degree to which information can flow freely. Industrial organization studies the strategic behavior of firms, the structure of markets and their interactions. The common market structures studied include perfect competition, monopolistic competition, various forms of oligopoly, and monopoly. Natural monopoly, or the overlapping concepts of "practical" and "technical" monopoly, is an extreme case of failure of competition as a restraint on producers. The problem is described as one where the more of a product is made, the greater the unit costs are. This means it only makes economic sense to have one producer.

Information asymmetries arise where one party has more or better information than the other. The existence of information asymmetry gives rise to problems such as moral hazard, and adverse selection, studied in contract theory. The economics of information has relevance in many fields, including finance, insurance, contract law, and decision-making under risk and uncertainty.

Incomplete markets is a term used for a situation where buyers and sellers do not know enough about each other's positions to price goods and services properly. Based on George Akerlof's Market for Lemons article, the paradigm example is of a dodgy second hand car market. Customers without the possibility to know for certain whether they are buying a "lemon" will push the average price down below what a good quality second hand car would be. In this way, prices may not reflect true values.

Public goods are goods which are undersupplied in a typical market. The defining features are that people can consume public goods without having to pay for them and that more than one person can consume the good at the same time.

Externalities occur where there are significant social costs or benefits from production or consumption that are not reflected in market prices. For example, air pollution may generate a negative externality, and education may generate a positive externality (less crime, etc.). Governments often tax and otherwise restrict the sale of goods that have negative externalities and subsidize or otherwise promote the purchase of goods that have positive externalities in an effort to correct the price distortions caused by these externalities. Elementary demand-and-supply theory

predicts equilibrium but not the speed of adjustment for changes of equilibrium due to a shift in demand or supply.

In many areas, some form of price stickiness is postulated to account for quantities, rather than prices, adjusting in the short run to changes on the demand side or the supply side. This includes standard analysis of the business cycle in macroeconomics. Analysis often revolves around causes of such price stickiness and their implications for reaching a hypothesized long-run equilibrium. Examples of such price stickiness in particular markets include wage rates in labour markets and posted prices in markets deviating from perfect competition.

Macroeconomic instability, addressed below, is a prime source of market failure, whereby a general loss of business confidence or external shock can grind production and distribution to a halt, undermining ordinary markets that are otherwise sound.

Environmental scientist sampling waterSome specialised fields of economics deal in market failure more than others. The economics of the public sector is one example, since where markets fail, some kind of regulatory or government programme is the remedy. Much environmental economics concerns externalities or "public bads".

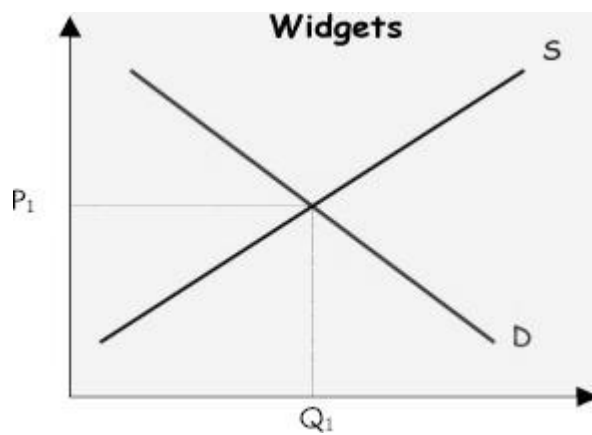
Policy options include regulations that reflect cost-benefit analysis or market solutions that change incentives, such as emission fees or redefinition of property rights. Much of economics is positive, seeking to describe and predict economic phenomena. Normative economics seeks to identify what economies ought to be like.

Welfare economics is a normative branch of economics that uses microeconomic techniques to simultaneously determine the allocative efficiency within an economy and the income distribution associated with it. It attempts to measure social welfare by examining the economic activities of the individuals that comprise society.

## 6.3 Market Changes

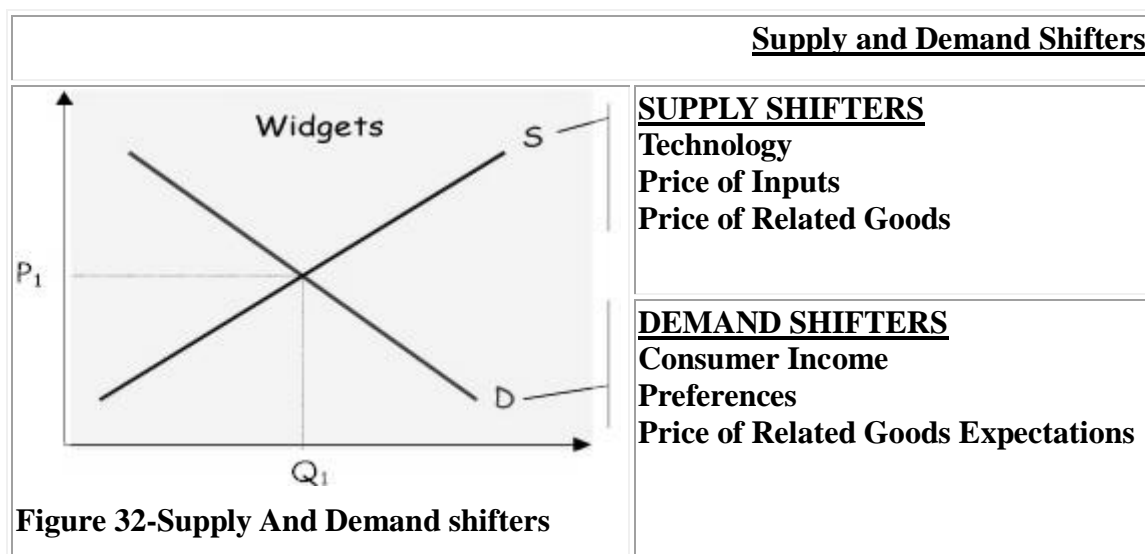
If only price and quantity are allowed to change, the interaction of buyers and sellers in markets results in an equilibrium price and quantity. The relationship between price and quantity for both buyers and sellers of widgets is represented by the supply and demand curves below. ***All other influences on market participants held constant***, an equilibrium price and quantity will emerge!

Equilibrium price and quantity in the widget market are shown as  $P_1$  and  $Q_1$  on the graph below.



**Figure 31-Market changes**

However, there are factors other than price that influence buying and selling behavior. As a review, several of the factors that influence both buyers (demand) and sellers (producers or suppliers) are shown on the graph below.

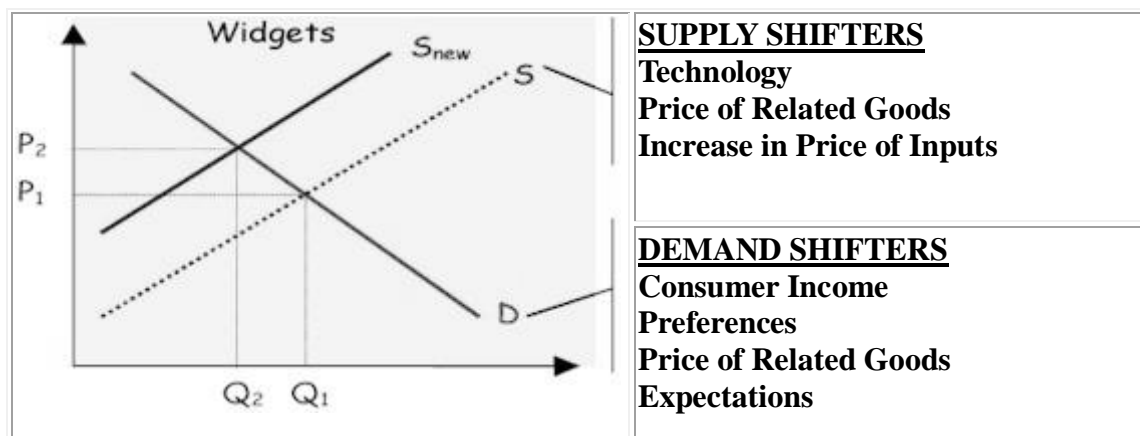


**Figure 32-Supply And Demand shifters**

If any of these factors, previously held constant, change (represented as a shift in the demand or supply curve) then equilibrium price and quantity change. For example, suppose a sharp increase in labor costs hit the widget market. A change in input prices directly impacts the supply side of the market, shifting the supply curve upward (reflecting higher costs to produce each unit of output). See graph below.

What happens to price and quantity? Due to higher costs, producers are no longer willing to offer  $Q_1$  and price  $P_1$ . As producers increase the price of widgets, consumers purchase less widgets (movement along a demand curve since consumers are only responding to price change). A new equilibrium will be reached at  $Q_2$  and  $P_2$ . We can conclude the price of widgets will increase and the quantity bought and sold in the market will decrease.



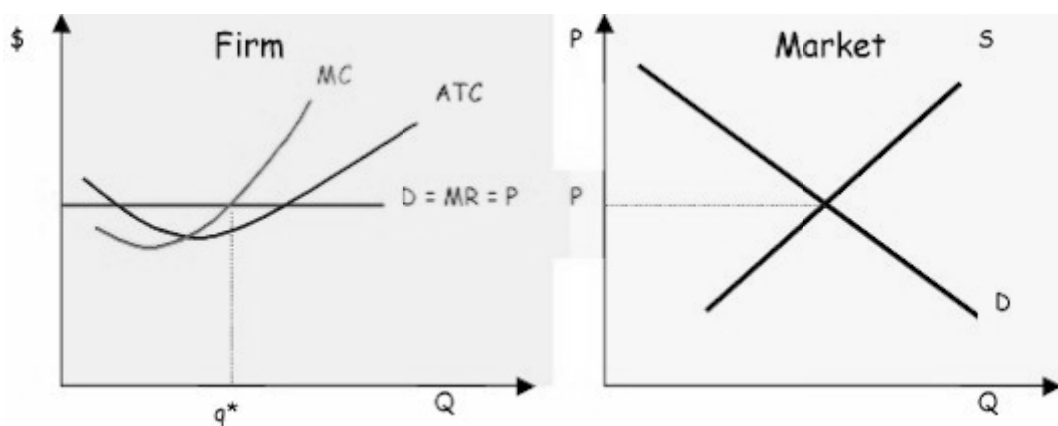


## 6.4 Perfect Competition

Because of the characteristics of a competitive market (many firms producing similar products), an individual firm must take market prices as given. Firms in a competitive market have very little control over what price they receive for their output. Since the firm's output is small relative to the total sold in the market, the firm's output decision will not significantly influence market prices. If a firm tried to charge a price higher than the market price, no one would purchase its output (why would buyers pay a higher price for the same good?).

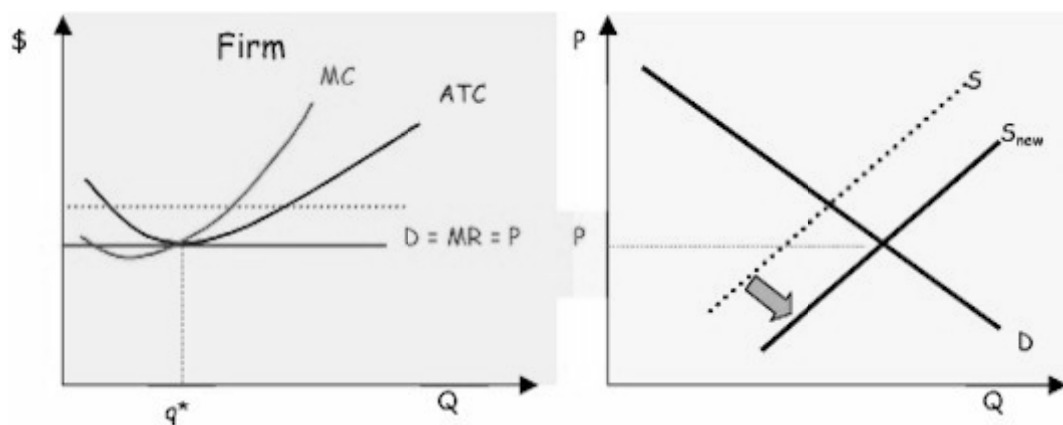
Examine the graph below. Notice that the price in the market,  $P$ , is what the firm can receive for its output. The graph also indicates that  $P$  is also equal to the firm's demand curve  $D$ . Recall that a demand curve indicates how much buyers are willing to pay for different quantities of output. Since the firm can sell any given quantity of output for this price, price is also equal to  $D$  and  $MR$ .

Given costs and market prices, this firm will produce  $q^*$  level of output ( $MR=MC$ ). Since  $P$  is greater than  $ATC$  at the profit maximizing output level, this firm is making an economic rent (profit).



### Long-run Dynamics of Competitive Markets:-

The graph above indicated that the individual competitive firm is making a profit (returns above costs). Economic rent will not last in a competitive market. Why? One explanation is that potential firms will realize a profit opportunity exists and will enter the market (one of the characteristics of a perfectly competitive market is relatively easy entry and exit from the market). This potential response is shown on the graph below. As more firms enter this market, the market supply curve increases (shifts to the right). Note that as market prices fall, economic rents dissipate and approach zero.



monopolist exercises some control over the price it can charge for its output. In fact the monopolist's demand curve for its output is the market demand curve.

The following demand curve shows that if the monopoly charges \$100 for its output, consumers would purchase 10 units of output. If the monopolist wanted to sell 11 units of output, the monopolist would have to lower price.

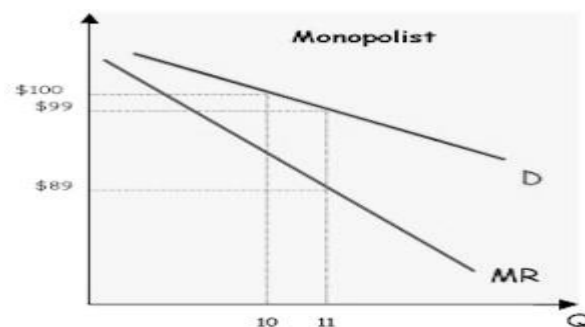
## 6.5 Monopolist's Marginal Revenue.

Suppose this monopolist lowered price from \$100 to \$99 in order to sell an additional unit of output (10 to 11). The monopolist only receives an extra \$89 in revenue rather than \$99. The monopolist

receives \$99 extra dollars from the 11<sup>th</sup> unit sold. However, since the monopolist now charges \$99 for every unit of output, the monopolist had to sacrifice \$1 in revenue on the 10 units that consumers were willing to pay \$100. Thus, the additional revenue the monopolist receives is \$89 (+\$99 - \$10).

- As a double check, total revenue when price = \$100 is \$1,000 (10 x \$100). Total revenue when price is lowered to \$99 is \$1,089 (11 x \$99). The difference in total revenue is marginal revenue and is equal to \$89.

From the above, we can see that the monopolist marginal revenue is less than price. For a perfectly competitive firm, price is equal to marginal revenue (see graph below).

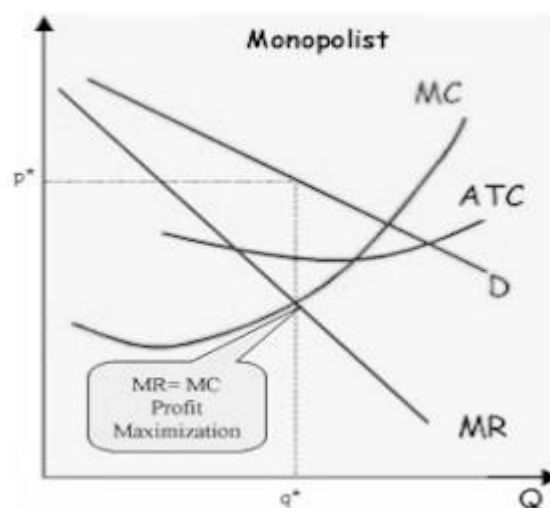


**Figure 33-Monopolist Revenue**

### Profit Maximizing Output Level for Monopolist

The profit maximizing rule for the monopolist is no different than from any other firm. The monopolist will continue to produce output as long as the additional revenue received is greater than or equal to the additional cost to produce that unit. On the graph below, profits are maximized at  $q^*$  output level.

The monopolist will use the demand curve to establish the price it will charge for output, shown as  $p^*$  on graph below.



## 6.6 Summary



Thus Monopolistic competition, also called competitive market, where there are a large number of firms, each having a small proportion of the market share and slightly differentiated products. Oligopoly, in which a market is dominated by a small number of firms that together control the majority of the market share. Duopoly, a special case of an oligopoly with two firms. Oligopsony, a market, where many sellers can be present but meet only a few buyers. Monopoly, where there is only one provider of a product or service. Natural monopoly, a monopoly in which economies of scale cause efficiency to increase continuously with the size of the firm. A firm is a natural monopoly if it is able to serve the entire market demand at a lower cost than any combination of two or more smaller, more specialized firms. Monopsony, when there is only one buyer in a market.

## 6.7 Key words

Monopoly, oligopoly, oligopsony, Duopoly, Monopsony, Monopolistic Competition, Perfect competition

## 6.8 Questions for Discussion

1. Explain the basic market structure with relevant examples.
2. Describe the concept of Monopolist's Marginal Revenue.
3. Draw the graph and explain the perfect Competition.

## 6.9 Suggested Reading

1. G.S. Gupta – Managerial Economics Tata Mc Graw Hill.
2. Varshney and Maheswari - Managerial Economics, Sultan Chand & Sons.
3. Mehta P.L. - Managerial Economics Sultan Chand & Sons.
4. Jocl Dean – Managerial Economics Prentice Hall.
5. Rengarajan L – Principles of Macro Economics, Tata McGra Hill.

# **LESSON**

## **7**

### **Methods of Pricing**

#### **Contents**

**7.0 Aim and Objective**

**7.1 Introduction**

**7.2 Types of Pricing**

**7.3 Approaches of Pricing**

**7.4 Pricing tactics**

**7.5 Value Based Pricing**

**7.6 Summary**

### **7.7 Key Words**

### **7.8 Questions for Discussion**

### **7.9 Suggested Reading**

## **7.0 Aim and Objective**

In this lesson we shall understand the Methods of Pricing. After studying this, you will be able to:

1. Discuss the Meaning, definition of pricing.
2. Describe the concept of pricing ,approaches and its types.

## **7.1 Introduction**

Pricing is the process of determining what a company will receive in exchange for its products. Pricing factors are manufacturing cost, market place, competition, market condition, and quality of product. Pricing is also a key variable in microeconomic price allocation theory. Pricing is a fundamental aspect of financial modeling and is one of the four Ps of the marketing mix. The other three aspects are product, promotion, and place. Price is the only revenue generating element amongst the four Ps, the rest being cost centers.

Pricing is the manual or automatic process of applying prices to purchase and sales orders, based on factors such as: a fixed amount, quantity break, promotion or sales campaign, specific vendor quote, price prevailing on entry, shipment or invoice date, combination of multiple orders or lines, and many others. Automated systems require more setup and maintenance but may prevent pricing errors. The needs of the consumer can be converted into demand only if the consumer has the willingness and capacity to buy the product. Thus pricing is very important in marketing.

## **7.2 Types of Pricing**

### **Effective price**

The effective price is the price the company receives after accounting for discounts, promotions, and other incentives.

### **Line Pricing**

Line Pricing is the use of a limited number of prices for all product offerings of a vendor. This is a

tradition started in the old five and dime stores in which everything cost either 5 or 10 cents. Its underlying rationale is that these amounts are seen as suitable price points for a whole range of products by prospective customers. It has the advantage of ease of administering, but the disadvantage of inflexibility, particularly in times of inflation or unstable prices.

### **Loss leader**

A loss leader is a product that has a price set below the operating margin. These results in a loss to the enterprise on that particular item in the hope that it will draw customers into the store and that some of those customers will buy other, higher margin items.

### **Promotional pricing**

Promotional pricing refers to an instance where pricing is the key element of the marketing mix.

### **Price/quality relationship**

The price/quality relationship refers to the perception by most consumers that a relatively high price is a sign of good quality. The belief in this relationship is most important with complex products that are hard to test, and experiential products that cannot be tested until used (such as most services). The greater the uncertainty surrounding a product, the more consumers depend on the price/quality hypothesis and the greater premium they are prepared to pay. The classic example is the pricing of Twinkies, a snack cake which was viewed as low quality after the price was lowered. Excessive reliance on the price/quantity relationship by consumers may lead to an increase in prices on all products and services, even those of low quality, which causes the price/quality relationship to no longer apply.

### **Premium pricing**

Premium pricing (also called prestige pricing) is the strategy of consistently pricing at, or near, the high end of the possible price range to help attract status-conscious consumers. Examples of companies which partake in premium pricing in the marketplace include Rolex and Bentley. People will buy a premium priced product because:

They believe the high price is an indication of good quality;

They believe it to be a sign of self worth - "They are worth it;" it authenticates the buyer's success and status; it is a signal to others that the owner is a member of an exclusive group;

They require flawless performance in this application - The cost of product malfunction is too high to buy anything but the best - example : heart pacemaker.

### **Demand-based pricing**

Demand-based pricing is any pricing method that uses consumer demand - based on perceived value - as the central element. These include: price skimming, price discrimination and yield management, price points, psychological pricing, bundle pricing, penetration pricing, price lining, value-based pricing, geo and premium pricing. Pricing factors are manufacturing cost, market place, competition, market condition, quality of product.

### **Multidimensional pricing**

Multidimensional pricing is the pricing of a product or service using multiple numbers. In this practice, price no longer consists of a single monetary amount (e.g., sticker price of a car), but rather consists of various dimensions (e.g., monthly payments, number of payments, and a down payment). Research has shown that this practice can significantly influence consumers' ability to understand and process price information.

Price-Quality Effect Buyers are less sensitive to price the more that higher prices signal higher quality. Products for which this effect is particularly relevant include: image products, exclusive products, and products with minimal cues for quality. Expenditure Effect Buyers are more price

sensitive when the expense accounts for a large percentage of buyers' available income or budget.

**End-Benefit Effect** The effect refers to the relationship a given purchase has to a larger overall benefit, and is divided into two parts: **Derived demand:** The more sensitive buyers are to the price of the end benefit, the more sensitive they will be to the prices of those products that contribute to that benefit. **Price proportion cost:** The price proportion cost refers to the percent of the total cost of the end benefit accounted for by a given component that helps to produce the end benefit (e.g., think CPU and PCs). The smaller the given components share of the total cost of the end benefit, the less sensitive buyers will be to the component's price.

**Shared-cost Effect** The smaller the portion of the purchase price buyers must pay for themselves, the less price sensitive they will be. **Fairness Effect** Buyers are more sensitive to the price of a product when the price is outside the range they perceive as "fair" or "reasonable" given the purchase context. **The Framing Effect** Buyers are more price sensitive when they perceive the price as a loss rather than a forgone gain, and they have greater price sensitivity when the price is paid separately rather than as part of a bundle.

## 7.3 Approaches of Pricing

Pricing as the most effective profit lever. Pricing can be approached at three levels.

1. The industry
2. Market
3. Transaction level.
  - Pricing at the industry level focuses on the overall economics of the industry, including supplier price changes and customer demand changes.
  - Pricing at the market level focuses on the competitive position of the price in comparison to the value differential of the product to that of comparative competing products.
  - Pricing at the transaction level focuses on managing the implementation of discounts away from the reference, or list price, which occur both on and off the invoice or receipt.

## 7.4 Pricing tactics

Micromarketing is the practice of tailoring products, brands (microbrands), and promotions to meet the needs and wants of microsegments within a market. It is a type of market customization that deals with pricing of customer/product combinations at the store or individual level.

### **Pricing mistakes:-**

Many companies make common pricing mistakes. Bernstein's article "Supplier Pricing Mistakes" outlines several which include:

1. Weak controls on discounting

2. Inadequate systems for tracking competitor selling prices and market share
  3. Cost-Up pricing
  4. Price increases poorly executed
  5. Worldwide price inconsistencies
  6. Paying sales representatives on dollar volume vs. addition of profitability measures
- Prices, or the historical price.

## 7.5 Value based Pricing

The goal of value-based pricing is to align price with value delivered. Price for any individual customer can be customized to reflect the specific value delivered. Examples could include metrics such as number of users and the value per users, number of annual transactions and the value per transaction, size of revenues and the impact on revenues, cost savings, or other measurements. Value based pricing is intended to make companies become more competitive and more profitable than using simpler pricing methods. It can also be used in product development and product management to configure products to maximize value for specific customers.

Value-based pricing is dependent upon an understanding of how customers measure value, through careful evaluation of customer operations. Survey methods are sometimes used to determine the value, and therefore the willingness to pay, a customer attributes to a product or a service. Frameworks for value-based pricing include Economic Value Estimation, Relative Attribute Positioning, Van Westendorp Price Sensitivity Meter, Conjoint Analysis and Navetti Ratio To Complete. Another value pricing method uses Customer Value Research, which is Bernstein & Macias' method for gaining the customer's perception of value through the use of both qualitative and quantitative research methods.

**Time-based pricing** is a special case of price discrimination in which producers charge different rates for a given good or service depending on the time, day, month, and so on. For instance, it is common practice in the tourism industry to charge higher prices during the peak season, or during special-event periods and only charge the operating costs of the establishment during the offpeak season. Investments for business expansion in this case is funded out of profit earned during the peak season. Another common example of this pricing strategy is found in transportation sectors, which may charge higher prices during rush-hours.

**Psychological pricing** or price ending is a marketing practice based on the theory that certain prices have a psychological impact. The retail prices are often expressed as "odd prices": a little less than a round number, e.g. \$19.99 or \$2.98. The theory is this drives demand greater than would be expected if consumers were perfectly rational. Psychological pricing is one cause of price points.

## 7.6 Summary

Thus Pricing is the manual or automatic process of applying prices to purchase and sales orders, based on factors such as: a fixed amount, quantity break, promotion or sales campaign, specific vendor quote, price prevailing on entry, shipment or invoice date, combination of multiple orders or lines, and many others. Automated systems require more setup and maintenance but may prevent pricing errors. The needs of the consumer can be converted into demand only if the consumer has the willingness and capacity to buy the product. There are various kinds of Pricing in practice.

## 7.7 Key words

Pricing, Effective, Value, Time based, Demand push, Loss leader, Psychological pricing, Promotional pricing, Premium Pricing.

## 7.8 Questions for Discussion

1. Explain the various types of pricing.
2. Describe the Pricing approaches and tactics involved in pricing methods.

## 7.9 Suggested Reading

1. G.S. Gupta – Managerial Economics Tata Mc Graw Hill.
2. Varshney and Maheswari - Managerial Economics, Sultan Chand & Sons.
3. Mehta P.L. - Managerial Economics Sultan Chand & Sons.
4. Joel Dean – Managerial Economics Prentice Hall.
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# **LESSON**

## **8**

### **Profit Analysis**

#### **Contents**

**8.0 Aim and Objective**

**8.1 Introduction**

**8.2 Types of Profit**

**8.3 Maximizing Profit**

**8.4 Cost-Volume-Profit Analysis**



### **8.5 Value Based Pricing**

### **8.6 Summary**

### **8.7 Key Words**

### **8.8 Questions for Discussion**

### **8.9 Suggested Reading**

## **8.0 Aim and Objective**

In this lesson we shall understand the profit analysis. After studying this, you will be able to:

1. Discuss the Meaning, definition of profit.
2. Describe the concept of profit analysis, cost volume-profit analysis.

## **8.1 Introduction**

In economics, the term profit has two related but distinct meanings. Normal profit represents the total opportunity costs (both explicit and implicit) of a venture to an entrepreneur or investor, whilst economic profit (also abnormal, pure, supernormal or excess profits, or simply profit) is, in neoclassical economics at least, the difference between a firm's total revenue and all costs, including normal profit. In classical economics (economic) profit is the return to the employer of capital stock (such as machinery, factories, and ploughs) in any productive pursuit involving labor. These two definitions are actually the same. In both instances economic profit is the return to an entrepreneur or a group of entrepreneurs. Economic profit is thus contrasted with economic interest which is the return to an owner of capital stock or money or bonds. A related concept is that of economic rent.

## **8.2 Types of Profit**

Types of profit have been referenced, including social profit (related to externalities). It is not to be confused with profit in finance or accounting, which is equal to revenue minus only explicit costs, or super profit, a concept in Marxian economic theory.

### **Normal profit**

Normal profit is the sum of explicit and implicit costs, and so not a component of economic profit at all. It represents the opportunity cost for enterprise, since the time that the owner spends running the firm could be spent on running another firm. The enterprise component of normal profit is thus the profit that a business owner considers necessary to make running the business worth his or her while i.e. it is comparable to the next best amount the entrepreneur could earn doing another job. Particularly if enterprise is not included as a factor of production, it can also be viewed a return to capital for investors including the entrepreneur, equivalent to the return the capital owner could have expected (in a safe investment), plus compensation for risk.

Only normal profits arise in circumstances of perfect competition when long run economic equilibrium is reached; there is no incentive for firms to either enter or leave the industry.

### **Economic profit**

An economic profit arises when revenue exceeds the opportunity cost of inputs, noting that these costs include the cost of equity capital that is met by normal profits.

In principle there are three kind of abnormal profit:

#### **1. Monopoly rent**

#### **2. Resource rent**

#### **3. Intra marginal rent**

All enterprises can be stated in financial capital of the owners of the enterprise. The economic profit may include an element in recognition of the risks that an investor takes. It is often uncertain, because of incomplete information, whether an enterprise will succeed or not. This extra risk is included in the minimum rate of return that providers of financial capital require, and so is treated as still a cost within economics. The size of that return is commensurate with the riskiness associated with each type of investment, as per the risk-return spectrum.

Economic profit does not occur in perfect competition in long run equilibrium; if it did, there would be an incentive for new firms to enter the industry until there was no longer any profit. Once risk is accounted for, long-lasting economic profit is thus viewed as the result of constant cost-cutting and performance improvement ahead of industry competitors, or an inefficiency caused by monopolies or some form of market failure.

In a single-goods case, a positive economic profit happens when the firm's average cost is less than the price of the product or service at the profit-maximizing output. The economic profit is equal to the quantity of output multiplied by the difference between the average cost and the price.

### **Other applications**

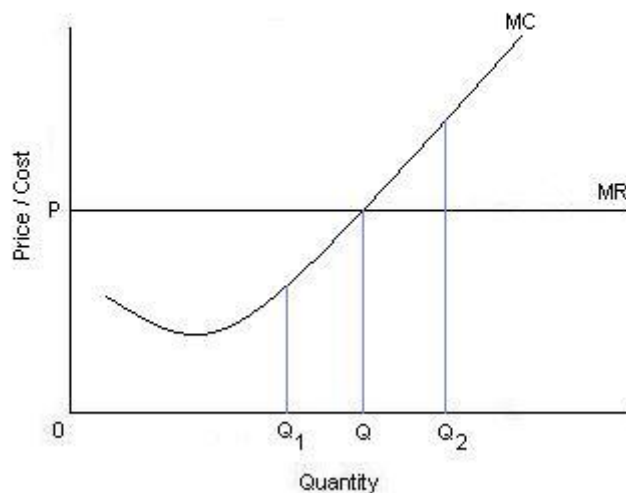
The social profit from a firm's activities is the normal profit plus or minus any externalities that occur in its activity. A firm may report relatively large monetary profits, but by creating negative externalities their social profit could be relatively small.

Profitability is a term of economic efficiency. Mathematically it is a relative index – a fraction with profit as numerator and generating profit flows or assets as denominator.

## **8.3 Maximizing Profits**

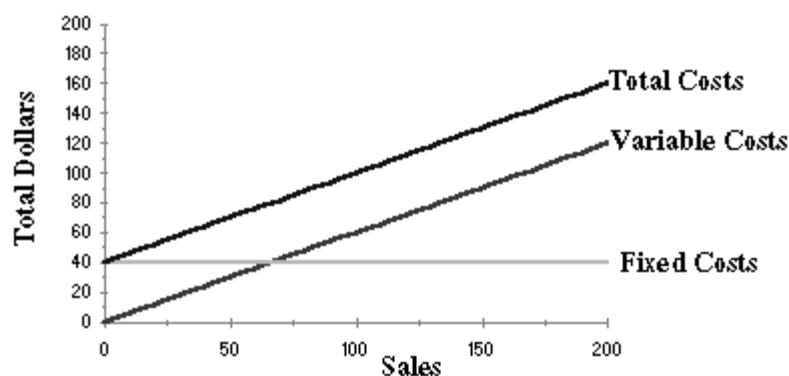
## 8.4 Cost-Volume-Profit Analysis

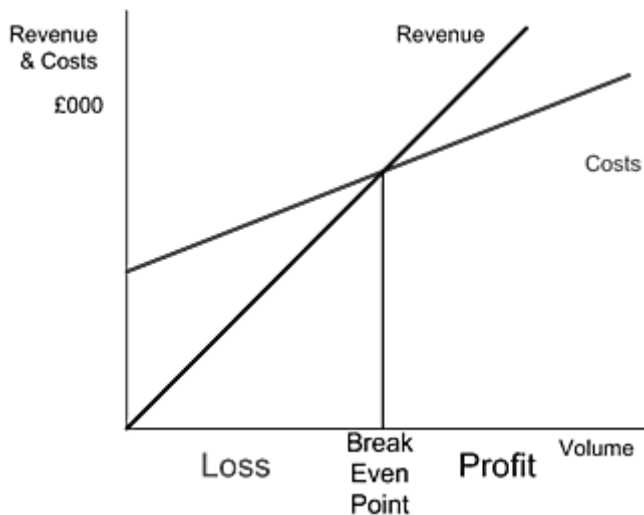
**Profit-maximising output of a firm in perfect competition**



Profit is defined as the difference in total revenue, TR, and total cost, TC. A firm maximizes profit by operating at the point where the distance between the total revenue curve and total cost curve is at its maximum. This point occurs where the slopes of the two functions are equal. The slope of the TR function is marginal revenue, MR, while the slope of the total cost function is marginal costs, MC. Thus a profit maximizing firm will produce that quantity of output at which marginal revenue, MR, equals marginal cost, MC. This rule applies regardless of market structure. The only "special" case is a firm operating in a perfectly competitive market. Such a firm operates where price, P, equals MC. However, this is not a true exception to the rule because an assumption of PC is that all firms face a perfectly elastic demand curve. With a perfectly elastic demand curve there is no separate margin revenue curve - MR equals demand and equals price. So with a PC firm  $MR = D = P$ .

Cost-Volume-profit(CVP), in managerial economics is a form of cost accounting. It is a simplified model, useful for elementary instruction and for short-run decisions.





**Figure 34-Cost-Volume-Profit Graph**

Cost-volume-profit (CVP) analysis expands the use of information provided by breakeven analysis. A critical part of CVP analysis is the point where total revenues equal total costs (both fixed and variable costs). At this breakeven point (BEP), a company will experience no income or loss. This BEP can be an initial examination that precedes more detailed CVP analysis.

Cost-volume-profit analysis employs the same basic assumptions as in breakeven analysis. The assumptions underlying CVP analysis are:

The behavior of both costs and revenues is linear throughout the relevant range of activity. (This assumption precludes the concept of volume discounts on either purchased materials or sales.) Costs can be classified accurately as either fixed or variable. Changes in activity are the only factors that affect costs. All units produced are sold (there is no ending finished goods inventory). When a company sells more than one type of product, the sales mix (the ratio of each product to total sales) will remain constant.

The components of Cost-Volume-Profit Analysis are:

1. Level or volume of activity
2. Unit Selling Prices
3. Variable cost per unit
4. Total fixed costs
5. Sales mix
6. CVP assumes the following:
  7. Constant sales price;
  8. Constant variable cost per unit;
  9. Constant total fixed cost;
  10. Constant sales mix;
  11. Units sold equal units produced.

These are simplifying, largely linearizing assumptions, which are often implicitly assumed in elementary discussions of costs and profits. In more advanced treatments and practice, costs and revenue are nonlinear and the analysis is more complicated, but the intuition afforded by linear CVP remains basic and useful.

One of the main Methods of calculating CVP is Profit volume ratio: which is  $(\text{contribution} / \text{sales}) \times 100 =$  this gives us profit volume ratio.

contribution stands for Sales minus variable costs.

Therefore it gives us the profit added per unit of variable costs.

CVP, demonstrating relation of Total Costs, Sales, and Profit and Loss.

The assumptions of the CVP model yield the following linear equations for total costs and total revenue (sales):

These are linear because of the assumptions of constant costs and prices, and there is no distinction between Units Produced and Units Sold, as these are assumed to be equal. Note that when such a chart is drawn, the linear CVP model is assumed, often implicitly.

In symbols:

where

**TC = Total Costs**

**TFC = Total Fixed Costs**

**V = Unit Variable Cost (Variable Cost per Unit)**

**X = Number of Units**

**TR = S = Total Revenue = Sales**

**P = (Unit) Sales Price**

Profit is computed as  $TR - TC$ ; it is a profit if positive, a loss if negative.

**Break down:-**

Costs and Sales can be broken down, which provide further insight into operations.

Decomposing Total Costs as Fixed Costs plus Variable Costs.

One can decompose Total Costs as Fixed Costs plus Variable Costs:

Decomposing Sales as Contribution plus Variable Costs.

Following a matching principle of matching a portion of sales against variable costs, one can decompose Sales as Contribution plus Variable Costs, where contribution is "what's left after deducting variable costs". One can think of contribution as "the marginal contribution of a unit to the profit", or "contribution towards offsetting fixed costs".

$C = \text{Unit Contribution (Margin)}$

Profit and Loss as Contribution minus Fixed Costs.

Subtracting Variable Costs from both Costs and Sales yields the simplified diagram and equation for Profit and Loss.

In symbols:

Diagram relating all quantities in CVP.

These diagrams can be related by a rather busy diagram, which demonstrates how if one subtracts Variable Costs, the Sales and Total Costs lines shift down to become the Contribution and Fixed Costs lines. Note that the Profit and Loss for any given number of unit sales is the same, and in particular the break-even point is the same, whether one computes by  $\text{Sales} = \text{Total Costs}$  or as  $\text{Contribution} = \text{Fixed Costs}$ . Mathematically, the contribution graph is obtained from the sales graph by a shear, to be precise, where V are Unit Variable Costs.

**Applications**

CVP simplifies the computation of breakeven in break even analysis, and more generally allows simple computation of Target Income Sales. It simplifies analysis of short run trade-offs in operational decisions.

**Limitations**

CVP is a short run, marginal analysis: it assumes that unit variable costs and unit revenues are constant, which is appropriate for small deviations from current production and sales, and assumes a neat division between fixed costs and variable costs, though in the long run all costs are variable.

For longer-term analysis that considers the entire life-cycle of a product, one therefore often prefers activity-based costing or throughput accounting.

## 8.5 Perfect Competition, Profit Analysis

A perfectly competitive firm produces the profit-maximizing quantity of output that generates the highest level of profit. This profit approach is one of three methods that used to determine the profit-maximizing quantity of output. The other two methods involve a comparison of total revenue and total cost or a comparison of marginal revenue and marginal cost.

Perfect competition is a market structure characterized by a large number of small firms producing identical products with perfect resource mobility and perfect knowledge. These conditions mean a perfectly competitive firm faces a horizontal, or perfectly elastic, demand curve. With this horizontal demand curve, marginal revenue is equal to average revenue, both of which are also equal to price.

Comparable to any profit-maximizing firm, a perfectly competitive firm produces the quantity of output in the short run that generates the maximum difference between total revenue with total cost, which is economic profit. At this production level, the firm cannot increase profit by changing the level of production. The analysis of profit can be achieved through a table of numbers or by a comparison of total revenue and total cost curves.

Measure of a company's financial performance based on the residual wealth calculated by deducting cost of capital from its operating profit (adjusted for taxes on a cash basis). (Also referred to as "economic profit".)

**The formula for calculating EVA is as follows:**

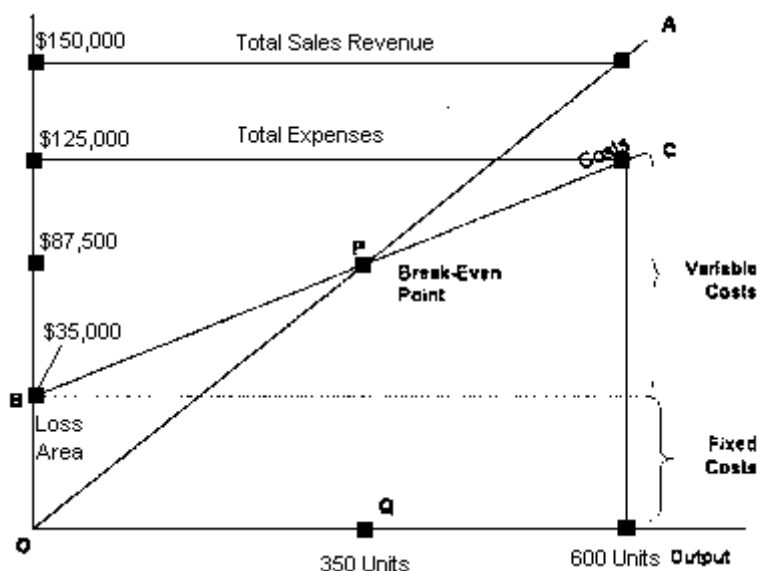
**= Net Operating Profit After Taxes (NOPAT) - (Capital \* Cost of Capital)**

The relationships among revenue, cost, profit and volume can be expressed graphically by preparing a cost-volume-profit (CVP) graph or break even chart. A CVP graph highlights CVP relationships over wide ranges of activity and can give managers a perspective that can be obtained in no other way.

Preparing a CVP Graph or Break-Even Chart:

In a CVP graph some times called a break even chart unit volume is commonly represented on the horizontal (X) axis and dollars on the vertical (Y) axis. Preparing a CVP graph involves three steps.

1. Draw a line parallel to the volume axis to present total fixed expenses. For example we assume total fixed expenses \$35,000.



2. Choose some volume of sales and plot the point representing total expenses (fixed and variable) at the activity level you have selected. For example we select a level of 600 units. Total expenses at that activity level is as follows:

Fixed Expenses	\$35,000
Variable Expenses (150×600)	\$90,000
	-----
Total Expenses	\$125,000
	=====

After the point has been plotted, draw a line through it back to the point where the fixed expenses line intersects the dollars axis.

3. Again choose some volume of sales and plot the point representing total sales dollars at the activity level you have selected. For example we have chosen a volume of 600 units. sales at this activity level are \$150,000 (600units × \$250) draw a line through this point back to the origin. The breakeven point is where the total revenue and total expense lines cross. See the graph and note that break even point is at 350 units. It means when the company sells 350 units the profit is zero. When the sales are below the break even the company suffers a loss. When sales are above the breakeven point, the company earns a profit and the size of the profit increases as sales increase.

## 8.6 Summary

Thus term profit has two related but distinct meanings. Normal profit represents the total opportunity costs (both explicit and implicit) of a venture to an entrepreneur or investor, whilst economic profit (also abnormal, pure, supernormal or excess profits, or simply profit) is, in neoclassical economics at least, the difference between a firm's total revenue and all costs, including normal profit. In classical economics (economic) profit is the return to the employer of capital stock (such as machinery, factories, and ploughs) in any productive pursuit involving labor. These two definitions are actually the same. In both instances economic profit is the return to an entrepreneur or a group of entrepreneurs. Economic profit is thus contrasted with economic interest which is the

return to an owner of capital stock or money or bonds. A related concept is that of economic rent.

## 8.7 Keywords

Explicit, Implicit Profit, Normal Profit, Economist Profit, Profit analysis, Break even, Cost-Volume-Profit Analysis

## 8.8 Questions for Discussion

1. Describe the importance of Profit analysis.
2. Discuss the Cost-Volume-Profit analysis with graphical presentation.
3. Explain the concept of Maximizing Profit.

## 8.9 Suggested Reading

1. G.S. Gupta – Managerial Economics Tata Mc Graw Hill.
2. Varshney and Maheswari - Managerial Economics, Sultan Chand & Sons.
3. Mehta P.L. - Managerial Economics Sultan Chand & Sons.
4. Joel Dean – Managerial Economics Prentice Hall.
5. Rengarajan L – Principles of Macro Economics, Tata McGraw Hill.

# LESSON



# 9

## Investment Analysis

### Contents

**9.0 Aim and Objective**

**9.1 Introduction**

**9.2 Investment Flow**

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### 9.0 Aim and Objective

In this lesson we shall understand the Investment analysis. After studying this, you will be able to:

1. Discuss the Meaning, definition of Investment.
2. Describe the concept of Investment analysis, Breakeven Investment.

### 9.1 Introduction

Investment is the change in capital stock during a period. Consequently, unlike capital, investment

is a flow term and not a stock term. This means that while capital is measured at a point in time, while investment can only be measured over a period of time. If we ask "what is capital right now?" we might get an answer along the lines of \$10 trillion. But if we ask "what is investment right now?" This cannot be answered. The quantity of a flow always depends on the period in consideration. Thus, we can answer "what is investment this month?" (and might be told it is \$10 million) or "what is investment this year?" (and might be told \$1 billion).

## 9.2 Investment Flow

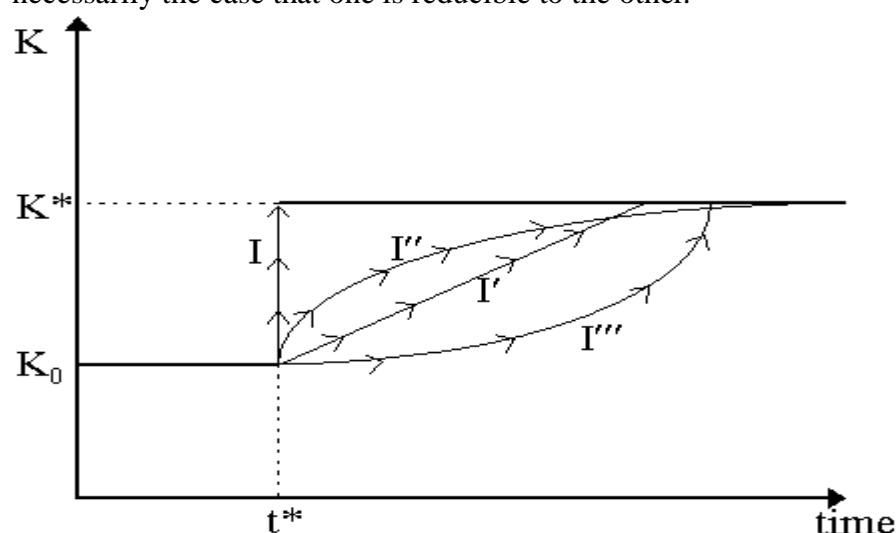
We can calculate the investment flow in a period as the difference between the capital stock at the end of the period and the capital stock at the beginning of the period. Thus, the investment flow at time period  $t$  can be defined as:

$$I_t = K_t - K_{t-1}$$

where  $K_t$  is the stock of capital at the end of period  $t$  and  $K_{t-1}$  is the stock of capital at the end of period  $t-1$  (and thus at the beginning of period  $t$ ).

How is the theory of investment different from the theory of capital? If all capital is circulating capital, so that it is completely used up within a period, then no capital built up during the previous period can be brought over into next period. In this special case, the theory of capital and the theory of investment become one and the same thing.

With fixed capital, the story is different -- and more complicated as there seems to be two decisions that must be addressed: the amount of capital and the amount of investment. These are different decisions. One is about the desired level of capital stock. The other is about the desired rate of investment flow. The decisions governing one will inevitably affect the other, but it is not necessarily the case that one is reducible to the other.



**Figure 35-Investment flow**

There are effectively two ways of thinking about investment. At the risk of annoying some people, we shall refer to these as the "Hayekian" and "Keynesian" perspectives. The Hayekian perspective conceives of investment as the adjustment to equilibrium and thus the optimal amount of investment is effectively a decision on the optimal speed of adjustment. A firm may decide it needs

a factory (the "capital stock" decision), but its decision on how fast to build it, how much to spend each month building it, etc. -- effectively, the "investment" decision -- is a separate consideration. Naturally, the capital decision influences the investment decision: a firm which has \$10 billion of capital and decides that it needs \$15 billion of capital, therefore requires investment of \$5 billion. But if this adjustment can be done "instantly", then there is really no actual investment decision to speak of. We just change the capital stock automatically. The capital decision governs everything. However, if for some reason, instant adjustment is not possible, then the investment story begins to matter. How do we distribute this \$5 billion adjustment? Do we invest in an even flow over time, e.g. \$1 billion this week, another \$1 billion next week, and so on? Or do we invest in descending increments, e.g. invest \$1 billion this week, \$500 million next week, \$300 million the week after that, etc. and approach the \$5 billion mark asymptotically? Or should we invest in ascending increments, e.g. \$10 million this week, \$100 million next week, etc.? Delivery costs, changing prices of suppliers, fluctuating interest rates and financing costs, and other such considerations, make some adjustment processes more desirable than others. These different patterns of "approaching" the desired \$5 billion adjustment in capital stock and the considerations that enter into determining which adjustment pattern to follow is what lies at the heart of the Hayekian approach to investment theory.

The Hayekian approach is shown heuristically in Figure 1, where we start at capital stock  $K_0$  and then, at  $t^*$ , we suddenly change our desired capital stock from  $K_0$  to  $K^*$ . Figure 1 depicts four alternative investment paths from  $K_0$  towards  $K^*$ . Path I represents "instant" adjustment type of investment (i.e. all investment happens at once at  $t^*$  and no more investment afterwards). Path I? represents an "even flow" adjustment path, with investment happening at a steady rate after  $t^*$  until  $K^*$  is reached. Path I? ? is the asymptotic investment path (gradually declining investment), while path I? ? ? depicts a gradually increasing investment path. All paths, except for the first instant one, imply that "investment" flows will be happening during the periods that follow  $t^*$ .

Figure 1 - Adjustment Paths towards  $K^*$

The "Keynesian" approach places far less emphasis on the "adjustment" nature of investment. Instead, they have a more "behavioral" take on the investment decision. Namely, the Keynesian approach argues that investment is simply what capitalists "do". Every period, workers consume and capitalists "invest" as a matter of course. This leads Keynesians to underplay the capital stock decision. This does not mean that Keynesians ignore the fact that investment is defined as a change in capital stock. Rather, they believe that the main decision is the investment decision; the capital stock just "follows" from the investment patterns rather than being an important thing that needs to be "optimally" decided upon beforehand. Thus, when businesses make investment decisions, they do not have an "optimal capital stock" in the back of their mind. They are more concerned as to what is the optimal amount of investment for some particular period. For Keynesians, then, optimal investment not about "optimal adjustment" but rather about "optimal behavior".

In economics, the "Keynesian" perspective has a longer history than the "Hayekian" one precisely because so many of the early economists, from Turgot (1766) onwards, concentrated on circulating capital rather than fixed capital. With circulating capital, the question of the "optimal capital stock" cannot come up; there is only the "optimal investment" decision (i.e. capital per period). The first theory of investment we consider here, Irving Fisher's (1930) theory, follows these lines. Fisher's theory was originally conceived as a theory of capital, but as he assumes all capital is circulating, then it is just as proper to conceive of it as a theory of investment.

John Maynard Keynes (1936) followed suit. Or, rather, in his theory, Keynes made much of the investment decision but was quiet about the underlying fixed capital. As such, Keynesian macroeconomics swept the issue of the changing capital stocks under the rug -- where it stayed until it was dug up by growth theorists many years later. Modern Neo-Keynesian and Post Keynesian theorists have attempted to insert capital stocks into Keynesian theory in order to obtain a "more complete" macroeconomic theory, but have generally adhered to Keynes's strategy of placing the investment decision as the centrepiece and subordinating capital stock considerations to it.

Fixed capital, and thus the optimal capital stock, was an important feature in the work of John Bates Clark (1899), Frank Ramsey (1928) and Frank H. Knight (1936, 1946). Or, properly speaking, these theorists embraced the idea of a "permanent fund" of capital in the economy, and thus were naturally led to ask questions about its optimal "size". This was effectively what Neoclassical theorists such as Dale W. Jorgensen (1963) picked up in their theories. However, while elaborate on the determination of the optimal capital stock, these theories tended to skimp on the determination of the adjustment towards it, i.e. on investment.

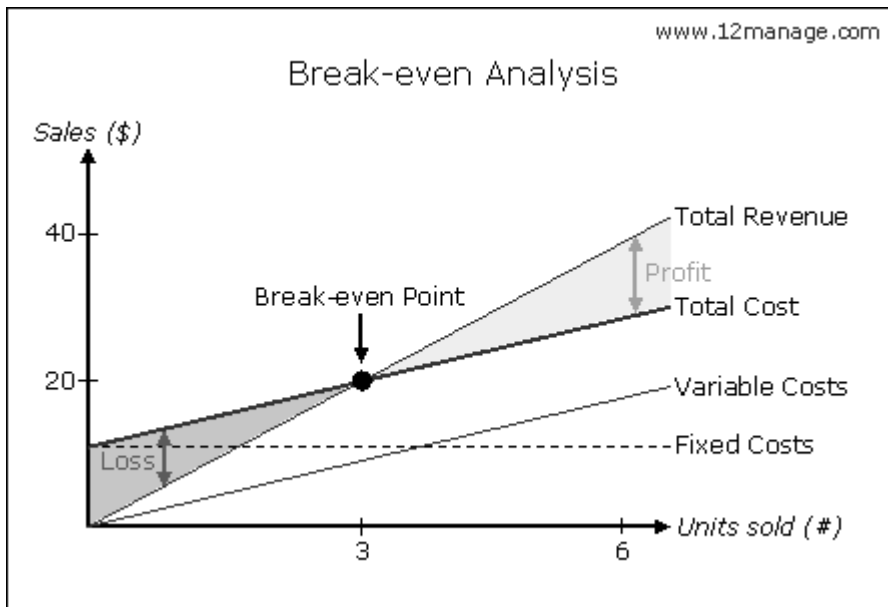
The great intermediate figure was Friedrich A. von Hayek (1941), who juggled with the concepts of fixed and circulating capital by conceiving of an optimal stock of fixed capital and of investment as the optimal adjustment towards it (an idea that Knut Wicksell (1898, 1901) had also toyed with). This was the notion picked up in later years by Abba Lerner (1944, 1953), Friedrich Lutz and Vera Lutz (1951), Trygve Haavelmo (1960) and the marginal adjustment cost theorists (Eisner and Strotz, Lucas, Treadway, Gould, etc.) The modern Neoclassical theory of investment stems largely from this tradition.

In what follows, we shall go through a few points in each of these types of theories. We should point out now that our emphasis is on theories of the investment decision, in its more "production"-theoretic sense rather than a macroeconomic one. We are not concerned here with the theory of interest rates, in which investment theory plays an important role, as that would entangle us in the details of the monetary theories of Wicksell, Robertson, Ohlin, Hayek, Keynes and others. We treat this elsewhere.

There is no comprehensive text on investment theory. The following treatises, however, contain good surveys of substantial areas of investment theory: Friedrich Lutz and Vera Lutz (1951), Trygve Haavelmo (1960), Jack Hirschleifer (1970), Andrew Abel (1979) and Mark Precious (1987). Also recommended is the collection edited by Paul Davidson (1993).

## 9.3 Break-Even Method of Investment

Break-even analysis is a useful tool to study the relationship between fixed costs, variable costs and returns. A break-even point defines when an investment will generate a positive return and can be determined graphically or with simple mathematics. Break-even analysis computes the volume of production at a given price necessary to cover all costs.



**Figure 36-Break Even Method**

Break-even price analysis computes

the price necessary at a given level of production to cover all costs. To explain how break-even analysis works, it is necessary to define the cost items.

Fixed costs, incurred after the decision to enter into a business activity is made, are not directly related to the level of production. Fixed costs include, but are not limited to, depreciation on equipment, interest costs, taxes and general overhead expenses. Total fixed costs are the sum of the fixed costs.

Variable costs change in direct relation to volume of output. They may include cost of goods sold or production expenses such as labor and power costs, feed, fuel, veterinary, irrigation and other expenses directly related to the production of a commodity or investment in a capital asset. Total variable costs (TVC) are the sum of the variable costs for the specified level of production or output. Average variable costs are the variable costs per unit of output or of TVC divided by units of output.

Total fixed costs are shown in Figure 1 by the broken horizontal line. Total fixed costs do not change as the level of production increases. Total variable costs of production are indicated by the broken line sloping upward, which illustrates that total variable costs increase directly as production increases.

The total cost line is the sum of the total fixed costs and total variable costs. The total cost line parallels the total variable cost line, but it begins at the level of the total fixed cost line.

The total income line is the gross value of the output. This is shown as a dotted line, starting at the lower left of the graph and slanting upward. At any point, the total income line is equivalent to the number of units produced multiplied by the price per unit.

The key point (break-even point) is the intersection of the total cost line and the total income line (Point P). A vertical line down from this point shows the level of production necessary to cover all costs. Production greater than this level generates positive revenue; losses are incurred at lower levels of production.

1. A break-even point defines when an investment will generate a positive return.
2. Fixed costs are not directly related to the level of production.
3. Variable costs change in direct relation to volume of output.

4.Total fixed costs do not change as the level of production increases.

Figure 2: Graph form of break-even analysis.

### **Appraisal of Break-Even Analysis**

The main advantage of break-even analysis is that it points out the relationship between cost, production volume and returns. It can be extended to show how changes in fixed cost-variable cost relationships, in commodity prices, or in revenues, will affect profit levels and break-even points.

Limitations of break-even analysis include:

- It is best suited to the analysis of one product at a time;
- It may be difficult to classify a cost as all variable or all fixed; and
- There may be a tendency to continue to use a break-even analysis after the cost and income functions have changed.

Break-even analysis is most useful when used with partial budgeting or capital budgeting techniques. The major benefit to using break-even analysis is that it indicates the lowest amount of business activity necessary to prevent.

## **9.4 Macro Investment Analysis**

Macro Investment Analysis is part of the field generally known as Financial Economics, which is, in turn, a specialty within the broader field of Economics. To provide a context for what will follow, it is useful to consider (if only briefly) the domain of the financial economist.

One of the fundamental aspects of economic activity is a trade in which one party provides another party something, in return for which the second party provides the first something else. In many such trades, or transactions, one or both parties are human beings. If Mr. A gives Ms. B an orange and Ms. B gives Mr. A two apples, it is a trade between two people. In other cases, only one is a human being. If a fisherman throws a fish back in the water to get more fish a year hence, it is a trade between a person and nature. Often the first type of trade is called an exchange, while the second is called production.

Economists generally (but not always) concern themselves with exchanges in which one of the items traded is money. To facilitate trade, most societies establish a convention in which a particular item serves as numeraire. Thus if dollars serve as money, one typically trades oranges for apples by (1) trading oranges for dollars ("selling oranges"), then (2) trading dollars for apples ("buying apples"). The terms of the first trade (e.g. \$1 for 1 orange) determine the price of an orange (e.g. \$1); the terms of the second trade (e.g. \$0.50 for one apple) determine the price of an apple (e.g. \$0.50). Together, these prices determine the terms of trade for an exchange of oranges for apples (e.g. 1 orange for 2 apples).

The use of money greatly simplifies trading, thus lowering transactions costs. If a society produces 100 different goods, there are 4,950 different possible "good-for-good" trades ( $[100 \times 100 - 100] / 2$ ). With money, only 100 prices are needed to establish all possible trading ratios.

Traditional economics focuses on exchanges in which money is one, but only one, of the items traded. Financial economics concentrates on exchanges in which money of one type or another is likely to appear on both sides of a trade.

In a single society with only one form of money, there would be no role for financial economics

were it not for time and uncertainty. In fact, however, both of these aspects are crucial elements in the lives of individuals and economies.

Many decisions involve trading money now for money in the future. Such trades, be they between people or with nature, fall in the domain of financial economics.

In many such cases, the amount of money to be transferred in the future is uncertain. Financial economists thus deal with both time and uncertainty. Often the latter is called risk.

In many situations, agreements allow one party to make decisions at later times that can affect subsequent transfers of money. Thus financial economists deal with contracts involving options.

Often, information can reduce or possibly eliminate the uncertainty associated with future outcomes. Thus financial economists study the impact of information on trades involving money.

In sum, the financial economist can be distinguished from more traditional economists by his or her concentration on monetary activities in which time, uncertainty, options and/or information play roles. Not surprisingly, Macro Investment Analysis requires careful attention to all four of these key elements.

## 9.5 Over-Investment Theory of Business Cycle

A.F. Hayek assumes economy in equilibrium. Whenever this equilibrium is disturbed then there is expansion or contraction. This theory says that when the economy is in equilibrium, the rate of interest is such that  $\text{Saving} = \text{Investment}$  there is no unemployed resources.

Suppose the bank credit expansion takes place, then the equilibrium rate of interest is disturbed. This low market rate of interest will tempt the businessmen to borrow more and invest in new ventures. This leads to upswing in business cycle; as a result employment, output, profit and demand increases.

But then this phase does not continue indefinitely. Due to scarcity of resources, this expansion phase cannot go on and on. But due to increase in price, the people are forced to decrease consumption and start saving more. This forced saving due to high price makes the bank ease credit and investment starts.

The economy comes out of its downswing as income increases and people revert to earlier consumption and expenditure levels. This helps economy to recover and the upswing starts again. This theory says that the over investment due to forced saving by people in inflation is the cause of fluctuations in economic activities. Hayek says, voluntary saving leads to change in structure of production permanently but forced saving brings changes which are not permanent

The limitations for this theory are –

Assumption of full employment is unrealistic. Undue importance is given to bank's rate of interest. Even if the rates of interest are constant, there will be variation. The expected returns from capital investment are determined by the demand for and the price of the output of goods or services generated by an investment and also by the costs of production. A rise in demand for the output that capital is purchased to supply will increase the potential revenue streams that a business can expect from a new project. Similarly, a change in the costs of purchasing the capital inputs the costs of training workers to use new capital and in maintaining the capital stock will also affect the expected rate of return.

### **The importance of business expectations and uncertainty**

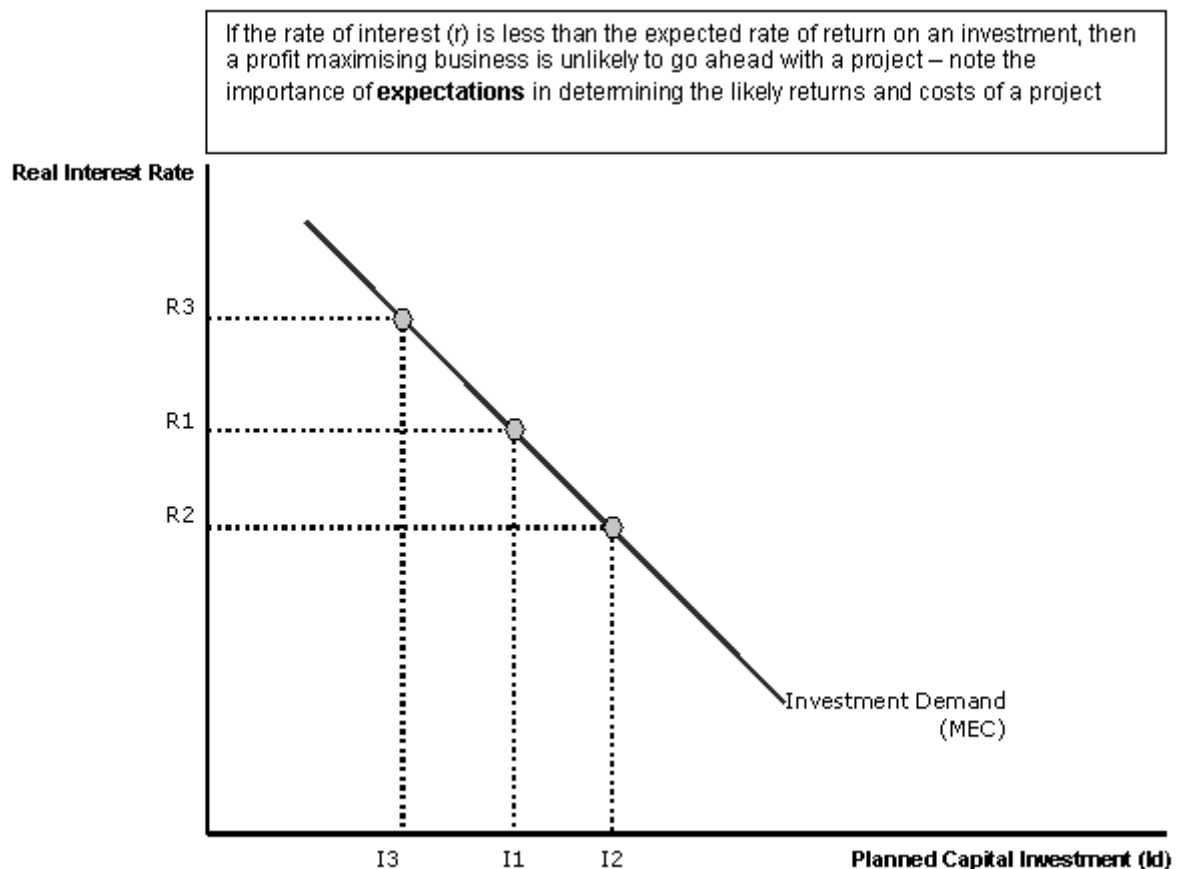
Expectations of demand, prices and costs over the lifetime of the investment are key determinants of expected returns. There is always uncertainty about the expected rate of return particularly when

demand is volatile and sensitive to changes in interest rates, the exchange rate and incomes.

The rate of return from an investment is also influenced by the rate at which an investment project is assumed to depreciate over time and the effects of changes in corporation tax on company profits.

The cost and availability of internal and external finance is important, as higher costs of finance (e.g. higher interest rates) require greater returns from the investment to ensure that it is profitable.

The marginal efficiency of capital (MEC) – the demand curve for investment



Expected rates of return on investment matter when businesses are making investment decisions and this is where the concept of the marginal efficiency of capital comes in. The marginal efficiency of capital (MEC) is defined as the rate of interest which makes a proposed investment project viable “at the margin”. This is illustrated in the diagram above. At lower rates of interest (i.e.  $R_2$  rather than  $R_1$ ) more capital projects appear financially viable because the cost of borrowing money to finance the investment is lower and the opportunity cost of using retained profits as an internal source of investment finance is also reduced. A fall in interest rates should (ceteris paribus) lead to an expansion along the investment demand curve. Similarly higher interest rates ( $R_3$ ) may lead to some projects being postponed or cancelled.

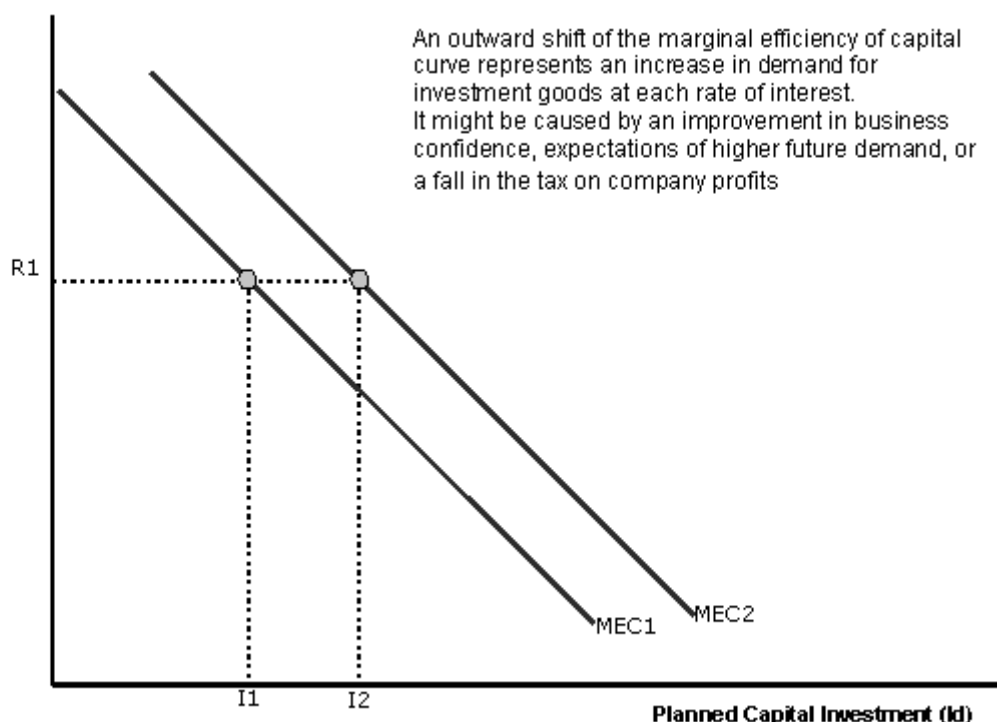
The limited statistical evidence available for the UK is that the demand for new capital goods tends to be interest inelastic i.e. there is only a weak link between changes in interest rates and fluctuations in planned capital investment by businesses. Partly this is because many firms prefer to use the capital market through the issue of new shares and bonds to raise funds for investment rather than relying on bank loans.

That said, the rate of interest can and does affect capital investment decisions – perhaps through its effect on business confidence and also expectations of changing demand and the links between



interest rates and the exchange rate. So a period of lower interest rates might stimulate more investment because of expectations of rising consumer demand and a lower exchange rate which will boost export demand.

#### Real Interest Rate



Changes in business confidence, the costs of capital and demand lead to shifts in the investment demand curve. For example, an increase in export sales overseas might be an increase in the expected rates of return on capital investment and thus an outward shift of the investment demand schedule.

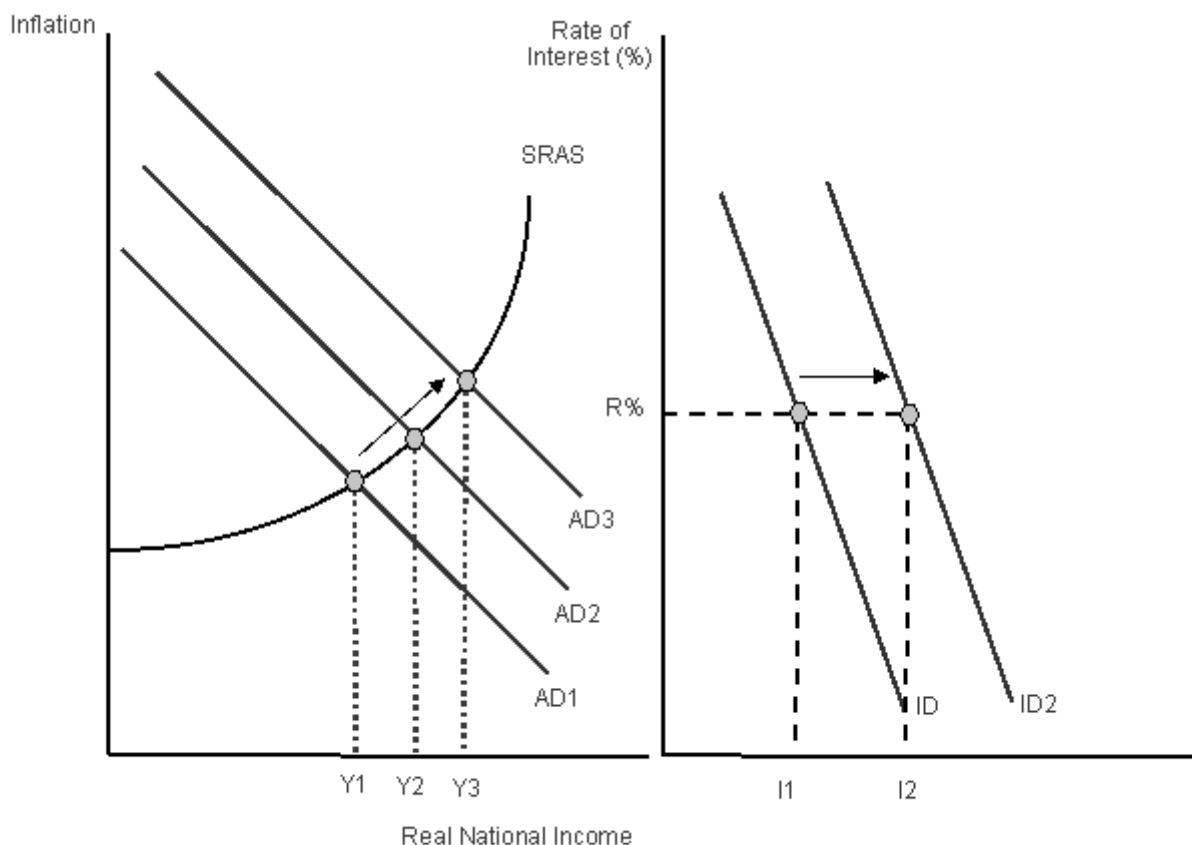
#### Concerns about demand and profits act as constraint on investment plans

The data shown in the previous chart is taken from the quarterly survey of business confidence by the Confederation of British Industry. It suggests that uncertainty about the strength of future demand and the absence of a satisfactory level of profit are consistently the two biggest factors likely to constrain the level of capital investment by businesses. Certainly in recent years, the cost of finance – influenced by the level of interest rates – has come firmly at the bottom of the ranking of key factors, although this may not be the case for smaller manufacturing businesses that may not have the opportunity to borrow at the same rate of interest as larger multinational operations.

#### The Accelerator Model of Investment

This is another theory of investment. Put simply, the accelerator model suggests a positive relationship between investment and the rate of growth of demand or output. Accelerator theories of investment assume that there is a desired capital stock for a given level of output and interest rates. A rise in output or a fall in interest rates may prompt increased levels of investment as firms adjust to reach the new optimal capital stock level.

#### Planned investment spending



The accelerator model works on the basis of a fixed capital to output ratio which implies that in order to produce extra goods and services a business needs to adjust its investment to meet changes in demand. For example if demand in a given year rises by £4 million and each extra £1 of output requires an average of £3 of capital inputs to produce this output, then the net level of investment required will be £12 million.

One criticism of this simple accelerator model is that the capital stock of a business can rarely be adjusted immediately to its desired level because of 'adjustment costs' and 'time lags' between an investment project being given the go-ahead and it coming 'on stream' to produce the extra output. The adjustment costs include the cost of lost business due to installation of new equipment or the financial cost of re-training workers. Firms will usually make progress towards achieving an optimum capital stock rather than moving smoothly from one optimal size of plant and machinery to another.

A further criticism of the basic accelerator model is that it ignores the level of spare capacity that a business might have at their disposal. For example in the latter stages of an economic recession, most businesses are operating below their capacity limits (i.e. there is a sizeable negative output gap in the economy). If demand then picks up in the recovery phase of the cycle, there is little immediate need for businesses to increase their investment because they can make more intensive use of whatever existing capacity is available now. Investment is more likely to be strong when businesses are operating close to their production limits, and when they need to boost their capacity in order to meeting rising demand from consumers.

The accelerator model predicts a positive relationship between the rate of growth of demand and planned investment. But much depends on the capital to output ratio; the amount of spare capacity

that a business has, and also the supply-side capacity of businesses that produce the capital goods.

## 9.6 Summary

Investment is the change in capital stock during a period. Break-even analysis is a useful tool to study the relationship between fixed costs, variable costs and returns. A break-even point defines when an investment will generate a positive return and can be determined graphically or with simple mathematics. Break-even analysis computes the volume of production at a given price necessary to cover all costs. Macro Investment Analysis is part of the field generally known as Financial Economics, which is, in turn, a specialty within the broader field of Economics.

## 9.7 Keywords

Investment analysis, Breakeven, Macro investment, over investment theory

## 9.8 Questions for Discussion

1. Describe the importance of Investment analysis.
2. Explain the breakeven investment analysis with graph.
3. Detail the concept of Investment Flow.
4. Illustrate the Macro Investment theory with their limitations.

## 9.9 Suggested Reading

1. G.S. Gupta – Managerial Economics Tata Mc Graw Hill.
2. Varshney and Maheswari - Managerial Economics, Sultan Chand & Sons.
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5. Rengarajan L – Principles of Macro Economics, Tata McGraw Hill.

# **LESSON**

## **10**

### **Macro Economics Concepts**

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**10.11 Questions for Discussion**

**10.12 Suggested Reading**

## 10.0 Aim and Objective

This unit aims at providing an understanding of

1. Overview of macroeconomics
2. How the various macro economic variables affect an economy using aggregate demand and Supply analysis.
3. How to measure national income and to define GDP, GNP and NNP
4. Understand the three methods of calculating national income and to distinguish correctly between nominal and real values

## 10.1 Introduction

Macroeconomics is the study of the economy at the aggregate level. It goes beyond understanding the behaviour of individual economic units and the determination of prices in particular markets, which is the subject of microeconomics. It tries to understand the activities of households and business as a group in addition to the behavior and role of local and national governments. To study macroeconomics we must begin with a solid understanding of the individual behavior of these households, business firms, and government entities such that there is consistency with behavior in aggregate. In particular, it focuses on the interaction of the goods, labour, and assets market in the economy and tries to explain how economic behaviour and policies affect the overall functioning of these markets. It also studies the subsequent impact of these interactions on variables such as output, employment, wages, prices, money supply, interest rates, inflation, the budget, debt, balance of payment, and exchange rates. In order to analyze such a wide range of issues at the aggregate level, macroeconomics offers theoretical frameworks and models to abstract from and simplify many of the facts and key relationships that describe the economy. One of the important macroeconomic tools that helps in explaining the major trends in output and prices is the aggregate demand and supply analysis. Thus, to start with, in this unit we will discuss how the field of macroeconomics developed, the important concerns of the subject, and some of the important macroeconomic variables and their relationship, giving greater importance to the measurement of national income. Macroeconomics a depiction of the circular flow of income.

Macroeconomics examines the economy as a whole to explain broad aggregates and their interactions "top down," that is, using a simplified form of general-equilibrium theory. Such aggregates include national income and output, the unemployment rate, and price inflation and sub aggregates like total consumption and investment spending and their components. It also studies effects of monetary policy and fiscal policy.

Since at least the 1960s, macroeconomics has been characterized by further integration as to micro-based modeling of sectors, including rationality of players, efficient use of market information, and imperfect competition.

This has addressed a long-standing concern about inconsistent developments of the same subject. Macroeconomic analysis also considers factors affecting the long-term level and growth of national income. Such factors include capital accumulation, technological change and labor force growth.

## 10.2 Economic Indicators

### Basic Indicators

The following basic economic indicators are important to understand:

**Gross Domestic Product (GDP)** - is the total amount of all goods and services produced in the country. This includes consumer spending, government spending and business inventories. Real GDP is a variant that takes out the impact of inflation, so that GDP can be compared over time. Real GDP is the basic measure of business activity and tracks the business cycle.

**Consumer Price Index (CPI)** -is a measure of the price of a basket of goods and services; increases to this index indicate an increase in inflation.

**Producer Price Index (PPI)** -is a measure of the price of commercial items, such as farm products and industrial commodities. PPI indicates the cost to produce items and is the leading indicator of inflation.

**Trade deficit** - results when a country's imports exceed its exports. The United States usually has a trade deficit.

**Trade surplus** - results when a country's exports exceed its imports.

**Balance of payments (BOP)** - is the amount of foreign currency taken in minus the amount of domestic currency paid out; the United States usually has a balance of payments deficit.

**Unemployment rate** - the Bureau of Labor Statistics releases employment numbers each month that note the number of employed and unemployed people in the United States, as well as the percentage of unemployed. Increases in the unemployment rate tend to occur when the economy declines and vice versa. The number of unemployed and percentage of unemployed may seem redundant, but they are very different. If the population increases, the number of unemployed may increase, but the percentage could remain the same.

### Leading, coincident and lagging indicators

Certain economic indicators serve as barometers of economic activity. These are divided into three categories: leading indicators, coincident (or current) indicators and lagging indicators.

1. Leading indicators preview signs of improvement or decline in economic conditions. Some of these leading indicators include plant and equipment orders, money supply, stock prices, consumer expectations, average work week for production workers and average weekly claims for unemployment insurance. Coincident indicators coincide with current economic activity. Examples include nonfarm employment, industrial production, manufacturing and trade sales, and personal income minus transfer payments such as Social Security, disability benefits and unemployment compensation.

2. Lagging indicators are signs that do not emerge until after a change in economic conditions. They include the unemployment rate, business spending, labor costs, bank loans outstanding and bank interest rates.

## 10.3 Economic growth and General equilibrium

Growth economics studies factors that explain economic growth – the increase in output per capita of a country over a long period of time. The same factors are used to explain differences in the level of output per capita between countries, in particular why some countries grow faster than others, and whether countries converge at the same rates of growth.

Much-studied factors include the rate of investment, population growth, and technological change. These are represented in theoretical and empirical forms (as in the neoclassical and endogenous growth models) and in growth accounting.

The economics of a depression were the spur for the creation of "macroeconomics" as a separate discipline field of study.

During the Great Depression of the 1930s, John Maynard Keynes authored a book entitled *The General Theory of Employment, Interest and Money* outlining the key theories of Keynesian economics. Keynes contended that aggregate demand for goods might be insufficient during economic downturns, leading to unnecessarily high unemployment and losses of potential output.

He therefore advocated active policy responses by the public sector, including monetary policy actions by the central bank and fiscal policy actions by the government to stabilize output over the business cycle. Thus a central conclusion of Keynesian economics is that, in some situations, no strong automatic mechanism moves output and employment towards full employment levels. John Hicks' IS/LM model has been the most influential interpretation of *The General Theory*.

Over the years, the understanding of the business cycle has branched into various schools, related to or opposed to Keynesianism. The neoclassical synthesis refers to the reconciliation of Keynesian economics with neoclassical economics, stating that Keynesianism is correct in the short run, with the economy following neoclassical theory in the long run.

The New classical school critiques the Keynesian view of the business cycle. It includes Friedman's permanent income hypothesis view on consumption, the "rational expectations revolution" spearheaded by Robert Lucas, and real business cycle theory.

In contrast, the New Keynesian School retains the rational expectations assumption however it assumes a variety of market failures. In particular, New Keynesians assume prices and wages are "sticky", which means they do not adjust instantaneously to changes in economic conditions.

## 10.4 Overview of Macroeconomics

Thus, the new classical assume that prices and wages adjust automatically to attain full employment, whereas the new Keynesians see full employment as being automatically achieved only in the long run, and hence government and central-bank policies are needed because the "long run" may be very long.

Economics is a social science that studies how different societies allocate scarce resources to meet the unlimited wants and needs of its members. It studies how societies distribute these Scarce resources among different people so that they are used efficiently to produce valuable commodities. The resources are considered scarce because they are available only in limited quantities compared to human desires, which are unlimited. Given the limited resources and unlimited wants of human being, making the best use of these scarce resources is highly important for any society. An economy is producing efficiently when it cannot make anyone economically better off without making someone else worse off. Since economics is concerned with the human desire and potential to produce, which varies among various members of the society, it studies the human social behavior - behavior of individuals and interaction among these individuals. The term originates from two Greek words oikon and nomos, which means laws of household. This field of study might also be considered as the science of human progress; that is, how choices are made such that living standards of individual human beings improve.

Improvement in living standards includes: lower infant mortality, the provision of basic and essential health care, appropriate shelter and infrastructure, and meeting basic physiological needs of every human being. It may also include developing political and social systems that celebrate human initiative, creativity and spirit. The essence of economics is to find out how to organize society in a way that will lead to most efficient use of resource. Economists have adopted different approaches to analyze various economic problems. One useful approach is through study of the ways in which the production is managed to produce goods and services. If we take this approach to understand economics, then we need to understand technology, how to create it and how to efficiently use it. Since the production system is not the only system that affects the economic system, we also need to acknowledge the political system that exists and its potential to influence the problem of distribution. Thus, an economic system must cater to the physical needs of human beings and satisfy their wants and desires that provide much of the incentive for human progress.

Macroeconomics is a subject that tries to address some of the big questions like why do some countries enjoy a standard of living many times greater than others? Why do some countries grow at a very fast rate while others have stagnated growth? What impact does the change in oil prices have upon the economy? What impact does the political decisions made by the government have on the economy? These questions force us to examine key economic issues such as investment levels, infrastructure development, improvements in education and technological growth.



Understanding these issues is important since we need to prioritize and choose economic action that will bring prosperity. The study of macroeconomics helps us to interpret the past, comprehend the present and predict the future.

When we look at the macroeconomic, we look at the sum of all individual production and consumption choices. Since production is constrained on the aggregate by the scarcity of resources, macroeconomics is the study of trade offs in the allocation and use of resources within and across different time periods.

We can think of macroeconomics as an investigation of the economy's production and consumption possibility frontier, of the factors that determine the position and shape of this frontier, and the process by which particular point is chosen in this frontier.

## 10.5 Goals of Macroeconomics

Macroeconomics helps us to understand the different forces that shape our economy, how the economy's performance can be improved, and how economic outcomes can be affected. By providing us with this understanding, it helps us to forecast the future of the economy, what is likely to happen to various macroeconomic variables including prices, demand, income and employment. There are five major goals in

Macroeconomics, which are:

1. Full employment
2. Price Stability
3. Efficiency
4. Economic growth
5. Equity

We can also consider many other goals, but these goals broadly encompass an entire spectrum of issues that are studied in macroeconomics. Many of these goal complement or conflict with each Other. For instance the goals of stable prices tend to encourage efficient resource allocation whereas the goals of low unemployment may come at the cost of higher inflation. Thus prioritizing is important when pursuing various goals of macroeconomics.

## 10.6 Schools of Thought

There are two distinct schools of thought, the classical or monetarist school and the Keynesian/activist school. The classical/ monetarist view is that markets are efficient and laissez-faire (market that takes care of itself) is the best means of achieving desired outcomes. Government intervention in the economy only creates distortions and inefficiencies.

Any disequilibrium is temporary or created by government intervention. Proponents of the Keynesian school of thought on the other hand, believe that there are inherent rigidities and inefficiencies in the market systems which prevent the economy from reaching a desirable equilibrium position. Modern versions of the classical and Keynesian schools are represented by the new classical / neo-monetarist and new Keynesian schools of thought. These schools of thought

retain their basic differences in ideological position regarding the role of markets versus governments but also incorporate variables such as expectations, information flows, flexibility of market prices and wages, and structural rigidities to explain how markets function. The monetarist versus Keynesian debate has led to very different explanations for economic variables such as aggregate supply, unemployment, and inflation, for the economy's response to anticipated and unanticipated policy changes and exogenous shocks and for other macroeconomic processes.

## 10.7 Macro Economic Variables

Macroeconomic variables can be classified into four categories namely, target variables, intermediate variables, indicative variables and instrument variables. The target variables are the ultimate goal variables of an economy. National income is one of the important target variables that every economy tries to maximize since it represents the purchasing power of the individuals. Other target variables include price stability, social justice and globalization. Price stability is important since fluctuation negatively affects the real value of all variables, distorts income distribution and foreign exchange rates, affects the nominal interest rates and distorts taxes. Social justice is measured through unemployment, poverty, and income distribution among the households of the country. The goal of any economy is to minimize this variable to the maximum extent possible. Globalization is another target variable that is considered by an economy since no country wants to be left behind in the era when globalization is happening at a rapid pace.

The instrument variables are those variables that are determined by the policy maker which include fiscal and monetary policies (stabilizing tools) and agriculture, industry, trade and labour policies (regulation tools). The intermediate variables include variables like money supply, interest rate, savings, investment, bank credit, foreign exchange rate, imports, exports, etc. These variables are called intermediate variables since they lie between the instruments and target variables. Indicator variables provide signals to indicate the direction of the movement of the economy. We will discuss how some of these variables affect the economy of a country in detail. By understanding the measurement of the macroeconomic variables, you can monitor the economy, find the causes of the business cycles, and realize the importance of economic growth.

We can understand the relationship between various macroeconomic variables using aggregate demand and supply analysis. The macroeconomic variables can be categorized based on whether they affect the aggregate demand or aggregate supply. Variables such as price level, potential output, capital, labour and technology determine the aggregate supply. Variables such as Money, spending and taxes and other variables determine the aggregate demand.

## 10.8 National Income

Human Welfare is the most important concern of Macroeconomics. However, it is not very easy to

calculate, particularly when the relevant measure is the welfare of the society as a whole. In order to provide a solution, macroeconomists measure welfare in terms of the amount of goods and services i.e., output produced within an economy. If an economy produces more output, it can meet more of the demands of the society. National income is the flow of goods and services produced in an economy in a particular period – a year. Modern economy is money economy. Thus, national income of the country is expressed in money terms. We may say that national income is a money measure of the value of net aggregate of goods and services becoming available annually to the nation as a result of the economic activities of the community at large,

Consisting of households or individuals, business firms, and social and political institutions. GDP or gross domestic product is the value of all the final goods and services produced in the economy in a given time period. It is a measure of aggregate economic activity. We use GDP per capita, which is GDP divided by the population in the economy, to measure living standards.

We will reserve the discussion on the measurement of national income and analysis of national income for later and will move on to the next macroeconomic variable.

### **Investment, Savings and Employment:-**

Saving means economic surplus. It may be defined as an accounting difference between current income and current consumption. According to Keynes, it can be defined as the excess of income over expenditure of consumption. In the case of an individual, saving is that part of income which is not consumed by him and in the case of the community, it is the aggregate of the unconsumed part of the national income of all members of the community. We can represent saving symbolically

$$S = Y - C$$

Where , S denotes Saving ,Y stands for income and C stands for Consumption This symbolic expression of saving is applicable to both the individual as well as the community. Savings is the function of income and as income increases, savings also increases and vice versa. Savings depends on the propensity to save, which can be derived from the propensity to consume. The consumption function is a stable function of income in the short period, which makes the saving function also a stable one.

Aggregate domestic savings are the sum of savings made by the Households, firms and the government.

$$\text{Household saving} = \text{Disposable personal income} - \text{consumption expenditure}$$

$$\text{Firm Saving} = \text{Profits} - (\text{Dividends} + \text{Business taxes})$$

$$\text{Government saving} = \text{Public revenue} - \text{current expenditure}$$

Savings of households and firms taken together constitute private savings. Government's savings constitute public savings. Therefore, total savings is the sum of private and public saving. The rate and size of savings in an economy are determined by a multitude of factors including level of income, income distribution, consumption motivation, wealth, habit, population, political stability, security of life, taxation structure, government efforts to control inflation, rate of interest and other

subjective factors (precaution, foresight, calculation, improvement etc.)

Equality between savings and investment is regarded as an essential condition of equilibrium level of income, output and employment by Keynes as well as classical economists. The classical economist believes in the economy's equilibrium at full employment level. In their view, saving-investment equality is brought about by the mechanism of the rate of interest. Keynes presented an entirely different theory from that of classical theory in which he rejected the postulate of the rate of interest being a strategic or equilibrium variable that will bring about equality between investment and savings in full employment.

According to him, the savings-investment equality is a condition of equilibrium at any level of employment. In Keynes's view, investment does not depend on the level of income. It mainly depends on dynamic factors such as population growth, territorial expansion, progress of technology and the business expectations of the entrepreneurs. Keynes explained the savings and investment relation in terms of scheduled relation. His equation of Saving = Investment,  $S = I$  is analogous to that of supply and demand equation  $S = D$  in ordinary markets.

Employment of labour is an important macroeconomic variable. It usually refers to the employment of workers who are engaged in an act of production.

When a worker is employed in the production process he feels the pain of physical and mental stress which can lead to fatigue or tiredness after some hours of work apart from sacrificing his leisure time. Hence the worker expects a compensation for the economic contribution he makes by participating in the production process. Since the worker is employed in the creation of some type of utility or output, the value of this output is used for compensating the workers.

National Income is always expressed with reference to a time interval, since it is meaningless to talk of national income without mentioning the period over which it is generated. This is because it is a flow and not a stock. In other words, income is generated every year and at different rates. National income is usually measured and shown with reference to a year or as annual flow; it is thus, an amount of total production per unit of time. National income accounting emerged as an important tool in economic decision-making only after World War II. Prior to the Great Depression of 1929-30, national income accounting was mostly an academic exercise. Only after the great depression and Keynes published his seminal work titled "General Theory of Employment, Interest, and Money" in 1936, which analysed the causes of the depression, that the

governments started recognizing the need for national income estimation and other related aggregates to provide the basic framework for policy decisions and economic analysis. In India, national income estimation was pioneered by Dadabhai Naoroji way back in 1876 when the main purpose of it was to point out poverty and low living standards of the average Indian and serve as ammunition against colonial rule. However, these earlier accounts suffered from serious conceptual and statistical defects and limitations, in addition to being politically biased. After independence, in 1949, the government of India appointed a National Income Committee for estimating national income.

Today, national income accounting has a central role in policymaking and economic analysis in all countries. Economic policies, plans, and development programmes are formulated only after a careful study of national income data and other related aggregates. International comparisons are made based on the national income estimates. Macroeconomic performance is judged based on key national income indicators. National income accounts are a set of systematic statistical statements

which reflect the value of the total output produced in various sectors of the economy, such as agriculture, industry, trade, banking, etc., together with details of distribution of factor incomes among different groups and final expenditure of the economy. They are a measure of aggregate economic activity and show major economic flows and statistical relationship among the various sectors and sub sectors of the economy. National income accounting serves three basic functions, namely, Provides a simplified framework for understanding the interrelationship between the innumerable transactions that take place in an economy and to hold together the different pieces of the economy . Helps identify economic problems and provides an objective basis for evaluating economic policies and performances.

Provides the framework for making long-term economic policy decisions and programmes In national income accounting, the concept of national income has been interpreted in three ways.

**1. National Product:** It consists of all the goods and services produced by the community and exchanged for money during a year. It does not measure goods and services which are not paid for.

**2. National Dividend:** It consists of all the incomes, in cash and kind, accruing to factors of production in the course of generating the national product.

**3. National Expenditure:** This represents the total spending or outlay of the community on the goods and services produced during a given year. Since income is the source of expenditure, national expenditure constitutes the disposable income, which is equal to national income. Indeed, one man's income is another man's expenditure. When a person buys vegetables, it is his expenditure, but is the vegetable vendor's income. When the vegetable vendor spends part of his income in buying groceries, it becomes the income for the groceries merchant and so on. In a sense, therefore, the sum of expenditure of all agents of production is equal to the total income received by the factors of production during that year.

In fact, there is a fundamental equality between the total income and total expenditure of the community, as one's expenditure becomes another person's income in the economy. Hence there is a large circular flow established in which each expenditure creates an income, which in turn is spent and creates other incomes. Therefore, this total national income will be equal to the total national expenditure. The identity of the three factors of the flow of national income may be expressed as:

<b>National Expenditure = National Product = National Income or dividend.</b>
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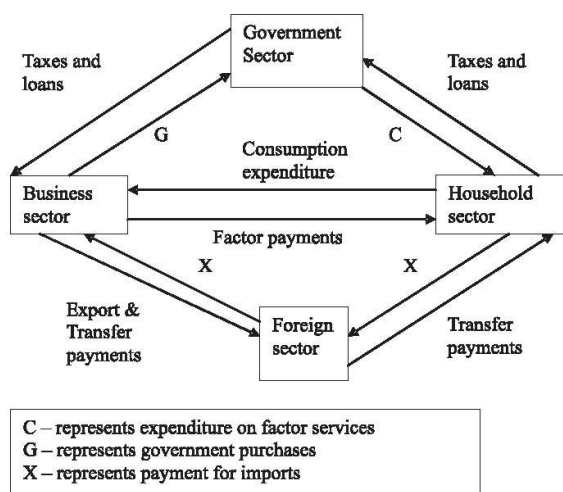
When we analyse the above three concepts, we find that national income is nothing but the total flow of wealth produced, distributed and consumed. It is not that the income is first earned and then gradually spent or distributed, or alternatively, it is not that the expenditure first takes place and then an income is earned. As a matter of fact the process of income creation and income distribution goes on simultaneously. According to the total production approach, it is the money value of goods and services produced by agents of production during the course of the year. According to income approach, it is the sum of income of agents of production, profits of public enterprises, and income from government companies. According to the total expenditure approach, national income is the sum total of expenditure of agents of production. Keynes has suggested three approaches to national income which are more suitable and practicable in the macro-analysis of income and employment is as follows:

1. Income-expenditure approach in which total expenditure of consumption and investment goods constitute total income.

2. Factor income approach in which national income is measured as the aggregate of income received by all the factors of production
3. Sales proceeds minus cost approach in which national income is measured as the aggregate of sales minus cost.

From Keynesian analysis, modern concepts of national income have been evolved which are more dynamic and content. Modern economists consider national income as a flow in three forms: income, output and expenditure. When goods are produced by the firms, factors of production comprising households are paid income. These income receipts are spent by the household sector on consumption and their savings are mobilized by the producers for investment spending. Likewise a circular flow is constituted between income and expenditure. Obviously, income, output and expenditure flows are always equal per unit of time. When we examine the interrelationship between the three definitions of national income, which are national income in terms of total production, total expenditure and total income, we find the circular flow of income.

### Circular Flow of Income



**Figure 37 Circular flow of Income**

The circular flow of income activities can be described as follows. The firms hire the factors of production to produce goods and services. The factors of production create real income. The factors of production are paid out of this real income, in terms of money as a reward for their services. They, in turn, spend this income on goods. This demand, in turn, spends this income which leads to expenditure that creates demand for goods. The flow is from production to income generation to expenditure, and from expenditure to production. The circular flow of income can be understood in terms of the two sector model, the three sector model and the four sector model.

The two sector model describes the circular flow of income in terms of flow between the firms and the households where households offer their services in the factor market and buy goods for consumption in the goods market. The firms supply goods to households as a reward for their services and such flow is termed as “real flow” in the economy. The factor payments are not made in kind but in terms of money which is utilized by the households in purchasing goods and services produced by the firm, thus resulting in circular flow between the firms and the households. Thus

according to this model the national income is represented by the following equation,

$$Y = C + I$$

Where Y stands for national income C stands for Consumption expenditure and I stands for the investment expenditure.

The three sector model includes the government sector in describing the circular flow of income. Government acts both as a consumer and producer in the modern economies. It has its own sources of income and expenditure. It collects taxes (compulsory payments levied by authorities Without any regard for service rendered by it) both from the firms and the households. Withdrawing some amount from the households and the firms for payment of taxes is called leakages which reduces the flow of income. The government spends income accumulated as such in activities designed to offer benefits to both the firms (subsidies for production, purchase of goods for collective use by the society) and the households (social spending on education, health, housing, etc.). After including the government spending, the equation will be

$$Y = C + I + G$$

where G stands for government expenditure.

In the four sector model, circular flow of income is studied by including the foreign sector in addition to households, business firms and the government sector. The inclusion of foreign sectors leads to fresh inflow of income to the circular flow through foreign transactions. Exports cause an injection of money by creating income for the domestic firms. Imports are considered leakages from the circular flow since they are expenditure incurred by the household sector to purchase goods from foreign countries, which will become income for firms in foreign countries and hence does not flow back into the economy. The circular flow of income according to the four sector model is depicted in the following diagram.

Figure 1. Circular Flow of Income according to four sector model.

Figure 1 shows the circular flow of money of the four sector open economy with taxes and imports as leakages from the circular flow on the right-hand side and government purchases and exports on the left hand side. Forms of transaction like imports, exports and transfer payments are shown arising from the households, the firms and the government. The combined activities of these sectors will cause inflow and outflow of funds thus forming balance of payments sectors. Inclusion of foreign sector in the income equation will be shown as follows.

$$Y = C + I + G + (X - M)$$

as we have already discussed, is the gross domestic product. If the export is greater than the import, net income earned abroad would be positive. On the other hand, if the export is lower than the import the net income earned would be negative and cause the GNP to be lower than the GDP of a country.

### Measures of output/income

GDP, GNP and NNP constitute the three fundamental measures of an economy's productive performance. We have already discussed

**Gross domestic product (GDP)** is the total value of output of goods and services produced in a country in a given period of time regardless of the ownership of the factors of production. It therefore includes both consumer and capital goods and the output of both the private and public sectors.

**Gross national product (GNP)** is the total output produced by domestically owned factors, some of which may be located abroad. It is calculated from GDP by adding on net property income from abroad.

**Net national product (NNP)** is GNP less the depreciation of the nation's capital stock. Now, let us discuss these measures in detail and understand these macroeconomic variables that determine these measures.

### **Gross National Product (GNP)**

In calculating national income, we add up all the goods and services produced in a country. Such a total represents the gross value of final products turned out by the whole economy in a year, which is technically called gross national product. The term gross indicates the inclusion of the provision for the consumption of the capital asset, for instance, depreciation or replacement allowances. GNP thus may be defined as the aggregate market value of all final goods and services produced during a given year. The concept of final goods and services stands for finished goods and services, ready for consumption of households and firms, and excludes raw materials and work-in-progress inventory and such other intermediary products. More specifically, all sales to households, business investment expenditures, and all government expenditure are treated as final products. But intermediary goods purchased by business firms are

obviously regarded as final goods. If we include it in calculating output, the value of this good which is also included in the final good produced will lead to double counting. In an open economy, GNP may be obtained by adding up the value of all consumption goods which are currently produced, value of all capital goods produced (gross investment), which implies the increase in inventories and gross products of buildings and equipments which included the provision for the consumption of the capital assets (depreciation and replacement allowances), governmental expenditure of various goods for rendering certain services to the benefit of the entire society, the value of net product which is the difference between the total exports and imports of the nation and the net amount earned abroad (difference between income earned by the nation through foreign investment and the income paid to the foreigners' investment).

GNP at market price, thus, represents

$$\text{GNP} = C + I + G + (X - M) + (R - P) \text{ where}$$

C stands for consumption goods,

I for capital goods or gross investment

G for government services

X for exports

M for imports

R for income receipts from abroad, and



P for income paid abroad.

GNP is the basic social accounting measure of the total output; it represents the final products ready for consumption, valued at current market prices.

### **Gross Domestic Product (GDP)**

GDP is calculated as the total of values of output of goods and services in the country without adding net factor incomes received from abroad. Thus, it is measured at market prices as

$$\text{GDP} = C + I + G + (X - M)$$

### **Net National Product**

It refers to the value of the net output of the economy during a year and is calculated by deducting the value of depreciation or replacement allowances of the capital assets from the GNP. Depreciation means wear and tear of machinery in the process of production and these machines have to be replaced at some future point when they become useless or outdated.

$\text{NNP} = \text{GNP} - D$
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where

D stands for depreciation allowances.

NNP is the value of total consumption plus the value of net investment of the community. In calculating NNP we take depreciation into account. But we do not consider capital appreciation, which is the increase in value of fixed assets, as the total quantity of the fixed assets remains the same. However, technically national income is obtained by deducting indirect taxes from the net product measured at current market prices, which is called NNP at factor cost. To distinguish between National income at market price and factor cost, let us understand that National income at market price is the price of the aggregate output at current market prices, which also includes some element of taxes and subsidies. Of the various measures of national income, GDP and GNP are considered most important. Let us compare these two measures to note down some important points about these measures: 1 Both GNP and GDP are time bound measurements, which refer to only current production and services, usually within a given year or quarter of a year.

Both GNP and GDP include only the value of final goods and services to avoid double counting. The value of intermediate goods and services, which go into the production of a good are, not included. At each stage of manufacturing, only the value added to the product at that particular stage of manufacture is counted towards GDP or GNP. However, you need to remember that it is not so easy to distinguish the intermediate and final products. 1 Some outputs are not sold in the market and so there are no observed prices to value these products. In such cases, the output is valued at the cost of the inputs needed to produce them. This is usually done for government outputs and services. Some goods that are produced in a year, but not sold, such as a firm's stockpile of inventories, are counted in that year's GDP or GNP. Inventories are treated as if they were "bought" by the firm that produced them even though this purchase never takes place. Even though capital goods are intermediate goods that are used in the production process, in national income accounting they are counted as final goods that are bought by the firms.

### **Real versus Nominal GDP**

Nominal GDP is the money value of output in a given period in current money terms whereas real

GDP is the actual physical amount of output produced during a given time period. Changes in real GDP refer to changes in physical production over different time periods by adjusting for price changes over this period. The goods are valued at constant prices. Real GDP enables us to see how much of change in output over two periods is due to changes in prices and how much of it is due to changes in actual physical production. For instance, if we want to compare today's GDP with GDP in 1985, we remove effects of price changes between these two periods. We multiply today's physical output by an index of 1985 prices and find out what today's output would have been worth if it had been sold at 1985 prices .

Thus, real GDP is a better indicator than nominal GDP of the actual performance of the economy in terms of producing goods and services. Real GDP growth measures how much output has really increased in an economy. The nominal versus real distinction will become clear when we look at price indices and inflation in the later sections.

## **Measuring GDP**

GDP can be valued at market prices or at factor cost. Valuation at market prices includes indirect taxes like sales tax and excise duty and subsidies, and is not necessarily the same as the price received by the sellers. Valuation at factor cost reflects the net price received by the seller, i.e., the market price less the excess of indirect taxes over subsidies. To measure output in terms of what it fetches on the market, we measure it at market prices and to measure output in terms of what it costs in terms of the factors of production, we measure it at factor costs. There are three approaches to measure GDP whether nominal or real. Two of these approaches concentrate on output data while the third approach uses the fact that the value of output must accrue as income to someone. These approaches are namely, the expenditure/ final goods approach, value-added approach, and income approach to national income accounting. We will discuss these approaches in detail later in the next unit. We will now discuss some of the other important measures in national income accounting.

## **Personal Income**

Personal income is the income accruing to households after adjustments in national income. We can obtain personal income by subtracting from national income the part that accrues to the corporate sector and add to it dividends which households receive, the transfers they receive from the government and personal interest income. Thus,

**PI = NI – corporate profits – social security and other contributions – net interest + Dividends + government transfers + personal interest income.**

## **Personal Disposable income**

Personal disposable income is the personal income adjusted for personal Taxes. Thus,

**PDI = PI – personal taxes**

This is the income that actually determines consumption and savings decision in the economy.

## **Price indicators**

We can use price indicators to compare average prices of a common basket of goods and services

over two different periods. Price indicators are a very important part of national income accounts for three reasons. Price stability or combating inflation is one of the key goals of macroeconomics. Movements in price indices enable us to understand changes in the price levels and accordingly undertake policy measures to realize price stability and control inflation. In order to find the economic growth as given by the growth rate of output in the economy, we need to adjust the nominal value of the output to changes in the price levels. Price indices enable us to separate changes in value of production/ expenditure/ income into their price and real output components. We can use price indices to deflate monetary or nominal figures and adjust for changes in the purchasing power of money. The three important price indices are the consumer price index (CPI), the wholesale price index (WPI), and the implicit GDP deflator.

### **Consumer Price Index (CPI)**

The consumer price index is the most widely used price index. The CPI is a weighted average of prices for a market basket of goods and services commonly purchased by households, at the retail level, and expressed in relation to a base year with an index value of 100. The CPI excludes exports and includes imports and converts them into a single index to measure the overall level of prices.

### **Wholesale Price Index (WPI)**

The WPI is the weighted average of the prices for a market basket of goods that are commonly purchased by firms in a given period. It is constructed from the input prices at the level of first significant commercial transactions. The WPI market basket consists of important inputs in the production process, including raw materials and semi-finished goods. The construction of WPI is similar to that of CPI. Since the WPI measures prices at an early stage of the distribution system, it signals inflationary pressures in the economy before the CPI. It also signals movements in the CPI since higher costs to producers are eventually passed on as higher prices for households.

### **Implicit GDP Deflator**

The implicit price deflator or GDP deflator is another important price indicator for the economy. It is the broadest measure of changes in the economy's price levels as it measures the changes in prices between the base and current year for all output in an economy. This is in contrast to the CPI and WPI which only look at prices for a given market basket of goods and services. The implicit price deflator is a Paasche index as it looks at current quantities. The implicit price deflator is defined as the ratio of nominal to real GDP for a given year. It is the price of a typical unit of output relative to its price in the base year. To get the deflator, we first need to determine the real GDP, which is the physical amount of output holding prices fixed. We can calculate the real GDP by using the following steps:

- i. Record expenditures in current prices for each good and service.
- ii. Measure price changes for each item and construct a price index for each item with the same base period.
- iii. Deflate each item by dividing expenditures in the current period by the price relative to the base year prices
- iv. Add all the outputs thus obtained in constant prices

Hence, real output is determined by aggregating the deflated values of individual expenditure items. Deflating is the process of finding the real value of some monetary magnitude by dividing by some appropriate price index. Since it is impossible to collect price data on each item, we use price indices for the principal components of expenditures such as personal consumption, investment, government expenditures, etc. The implicit deflator is then calculated as the ratio of nominal output in current prices to real output in constant prices and multiplying the ratio by 100. The index is called implicit as there are no predetermined weights unlike the CPI and WPI.

### **Problems with the indices**

There are several problems with the CPI.

- Comparison across years that are far apart are likely to be misleading and erroneous as the weights and the market basket under comparison tend to become unrepresentative of the market
- CPI has an upward bias where it tends to put too much weight on those items whose prices have increased and too little on items whose prices have declined. WPI also suffers from similar problems as the CPI, though probably less as input availability and firms' preferences for inputs are likely to change less than for final products.

### **Indian Economic Planning**

Planning has been one of the pillars of economic growth and development in India. Economic planning is a technique used to realize the predetermined and well-defined goals laid down by a Central Planning Authority. One of the comprehensive definitions of planning defines it as the making of major economic decisions, what and how much to be produced; how, when, and where it is to be produced; to whom it is to be allocated; by the conscious decision of a determinate authority, on the basis of a comprehensive survey of the economic system as a whole. Planning Commission of India defines planning under a democratic system as the technical coordination, by disinterested experts, of the consumption, production, investment, trade and income distribution in accordance with social objectives set by bodies and representatives of the country. To understand the importance of the Planning Commission in India and the impact of the plans developed by it, we need to know about how it evolved in India.

### **Evolution of Planning in India**

The Soviet Union was the first country in the world which endeavoured to attain economic Development through its Five Year Plan in as early as 1928. Jawaharlal Nehru who visited the USSR long before our Independence, personally viewed the achievements of planned development and stressed the importance of planning in India. However Netaji Subash Chandra Bose was the first to give it a concrete base and shape. When he became the Congress President in 1938, in his presidential address at Haripura, he spoke of the need for a planning commission. Consequently the "National Planning Committee" was formed. Based on the resolution of the Congress in 1947, the concept of planned development of India was laid down. The credit of planning in India goes to Shri Vishveswaraya who was the first to attempt at formulating a systematic plan for the economic reconstruction of India. His book "Planned Economy for India" was published in 1943. His efforts led to the establishment of the National Planning Committee by the National Congress Party. But the committee's work was disrupted by the outbreak of the Second World War. Many plans were formulated by various people, but remained just as plans and were never implemented. Soon after Independence, the concept of planned development in India was laid down by a resolution of the

Congress and led to the setting up of a planning commission in March, 1950. Subsequently, many organizations were set up in both the states and the centre to prepare policy programmes and to evaluate various schemes to be included in the planning framework. The Planning Commission in India is a multi-body consisting of Eminent Public Personalities, Administrators, Economists and Technical Experts.

The Prime Minister of India is the Chairman of the commission and gives direction on all major issues relating to the planning of the country. The chairman is the legal head of the commission; but the deputy chairman, who is a full time member, takes care of the day-to day operations of the commission.

### **Functions of the Indian Planning Commission**

1. To assess the available resources of the country including material, capital and human resources and investigate the possibilities of augmenting deficient resources
2. To formulate a plan for the most effective and balanced utilization of the country's resources
3. To identify the stages to carry out the plan and to determine the priorities of the plan
4. To determine the factors that would impede economic development and to establish the conditions required for successfully implementing the plan.
5. To determine the nature of the machinery that will be necessary for securing the successful execution of each stage of the plan in all its aspects.
6. To periodically appraise the progress achieved in the execution of each stage of the plan and to make recommendations towards policy adjustments and necessary action.

Even though the planning commission in India was created as a temporary staff agency, over time it has become very essential and a permanent feature of the Indian Planning Machinery.

### **Objectives of Indian Economic Planning**

The commission submits the draft of plan's priorities, quantum of outlays, sources of necessary funds to the National Development Council (NDC) which is a consultative body that acts as a coordinator between the States and the Planning Commission.

Economic planning has been viewed as a panacea for many perils that exist in an economy. The objectives of Indian plans have gradually evolved over time depending upon the circumstances in which these plans were formulated. When the first plan was launched, India was facing many problems including low growth in total output, high growth in population which created a large demand for consumption of goods post-war shortages, requirement of rehabilitation of refugees and the need for reconstruction of economy after the war. These circumstances did not allow development oriented objectives and hence it was confined to agricultural and infrastructural development. It aimed at correcting the imbalance in the economy by overall balanced development that ensures increase in national income and steady progress in standard of living. Since the

industrial base was very poor in the economy, the second plan concentrated on rapid industrialization of the economy, especially in basic and heavy industries. Industrialization required a strong capital base and hence India started vigorous planning to raise the saving and investment rate. The basic objective of Indian Economic Planning is the economic development of the country. It has certain short and long-term objectives. As we have discussed, as the planning process evolved, depending on the circumstances prevailing and problem faced by each plan, the short term objectives varied from plan to plan. Shortly, we will discuss the major objectives of each of the ten five year plans in detail. Before that we will briefly discuss certain long-term objectives of planning which have remained static and made the country move in the direction of steady progress. They include high rate of economic growth, promotion of social justice, self-reliance, full employment, and modernization. Raising the standard of living by increasing national and per capita income has been the first and foremost objective of all the plans in the country. Increasing the national income by producing more goods and services became the prime objective of our developmental plans. By attaining a higher growth rate of national income in comparison to the rate of population growth in the country, we can raise the per capita income.

Apart from concentrating on the growth of national income through mere production, planners also look at proper distribution of the surplus or wealth created in the economy to ensure improvement in the standard of living of all the sections of the society. Since growth unaccompanied by social justice is not desirable in a democratic country like India, another important objective of our plans is to provide and promote social justice. We can achieve this objective by eradicating poverty and by reducing inequalities in income, wealth. To ensure equality in international relationships and to reduce our vulnerability to international pressures and disturbances, our planners have taken, making our economy self-reliant as the third major objective of our plans. We can attain self-reliance by reducing and ultimately eliminating dependence on foreign aid and as a step towards that, we have achieved self-sufficiency in food grains.

One of the main goals of our plans has been eliminating unemployment and underemployment and the main hurdle in achieving this has been the explosion of population in the country. Our planners are trying to deal with this problem through proper manpower planning. We can attain modernization by making structural and institutional changes in economic activities that will lead to greater efficiency and productivity. We have been pursuing modernization through the use of advanced technological developments in various sectors of the economy. We have achieved self-reliance in food grains by modernization in the agricultural sector. Our planners are promoting the use of computers and electronic equipments, application of advanced techniques wherever feasible, especially in the fields of logistics and machineries industries to achieve the objective of modernization that will help us to refrain from dependence on foreign assistance.

## 10.9 Summary

In this section we have discussed that Economics is a study of how societies allocate their scarce resources to meet the unlimited wants of people. Macro economics is a study of the economy in the aggregate. Aggregate supply is the total of all products that the businesses in the

economy are willing to supply Aggregate demand is the demand for total good by the different sectors of the market. Analysis of aggregate demand and supply and how equilibrium is reached in an economy will help us in understanding the macroeconomic variables Some of the macroeconomic variables include national income, investment, savings, employment, inflation, balance of payment and exchange rate 1 National income is the flow of goods and services produced in an economy in a particular period and can be measured in different ways. 1 Circular flow of income analysis using two-sector, three-sector and four sector models helps us in understanding how national income is determined in an economy .National income can be determined using measures such as GDP, GNP,NNP. Price indicators play an important role in measuring national income. Some of the price indicators include CPI, WPI and Implicit GDP Deflator. Economic planning aims at facilitating the achievement of the economic goals of a country

## 10.10 Key words

Aggregate supply, Aggregate demand , macroeconomic variables , national income, investment, savings, employment, inflation, balance of payment and exchange rate ,s GDP, GNP,NNP. Price indicators,CPI, WPI and Implicit GDP Deflator.

## 10.11 Questions for Discussion

1. Why do you think understanding the subject of Macroeconomics is important?
2. What are the various goals of Macroeconomics?
3. How can you classify the macroeconomic variables?
4. Why is National Income considered as important macroeconomic Variable?
5. What are the three ways in which the concept of national income has been interpreted?
6. What do you understand by analyzing circular flow of income?
7. How can you measure GDP?

## 10.12 Suggested Reading

1. G.S. Gupta – Managerial Economics Tata Mc Graw Hill.
2. Varshney and Maheswari - Managerial Economics, Sultan Chand & Sons.
3. Mehta P.L. - Managerial Economics Sultan Chand & Sons.
4. Jocl Dean – Managerial Economics Prentice Hall.
5. Rengarajan L – Principles of Macro Economics, Tata McGra Hill.

# **LESSON**

## **11**

### **Business Cycle**

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## 11.0 Aim and Objectives

### 11.10 Questions for Discussion

### 11.11 Suggested Reading

This unit aims at providing an understanding of

1. Overview of Business Cycle
2. To understand the phases of Business cycle
3. To describe the modern International trade theories.

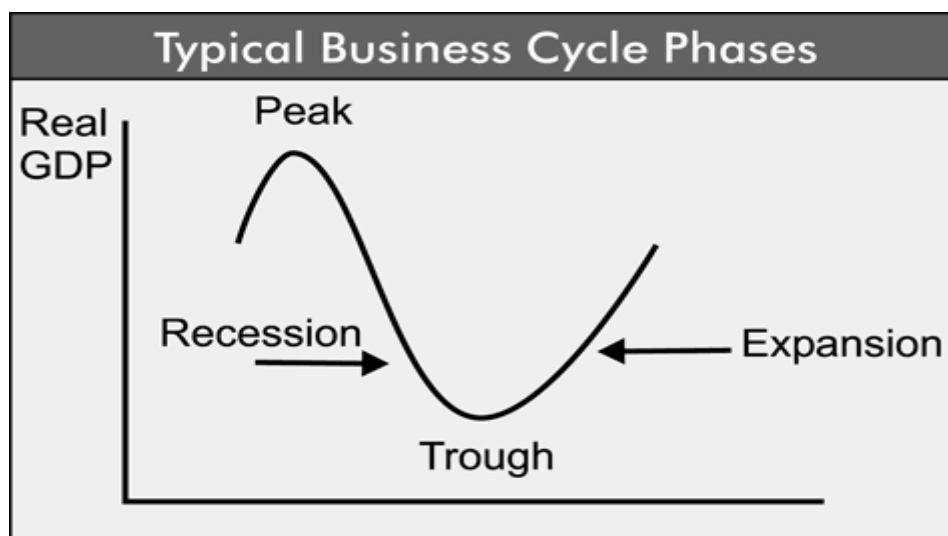
## 11.1 Introduction

The business cycle is the periodic but irregular up-and-down movements in economic activity, measured by fluctuations in real GDP and other macroeconomic variables. The business cycle refers to the periodic fluctuations of economic activity about its long term growth trend. The cycle involves shifts over time between periods of relatively rapid growth of output (recovery and prosperity), alternating with periods of relative stagnation or decline (contraction or recession). These fluctuations are often measured using the real gross domestic product. One of the government's main roles is to smooth out the business cycle and reduce its fluctuations. Business cycle is not a regular, predictable, or repeating phenomenon like the swing of the pendulum of a clock. Its timing is random and, to a large degree, unpredictable. Hence to call it as "cycles" is rather misleading as they don't tend to repeat at fairly regular time intervals. Most observers find that their lengths (from peak to peak, or from trough to trough) vary, so that cycles are not mechanical in their regularity. Since no two cycles are alike in their details, some economists dispute the existence of cycles and use the word "fluctuations" (or the like) instead. Others see enough similarities between cycles that the cycle is a valid basis of studying the state of the economy. A key question is whether or not there are similar mechanisms that generate recessions and/or booms that exist in capitalist economies so that the dynamics that appear as a cycle will be seen again and again.

## 11.2 Phases of Business Cycle

Business cycles, the periodic booms and slumps in economic activities, are generally compared to ebb and flow. The ups and downs in the economy are reflected by the fluctuations in aggregate economic magnitudes, including production, investment, employment, prices, wages, bank credits,

etc. The upward and downward movements in these magnitudes show different phases of business cycles. Basically, there are only two phases in a cycle, viz., prosperity and depression. However, considering the intermediate stages between prosperity and depression, a business cycle is identified as a sequence of four phases:



- Expansion of economic activities (A speedup in the pace of economic activity)
- Peak of boom or prosperity (The upper turning of a business cycle)
- Contraction (A slowdown in the pace of economic activity)
- Trough (The lower turning point of a business cycle, where a contraction turns into an expansion)
- Recovery and Expansion The Business Cycle is the name given to the periodic fluctuations in the level of economic activity that arise from movements in the level of aggregate demand. We can say that this cycle moves through four distinct phases:

### **The Business Cycle**

#### **Contraction:**

This phase will usually follow a boom, or a period of rapid economic expansion. At this time the rate of growth in GDP may fall, while the number of new jobs being created may also fall. As a result, over time the rate of unemployment may increase. Also at this time any upward pressure that had previously been evident on prices will subside. Pressure on the current account deficit may also ease, as people reduce their demand for imported goods and services.

#### **Recession:**

A recession is a phase in which the rate of growth is seen to be negative for two consecutive quarters. During this phase of the business cycle few new jobs will be created, and therefore the unemployment rate will continue to increase. (However, the rate of unemployment may not peak until after the recession has passed, as was the situation in Australia in the early 1990's.) Also at this time inflation will be lower than previously experienced, and will not be a priority of the federal government in the short term. The balance on current account is likely to be very low due to

reduced spending on imports.

### **Expansion:**

During a recession policies will be put in place to try and encourage economic expansion once again. Eventually confidence will return, and with it so will the level of investment. As this happens new jobs may be created, and the rate of growth will once again become positive. Prices may begin to rise, but it is unlikely that the government will focus on inflation, as it is important to get the economy growing steadily once again. The current account deficit may also slowly increase as the expansionary policy setting encourages spending once more, some of which will be on imports.

### **Boom:**

An economic boom is considered the peak of the business cycle. At this time growth reaches its highest point, and unemployment reaches its lowest point. However, also at this stage of the cycle we can expect higher rates of inflation (for example, in 1989/90 Australia experienced inflation of 8%) and an increasing current account deficit. As a result of these negative side effects, the policy makers will act to restrain growth. This may take the form of increased interest rates as implemented by the Reserve Bank of Australia. When there are no business cycles, the growth of the economy can be shown by a steady growth line as indicated in the figure. The various phases of business cycles are shown by the line of cycle which moves up and down the steady growth line. The expansion phase, which is indicated by the line of cycle moving above the steady growth line, marks the beginning of the prosperity in the economy. This phase is characterized by increase in output, employment, investment aggregate demand, sales, profits, bank credits, wholesale and retail prices, per capita output and a rise in standard of living. The growth rate eventually slows down and reaches its peak. The peak is generally characterized by slacking in the expansion rate and the end of expansion. It indicates the beginning of the downward slide in the economic activities from the peak. The phase of recession begins when the downward slide in the growth rate becomes rapid and steady. Output, employment, prices, etc. register a rapid decline, though the realized growth rate may still remain above the steady growth line. The economy enjoys a period of prosperity as long as growth rate exceeds or equals the expected steady growth rate. But when the growth rate goes below the steady growth rate, it marks the beginning of depression in the economy. In a stagnated economy, depression begins when the growth rate turns negative. The span of depression spreads over a period during which

growth rate stays below the zero growth rate in a stagnated economy. Trough is the phase during which the down-trend in the economy slows down and eventually stops. After trough, the economic activities once again register an upward movement with a lapse of time. Trough is the period of most severe strain on the economy. When the economy registers a continuous and rapid upward trend, it enters a phase of recovery. In this stage the growth rate may still be less than the steady growth rate, but still the economy once again enters the phase of expansion. If economic fluctuations are not controlled by the government, business cycles continue to recur.

### **Preventing Business Cycles**

Because the periods of stagflation are painful for many who lose their jobs, pressure arises for politicians to try to smooth out the oscillations. An important goal of all Western nations since the Great Depression has been to limit the dips. Government intervention in the economy can be risky, however. No one argues that managing economic policy to even out the cycle is an easy job in a society with a complex economy, even when Keynesian theory is applied. According to some theorists, notably nineteenth-century advocates of communism, this difficulty is insurmountable.

Karl Marx in particular claimed that the recurrent business cycle crises of capitalism were inevitable results of the system's operations. In this view, all that the government can do is to change the timing of economic crises. The crisis could also show up in a different form, for example as severe inflation or a steadily increasing government deficit. Worse, by delaying a crisis, government policy is seen as making it more dramatic and thus more painful. Good forecasts of cyclical turning points are critical to improve policy decisions. Monetary and fiscal policy helps to smooth the cycle out as well.

### **Traditional Business Cycle Models**

The main types of business cycles enumerated by Joseph Schumpeter and others in this field have been named after their discoverers or proposers:

1. the Kitchin Inventory Cycle (3-5 years)
2. the Juglar Cycle ( 7-11 years)
3. The Kuznets infrastructural investment cycle (15-25 years)
4. the Kondratieff wave or cycle (45 – 60 years)

Even longer cycles are occasionally proposed, often as multiples of the Kondratieff cycle.

## **11.3 Theories of Business Cycle**

A systematic study of business cycles is a relatively recent development that started in the nineteenth century. The classical economist believed that the world economic behaviour can be represented by the Law “ Supply creates its own demand”; only inflexible wage and interest rates lead to unemployment in the economy and that the market forces would, by themselves, maintain stability in the economy. Even though important contributions were made to the theory of business cycles prior to the Great Depression, the study of business cycle still remained outside the purview of the general economic theory. Keynes was the one to introduce business cycle into the general theoretical framework of economy. There are a number of trade cycle theories that have been proposed by contributors like Metzler, Harrod, Kalecki, Samuelson, Hicks, Goodwin, etc. Out of the various theories on business cycle, we will restrict our discussion to the Pure monetary theory and Multiplier – Accelerator Interaction Theory

### **The Pure Monetary Theory of Business Cycle**

The business cycle theories that laid emphasis on the monetary and credit system in their analysis are jointly known as monetary theory of business cycle. According to this theory, the main cause of business fluctuation is the unstable monetary and credit system in the economy. The cyclical process is basically caused by the fluctuations in the money supply and bank credit.

The business cycles are successive phases of inflation and deflation and all changes in the levels of economic activities are only a result of changes in money flows. When money supply falls, prices decrease, profits decrease resulting in fall of production. Likewise, when the money supply increases, prices rise, profits increase resulting in increase in total output. According to this theory, the principal factor affecting the money supply is the credit mechanism, which in the modern economies is the volume of credit created by the banking system. The expansion of bank credit starts

of the upswing of the business cycle and it continues till there is credit expansion. The banks expand credit facility as they find that in the given conditions, it is profitable to offer credit on easier terms motivating entrepreneurs to increase production. Consequently, bank credit is offered to different types of capital formation activities. As the profitability has increased, the entrepreneurs continue to borrow for capital investment, even when the interest rates begin to move upwards. Till the upward swing continues, the general level of price also increases as the demand increases at a faster rate when compared to increase in supply beyond a certain limit. The supply increases at a lower rate due to limited production capacity and the new investments cannot be made in the short run. Thus, credit expansion accelerates the process of economic expansion and helps rise in prices reinforcing the upswing in the cycle. After the expansion process becomes self-sustaining, it needs no further inducement from the banking system. Hence, the banking system starts restraining their credit expansion which results in the reversal of the process of prosperity. As the credit expansion comes to an end, entrepreneurs can no longer obtain bank credit for expanding their business operations. Due to lack of credit, the entrepreneurs find it difficult to meet their payment obligations and to maintain inventories at the existing levels. So they deplete their inventories and cancel the orders for purchase of input which marks the beginning of downswing.

### **Multiplier- Accelerator Theory of Business Cycle**

In his General Theory, Keynes had argued that it was the dynamics of expectations that generated cycles by affecting the marginal efficiency of investment and subsequently the multiplier and output. Nevertheless, Keynes did not venture into explaining the nature and causes of business cycle.

Roy Harrod in his theory of the trade cycle tried to explore the relationships between the Keynesian multiplier and accelerator-type investment functions to explain a growing, progressive economy with and without cycles. The principle of the multiplier as proposed by Keynes is that if investment increases, there will be an increase in output because of a “multiplier” relationship between equilibrium output and the autonomous components of spending. The principle of the accelerator, as laid out by Albert Aftalion (1913) and John Maurice Clark (1917), was that investment decisions on the part of firms are at least in part dependent upon expectations of future increases in demand, which may, in turn, be extrapolated from any current or past increases in aggregate demand or output. Thus, the multiplier principle implies that investment increases output whereas the acceleration principle implies that increases in output will themselves induce increases in investment. In the multiplier –accelerator models, these two principles are put together to examine the dynamic properties of investment and output as they affect each other and to examine how they generate business cycles. Roy F. Harrod attempted to formalize a Keynesian growth model and was not much successful. John Hicks sought to recast Harrod’s unstable “multiplier-accelerator” dynamics into cyclical ones by having explosive trajectories bang up against floors and ceilings. To this end, Hicks employed the formalism of dynamical difference equations, that had been introduced in a similar context by Paul Samuelson in his income-expenditure “oscillator” and by Lloyd Metzler in his inventory cycle. We will discuss in this section, the Samuelson’s model as a representative of this tradition.

### **Samuelson’s Model**

This model is regarded as the first step towards the integration of principles of multiplier and accelerator. In his model, he shows how the interaction of multiplier and accelerator results in

income generation and increase consumption and investment demands more than expected, causing economic fluctuations. In his model, investment is assumed to be composed of three parts. The first part is autonomous investment, which is the investment undertaken due to factors outside the control of the economy such as new inventions in the field of production technology and of new markets. The second is investment induced by interest rates and the final part is investment induced by changes in consumption demand, which is called derived investment. Now, let us discuss the interaction process of multiplier and accelerator in brief. When autonomous investment takes place in an economy,

people's income increases and the process of multiplier begins. Depending on the marginal propensity to consume, the increase in income results in the increase in demand for consumer goods and services. If there is no excess production capacity, the existing capacity of production will not be adequate to meet the increase in demand. Hence, the producers trying to meet this growing demand undertake new investments, which is derived investment. With this, the acceleration process starts. Due to derived investment, the income rises further, which in turn results in increase in demand for consumer goods and services. Thus, the multiplier and accelerator interact with each other and make the income grow at a much faster rate than expected, which is called the multiplier acceleration interaction.

Samuelson makes the following assumptions when proposing his model:

- \*no excess production capacity
- \*one year lag in consumption
- \*one year lag in increase in consumption and investment
- \*no government activity and no foreign trade

According to his model the economy will be in equilibrium when

$$Y_t = C_t + I_t \dots (1)$$

Where  $Y_t$  is the national income,  $C_t = a Y_{t-1}$  is the consumption expenditure, and  $I_t$  is the investment expenditure, all in time period  $t$  and  $a$  is mpc. We can express the investment as a function of consumption function with a one-year lag as

$$I_t = b (C_t - C_{t-1})$$

where  $b$  represents capital - output ratio that determines the accelerator. By substituting for  $C_t$  and  $I_t$  in equilibrium equation  $\dots (1)$ , we get

$$\begin{aligned} Y_t &= a Y_{t-1} + b (C_t - C_{t-1}) \\ &= a Y_{t-1} + b (a Y_{t-1} - a Y_{t-2}) \dots (2) \end{aligned}$$

The above equation  $\dots (2)$  is the final form of equilibrium equation from which we can infer that

We can arrive at any past or future income if we know the values of  $a$  and  $b$  and income for two years. The rate of income variation would depend on the values of  $a$  and  $b$ . In his model Samuelson has shown the various kinds of cycles that would be generated by different combinations of  $a$  and  $b$  which include damped non-oscillation, damped oscillation, explosive oscillation and explosive non-oscillation.

## 11.4 Analysis of the External Sector

International trade is the trade or exchange of goods between two or more countries. Scientific and technological developments have enabled contact, communication and trade between people from

distant parts of the globe. Trade between Tamils and Romans took place thousands of years back and today international trade has grown in volume and extent so that, even the existence of a nation may be threatened by loss of trade with other countries. In this unit, we will discuss in detail why countries trade with each other, the role of trade multiplier and the role of trade policy. International trade grows due to territorial division of labour and regional specialization in the countries of the world; in turn, it helps in the growth of the same factors, namely, regional specialization. We can distinguish international trade from domestic trade based on the following characteristic features:

Due to immobility of factors of production such as labour, capital and natural resources between different countries, the prices of same commodities may differ considerably in different countries

Due to wide diversities in climate, language, culture and customs, the international markets are heterogeneous. That is, there are considerable differences in buyer behaviour in different countries.

Existence of differences in national groups and political units influences the national policies and governmental controls to be widely different in different countries. Differences in currencies require the need for evolving common standards of exchange between currencies. The socio-economic policies of different countries, which aim to protect special interests within the countries considerably, influence the International trade (e.g. Currently, the policy of subsidies to

farmers has evolved as a major hitch in international trade, especially between developed and developing countries).

All these features, which differentiate international trade from domestic trade have led to the development of the subject of international economics. International economics is growing in importance as a field of study because of the rapid integration of international economic markets. More and more, businesses, consumers and governments realize that their lives are increasingly affected, not just by what goes on in their own town, state or country, but by what is happening around the world due to globalization. World economy is facing a fundamental shift where we are moving away from relatively self-contained national economies isolated from each other by barriers of distance, time zones, languages, government regulation, culture and business systems, towards a world in which national economies are merging into an interdependent global economic system through the process of globalization. In this globalized economy, the volume of goods, services and investment crossing national borders have expanded faster than world output every year during the last two decades of the 20<sup>th</sup> century. Globalization has been facilitated by international organizations such as World Trade Organization (WTO) and leaders of world's powerful economies advocating free trade among nations. With globalization, many products that we use are obtained from all over the world.

Globalization has increased the opportunities for a firm to expand its revenues by selling around the world and reduce its cost by producing in nations where key inputs are cheap. Regulatory and administrative barriers to international trade have come down. Nations have transformed their economies by privatizing state-owned enterprises, deregulating markets, increasing competition welcoming foreign investment in businesses from all around the world to expand internationally.

During the early 1900s many countries of the world erected formidable barriers to international trade and foreign direct investment. Many of the barriers to trade took the form of high tariffs on imports of manufactured goods. Due to retaliatory trade policies of countries, trade barriers were raised to very high levels, which led to the Great Depression in 1929. Hence, advanced industrial nations, under the umbrella of the General Agreement on Tariffs and Trade

(GATT) tried to remove the barriers to free flow of goods, services and capital between nations and the past data indicate that the efforts have been fruitful. In economics, we are interested in finding out the reasons behind international trade in general and specifically the drivers that force the world towards greater globalization. For understanding why countries trade between each other, we should know the advantages and disadvantages of International Trade.

### **Advantages of International Trade**

It boosts international specialization and geographical division of labour resulting in optimum utilization of world's natural resources, thus making it a win-win situation for all the parties participating in the game. Total output and exchangeable values of possessions of each country increases, thus improving the standard of life and quality of life throughout the world. (e.g the introduction of European Common Market has considerably improved the living standards in all the member countries). Improvement in cultural exchanges and ties between different countries helps in developing more cohesiveness in human community. Foreign trade eases local scarcity of food or other essential goods, temporary or long-standing, considerably. Improvement in international cooperation and appreciation of cultural diversity will lead to stable peace in the long run. International competition results in improvement of production quality and research and development of skill and new technological innovations.

### **Disadvantages of International Trade**

Rapid depletion of localized resources and raw materials may result in greater imbalances. For example, a country having oil as its major resource will be adversely affected by fast depletion of its oil resources. International competition tends to suppress local industry at developing stage and ultimately even kill it. Dumping of unwanted goods by advanced countries may result in economic slavery of developing countries, affecting their capital foundation and growth rate. Self-sufficient and self-reliant economy will decline in such countries.

## **11.5 Classical Theory of International Trade**

The theory of comparative advantages formulated by Daniel Ricardo in 1815 is regarded as the classical theory of international trade. This theory has been put forth as an alternative to Adam Smith's principles of absolute cost advantage. The theory has been developed based on a theorem, which states that, other things being equal, a country tends to specialize and export those commodities in whose production it has maximum comparative advantage. Ricardo's two country, two commodity one factor model has been developed with the following assumptions.

1. Labour is the only productive factor
2. Cost of production is measured in terms of labour units.
3. Labour is homogeneous and perfectly mobile domestically, but immobile internationally
4. Unrestricted free trade exists.
5. There is constant return to scale.



6. There is full employment equilibrium, and

7. There is perfect competition. ( There are large number of buyers and sellers in the market that individuals have no influence and the market decides the price of the products).

To illustrate the concept of comparative advantage, let us take an example. A country having comparative advantage in the production of wheat, sugar and cotton may trade these commodities with a country, which may have comparative cost advantage in the production of steel and paper. It may trade with another country for oil, manure or wine in which that country may have comparative cost advantage.

Illustration of comparative cost differences:

Country R has absolute advantage in production of both A and B over country S, but comparative cost advantage is greater for commodity A whose relative cost of production is 80% of that of S, while with respect to B it is 90% of that of S. Country S had least comparative disadvantage in the production of commodity B. Therefore, country R will produce commodity A and trade it with country S that produces commodity B. For example if country R requires 100 units of commodity A and 200 units of commodity B and produce both domestically it will cost 24000. Similarly, if country S wants 300 units of commodity A and 100 units of commodity B and produce both domestically it will cost 32500 for country B, thus in total it costs 56500. If both the countries decide to enter into trade with each other, where country R produces only commodity A and country S produces only commodity B and trade, country R has to spend 24000 for production of 400 units of commodity A, and country B has to spend 30000 for producing 300 units of commodity B. Since, country R has absolute advantage, it can sell to country B for some profit in exchange of commodity B from country S. Thus, both the countries can share the saving of 2500 accrued by the comparative advantage.

As the example suggests, this theory claims that both the trading countries gain from the trade. Comparative cost advantages in labour units have been modified in terms of cost of production by taking into account the variations in wage rates in the trading countries.

This may alter the relative comparative advantages. But wage rates may not alter so as to convert the advantage into disadvantage. Prof. Taussig has proposed a modified theory of comparative cost advantage in which cost of production is measured in terms of money. To understand Taussig's theory, you may assume that one labour unit, say a man day, costs Rs. 120 in country R and Rs. 132 in country S and analyse Taussig's theory. You can also repeat the analysis with modified rates of Rs. 180 in country R and Rs. 140 in country S. The classical theory of comparative advantage has many limitations, which may be suggested by the assumptions on which it is based. We may enumerate them as follows. As the theory is based on labour as the only factor affecting cost of production, the effect of cost of non-labour factors of production may have a different state of comparative advantage. The assumption of homogeneity of labour is a serious limitation of the theory and has been discarded subsequently. The theory assumes constant returns for additional production while in fact the cost diminishes for surplus production as per the elasticity of supply and demand. The theory assumes full employment and had to be modified based on employment conditions. As the theory ignores transport costs, the actual cost may tend to nullify or boost the comparative advantage. International trade involves large number of countries and commodities and Ricardo's two-country two-commodity and one factor model is too inadequate for realistic assessment. In spite of the limitations, it may be appreciated that it has initiated a model for assessment of comparative advantage and the model has been subsequently modified to account for

the limitations and it is still appreciated as having an elegant logical structure.

As the theory assumes free trade with perfect competition, its conclusion that all the parties in the game gain, is illusory with respect to trade between developed and developing countries. Hence, these countries try to enhance their condition by planned production and regulation of foreign trade and seek to develop import substitutions.

## 11.6 Modern Theory of International Trade

### Development of Ohlin's theory

B. Ohlin's modern theory of international trade is based on the general equilibrium approach. Ohlin accepts Ricardo's comparative cost difference as the basis of international trade. However, he considered Ricardo's theory as incomplete as it does not explain the causes for comparative cost differences. For him, international trade is only a special case of inter-regional trade and does not have much substantial difference. He has pointed out that establishment of exchange rates for various currencies have eliminated the need for separate theory for international trade. Accepting the theory of comparative cost difference (of Ricardo) as the basis for international trade Ohlin seeks to explain the real cause for this difference and tries to establish it on a more logical footing. According to him, trade results on account of different relative prices of different goods in different countries and the relative commodity price difference is the result of relative costs and factor price differences in different countries which, in turn, are due to differences in factor endowments in different countries. Thus, trade occurs between different countries because different countries have different factor endowments. Hence, Ohlin's theory is also called the factor endowment theory. He considered factors such as national frontiers, tariff barriers, different languages, and customs as only temporary obstacles to the free flow of trade between countries, and hence will collapse at a stage giving place to the fundamental principle of general value theory which he called, "the mutual interdependence price theory".

According to the theory, the prices of a commodity are determined by the total demand and supply forces in the market. But the cost of production comprises prices paid to factors of production, which also includes consumers as producing agents for the commodity, and hence the price of commodity rests on mutual interdependence. Ohlin developed a simplified static model based on the following assumptions:

1. There are two factors, namely, labour and capital
2. Two countries I and J exists such that I is labour abundant and B is capital rich
3. There are two goods L and C such that L is labour intensive and C is capital intensive
4. There is perfect competition in both the commodity and factor markets
5. All the production functions are homogeneous of the first degree
6. There are no transport costs or other impediments to trade

With these assumptions, he has explained the meaning of comparative advantage or relative price

difference and sought to prove the “factor price equilibrium theorem”.

We can present the interpretation of Ohlin’s theory based on these assumptions as follows:

Two countries will involve in a trade if the relative prices of goods (say L and C) are different. That is, trade will result when a country can buy goods cheaper from outside than it can produce them domestically. Under competitive market conditions, prices are equal to average costs. i.e., relative price differences are because of cost differences, which are due to factor price differences in the two countries.

1. Supply and demand determine the factor prices. For a given demand, a capital rich country has a lower capital price and a labour intensive country will have a cheaper labour price. Defining the factor price ratio as the ratio of price of labour to the price of capital it is taken as a model parameter. Product L being labour intensive will be cheaper in country I while C will be cheaper in country J. Therefore, country I will tend to specialize in L and J will tend to specialize in C. These differences will persist due to international immobility of factors of production. (Globalization is an attempt to create mobility for the factors of production). Thus, by interpreting the Ohlin’s model, we can arrive at the following conclusions:

i. Differences in commodity prices in the two countries are the basis of international trade.

ii. Differences in factor endowments cause the differences in commodity prices.

iii. A capital rich country specializes in capital-intensive products and a labour abundant country specializes in labour- intensive products. In his illustration, Ohlin used Australia and England. While Australia is rich in capital (land), it has scanty labour force. England though, also rich in capital has greater availability of cheap labour. Hence, Australia was selling capital-intensive products such as wheat, wool and meat to England, purchasing in return labour-intensive industrial products. Ohlin also points out that relative price differences will lead to absolute price differences when the exchange rate between the two countries is settled. He claims that his conclusions though derived from a simple model can be extended to multi-product, multi-nation trade and makes the following observations:

1. The theory can be extended to any number of regions without making any change in the methods or altering the conclusions; only the theory would become more complex. It is not necessary that the regions should have disproportionate factor supply. Even if the factor prices are the same in the two countries, presence of large market can encourage specialization. Qualitative differences in different factors in two regions may make it difficult to compare relative differences in the two regions. This may be solved by classifying all these factors under different groups. It is the demand and supply that are more important for comparison than homogeneity of factors. Transport costs, ignored in the initial analysis can be subsequently included in a modified model to determine their effect on prices and trade. The assumption of the constant cost is not necessarily a draw-back of the model as it is not necessary for validity of the theory. However, the assumption of full employment and perfect competition are not realizable in practice, because of international monopoly and absence of free trade. But without these assumptions the theory could not have been developed.

### **Comparison with Classical Theory**

- i. Ricardo presents a separate theory for international trade, while in modern theory, international trade is treated by adding a space dimension to domestic trade theory.
- ii. The Classical theory is a one-factor (labour) theory while The modern theory includes capital as second factor.
- iii. Unlike the classical theory, the modern theory is a multiple market theory of pricing.
- iv. The classical theory tries to establish normative economics while the modern theory contributes to the development of positive economics.
- v. . The classical theory stresses on the quality differences of labour in two countries while the modern theory emphasizes on the difference in factor endowments.
- vi. Ricardo does not explain the basis of comparative cost differences. Ohlin's theory explains it by taking into account the differences in quantity of all factors and also it takes into account the wide differences in factor endowments for different goods. This is the significant difference and improvement over classical theory.

### **Empirical Tests of the Factor Endowment Theory**

Any theory starts as a hypothesis formed through observations of field realities and is strengthened by methodical verifications through systematically constructed and conducted tests. Some of the important test that helped in strengthening the theory are described as below.

#### **MacDougall's Test**

MacDougall made an attempt to find out whether a country's exports consists of goods involving the use of relatively abundant factors or not. He compared the export shares of UK and USA, two capital abundant countries. Contrary to expectation, England's export of capital-intensive goods was so negligible as to refute Ohlin's theory. But the test was criticized for using a wrong parameter (horsepower) as a measure of capital-intensity. In fact, horse power should have been treated as labour assisted by mechanical power.

#### **Leontief Paradox**

Another study of American exports by Leontief also led to another similar unexpected observation that though America is a capital-intensive country, it exports mostly labour-intensive goods. This is known in economics literature as the Leontief paradox.

Bhardwaj's study of bilateral trade between India and USA has shown that America exports to India more labour intensive goods while Indian exports to America mostly capital-intensive goods which is quite contrary to Ohlin's theory.

There are two ways to adjust an international monetary disequilibrium. Such a disequilibrium will induce payment imbalances at the existing exchange rate. The authorities can allow exchange rates to adjust in response, which will alter the values of national money supplies to accommodate what is demanded and thereby prevent or eliminate the payments imbalances. Alternatively, the authorities can intervene to maintain the existing exchange rates and thereby alter the national money supply to accommodate what is demanded. In the former case the individual countries are able to control independently their money supply and should be prepared to suffer exchange rate volatility. In the latter case the reverse hold true. In practice, both methods are combined in various ways.

## **11.7 Trade Policy Tools**

Trade policies come in many varieties. Generally they consist of either taxes or subsidies, quantitative restrictions or encouragements, on either imported or exported goods, services and assets. Let us briefly describe some of policies that countries have implemented or have proposed implementing imported or exported goods, services and assets. Let us briefly describe some of policies that countries have implemented or have proposed implementing .

### **Import Tariff**

An import tariff is a tax collected on imported goods. A tariff is any tax or fee collected by a government. There are two basic ways in which tariffs may be levied: specific tariffs and ad valorem tariffs. A specific tariff is levied as a fixed charge per unit of imports. So irrespective of the value of the product, the quantity determines the tariff. An ad valorem tariff is levied as a fixed percentage of the value of the commodity imported. “Ad valorem” is Latin for “on value” or “in proportion to the value.”

Different tariffs are generally applied to different commodities. Governments rarely apply the same tariff to all goods and services imported into the country. Countries have a tariff schedule which specifies the tariff collected on every particular good and service.

### **Import Quotas**

Import quotas are limitations on the quantity of goods that can be imported into the country during a specified period of time. If an import quota is set below the free trade level of imports, it is called a binding quota. If a quota is set at or above the free trade level of imports then it is referred to as a non-binding quota. Goods that are illegal within a country effectively have a quota set equal to zero. Thus many countries have a zero quota on narcotics and other illicit drugs.

There are two basic types of quotas: absolute quotas and tariff-rate quotas. Absolute quotas limit the quantity of imports to a specified level during a specified period of time. Sometimes these quotas are set globally and thus affect all imports while sometimes they are set only against specified countries. Absolute quotas are generally administered on a first-come first-served basis. For this reason, many quotas are filled shortly after the opening of the quota period. Tariff-rate quotas allow a specified quantity of goods to be imported at a reduced tariff rate during the specified quota period.

### **Voluntary Export Restraint**

Voluntary export restraint is a restriction set by a government on the quantity of goods that can be exported out of a country during a specified period of time. It is referred to as voluntary since it is implemented upon the insistence of the importing nations.

Typically VERs arise when the import-competing industries seek protection from a surge of imports from particular exporting countries. VERs are then offered by the exporter to appease the importing country and to avoid the effects of possible trade restraints on the part of the importer. Thus VERs are rarely completely voluntary.

Also, VERs are typically implemented on a bilateral basis, that is, on exports from one exporter to one importing country.

### **Export Taxes**

An export tax is a tax collected on exported goods. As with tariffs, export taxes can be set on a specific or an ad valorem basis.

### **Export Subsidies**

Export subsidies are payments made by the government to encourage the export of specified products. As with taxes, subsidies can be levied on a specific or ad valorem basis. The most common product groups where export subsidies are applied are agricultural and dairy products.

Most countries have income support programs for their nation's farmers. These are often motivated by national security or self-sufficiency considerations. Farmers' incomes are maintained by restricting domestic supply, raising domestic demand, or a combination of the two. By encouraging exports, the government will reduce the domestic supply and eliminate the need for the government to purchase the excess.

#### **Other Policies**

A Voluntary Import Expansion (VIE) is an agreement to increase the quantity of imports of a product over a specified period of time. A Government Procurement Policy requires that a specified percentage of purchases by the central or state governments be made from domestic firms rather than foreign firms.

Health and Safety Standards regulate the use of some goods, such as pharmaceuticals. These regulations can have an effect upon trade patterns even though the policies are not designed based on their effects on trade.

Red-tape barriers refers to costly administrative procedures required for the importation of foreign goods. Red-tape barriers can take many forms. A red-tape barrier may arise if multiple licences must be obtained from a variety of government sources before importation of a product is allowed.

## **11.8 Summary**

Business cycle is the periodic but irregular up and down movement in economic activity, which is determined by various macroeconomic variables.

- ◆ The business cycle includes expansion, peak, contraction, trough phases
- ◆ There are various theories which explain the reason for these business cycles.

International Trade boosts international specialization and geographical division of labour resulting in optimum utilization of world's natural resources, thus making it a win-win situation for all the parties participating in the game

◆ Rapid depletion of localized resources and raw materials may result in greater imbalances.

◆ The theory of comparative advantages formulated by Daniel Ricardo in 1815 is regarded as the classical theory of international trade.

◆ The classical theory has been developed based on a theorem, which states that, other things being equal, a country tends to specialize and export those commodities in whose production it has maximum comparative advantage.

◆ Ohlin developed a simplified static model based on certain assumptions. Ohlin's theory explains basis of comparative cost differences by taking into account the differences in quantity of all factors and also it takes into account the wide differences in factor endowments for different goods. This is the significant difference and improvement over classical theory

- ❖ MacDougall's Test, Leontief Paradox, and Bhargava's study are some of the empirical tests of the Factor Endowment or Ohlin's Theory
- ❖ Ohlin's factor proportion analysis is regarded as an explanation of the international trade phenomenon
- ❖ There are two ways to adjust an international monetary disequilibrium. Authorities can allow exchange rates to adjust in response or intervene to maintain the existing exchange rates and thereby alter the national money supply to accommodate what is demanded
- ❖ The foreign trade multiplier is smaller than the multiplier in a closed economy since  $mpm$  is added to the denominator. The international sector becomes another source of disturbance influencing income. Policies that influence the national income will also influence the trade balance. Various trade policy tools like import tariff, export tariff, export subsidies can affect international trade.

## 11.9 Key words

Business Cycle, Multiplier accelerator, International Trade, Endowment, Recession, peak, Boom

## 11.10 Questions for Discussion

1. What are the phases of business cycle and how does the economic policy of government affect the business cycle?
2. What does the multiplier-accelerator model suggest?
3. What are the characteristics that differentiate international trade from domestic trade?
4. Why is international economics as a field of study gaining importance?
5. What are the advantages and disadvantages of International Trade?
6. What are the assumptions made by Ricardo in his theory on International trade?
7. Illustrate comparative advantage with an example
8. Compare Ohlin's theory with classical theory of international trade
9. Describe the various tests of the factor endowment theory.
10. What are the various trade policies that affect international trade?
11. Comment on Indian trade policy.

## 11.11 Suggested Reading

1. G.S. Gupta – Managerial Economics Tata Mc Graw Hill.
2. Varshney and Maheswari - Managerial Economics, Sultan Chand & Sons.
3. Mehta P.L. - Managerial Economics Sultan Chand & Sons.
4. Joel Dean – Managerial Economics Prentice Hall.
5. Rengarajan L – Principles of Macro Economics, Tata McGraw Hill.

# **LESSON**

## **12**

### **Balance of Payment**

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## 12.0 Aim and Objective

This unit aims at providing an understanding of

1. Overview of Balance of Payment
2. To understand Inflation, Deflation and Monetary policy
3. How to measure inflation?
4. To explain the importance of Fiscal Policy.
5. To mention the concepts of Monetary policy prevailing in India.

## 12.1 Introduction

Money is a means of final payment for goods in most price system economies and the unit of account in which prices are typically stated. It includes currency held by the nonbank public and checkable deposits. It has been described as a social convention, like language, useful to one largely because it is useful to others.

As a medium of exchange, money facilitates trade. Its economic function can be contrasted with barter (non-monetary exchange). Given a diverse array of produced goods and specialized producers, barter may entail a hard-to-locate double coincidence of wants as to what is exchanged, say apples and a book. Money can reduce the transaction cost of exchange because of its ready acceptability. Then it is less costly for the seller to accept money in exchange, rather than what the buyer produces. At the level of an economy, theory and evidence are consistent with a positive relationship running from the total money supply to the nominal value of total output and to the general price level. For this reason, management of the money supply is a key aspect of monetary policy.

National accounting is a method for summarizing aggregate economic activity of a nation. The national accounts are double-entry accounting systems that provide detailed underlying measures of such information. These include the national income and product accounts (NIPA), which provide estimates for the money value of output and income per year or quarter.

NIPA allows for tracking the performance of an economy and its components through business cycles or over longer periods. Price data may permit distinguishing nominal from real amounts, that is, correcting money totals for price changes over time. The national accounts also include measurement of the capital stock, wealth of a nation, and international capital flows.

## 12.2 International economics

International trade studies determinants of goods-and-services flows across international boundaries. It also concerns the size and distribution of gains from trade. Policy applications include estimating the effects of changing tariff rates and trade quotas. International finance is a macroeconomic field which examines the flow of capital across international borders, and the effects of these movements on exchange rates. Increased trade in goods, services and capital between countries is a major effect of contemporary globalization. World map showing GDP (PPP) per capita. The distinct field of development economics examines economic aspects of the development process in relatively low-income countries focussing on structural change, poverty, and economic growth. Approaches in development economics frequently incorporate social and political factors.

Economic systems are the branch of economics that studies the methods and institutions by which societies determine the ownership, direction, and allocation of economic resources. An economic system of a society is the unit of analysis.

Among contemporary systems at different ends of the organizational spectrum are socialist systems and capitalist systems, in which most production occurs in respectively state-run and private enterprises. In between are mixed economies. A common element is the interaction of economic and political influences, broadly described as political economy. Comparative economic systems studies the relative performance and behavior of different economies or systems.

Contemporary mainstream economics, as a formal mathematical modeling field, could also be called mathematical economics. It draws on the tools of calculus, linear algebra, statistics, game theory, and computer science. Professional economists are expected to be familiar with these tools, although all economists specialize, and some specialize in econometrics and mathematical methods while others specialize in less quantitative areas.

Heterodox economists place less emphasis upon mathematics, and several important historical economists, including Adam Smith and Joseph Schumpeter, have not been mathematicians. Economic reasoning involves intuition regarding economic concepts, and economists attempt to analyze to the point of discovering unintended consequences.

## **Theory**

Mainstream economic theory relies upon a priori quantitative economic models, which employ a variety of concepts. Theory typically proceeds with an assumption of *ceteris paribus*, which means holding constant explanatory variables other than the one under consideration. When creating theories, the objective is to find ones which are at least as simple in information requirements, more precise in predictions, and more fruitful in generating additional research than prior theories.

In microeconomics, principal concepts include supply and demand, marginalism, rational choice theory, opportunity cost, budget constraints, utility, and the theory of the firm. Early macroeconomic models focused on modeling the relationships between aggregate variables, but as the relationships appeared to change over time macroeconomists were pressured to base their models in microfoundations.

The aforementioned microeconomic concepts play a major part in macroeconomic models – for instance, in monetary theory, the quantity theory of money predicts that increases in the money supply increase inflation, and inflation is assumed to be influenced by rational expectations. In

development economics, slower growth in developed nations has been sometimes predicted because of the declining marginal returns of investment and capital, and this has been observed in the Four Asian Tigers. Sometimes an economic hypothesis is only qualitative, not quantitative.

Expositions of economic reasoning often use two-dimensional graphs to illustrate theoretical relationships. At a higher level of generality, Paul Samuelson's treatise *Foundations of Economic Analysis* (1947) used mathematical methods to represent the theory, particularly as to maximizing behavioral relations of agents reaching equilibrium. The book focused on examining the class of statements called operationally meaningful theorems in economics, which are theorems that can conceivably be refuted by empirical data.

Economic theories are frequently tested empirically, largely through the use of econometrics using economic data. The controlled experiments common to the physical sciences are difficult and uncommon in economics, and instead broad data is observationally studied; this type of testing is typically regarded as less rigorous than controlled experimentation, and the conclusions typically more tentative. The number of laws discovered by the discipline of economics is relatively very low compared to the physical sciences. Statistical methods such as regression analysis are common. Practitioners use such methods to estimate the size, economic significance, and statistical significance ("signal strength") of the hypothesized relation(s) and to adjust for noise from other variables. By such means, a hypothesis may gain acceptance, although in a probabilistic, rather than certain, sense. Acceptance is dependent upon the falsifiable hypothesis surviving tests. Use of commonly accepted methods need not produce a final conclusion or even a consensus on a particular question, given different tests, data sets, and prior beliefs.

Criticism based on professional standards and non-replicability of results serve as further checks against bias, errors, and over-generalization, although much economic research has been accused of being non-replicable, and prestigious journals have been accused of not facilitating replication through the provision of the code and data. Like theories, uses of test statistics are themselves open to critical analysis, although critical commentary on papers in economics in prestigious journals such as the *American Economic Review* has declined precipitously in the past 40 years. This has been attributed to journals' incentives to maximize citations in order to rank higher on the Social Science Citation Index (SSCI).

In applied economics, input-output models employing linear programming methods are quite common. Large amounts of data are run through computer programs to analyze the impact of certain policies; IMPLAN is one well-known example.

Experimental economics has promoted the use of scientifically controlled experiments. This has reduced long-noted distinction of economics from natural sciences allowed direct tests of what were previously taken as axioms. In some cases these have found that the axioms are not entirely correct; for example, the ultimatum game has revealed that people reject unequal offers.

In behavioral economics, psychologists Daniel Kahneman and Amos Tversky have won Nobel Prizes in economics for their empirical discovery of several cognitive biases and heuristics. Similar empirical testing occurs in neuroeconomics. Another example is the assumption of narrowly selfish preferences versus a model that tests for selfish, altruistic, and cooperative preferences. These techniques have led some to argue that economics is a "genuine science."

## 12.3 Inflation

In modern economies, inflation has become a common and even chronic problem in both Developed and underdeveloped economies. Different economists define this phenomenon in different ways. Let us start our discussion on inflation with a few of these definitions. Inflation is a rise in the general level of prices, measured against some baseline of purchasing power. It is understood by more people as a substantial and rapid general increase in the level of prices and consequent deterioration of the value of money. The common feature of inflation is the price rise, the degree of which may be measured by price indices. Inflation is statistically measured in terms of the percentage increase in the price index per unit of time. The prevailing view in mainstream economics is that inflation is caused by the interaction of the supply of money with output and interest rates. There are at least two distinct views of the concept of inflation, namely a pure monetary phenomenon and post full employment phenomenon. Monetarists in general, regard inflation as a purely monetary phenomenon. They believe that monetary effects dominate all others in setting the rate of inflation, or broadly speaking, monetarists, and those who believe that the interaction of money, interest and output dominate over other effects. It is held that when money supply exceeds the normal absorbing capacity of the economy, it leads to persistently rising prices. In other words, when there is over-expansion of money supply and too much money saving too few goods, inflation occurs. Inflation occurs when the volume of money actively bidding for goods and services increases faster than the available supply of goods, when the growth of national income in money units is greater than its growth in physical units.

According to the quantity theory of money, other things being equal, if money supply increases, there is inflation. But, the theory failed to explain the phenomenon of hyper-inflation, where the rise in prices may cause an increase in money supply which, in turn may cause further rise in prices and this vicious spiral of the dynamic process of inflation makes it difficult to distinguish cause and effect. In the Keynesian view, rising prices in all situations cannot be termed as inflation. In a situation of underemployment, when an increase in money supply and rising prices are accompanied by an expansion of output and employment, inflation does not occur. Sometimes due to bottlenecks in the economy, the increase in money supply may cause costs and prices to increase more than the expansion of output and employment. This is known as semi-inflation. Once full-employment level is reached, the entire increase in money supply is reflected by rising prices, which is the case of true inflation. Inflation occurs in a situation where there is an increase in demand expressed through more money spending but no corresponding increase in production either due to bottlenecks operating in the economy or because the economy has already reached the full employment level. Thus, rising prices in all situations cannot be termed as inflation. Real inflation occurs only when the entire increase in the money supply is reflected simply by rising prices, once the full employment level is reached. Keynes mentions the following four related terms while discussing the concept of inflation.

### **Reflation:**

It is a situation of rising prices, deliberately undertaken to relieve depression. With rising prices, employment, output and income also increase till the economy reaches the full-employment.

**Inflation:**

It occurs when prices rise after the full employment is reached. It is a long term operating dynamic process of persistently rising price levels, which is irreversible in the short run. It is usually characterized by an overflow of money and credit. In fact, the root cause of inflation is the expansion of money supply beyond the normal absorbing capacity of the economy.

**Disflation:**

When prices are falling due to anti-inflationary measures adopted by the authorities, with no corresponding decline in the existing level of employment, output and income.

**Deflation:**

It is a condition of falling prices accompanied by the decreasing level of employment, output and income. Deflation is just the opposite of inflation. Other theories, such as those of the Austrian school of economics, believe that inflation of the general price level and of specific prices is a result from an increase in the supply of money by central banking authorities.

## 12.4 Measures of Inflation

Measuring inflation is a question of Econometrics, which is, finding objective ways of comparing nominal prices to real activity. In many places in economics, “real” variables need to be compared, in order to calculate GDP, effective interest rate and improvements in productivity.

Each inflationary measure takes a “basket” of goods and services, then the prices of the items in the basket are compared to a previous time, then adjustments are made for the changes in the goods in the basket itself. For example if a month ago canned corn was sold in 10 oz. jars, and this month it is sold in 9.5 oz jars, then the prices of the two cans have to be adjusted for the contents. The result is the amount of increase in price which is attributed to “inflation” and not to improvements in productivity. This means that there are many measures of inflation, depending on which baskets of goods and services are used as the basis for comparison. Depending on the context, we can use different kinds of inflation measures to determine the real change in prices.

**Commonly used measures of inflation:-**

Examples of common measures of inflation include:

1. Consumer price indexes (CPIs) which measure the price of a selection of goods purchased by a “typical consumer”.
2. Producer price indexes (PPIs) which measure the price received by a producer. This differs from the CPI in that price subsidization, profits, and taxes may cause the amount received by the producer to differ from what the consumer paid. There is also typically a delay between an increase in the PPI and any resulting increase in the CPI. Producer price inflation measures the pressure being put on producers by the costs of their raw materials. This could be “passed on” as consumer inflation, or it could be absorbed by profits, or offset by increasing productivity. Wholesale price indexes, which measure the change in price of a selection of goods at wholesale, prior to retail mark ups and sales taxes. These are very similar to the Producer Price Indexes. Commodity price indexes, which measure the change in price of a selection of commodities. In the present commodity price indexes are weighted by the relative importance of the components to the “all in” cost of an

employee.

3. GDP Deflators use an entire economy as the basket of goods and services, rather than some particular subset. The term “deflator” in this case means the percentage to reduce current prices to get the equivalent price in a previous period. The US Commerce Department publishes a deflator series for the US economy.

4. Purchasing Power Parity adjusts for the inflationary effects of goods being non-tradable between two or more economies, for example land prices, to compare standard of living purchasing power between two economies. PPP adjustments are, therefore, measuring inflation in location, rather than in time. Many inflation series numbers are also published for particular geographic regions. For example, the US Bureau of Labor Statistics breaks down CPI-U calculations down to different regions of the US. Historical Inflation Before collecting consistent econometric data became standard for governments, and for the purpose of comparing absolute, rather than relative standards of living, various economists have calculated imputed inflation figures. Most inflation data before the early 20th century is imputed based on the known costs of goods, rather than on those compiled at the time. It is also used to adjust for the differences in real standard of living for the presence of technology. This is equivalent to not adjusting the composition of baskets over time.

## 12.5 Balance of Payment

The **Balance of Payments** ‘BOP’ is an account of all transactions between one country and all other countries—transactions that are measured in terms of receipts and payments. From the Indian perspective, a receipt represents any Rupees flowing into the country or any transaction that requires the exchange of foreign currency into Rupees. A payment represents Rupees flowing out of the country or any transaction that requires the conversion of Rupees into some other currency. The three main components of the Balance of Payments are the current account, capital account and balancing account.

1. The **Current Account** including Merchandise (Exports and Imports), Investment income (rents, profits, interest)
2. The **Capital Account** measuring Foreign investment in the U.S. and U.S. investment abroad, and
3. The **Balancing Account** allowing for changes in official reserve assets (SDR’s, Gold, other payments)

Balance of payment account is based on a double-entry book keeping: each transaction is recorded twice. Payment to a foreigner is a debit. And a receipt from him is a credit. In other words, transactions leading to foreign exchange supply are a credit and receipt from them is a debit. In general exports are credits and imports are debits. Like income from them export of goods, interest and dividend income received from abroad is treated as credit items as they provide foreign currencies.

**Exchange Rate:-**

The exchange rate between two currencies specifies how much one currency is worth in terms of the other. If a currency is free-floating, its exchange rate is allowed to vary against that of other currencies and is determined by the market forces of supply and demand. Exchange rates for such currencies are likely to change almost constantly as quoted in financial markets, mainly by banks, around the world. A movable or adjustable peg system is a system of fixed exchange rates, but with a provision for the devaluation of a currency. <sup>1</sup> The nominal exchange rate is the rate at which an organization can trade the currency of one country for the currency of another. The real exchange rate (RER) is an important concept in economics, though it is quite difficult to grasp concretely. It is defined by the model:

$RER = e (P/P^*)$ , where 'e' is the exchange rate, as the number of foreign currency units per home currency unit; where P is the price level of the home country; and where P\* is the foreign price level. Unfortunately, this compact and simple model for RER calculations is only a theoretical ideal. In practical usage, there are many foreign currencies and price level values to take into consideration. Correspondingly, the model calculations become increasingly more complex. Furthermore, the model is based on purchasing power parity (PPP), which implies a constant

RER. The empirical determination of a constant RER value could never be realized, due to limitations on data collection. PPP would imply that the RER is the rate at which an organization can trade the goods and services of one economy (e.g. country) for those of another. More recent approaches in modelling the RER employ a set of macroeconomic variables, such as relative Productivity and the real interest rate differential.

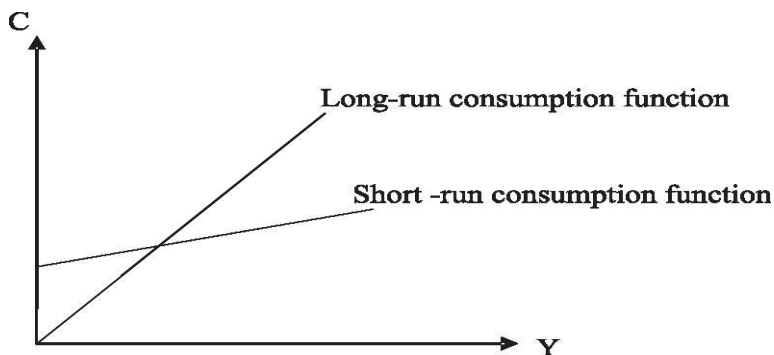
## 12.6 Consumption Spending

Consumption is the most important part of aggregate expenditure. It is the main determinant of income. Therefore, a detailed understanding of consumption is critical to understanding the determination of equilibrium income and fluctuations in income. In the Keynesian model, consumption is determined solely by disposable income. Keynes' notion of MPC stems from his view of human psychology, that individuals spend more when income rises but that they do not spend the entire increase in their income. The Keynesian model predicts that the average propensity to consume ( $APC = C/Y$ ) declines with income. This is because saving is like a luxury good with the rich tending to save a greater proportion of their income than the poor. In Keynes' view, the interest rate has little short term influence on consumption.

The empirical evidence on the Keynesian model of consumption is mixed. Studies using short time series data tend to support the fact that MPC lies between 0 and 1 and that income is an important determinant of consumption. However, studies of long time series data indicate that the average

propensity to consume is very stable over long periods of time and that despite higher income, one does not get large increases in the rate of savings as would be predicted by the Keynesian model. Over short time series studies, the APC does decline but over longer time series, it is stable. This would indicate that the consumption functions are different in the short run and the long run as shown below. Several theories of consumption have emerged to explain this fact.

### **Intertemporal consumption:-**



**Figure 38- Intertemporal model**

Individuals decide on their consumption across different time periods subject to a multiperiod budget constraint. They maximize utility intertemporally (Maximize utility across different time periods). Consumers maximize utility by setting the marginal rate of substitution (marginal rate of substitution of X for Y is the quantity of Y which would just compensate the consumer for the loss of the marginal unit of X) in consumption across two periods equals the relative price of consuming between the two periods. The main feature that differentiates it from the Keynesian specification of consumption is that consumption is a function of lifetime income and not merely the current income. Consumers look at the present value of current and future income. They respond to the changes in the relative price of consumption (changes in the interest rate) between two periods based on their preferences, whether they are borrowers or lenders, whether they face liquidity constraints or not, policies such as taxes on savings, et. Thus, consumption is determined by a richer set of variables than predicted by the Keynesian model.

### **Life Cycle (LC) Hypothesis**

One of the most important alternative theories of consumption is Modigliani's life cycle model of consumption and savings. In many ways it is similar to the intertemporal model. According to this theory, individuals are believed to base their current consumption decisions on their lifetime plan to maximize utility temporally. Families take into consideration both current and future expected income while making consumption decisions to smooth their consumption pattern over their lifetime, between working and retirement years. They save during their working years and live off savings during their retirement years to maintain smooth consumption levels. Consumers do not want a large drop in their living standard when they retire. Another important feature of the LC model is that, wealth in addition to income affects consumption. Wealth includes holding of



physical assets, human capital, bonds, etc. The net worth of an individual or family (Assets – Liabilities) is a determinant of consumption. Thus, individuals look at the present discounted value of their assets and income to decide on their consumption spending. Since wealth does not vary proportionately with income over short periods of time, the average propensity to consume declines over short time periods, in line with the Keynesian model. But over long time periods, wealth and income tend to move together which would explain the stable APC over long time series data. So, in the short run, one is moving along a given consumption function, while in the long run, there is a shift in the consumption function due to increase in wealth, thus preventing the APC from declining.

An important implication of the LC model is that savings vary over a person's lifetime. Young families with few assets and many wants and with expectations of higher future wages go into debt in their early years and save later on in their lives. Middle aged individuals save in anticipation of their retirement years and retired people dissave (deplete their saving). The consumption and savings functions of population in different age groups affect the overall consumption and saving propensities of the nation.

### **Permanent Income Hypothesis (PIH)**

Another very important model of consumption is the permanent income hypothesis developed by Milton Friedman. This model also assumes that consumption depends on lifetime income based on intertemporal decisions. According to this model, income is not regular; it changes randomly and temporarily across years. Hence, we can decompose the income into its permanent and transitory components. Individuals look at their permanent income over their lifetime in determining consumption in each period. Permanent income is the expected flow of income from the stock of human and non human wealth. Therefore, future income again affects current consumption.

According to this model, consumption depends mainly on permanent income and borrowings and savings is used to smooth consumption in response to transitory changes in income. People save in their good years to carry them through in their bad ones. Thus, when there is an increase in permanent income, it is consumed completely while when there is increase in transitory income, it is spread out over one's lifetime. The permanent income hypothesis has important policy implications. For instance, temporary tax cuts are likely to have a small effect on consumption spending. The role of expectation is also very important in this model since essentially one is dealing with intertemporal consumption choice. If individuals use all available information, then, only unexpected policy changes would cause changes in consumption spending.

Even a permanent tax cut if expected would already be factored into expected lifetime income and thus planned consumption. The discussion of the three alternative theories of consumption indicates that the Keynesian demand model grossly simplifies the nature of consumption spending. In reality, consumption spending depends on many other factors. According to these models, consumption rises when there are capital gains arising from increased value of assets, even if no extra income is received in the current period. This implies that the interest rate which affects returns to many assets is also a determinant of the consumption. Thus lifetime income and wealth together determine the pattern of current and future savings and consumption. Apart from income and wealth, other factors that affect the consumption expenditure include expectations, confidence in the economy, prices,

credit availability, interest rates etc.

## 12.7 Fiscal Policy

Fiscal policy is the economic term that defines the set of principles and decisions of a government in setting the level of public expenditure and how that expenditure is funded. Fiscal policy and monetary policy are the macroeconomic tools that governments have at their disposal to manage the economy. Fiscal policy is the deliberate change in government spending, government borrowing or taxes to stimulate or slow down the economy. It contrasts with monetary policy, which describes the policies about the supply of money to the economy.

The objectives of the fiscal policy are derived from the aspirations and goals of the society. Please recall that we have already discussed the possible macroeconomic goals in the first unit. Since the economic, political and social conditions are different for different countries, the objectives of the fiscal policy may also vary. However, the most common objectives of the fiscal policy of different countries are:

1. Economic growth
2. Promotion of employment
3. Economic stability
4. Social justice or equity

Irrespective of the objectives and their order of priorities, the two basic tools used by the fiscal policy are:

### **1. Taxation**

### **2. Public expenditure**

#### **Economic effects of fiscal policy:-**

Fiscal policy is used by governments to influence the level of aggregated demand in the economy, in an effort to achieve economic objectives of price stability, full employment and economic growth. Keynesian economics suggests that adjusting government spending and tax rates, are the best way to stimulate aggregate demand. This can be used in times of recession or low economic activity as an essential tool in providing the framework for strong economic growth and working toward full employment. However, such policies have commonly resulted in deficit spending.

During periods of high economic growth, a budget surplus can be used to decrease activity in the economy. A budget surplus will be implemented in the economy if inflation is high, in order to achieve the objective of price stability. The removal of funds from the economy will, by Keynesian Theory, reduce levels of aggregate demand in the economy and contract it, bringing about price stability.

Despite the importance of the fiscal policy, a paradox exists. In the case of a government running a budget deficit, funds will need to come from public borrowing (the issue of government bonds), overseas borrowing or the printing of new money. When governments fund a deficit with the release of government bonds, an increase in interest rates across the market can occur. This is because government borrowing creates higher demand for credit in the financial markets, causing a lower aggregate demand (AD) due to the lack of disposable income, contrary to the objective of a

budget deficit. This concept is called crowding out.

## 12.7 Monetary Policy

Money and credit in modern economy exercise vital influence upon the course, nature and volume of economic activities in an economy. Hence monetary policy plays a crucial role in moulding the economy. An appropriately conceived monetary policy can significantly aid in economic growth and prosperity by adjusting the money supply to the needs of the growth by channeling the flow of money into the desired productive network and by making institutional credit arrangement for specified fields of economic pursuit. Monetary policy can also be used for controlling the inflation and deflation in the economy. Monetary policy refers to the policy measures of the central bank to control availability, cost and use of money and credit in the country with the help of monetary measures. An ideal monetary policy may be defined as the efforts that are taken to reduce the disadvantages to a minimum and increase the advantages, resulting from the existence and operation of a monetary system. The central bank of a country is the traditional agent, which formulates and operates monetary policy. By its monetary policy, the central bank pursues to administer and control the country's money supply including the currency and demand deposits and to manage the foreign exchange rates.

In India, monetary policy comprises the decisions of the government and the Reserve Bank of India which directly influence the volume and composition of the money supply, the size and distribution of credit, the level and structure of interest rates, and directly and indirectly affect the other variables such as saving and investment, output, income and prices. The objective and scope of monetary policy are conditioned by the economic environment and the viewpoint of time. Monetary policy has to be structured and operated within the institutional framework of the monetary system of the country. In a broad sense however, the monetary policy should be aligned with the fiscal policy and debt management for controlling the economy. Recall our discussion on the fiscal policy and its impact of the national income in the previous unit. A sound monetary policy is the main prerequisite of a successful and comprehensive programme of developmental planning. Since economic growth is a real phenomenon and not a monetary one, a proper monetary policy is essential but not sufficient condition for achieving growth. Money plays a dynamic role by activating the idle resources and allocating the resources appropriately and efficiently. In a developed economy monetary policy aims at regulating the monetary measure whereas in developing economies monetary policy essentially aims at controlled expansion to facilitate economic growth and restrain inflationary pressure at the same time.

In the Indian context, the prime objective of the monetary policy is to accelerate the economic development in an environment of reasonable price stability. The generally accepted important goals of monetary policy include:

**Neutrality of Money:** The purpose of money is just to facilitate transactions without creating disturbances in the functioning of the economy. Hence, the money supply in the economy should be controlled in such a way that, the total output, total transactions, and prices of goods and services be

the same as in a moneyless economy. Thus, under the policy of neutral money, the monetary authority has to keep the quantity of money perfectly stable, i.e., the quantity of money is to be kept constant in all circumstances, for cyclical fluctuations are primarily caused by changes in the money supply. Business cycles under neutral money policy are expected to be comparatively milder. But this assumption has been criticized by many and valid reasons are given to prove that neutral money policy cannot check the occurrences of business cycles in an economy.

### **Exchange Stability:**

Maintenance of stable exchange rates is an essential condition to create international confidence and to promote international trade on the largest scale. The objective of exchange rate stability could be achieved by achieving equilibrium in the balance of payment through monetary policy. A restrictive monetary policy tends to reduce a country's balance of payment by reducing the demand for both domestic and imported goods, reduces prices of domestic goods making imported goods less attractive, and higher interest rates makes borrowing less attractive for foreign countries. Even though exchange rate stabilization helps in maintaining international economic relationship, as a goal of the monetary policy it can be achieved only at the cost of internal price stability, which is of prime importance for the smooth functioning and progress of the domestic economy, and it may seriously affect the economy of a country whose prosperity is independent for foreign trade, as inflationary or deflationary movements are passed on to countries through fixed exchange rates. In today's modern economy, where most of the countries are members of International monetary fund, the exchange rate stability has lost its importance. The IMF has established a system of free multilateral trade.

### **Price Stabilisation:**

Two of the chief disadvantages of the monetary system under capitalism are price fluctuations and cyclical variations. Thus, according to many economists including Keynes, a more important aim of monetary policy is to achieve and maintain price stabilization and normal course of business activity through appropriate credit regulation measures adopted by the central bank. The goal of price stabilization implies that in general the average price level as measured by wholesale price index or consumer price index should not be allowed to vary beyond narrow margins. A policy of price stabilization is objectionable as it is difficult to determine the price level to be selected for stabilization it will remove much of the price incentives for businesses leading to stagnation in production it price changes are a symptom rather than a cause of cyclical fluctuation and monetary policy has no control over it, and it ignores the dispersion of individual prices (which together constitute the average price level) which are more important in triggering economic activity in the system. Variations in price levels are useful for the successful working of the price mechanism for economic adjustment in the free market economy. Stability in prices in the face of declining costs adversely affects economic relations and functioning. There can be disharmonies and dislocations in the economic system even when the prices are stable. It is not very feasible since the central bank has no control over the non-banking financial intermediaries that control a large volume of credit activities in the economy. Alternatively, the monetary authority may follow a policy of either rising or falling price levels. When the inflation in the economy is rising at a rapid pace, it may adopt a falling prices policy as an anti inflationary measure. Similarly, in an

inexpedient deflationary situation, it may follow a rising prices policy with the aim of restoring prices to the previous level and thus attain a reasonable degree of price stabilization. There is a near unanimity now that there is no long-run trade-off between growth and inflation, i.e., monetary policy cannot permanently raise output above its potential through inflationary policies. Any attempts to raise output above the economy's potential will be eventually reflected in higher inflation.

### **Full Employment:**

Since Keynes, most economists consider full employment as the foremost and ideal objective monetary policy. Full employment means that unemployment is reduced to short intervals of standing by, with a certainty that one without a job, currently, will be wanted in the previous job or a new job within his power, soon. Full employment is only a precondition to social welfare and hence we must use it along with other economic resources with maximum efficiency and productivity. Recall our discussion on employment in Unit I, where we discussed saving and investment at the point of full employment. The obvious objective of a monetary policy is to attain equilibrium between savings and investment at full employment. The main task of the monetary policy is to find a level of interest rates, which exactly equals the investment demand with full employment.

### **Economic Growth:**

While economic growth is unquestionably a primary goal of any economy, as an objective of monetary policy, it is questionable. Many economists considered monetary policy as a short-run policy that aims at full employment and mitigating cyclical fluctuations. But, recently it has been proved that full employment is not enough and economic development is important for providing a high standard of living to the people. Monetary policy can contribute to the achievement of economic growth through a flexible monetary policy, where a restrictive monetary policy will be applied when there is excess demand in the economy and an expansionist credit policy will be adopted when there is a deficiency of aggregate demand. It can also help economic development by creating a favourable environment for saving and investment, by aiming for price stabilization. As savings is the main source of capital formation, when savings increase under favorable circumstances, it accelerates capital formation, which in turn accelerates economic growth.

To summarize, we can say that, monetary policy is necessarily concerned with all the major objectives of economic policy, namely, exchange rate stability, price and economic stability, full employment, and economic growth. These objectives are to some extent, in conflict with each other. Thus, the monetary authorities confront the challenge of prioritizing these objectives depending on the economic situation in which they are making decisions.

### **Structure & Framework of Monetary Policy in India:-**

In the Indian economy, structural reforms were initiated since the early 1990s, which included industrial deregulation, liberalisation of the foreign trade and investment regime, public enterprises reform and financial sector liberalisation. These reforms aimed at reorienting the Indian economy towards a market-oriented economy to foster greater efficiency and growth. The monetary policy in India has been affected by these wide-ranging reforms. Monetary policy framework had to contend

with a number of changes in its operating environment brought about primarily by financial and external sector liberalisation. The process of financial liberalisation necessitates a greater market orientation in view of the shift to a market-oriented economy from a control-oriented regime. Financial liberalisation has led to the emergence of financial conglomerates with implications for financial stability. Globalisation has posed several challenges for monetary management emanating from swings in international commodity prices from large and sudden movements in capital flows and exchange rates. Advances in information technology are revolutionising payment and settlement practices and are speeding up the spread of information. In order to face these challenges, during the 1990s, monetary policy in India revisited issues related to objectives, intermediate targets, instruments and operating procedures of monetary policy.

### **The Framework of Indian Monetary Policy**

Since independence, Indian Monetary policy has pursued the twin objectives of price stability and ensuring adequate credit to productive sectors of the economy. The relative emphasis of these two objectives depends on the underlying economic conditions and the monetary policy species it from time to time. Even after the introduction of the structural reforms, credit availability remains an important objective of monetary policy in India. In the pre-1990s period, credit allocation and administered pricing, along with inefficiencies and distortions, ensured a reasonable level of credit flow in the desired direction at the desired price. The cost of inefficiencies and distortions created by such policy had to be borne in different ways, including statutory preemptions - as high as 63.5 per cent of the incremental deposits of banks in 1992. Even after liberalisation, deregulation and enabling environment of comfortable liquidity at a reasonable price, banks continued to charge interest rates to various categories of borrowers by their category per -whether agriculture or small scale industry - rather than based on actual assessment of risks for each borrower, thus affecting the credit flow at reasonable interest rates. Hence, the Reserve Bank of India has been trying to reduce transaction and information costs to make credit available to such sectors at reasonable interest rates. With the opening up of the economy since the early 1990s, financial stability has emerged as one of the key considerations of monetary policy. Monetary management has to face the challenges posed by large capital flows and volatility in exchange rates. Since 1993-94 (excepting one year, 1995-96), due to large capital flows and surpluses in the current account, the overall balance of payments have recorded persistent growth. The Reserve Bank has absorbed such large surpluses in its foreign exchange reserves.

The distinction between short term and long-term flows is conceptually clear. However, in practice, it is not always easy to distinguish between the two for operational purposes. At any given time, some flows could be of an enduring nature whereas others could be temporary and, hence, reversible, and what appears to be short-term could last longer and vice versa, imparting a dynamic dimension to judgment about their relative composition. In a scenario of uncertainty facing the authorities in determining the temporary or permanent nature of inflows, it is sensible to suppose that such flows are temporary until we can firmly establish such flows to be of a permanent nature.

Large purchases of foreign exchange by the Central bank from the market have an expansionary effect on domestic money supply and, therefore, monetary policy has to manage episodes of volatility in the foreign exchange market. Although capital flows have been largely

stable, reflecting a cautious approach to capital account liberalisation, there have been nonetheless a few episodes of volatility in capital flows and exchange rates. As maintaining orderly conditions in the foreign exchange market is an important objective of monetary policy, monetary authorities have to face potential conflicts between the interest rate and exchange rate objectives. Financial stability concerns arise also due to the move from a Government dominated financial system to a market-oriented one. Financial stability ensuring uninterrupted financial transactions, maintenance of a level of confidence in the financial system amongst all the participants and stakeholders, and absence of excess volatility that unduly and adversely affects real economic activity. Such financial stability has to be particularly ensured when the financial system is undergoing structural changes to promote efficiency. In India, the vulnerability to real sector shocks has the potential to affect financial stability significantly. The major sources of shocks in India are very sharp increases in oil prices and extraordinary monsoon failures with consequent impact on the agricultural sector. Therefore, the weight to financial stability in India is higher than in many other countries.

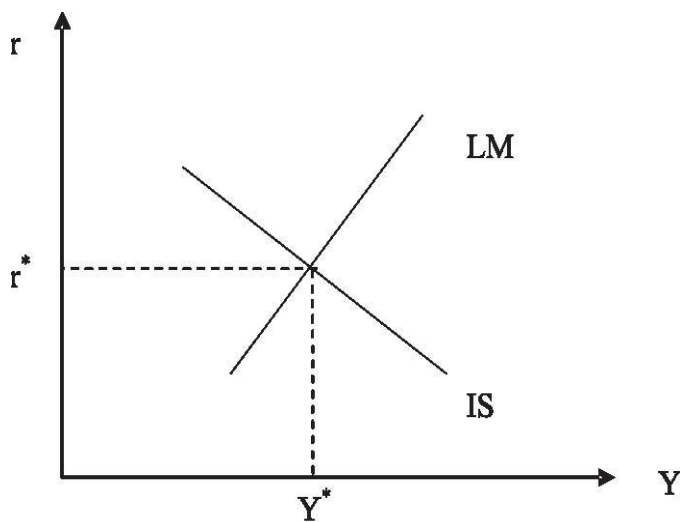
Financial integration and innovations have also necessitated refinements in the strategies and tactics of monetary policy in India. The Reserve Bank has made the following changes to face the current challenges:

1. Changed the policy framework from monetary targeting to multiple indicator approach
2. A significant shift towards market-based instruments away from direct instruments of monetary management
3. Liquidity management framework has been introduced in which market liquidity is now modulated through a mix of open market operations and changes in reserve requirements and standing facilities, reinforced by changes in the policy rates.
4. The introduction of the Market Stabilisation Scheme has provided further flexibility to the Reserve Bank in its market operations.

Over the past few years, the process of monetary policy formulation has become relatively more articulate, consultative and participative with external orientation, while the internal work processes have also been re-engineered to focus on technical analysis, coordination, horizontal management, rapid responses and being market savvy. The stance of monetary policy and the rationale are communicated to the public in a variety of ways, the most important being the monetary policy statements. The communications strategy and provision of timely information at regular intervals have facilitated the conduct of policy in an increasingly market oriented environment.

### **Interaction of Fiscal and Monetary Policies:-**

We shall consider the effects of fiscal and monetary policies and how the two can be used in conjunction to stabilize output. Suppose there is an increase in government expenditures. This shifts out the IS curve and given unchanged money supply, raises the equilibrium interest rate and output in the economy. If the monetary authorities want to stabilize the interest rate then they must increase money supply shifting out the LM curve and reduce the interest rate to its initial



**Figure 4.1 Interaction of IS and LM Curves**

level. However, in doing so, there is a further increase in output. Note that in this case, the increase in money supply is just enough to offset the crowding out effect of an increase in government expenditures. We get the full multiplier effect of increased government spending and not the smaller multiplier effect when we allow for the interest rate effect. If instead, the monetary authorities want to stabilize output, then they would contract the money supply, shifting back the LM curve sufficiently to bring back  $Y$  to its initial level. However, in doing so they would also drive up interest rates further. Thus, there are important policy tradeoffs and the authorities cannot stabilize both variables. They must decide on the right course of policy given their priorities. Now consider an increase in taxes. This reduces spending in the economy and shifts back the IS curve. Given LM curve this causes the equilibrium interest rate and output to decline. To stabilize output, monetary authorities would need to increase money supply. While this would bring back  $Y$  to its initial level or prevent it from declining much, there would be a larger decline in the interest rate. The mechanism by which output is restored is that though higher taxes reduce consumption spending, the expansionary monetary policy induces investment by lowering the interest rate and thus reverting the decline in expenditures and thus output. The above case clearly demonstrates that the impact of fiscal policy depends on the monetary policy adopted by the monetary authorities. There are macro econometric models of the economy which are based on these theories and which try to quantify the effect of various policies on the economy. Econometric disturbances can also cause shifts in the IS and LM curves. Exogenous changes in the demand for goods and services affect the position of the IS curve. Keynes has discussed the animal spirit of the investors and self-fulfilling optimism and pessimism in investment spending.

Thus, low confidence in the economy could be self-fulfilling by causing a decline in investment. The IS curve would shift to the left lowering equilibrium income and employment, thus validating the pessimism. Increased consumer confidence in the economy would raise consumption spending today, shifting up the consumption function and thus shifting out the IS curve. This would raise equilibrium output and income. Shocks to the LM curve can result from exogenous changes in money demand. Deregulation of the financial sector and introduction of new financial instruments can cause an outward shift in the money demand function (altering velocity perhaps). Then given the money supply, this would raise interest rates and the LM curve would shift up causing a decline



in output and a higher equilibrium interest rate. Monetary and fiscal policy can be used together, especially if they are well timed to offset these exogenous shocks and stabilize output and employment.

### **Modern Views On Inflation**

For all practical purposes, Emile James defined inflation as “a self-perpetuating and irreversible upward movement of prices, caused by an excess of demand over capacity to supply”. Here Prof. James points out that excess demand may be demand for investment as well as for consumer goods. The phrase “capacity to supply” in the definition stresses that any increase in demand at a given moment constitutes a call for an increase in production. If the productive apparatus can meet the challenge, there will be no inflation. Inflation can come about only if expansion in production or supply is held back by some obstacle, such as full employment of resources or occasionally, by some facilities, and market imperfections. In this sense, the term “inflation” is also applicable to an economy where a rise in the price level may not lead to increased output beyond a certain stage due to the existence of bottlenecks, even though the stage of full employment is not attained. Briefly, then, apart from price rises, the existence of excess demand is regarded as an essential characteristic of inflation. It is generally believed that inflation is accompanied by a growth in employment. However, in recent years, the world has been experiencing a situation in which the price level has been continually rising, but simultaneously, there has been a rise in the rate of unemployment and stagnation in the rate of growth. To describe this situation, Professor Samuelson has coined a new term, stagflation. As Samuelson says, “Stagflation involves inflationary rises in prices and wages at the same time so that people are able to find jobs, and firms are unable to find customers for what their plants can produce”.

Professor Brahmananda coined the term *stagflation* to describe inflation in India, which had the unique characteristic of recession accompanied by inflation. He described inflation as a state in which the scale and rate of growth of bank credit as well as the pattern of credit location have got so much out of alignment with the stock and the rate of growth of basic goods and their productivity in the system of production that the rate of price rise in basic goods appears as a parameter to all sectors of the community.

### **Features of Inflationary Economy**

The following are the strategic features of an inflationary economy:

1. There is a continually rising price trend, whether it is measured through wholesale price index (WPI) or consumers' price index (CPI).
  2. The money supply is in excess of the requisite production and exchange needs of the economy. There is undeserving excess of monetary liquidity adding fuel to the fire.
  3. There is over-expansion of credit by the banks.
  4. A good part of the flow of credit is supplied to unproductive channels, speculative activities, and sick and non-viable units of production.
- In many cases, there is no direct relaxation between the bank loans and physical capacities of the enterprises.
5. There is lack of financial discipline on the part of the government. The budget is usually large with large deficits of revenue and capital account.
  6. A large number of commodities are in short supply paving the way the sectoral price

disequilibrium.

7. Artificial scarcity is commonly caused by hoarding activities and has become conspicuous for traders, producers and consumers.

8. The rate of return of speculative hoarding of commodities, precious metals like gold and silver, and investments in immovable properties

– land, buildings, flats, etc. are higher and more fascinating than the rate of returns on shares, and bonds in an inflationary economy.

9. Interest rates in the unaccounted and unorganized sectors tend to be higher than those in the organized sectors of the money market.

10. Labour unrest, strikes, lockouts, etc. are common. Organised labour force successfully resists any reduction in real wages and pushes up the money-wages, thereby accelerating the process of cost-push inflation.

11. In an inflationary economy, the government is trapped in the cobweb of ever increasing public expenditure, larger budgets, higher taxes, larger public debts, huge deficit financing and a large number of controls, which, in turn, encourage black money and dual accounting system, black marketing, smuggling and other anti-social activities on account of the deterioration of the community's morals in general, caused by inflation. In fact, an economy is inflationary because it is inflationary. There tends to be a vicious circle of inflation when it is curbed immediately. In the long period, the state of unchecked inflation becomes a built-in feature of the economy and people expect the rate of inflation to accelerate further.

## **Theories Of Inflation**

Different economists have put forward different views on the phenomenon of inflation. We may survey briefly the main approaches to inflation. There are two basic approaches to the problem of the sources of inflation. The first is the Quantity Theory of Money Approach and the Excess Demand Thesis.

### **The Quantity Theory of Money Approach**

The first approach is based on the traditional quantity theory of money. According to this approach, other things being equal, if the money supply increases, prices rise and inflation occurs as a consequence. As we have seen in the previous sections, economists like Friedman, Hawtrey, Goldenweiser, etc. who looked upon inflation as a pure monetary phenomenon, vigorously advocated this theory. It follows from the Fisherian Quantity Theory version that says:

$$P = MV/T$$

When V and T remain constant under full-employment equilibrium condition of the economy, an increase in the stock of money M implies a direct proportionate rise of the price level P. Likewise, the income theory equation too implies the same thing. Thus when  $P = Y/O$  where if the real output (O) remains constant under full employment, an increase in Y the money income caused by an increased flow of money supply (M), tends to cause the price level (P) rise. The Quantity Theory of Money however, does not explain the phenomenon of “hyper-inflation” where it is the rise in prices that may cause an increase in the money supply, which in turn may cause a further rise in prices. In fact the phenomenon of money and prices chasing each other in a vicious spiral is so indivisible that it is not very easy to determine which is the cause and which is the effect. Moreover, the theory is

quite misleading and confusing if one were to analyze a situation of depression in which the government resorts to the usual fiscal and monetary techniques counteracting the evils of depression and the result is both increase in money supply and a rise in prices. A price rise which is necessary for revival of economic activity should not be considered as inflationary because inflation is generally harmful to the economy.

### **Demand Pull Vs Cost Push Inflation**

Broadly speaking, there are two schools of thought regarding the possible causes of inflation. One school views the demand-pull element as an important cause of inflation, while the other group of economists holds that inflation is mainly caused by the cost push element.

### **Demand-pull Inflation**

According to the demand-pull theory, prices rise in response to an excess of aggregate demand over existing supply of goods and services. The demand-pull theorists point out that inflation (demand-pull) might be caused, in the first place, by an increase in the quantity of money, when the economy is operating at full employment level. As the quantity of money increases, the rate of interest will fall and, consequently, investment will increase. This increased investment expenditure will soon increase the income of the various factors of production. As a result, aggregate consumption expenditure will increase leading to an effective increase in the effective demand. With the economy already operating at the level of full employment, this will immediately raise prices, and inflationary forces may emerge. Thus, when the general monetary demand rises faster than the general supply, it pulls up prices (commodity prices as well as factor prices, in general). Demand-pull inflation, therefore, manifests itself when there is active cooperation, or passive collusion, or a failure to take counteracting measures by monetary authorities. Demand-pull or just demand inflation may be defined as a situation where the total monetary demand persistently exceeds total supply of real goods and services at current prices, so that prices are pulled upwards by the continuous upward shift of the aggregate demand function. However, demand-pull inflation can also occur without an increase in the money supply. This can happen when either the marginal efficiency of capital increases or the marginal propensity to consume rises, so that investment expenditure may rise, thereby leading to a rise in the aggregate demand which will exert its influence in raising prices beyond the level of full employment already attained in the economy.

According to the demand-pull theorists, during the process of demand inflation, rise in wages accompanies or follows the price rise as a natural consequence. Under the condition of rising prices, when the rate of profit is increasing, producers are inclined in general to increase investment and employment, in that they bid against each other for labour, so that labour prices (i.e. wages) may rise. In short, the inflationary process, described by the demand-inflation theory, implies the following sequences. Increasing demand – increasing prices – increasing costs – increasing income – increasing demand – increasing prices – and so on. It should be noted that the concept of demand-pull inflation is associated with a situation of full employment where an increase to aggregate demand cannot be catered to by a corresponding expansion in the supply of all output. There can be many reasons for such excess monetary demand.

1. There may be an increase in the public expenditure (G) in excess of public revenue. This might have been made possible (or rendered necessary) through public borrowings from banks or through

deficit financing, which implies an increase in the money supply.

2. There may be an increase in the autonomous investment (I) in firms, which is in excess of the current savings in the economy. Hence, the flow of total expenditure tends to rise, causing an excess monetary demand leading to an upward pressure on prices.

3. There may be an increase in the marginal propensity to consume (MPC), causing an excess monetary demand. This could be due to the operation of demonstration effect and such other reasons.

4. In an open economy, an increasing surplus in balance of payments also leads to an excess demand. Increasing exports also have an inflationary impact because there is a generation of money income in the home economy, due to export earnings but, simultaneously, there is reduction in the domestic supply of goods because products are exported. If an export surplus is not balanced by increased savings, or through taxation, domestic spending will be in excess of the value of domestic output, marketed at current prices.

5. A diversion of resources from the consumption goods sector either to the capital goods sector or the military sector (for producing war goods) will lead to an inflationary pressure because while the generation of income and expenditure continue, the current flow of real output decreases on account of the high gestation period involved in these sectors. Again the opportunity cost of war goods is quite high in terms of the consumption goods meant for the civilian sector.

This leads to an excessive monetary demand for the goods and services against their real supply, causing the prices to move up. It is said that the demand-pull inflation can be averted through deflationary measures adopted by the monetary and fiscal authorities. Thus, passive policies are responsible for demand-pull inflation. Thus we have discussed some of the theories that explain inflation. Now, let us look at the labour market and understand the reasons behind unemployment and how unemployment and inflation are related in the following section.

## 12.8 Summary

Thus The **Balance of Payments** 'BOP' is an account of all transactions between one country and all other countries—transactions that are measured in terms of receipts and payments. Fiscal policy of the government determines the level of public expenditure and revenue which affects the income. Consumption models explain how consumption function will affect income determination. Business cycle is the periodic but irregular up and down movement in economic activity, which is determined by various macroeconomic variables. Monetary policy refers to the policy measures of the Central bank to control availability, cost and use of money and credit in the country with the help of monetary measures.

## 12.9 Key Words

Balance of Payment, Inflation, consumption Deflation, Demand pull and push, Monetary, Fiscal

policy

## 12.10 Questions for Discussion

1. Elaborate the concepts of Balance of Payment.
2. Explain the theories on Inflation, Deflation and Monetary policy
3. How to measure inflation?
- 4 . Explain the importance of Fiscal Policy.
5. Mention the concepts of Monetary policy prevailing in India.
6. What do you understand when you compare intertemporal model, life-cycle hypothesis and permanent income hypothesis?

## 12.11 Suggested Reading

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