

Final Term Assignment (Spring 2020)

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Q1. What is cost? Differentiate the following

Fixed and variable cost
Direct and Indirect cost
Explicit and Implicit cost
Actual and Opportunity cost

Answer:

COST

Cost refers to the amount of expenditure incurred in acquiring something. The expenditure incurred to produce an output or provide service. Thus the cost incurred in connection with raw material, labour, other heads constitute the overall cost of production.

OR

A cost is an expenditure required to produce or sell a product or get an asset ready for normal use. In other words, it's the amount paid to manufacture a product, purchase inventory, sell merchandise, or get equipment ready to use in a business process.

From a seller's point of view, cost is the amount of money that is spent to produce a good or product. If a producer were to sell his products at the production price, his costs and income would break even, meaning that he would not lose money on the sales. However, he would not make a profit.

From a buyer's point of view the cost of a product is also known as the price. This is the amount that the seller charges for a product, and it includes both the production cost and the mark-up, which is added by the seller in order to make a profit.

FIXED AND VARIABLE COST

FIXED COST

Fixed costs are predetermined expenses that remain the same throughout a specific period. These overhead costs do not vary with output or how the business is performing. To determine your fixed costs, consider the expenses you would incur if you temporarily closed your business. You would still continue to pay for rent, insurance and other overhead expenses.

Some examples of fixed costs include:

- Rent
- Telephone and internet costs
- Insurance
- Employee Salaries
- Loan Payments

Any small business owner will have certain fixed costs regardless of whether or not there is any business activity. Since they stay the same throughout the financial year, fixed costs are easier to budget. They are also less controllable than variable costs because they're not related to operations or volume.

Fixed costs remain constant for a specific period. These costs are often time-related, such as the monthly salaries or the rent.

VARIABLE COST

Variable costs, however, change over a specified period and are associated directly to the business activity. These are based on the business performance and the volume of services the business generates.

Some examples of variable costs include:

- Direct labor
- Commissions
- Taxes
- Operational expenses

Since they are changing continuously and the amount you spend on them differs from month-to-month, variable expenses are harder to monitor and control. They can decrease or increase rapidly, cut your profit margins and result in a steep loss or a whirlwind profit for the business.

Variable costs change directly with the output – when output is zero, the variable cost will be zero. The total variable cost to a business is calculated by multiplying the total quantity of output with the variable cost per unit of output.

A common example of variable costs is operational expenses that may increase or decrease based on the business activity. A growing business may incur more operating costs such as the wages of part-time staff hired for specific projects or a rise in the cost of utilities – such as electricity, gas or water.

Unlike fixed expenses, you can control your variable expenses to leave room for profits.

DIRECT AND INDIRECT COST

DIRECT COST

The cost that can be directly attributable to/identified with/ associated with the specific cost center or cost object like a product, function, activity, project and so on is known as Direct Cost. Based on elements, the direct costs are classified into the following parts:

- **Direct Material:** The cost of material that can be allocable to production.
Example: Raw material consumed during production of the unit.
- **Direct Labor:** Wages to the laborers that can be identified with a cost object.
Example: The term wages include bonus, gratuity, provident fund, perquisites, incentives, etc.
- **Direct Expenses:** It includes all the other expenses that are directly linked to the production of a product.
Example: Job processing charges, hire charges for tools and equipment, subcontracting expenses.

INDIRECT COST

Indirect cost is those costs that cannot be directly assigned to/related to/identified with a particular cost center or cost object, but they benefit multiple cost objects. It is not possible to calculate them for a single cost object. However, it needs to be apportioned over various products as well as among the different departments of the organization. It includes production, office & administration, selling & distribution costs. The indirect cost is divided into the following categories:

- **Indirect Material:** Material Cost which cannot be identified with a particular product or project.
Example: Lubricants
- **Indirect Labor:** Salary to the employees that cannot be allocable to a particular cost object.
Example: Salary to the management team and employees of the accounts department.
- **Indirect Expenses:** All the expenses other than indirect material and labor are included in this category.
Example: Interest, Rent, Tax, Duty, etc.

EXPLICIT AND IMPLICIT COST

EXPLICIT COST

Explicit Costs are the costs which involve an immediate outlay of cash from the business. The cost is incurred when any production process is going on, or activity is conducted in the normal course of business. The cost is a charge for the use of factors of production like land, labour, capital and so on. They are in the form of rent, salary, material, wages, and other expenses like electricity, stationery, postage, etc.

Explicit Costs show that payment has been made to outsiders, while business is carried on. The recognition and reporting of the explicit cost are very easy because they are recorded when they arise. They show that an amount has been spent over a business transaction. They can be calculated in terms of money.

Recording of the explicit cost is very important because it helps in the calculation of profit as well as it fulfils purposes like decision-making, cost control, reporting, etc.

IMPLICIT COST

Implicit Cost, also known as the economic cost, is the cost which the company had foregone while employing the alternative course of action. They do not involve any outflow of cash from the business. It is the value of sacrifice made by the entity at the time of exercising some other action. The cost occurs when an asset is used as a factor of production by the entity instead of renting it out.

As they are not actually incurred they cannot be easily measured, but they can be estimated. They are not recorded in the books of accounts as well as these are not reported. The purpose of ascertaining the implicit cost is that it helps in decision making regarding the replacement of any asset and much more.

Implicit costs have a direct impact on the profitability and performance of the company. Some common examples of implicit costs are Interest on owner's capital, salary to the proprietor, etc. which are not actually incurred but they exist.

ACTUAL AND OPPORTUNITY COST

ACTUAL COST

Actual cost means the amount of money that was paid to acquire a product or asset. It's exactly what it sounds like—the actual cost. This cost could be either a historical, past, or present day cost of product. This is not the budgeted or forecasted costs that management has anticipated as they might include vendor expenses like the costs of delivery, set up and testing. These costs also reflect factors like vendor discounts or price increases.

Example

Actual cost also applies to manufacturing products as well. The actual cost of manufacturing a product is the total expenditures required to build or manufacture the product. Think of actual cost as the end result of a manufacturing process.

First, a company starts planning the production and forecasts what the expenses will be. Second, the company budgets what it will be able to afford and adjusted to the production levels to meet the budget. If everything goes according to plan, the actual costs will equal the budgeted costs. In the real world, things can go wrong and budgets are not always met. The end result is the actual cost. It could be plus or minus the budgeted or forecasted cost.

OPPORTUNITY COST

Opportunity cost is the cost of taking one decision over another. That can come in the form of time, money, effort, or 'utility' (essentially enjoyment or satisfaction). We make these decisions every day in our lives without even thinking.

When we make a purchasing decision, we subconsciously consider several factors before making a decision. However, because we make so many decisions each and every day, our brain stores previous decisions we made and uses them to help speed up the decision process. Our brains simultaneously consider factors such as time, effort, and money. This then allows us to come to a decision which best optimizes have much we value each of these factors.

Example

We may purchase a Halwa Puri on the way to work. We choose this over having breakfast at home or sitting down in a restaurant for a full breakfast. A Halwa Puri is cheaper than a restaurant lunch but more expensive than breakfast at home. We don't sit down thinking about this decision for hours or days. These are decisions we take in minutes or seconds.

Well when we buy a Halwa Puri, we forego Rs. 100, or however much it costs. The opportunity cost includes what we could have brought instead of a Halwa Puri. This could be a bottle of Cola, a Biscuits, or some French Fries.

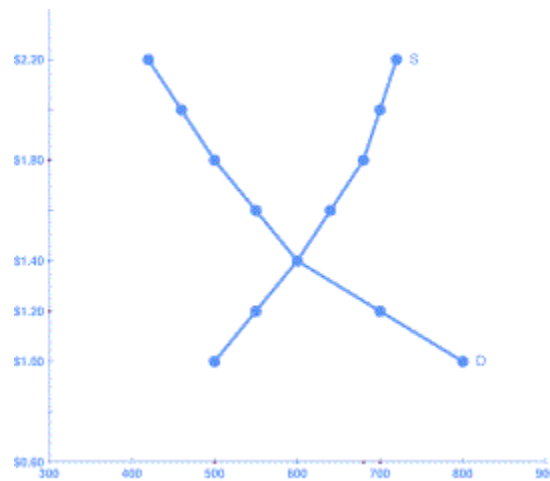
When considering opportunity cost, we must also consider 'utility'; essentially, how much pleasure/enjoyment the individual gets from one action over another. So whilst the Halwa Puri saves time and effort, it costs more than breakfast at home, and gives the consumer lower satisfaction than a full breakfast.

Q2. (Part-a) Suppose there is short of Facemask in the market during this Pandemic situation. What will be the effect of short of supply on the market equilibrium?

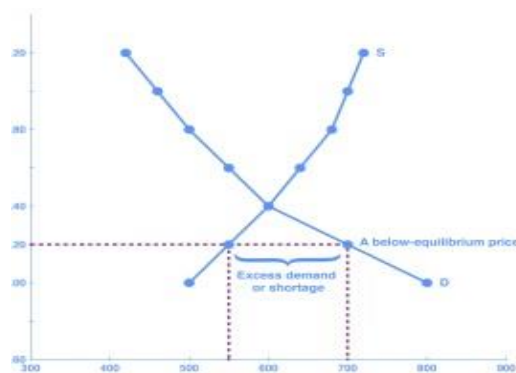
Answer:

In order to understand market equilibrium, we need to start with the laws of demand and supply. Recall that the law of demand says that as price decreases, consumers demand a higher quantity. Similarly, the law of supply says that when price decreases, producers supply a lower quantity.

Because the graphs for demand and supply curves both have price on the vertical axis and quantity on the horizontal axis, the demand curve and supply curve for a particular good or service can appear on the same graph. Together, demand and supply determine the price and the quantity that will be bought and sold in a market. These relationships are shown as the demand and supply curves in Figure 1, which is based on the data in Table, below.



Let's consider the facemask shortage due to Covid-19 pandemic in all over the world. Suppose that the price is Rs 50 per facemask, as the dashed horizontal line at this price in Figure below, shows. At this price, the quantity demanded is 700 cartons, and the quantity supplied is 550 cartons.



Quantity supplied (550 cartons) is less than quantity demanded (700 cartons). Or, to put it in words, the amount that producers want to sell is less than the amount that consumers want to buy facemask. We call this a situation of excess demand (since $Q_d > Q_s$) or a shortage.

In this situation, facemask buyers mass the facemask distributors/dealers/shopkeepers, only to find many facemask distributors/dealers/shopkeepers running short of facemask. Facemask manufacturing companies and facemask distributors/dealers/shopkeepers recognize that they have an opportunity to make higher profits by selling what facemask they have at a higher price. These price increases will stimulate the quantity supplied and reduce the quantity demanded of facemasks. As this occurs, the shortage of facemask will decrease. How far will the facemask price rise? The price will rise until the shortage is eliminated and the quantity supplied of facemask equals quantity demanded. In other words, the market will be in equilibrium again. As before, the equilibrium occurs at a price of Rs 50 per facemask and at a quantity of 600 cartons.

Generally any time the price for a facemask is below the equilibrium level, incentives built into the structure of demand and supply will create pressures for the price of facemask to rise. Similarly, any time the price for a facemask is above the equilibrium level, similar pressures will generally cause the price to fall.

Effect on Equilibrium

Equilibrium is important to create both a balanced market and an efficient market. If a market is at its equilibrium price and quantity, then it has no reason to move away from that point, because it's balancing the quantity supplied and the quantity demanded. However, if a market is not at equilibrium, then economic pressures arise to move the market toward the equilibrium price and equilibrium quantity. This happens either because there is more supply of facemask than what the market is demanding or because there is more demand of facemask than the market is supplying. This balance is a natural function of a free-market economy.

Also, a competitive market that is operating at equilibrium is an efficient market. Economist typically defines efficiency in this way: when it is impossible to improve the situation of one party of facemask without imposing a cost on another. Conversely, if a situation is inefficient, it becomes possible to benefit at least one party without imposing costs on others.

Efficiency in the demand and supply model has the same basic meaning: The economy is getting as much benefit as possible from its scarce resources, and all the possible gains from facemask trade have been achieved. In other words, the optimal amount of each facemask is being produced and consumed.



Q2. (Part-b) What are variables and also differentiate between dependent and independent variables with examples.

Answer:

VARIABLE

The things that are changing in an experiment are called variables. A variable is any factor, trait, or condition that can exist in differing amounts or types. Or we can say Variables represents the measurable traits that can change over the course of a scientific experiment.

A characteristic, number, or quantity that increases or decreases over time, or takes different values in different situations.

Two basic types are

(1) **Independent variable:** that can take different values and can cause corresponding changes in other variables, and

(2) **Dependent variable:** that can take different values only in response to an independent variable.

Independent Variable

The independent variable is the condition that you change in an experiment. It is the variable you control. It is called independent because its value does not depend on and is not affected by the state of any other variable in the experiment. Sometimes you may hear this variable called the "controlled variable" because it is the one that is changed. Do not confuse it with a "control variable," which is a variable that is purposely held constant so that it can't affect the outcome of the experiment.

Dependent Variable

The dependent variable is the condition that you measure in an experiment. You are assessing how it responds to a change in the independent variable, so you can think of it as depending on the independent variable. Sometimes the dependent variable is called the "responding variable."

Independent and Dependent Variable Examples

1. In a study to determine whether how long a student sleeps affects test scores, the independent variable is the length of time spent sleeping while the dependent variable is the test score.
2. You want to compare brands of paper towels, to see which holds the most liquid. The independent variable in your experiment would be the brand of paper towel. The dependent variable would be the amount of liquid absorbed by the paper towel.
3. In an experiment to determine how far people can see into the infrared part of the spectrum, the wavelength of light is the independent variable and whether the light is observed (the response) is the dependent variable.
4. If you want to know whether caffeine affects your appetite, the presence/absence of a given amount of caffeine would be the independent variable. How hungry you are would be the dependent variable.

5. You want to determine whether a chemical is essential for rat nutrition, so you design an experiment. The presence/absence of the chemical is the independent variable. The health of the rat (whether it lives and can reproduce) is the dependent variable. If you determine the substance is necessary for proper nutrition, a follow-up experiment might determine how much of the chemical is needed. Here, the amount of chemical would be the independent variable and the rat health would be the dependent variable.

Q3. (Part-a) What is Regression Analysis and what is its importance in Managerial Economics?

Answer: Regression analysis is a powerful statistical method that allows you to examine the relationship between two or more variables of interest and used for the estimation of relationships between a dependent variable and one or more independent variables. It can be utilized to assess the strength of the relationship between variables and for modeling the future relationship between them.

Regression analysis includes several variations, such as linear, multiple linear, and nonlinear. The most common models are simple linear and multiple linear. Nonlinear regression analysis is commonly used for more complicated data sets in which the dependent and independent variables show a nonlinear relationship.

Importance of Regression Analysis in Managerial Economics

The importance of regression analysis which we read in Managerial Economics is that it is Regression analysis all about data: data means numbers and figures that actually define in business. It helps businesses understand the data points they have and use them – specifically the relationships between data points – to make better decisions, including anything from predicting sales to understanding inventory levels and supply and demand. Of all the business analysis techniques, regression analysis is often referred to as one of the most significant. One business analyst puts it this way:

The regression method of forecasting means studying the relationships between data points, which can helps to:

- Predict sales in the near and long term.
- Understand inventory levels.
- Understand supply and demand.
- Review and understand how different variables impact all of these things.

“Most companies use regression analysis to explain a phenomenon they want to understand for example

- Why customer service calls dropped in the past year or even the past month.
- Predict what sales will look like in the next six month.
- Whether to choose one marketing promotion over another.
- Whether to expand the business or create and market a new product.

The benefit of regression analysis is that it can be used to understand all kinds of patterns that occur in data. These new insights may often be very valuable in understanding what can make a difference in your business.

Q3. (Part-b) Given the Data,

Y	25	55	68	90	122	200	280	450	900
x	100	250	500	800	1050	1300	1650	2400	3500

Estimate the parameters and interpret your results.

Answer:

X	Y	x	y	xy	x ²
100	25	-1183	-218	257894	1399489
250	55	-1033	-188	194204	1067089
500	68	-783	-175	137025	613089
800	90	-483	-153	73899	233289
1050	122	-233	-121	28193	54289
1300	200	17	-43	-731	289
1650	280	367	37	13579	134689
2400	450	1117	207	23129	1247689
3500	900	2217	657	1456569	4915089
11550	2190	3	3	2391851	9665001

$$\bar{x} = \frac{\sum X}{n} = \frac{11550}{9} = 1283$$

$$\bar{y} = \frac{\sum Y}{n} = \frac{2190}{9} = 243$$

Formula:- $b^{\wedge} = \frac{\sum xy}{\sum x^2} = \frac{2391851}{9665001} = 0.247$

$$a = \bar{y} - b\bar{x} = 243 - 0.247 \times 1283 = 312278$$

$$Y = a + bx$$

$$Y = 312278 + 0.247X$$

Positive relation