

# **UNIT 4**

## **TIME VALUE OF MONEY (TVM)**

The time value of money (TVM) is the concept that money you have now is worth more than the identical sum in the future due to its potential earning capacity. This core principle of finance holds that provided money can earn interest, any amount of money is worth more the sooner it is received. TVM is also sometimes referred to as present discounted value.

- Time value of money is based on the idea that people would rather have money today than in the future.
- Given that money can earn compound interest, it is more valuable in the present rather than the future.
- The formula for computing time value of money considers the payment now, the future value, the interest rate, and the time frame.
- The number of compounding periods during each time frame is an important determinant in the time value of money.

## **TIME VALUE OF MONEY FORMULA**

Depending on the exact situation in question, the time value of money formula may change slightly. For example, in the case of annuity or perpetuity payments, the generalized formula has additional or less factors. But in general, the most fundamental TVM formula takes into account the following variables:

- FV = Future value of money
- PV = Present value of money
- $i$  = interest rate
- $n$  = number of compounding periods per year
- $t$  = number of years

Based on these variables, the formula for TVM is:

$$FV = PV \times [ 1 + (i / n) ]^{(n \times t)}$$

### **Time Value of Money Examples**

Assume a sum of \$10,000 is invested for one year at 10% interest. The future value of that money is:

$$FV = \$10,000 \times (1 + (10\% / 1) ^ (1 \times 1) = \$11,000$$

The formula can also be rearranged to find the value of the future sum in present day dollars. For example, the value of \$5,000 one year from today, compounded at 7% interest, is:

$$PV = \$5,000 / (1 + (7\% / 1) ^ (1 \times 1) = \$4,673$$

### **Effect of Compounding Periods on Future Value**

The number of compounding periods can have a drastic effect on the TVM calculations. Taking the \$10,000 example above, if the number of compounding periods is increased to quarterly, monthly, or daily, the ending future value calculations are:

- Quarterly Compounding:  $FV = \$10,000 \times (1 + (10\% / 4) ^ (4 \times 1) = \$11,038$
- Monthly Compounding:  $FV = \$10,000 \times (1 + (10\% / 12) ^ (12 \times 1) = \$11,047$
- Daily Compounding:  $FV = \$10,000 \times (1 + (10\% / 365) ^ (365 \times 1) = \$11,052$

This shows TVM depends not only on interest rate and time horizon, but also on how many times the compounding calculations are computed each year

## Simple and Compound Interest

- **Simple interest** is calculated on the [principal](#), or original, amount **of a loan.**

### **Simple Interest Formula**

The formula for calculating simple interest is:

$$\text{Simple interest} = P \times i \times n$$

**where:**

$P$  = Principle

$i$  = interest rate

$n$  = term of the loan

Thus, if simple interest is charged at 5% on a \$10,000 loan that is taken out for three years, the total amount of interest payable by the borrower is calculated as  $\$10,000 \times 0.05 \times 3 = \$1,500$ .

Interest on this loan is payable at \$500 annually, or \$1,500 over the three-year loan term.

### **Compound Interest Formula**

The formula for calculating compound interest in a year is:

$$\text{Compound interest} = [P(1+i)^n] - P$$

$$\text{Compound interest} = P[(1+i)^n - 1]$$

**where:**

$P$  = Principle

$i$  = interest rate in percentage terms

$n$  = number of compounding periods for a year

**Compound Interest = Total amount of Principal and Interest in future (or Future Value) less the Principal amount at present**

called Present Value (PV). PV is the current worth of a future sum of money or stream of cash flows given a specified rate of return.

Continuing with the simple interest example, what would be the amount of interest if it is charged on a compound basis? In this case, it would be:

$$\$10,000 [(1 + 0.05)^3 - 1] = \$10,000 [1.157625 - 1] = \$1,576.25.$$

- **Compound interest is calculated on the principal amount and also on the accumulated interest of previous periods, and can thus be regarded as "interest on interest."**

## **NOMINAL AND EFFECTIVE RATE OF INTEREST**

**Effective interest rate** is the one which caters the compounding periods during a payment plan. ... The **nominal interest rate** is the periodic **interest rate** times the number of periods per year. For example, a **nominal annual interest rate** of 12% based on monthly compounding means a 1% **interest rate** per month (compounded).

**Nominal interest rate is also defined as a stated interest rate. This interest works according to the simple interest and does not take into account the compounding periods. Effective interest rate is the one which caters the compounding periods during a payment plan. It is used to compare the annual interest between loans with different compounding periods like week, month, year etc. In general stated or nominal interest rate is less than the effective one. And the later depicts the true picture of financial payments. The nominal interest rate is the periodic interest rate times the number of periods per year. For example, a nominal annual interest rate of 12% based on monthly compounding means a 1% interest rate per month (compounded). A nominal interest rate for compounding periods less than a year is always lower than the equivalent rate with annual compounding (this immediately follows from elementary algebraic manipulations of the formula for compound interest). Note that a nominal rate without the compounding frequency is not fully defined: for any interest rate, the effective interest rate cannot be specified without knowing the compounding frequency and the rate. Although some conventions are used where the compounding frequency is understood, consumers in particular may fail to understand the importance of knowing the effective rate. Nominal interest rates are not comparable unless their compounding periods are the same; effective interest rates correct for this by**

**"converting" nominal rates into annual compound interest. In many cases, depending on local regulations, interest rates as quoted by lenders and in advertisements are based on nominal, not effective interest rates, and hence may understate the interest rate compared to the equivalent effective annual rate. The term should not be confused with simple interest (as opposed to compound interest) which is not compounded. The effective interest rate is always calculated as if compounded annually. The effective rate is calculated in the following way, where  $ie$  is the effective rate,  $r$  the nominal rate (as a decimal, e.g. 12% = 0.12), and "m" the number of compounding periods per year (for example, 12 for monthly compounding):**

$$ie = (1 + r/m)^m - 1$$

**The following two tables will illustrate the terminologies commonly used for  $ie$  and  $r$ .**

## **INTEREST, CASH FLOW DIAGRAMS, PRINCIPLES**

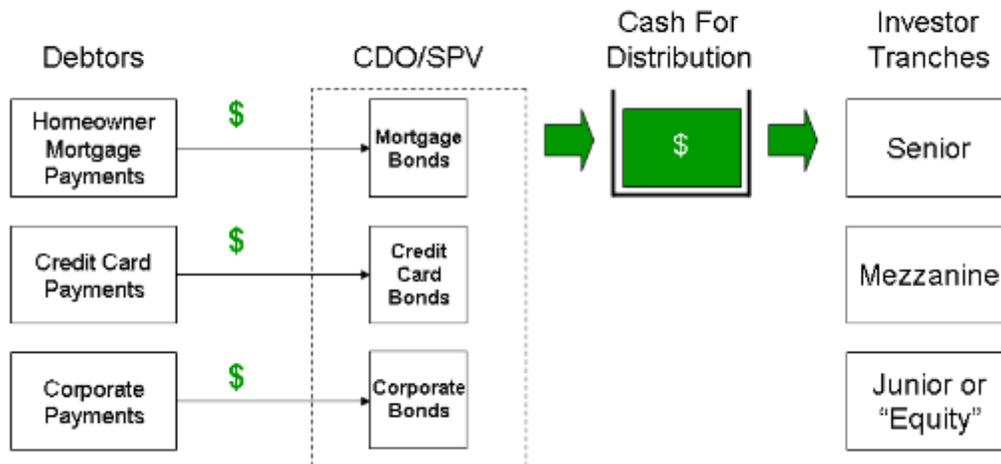
**A cash-flow diagram is a financial tool used to represent the cash flows associated with a security, "project", or business.**

**As per the graphics, cash flow diagrams are widely used in structuring and analyzing securities, particularly swaps. They may also be used to represent payment schedules for bonds, mortgages and other types of loans.**

**In the context of business, and engineering economics, these are used by management accountants and engineers, to represent the cash-transactions which will take place over the course of a given project.**

**Transactions can include initial investments, maintenance costs, projected earnings or savings resulting from the project, as well as salvage and resale value of equipment at the end of the project. These diagrams - and the associated modeling - are then used to determine a break-even point ("cash flow neutrality"), or to further, and more generally, analyze operations and profitability. See cash flow forecast and operating cash flow.**

## Cash Flow Diagram - Simplified



## **PRESENT WORTH METHOD DEFINITION**

**Present worth method.** In this **method** of comparison, the cash flows of each alternative will be reduced to time zero by assuming an interest rate  $i$ . In most of the practical decision environments, executives will be forced to select the best alternative from a set of competing alternatives

## **Summary of Important Points**

- ★ PW method converts all cash flows to **present value at MARR**
- ★ Alternatives can be **mutually exclusive or independent**
- ★ Cash flow estimates can be for **revenue or cost** alternatives
- ★ PW comparison must always be made for **equal service**
- ★ Equal service is achieved by using **LCM** or **study period**
- ★ Capitalized cost is PW of project with **infinite life**;  $CC = P = A/i$

## **FUTURE WORTH METHOD DEFINITION**

**Future Value Definition.** Future value (FV) is the **value** of a sum of money at a **future** point in time for a given interest rate. The idea is to adjust the present **value** of a sum of money for the time **value** of money over the specified time period. ... It is simply the principal amount adjusted for the annual interest rate.

$$FV = PV \left(1 + \frac{r}{m}\right)^{mT}$$

Where:

PV = Money invested today

r = Annual interest rate

T = Number of Years

m = Number of periods based on compounding frequency

## **ANNUAL WORTH METHOD DEFINITION**

**Annual Worth (AW) Analysis** is **defined** as the equivalent uniform **annual worth** of all estimated receipts (income) and disbursements (costs) during the life cycle of a project. Initial. Cost. **Annual** Cost. Overhaul Cost.

### Formulas

$$P = F \left( \frac{1}{1+i} \right)^n$$

$$A = P \left( \frac{i(1+i)^n}{(1+i)^n - 1} \right)$$

**P** = Present worth, value, or amount

**F** = Future worth, value, or amount

**A** = Uniform amount per interest period

**i** = Discount rate.

**N** = Number of compounding periods; or the expected life of an asset

## **INTERNAL RATE OF RETURN METHOD**

Introduction. The **internal rate of return (IRR)** is a discounting cash flow technique which gives a **rate of return** earned by a project. The **internal rate of return** is the discounting **rate** where the total of initial cash outlay and discounted cash inflows are equal to zero

ADVANTAGES	DISADVANTAGES
<ol style="list-style-type: none"><li>1. <b>Time Value of Money</b> is being considered while calculating IRR.</li><li>2. <b>Simple to interpret</b> after the IRR is calculated. Easy to visualize by manager</li><li>3. <b>No requirement of finding Hurdle Rate / Required Rate of Return</b></li><li>4. Managers <b>make rough estimate of Required Rate of Return</b></li></ol>	<ol style="list-style-type: none"><li>1. <b>Economies of Scale is ignored</b></li><li>2. <b>Impractical implicit assumption</b> of reinvestment rate at the IRR itself for remaining period of the project.</li><li>3. <b>Dependent or contingent project</b> are being <b>ignored</b> while calculating IRR.</li><li>4. <b>Mutually exclusive project are ignored.</b></li><li>5. <b>Different terms of project is not considered</b> by IRR method</li><li>6. A mix of positive and negative future cash flows</li><li>7. <b>If later cash inflows are not sufficient</b> to cover initial investment calculation of IRR <b>is not possible</b></li><li>8. <b>What will increase in wealth is not possible to be measured by IRR.</b></li></ol>

## **COST BENEFIT ANALYSIS FOR PUBLIC PROJECTS**

In such cases **Cost – Benefit Analysis (CBA)** has been applied. The purpose of CBA is to ensure that the **public** sector allocates scarce re-sources efficiently to competing **public** sector **projects**. ... The **cost** of a **project** should be somehow related to the **benefit** expected from it.

Often the short-term distributional objectives may come into **conflict** with longer-term efficiency and distributional objectives (often the case with politicians).

CBA estimates and totals up the equivalent money value of the benefits and costs to the community of projects to establish whether they are worthwhile.

This means that all benefits and costs of a project should be measured in **terms of their equivalent money value and in particular time.**



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## **Depreciation of capital asset**

Over time, the value of a company's **capital assets** declines. ...

This **depreciation** in the **asset's** value must be accounted for on the company's income statement and balance sheet to capture the loss in value over time as an expense and as a reduction in the **asset's** actual value.

**To calculate this capital expenditure depreciation expense, the company's accounting team must use the asset's purchase price, its useful life, and its residual value. Here's how.**

**First, what depreciation method should be used?**

**There are numerous methods an accountant can use to calculate an asset's depreciation expense. The method chosen will depend on the asset, the implications for the income statement, and a company's internal policies.**

**In the example below, we'll keep it simple and use the straight-line depreciation method. This method accounts for depreciation by taking the same amount as an expense each year over the asset's useful life. This method is common for depreciating assets that gradually and consistently succumb to wear and tear over time. The wear and tear on the building's roof, for example, is likely to wear down equally in its second year as it is in its sixth or seventh year.**

While simple enough, the straight-line method is not always the best choice. Accelerated depreciation allows a company to take a larger depreciation expense in the first few years after the asset is purchased and smaller amounts in later years. This method makes sense logically in the context of, for example, an automobile. The moment the car is driven off the sales lot, it loses a large percentage of its value. As it ages though, the rate at which it loses value decreases. In this case, the real-world reality of purchasing a vehicle is best represented with an accelerated depreciation schedule. Taking more depreciation up front also has the advantage of reducing the company's tax liability, which can be a major factor in management's approach to its depreciation policy.

The two most common accelerated depreciation methods are the double-declining method and the sum-of-year method. For even more complex situations, a company could elect to use even *more* involved accounting methods like the hours-of-service depreciation method or the unit-of-production method.

#### Calculating straight-line depreciation

For this example, let's assume that a farmer purchases a tractor for \$25,000 that he expects will last him 10 years. At the end of this 10-year period, the farmer reckons he can sell the tractor on the used market for \$8,000.

Using the straight-line method, we know that we will be creating a constant depreciation expense every year. We also know that the book value of the tractor should equal \$8,000 after 10 years (this is its residual, or salvage, value).

To calculate how much should be expensed as depreciation each year, we first subtract the \$8,000 residual value from the original \$25,000 purchase price. That result, \$17,000, is then divided by the number of years in the tractor's useful life, in this case 10 years, to give us our annual depreciation expense for the tractor. \$17,000 divided by 10 years is \$1,700 per year.

The causes of depreciation are:

- **Wear and tear.** Any asset will gradually break down over a certain usage period, as parts wear out and need to be replaced. ...
- **Perishability.** Some assets have an extremely short life span. ...
- **Usage rights.** ...
- **Natural resource usage.** ...
- **Inefficiency/obsolescence.**

## **STRAIGHT LINE METHOD OF DEPRECIATION**

**Straight line** basis is a **method** of calculating **depreciation** and amortization, the process of expensing an asset over a longer period of time. It is calculated by dividing the difference between an asset's cost and its expected salvage value by the number of years it is expected to be used.

- Straight line basis is a method of calculating depreciation and amortization, the process of expensing an asset over a longer period of time.
- It is calculated by dividing the difference between an asset's cost and its expected salvage value by the number of years it is expected to be used.
- Straight line basis is popular because it is easy to calculate and understand, although it also has several drawbacks.

## **Declining balance method**

**Declining balance method** of **depreciation** is an accelerated **depreciation method** in which the **depreciation** expense declines with age of the fixed asset. **Depreciation** expense under the **declining balance** is calculated by applying the **depreciation** rate to the book value of the asset at the start of the period.

## **UNIT-5**

### **INFLATION**

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**In economics, inflation is a sustained increase in the general price level of goods and services in an economy over a period of time. When the general price level rises, each unit of currency buys fewer goods and services; consequently, inflation reflects a reduction in the purchasing power per unit of money – a loss of real value in the medium of exchange and unit of account within the economy. The opposite of inflation is deflation, a sustained decrease in the general price level of goods and services. The common measure of inflation is the inflation rate, the annualized percentage change in a general price index, usually the consumer price index, over time.**

[Inflation](#) is when the prices of goods and services increase. There are four main types of inflation, categorized by their speed. They are creeping, walking, galloping, and hyperinflation. There are specific types of asset inflation and also wage inflation. Some experts say demand-pull and cost-push inflation are two more types, but they are causes of inflation. So is the expansion of the money supply.

#### 1. Creeping Inflation

Creeping or mild inflation is when prices rise 3% a year or less. According to the Federal Reserve, when prices increase 2% or less, it benefits economic growth. This kind of mild inflation makes consumers expect that prices will keep going up. That boosts demand. Consumers buy now to beat higher future prices. That's how mild inflation drives economic expansion. For that reason, the Fed sets 2% as its target

#### 2. Walking Inflation

This strong, or destructive, inflation is between 3-10% a year. It is harmful to the economy because it heats-up economic growth too fast. People start to buy more than they need to avoid tomorrow's much higher prices. This increased buying drives demand even further so that suppliers can't keep up. More important, neither can wages. As a result, [common goods and services](#) are priced out of the reach of most people.

### 3. Galloping Inflation

When inflation rises to 10% or more, it wreaks absolute havoc on the economy. Money loses value so fast that business and employee income can't keep up with costs and prices. Foreign investors avoid the country, depriving it of needed capital. The economy becomes unstable, and government leaders lose credibility. Galloping inflation must be prevented at all costs.

### 4. Hyperinflation

Hyperinflation is when prices skyrocket more than 50% a month. It is very rare. In fact, most examples of hyperinflation occur when governments print money to pay for wars. Examples of hyperinflation include Germany in the 1920s, Zimbabwe in the 2000s, and Venezuela in the 2010s. The last time America experienced hyperinflation was during its civil war.

### 5. Stagflation

Stagflation is when economic growth is stagnant, but there still is price inflation. This combination seems contradictory, if not impossible. Why would prices go up when there isn't enough demand to stoke economic growth?

It happened in the 1970s when the United States abandoned the gold standard. Once the dollar's value was no longer tied to gold, it plummeted. At the same time, the price of gold skyrocketed.

## **MEASURES TO CONTROL INFLATION.**

Some of the important measures to control inflation are as follows: 1.

Monetary Measures 2. Fiscal Measures 3. Other Measures.

**Inflation is caused by the failure of aggregate supply to equal the increase in aggregate demand. Inflation can, therefore, be controlled by increasing the**

supplies of goods and services and reducing money incomes in order to control aggregate demand.

The various methods are usually grouped under three heads: monetary measures, fiscal measures and other measures.

### 1. Monetary Measures:

Monetary measures aim at reducing money incomes.

#### (a) Credit Control:

One of the important monetary measures is monetary policy. The central bank of the country adopts a number of methods to control the quantity and quality of credit. For this purpose, it raises the bank rates, sells securities in the open market, raises the reserve ratio, and adopts a number of selective credit control measures, such as raising margin requirements and regulating consumer credit. Monetary policy may not be effective in controlling inflation, if inflation is due to cost-push factors. Monetary policy can only be helpful in controlling inflation due to demand-pull factors.

#### (b) Demonetisation of Currency:

However, one of the monetary measures is to demonetise currency of higher denominations. Such a measure is usually adopted when there is abundance of black money in the country.

#### (c) Issue of New Currency:

The most extreme monetary measure is the issue of new currency in place of the old currency. Under this system, one new note is exchanged for a number of notes of the old currency. The value of bank deposits is also fixed accordingly. Such a measure is adopted when there is an excessive issue of notes and there is hyperinflation in the country. It is a very effective measure. But is inequitable for it hurts the small depositors the most.

## 2. Fiscal Measures:

Monetary policy alone is incapable of controlling inflation. It should, therefore, be supplemented by fiscal measures. Fiscal measures are highly effective for controlling government expenditure, personal consumption expenditure, and private and public investment.

The principal fiscal measures are the following:

### (a) Reduction in Unnecessary Expenditure:

The government should reduce unnecessary expenditure on non-development activities in order to curb inflation. This will also put a check on private expenditure which is dependent upon government demand for goods and services. But it is not easy to cut government expenditure. Though this measure is always welcome but it becomes difficult to distinguish between essential and non-essential expenditure. Therefore, this measure should be supplemented by taxation.

### (b) Increase in Taxes:

To cut personal consumption expenditure, the rates of personal, corporate and commodity taxes should be raised and even new taxes should be levied,

but the rates of taxes should not be so high as to discourage saving, investment and production. Rather, the tax system should provide larger incentives to those who save, invest and produce more.

Further, to bring more revenue into the tax-net, the government should penalise the tax evaders by imposing heavy fines. Such measures are bound to be effective in controlling inflation. To increase the supply of goods within the country, the government should reduce import duties and increase export duties.

*(c) Increase in Savings:*

Another measure is to increase savings on the part of the people. This will tend to reduce disposable income with the people, and hence personal consumption expenditure. But due to the rising cost of living, people are not in a position to save much voluntarily.

Keynes, therefore, advocated compulsory savings or what he called ‘deferred payment’ where the saver gets his money back after some years. For this purpose, the government should float public loans carrying high rates of interest, start saving schemes with prize money, or lottery for long periods, etc. It should also introduce compulsory provident fund, provident fund-cum-pension schemes, etc. All such measures increase savings and are likely to be effective in controlling inflation.

*(d) Surplus Budgets:*

An important measure is to adopt anti-inflationary budgetary policy. For this purpose, the government should give up deficit financing and instead have surplus budgets. It means collecting more in revenues and spending less.

*(e) Public Debt:*

At the same time, it should stop repayment of public debt and postpone it to some future date till inflationary pressures are controlled within the economy. Instead, the government should borrow more to reduce money supply with the public.

Like monetary measures, fiscal measures alone cannot help in controlling inflation. They should be supplemented by monetary, non-monetary and non-fiscal measures.

**3. Other Measures:**

The other types of measures are those which aim at increasing aggregate supply and reducing aggregate demand directly.

*(a) To Increase Production:*

The following measures should be adopted to increase production:

(i) One of the foremost measures to control inflation is to increase the production of essential consumer goods like food, clothing, kerosene oil, sugar, vegetable oils, etc.

(ii) If there is need, raw materials for such products may be imported on preferential basis to increase the production of essential commodities,

(iii) Efforts should also be made to increase productivity. For this purpose, industrial peace should be maintained through agreements with trade unions, binding them not to resort to strikes for some time,

(iv) The policy of rationalisation of industries should be adopted as a long-term measure. Rationalisation increases productivity and production of industries through the use of brain, brawn and bullion,

(v) All possible help in the form of latest technology, raw materials, financial help, subsidies, etc. should be provided to different consumer goods sectors to increase production.

*(b) Rational Wage Policy:*

Another important measure is to adopt a rational wage and income policy. Under hyperinflation, there is a wage-price spiral. To control this, the government should freeze wages, incomes, profits, dividends, bonus, etc.

But such a drastic measure can only be adopted for a short period as it is likely to antagonise both workers and industrialists. Therefore, the best course is to link increase in wages to increase in productivity. This will have a dual effect. It will control wages and at the same time increase productivity, and hence raise production of goods in the economy.

*(c) Price Control:*

Price control and rationing is another measure of direct control to check inflation. Price control means fixing an upper limit for the prices of essential consumer goods. They are the maximum prices fixed by law and anybody charging more than these prices is punished by law. But it is difficult to administer price control.

*(d) Rationing:*

Rationing aims at distributing consumption of scarce goods so as to make them available to a large number of consumers. It is applied to essential consumer goods such as wheat, rice, sugar, kerosene oil, etc. It is meant to stabilise the prices of necessities and assure distributive justice. But it is very inconvenient for consumers because it leads to queues, artificial shortages, corruption and black marketing. Keynes did not favour rationing for it “involves a great deal of waste, both of resources and of employment.”

**Concepts of national income**

**National Income** is total amount of goods and services produced within the nation during the given period say, 1 year. It is the total of factor **income** i.e. wages, interest, rent, profit, received by factors of production i.e. labour, capital, land and entrepreneurship of a nation.

***(A) Gross Domestic Product (GDP):***

GDP is the total value of goods and services produced within the country during a year. This is calculated at market prices and is known as GDP at market prices. Dernberg defines GDP at market price as “the market value of the output of final goods

and services produced in the domestic territory of a country during an accounting year.”

**There are three different ways to measure GDP:**

Product Method, Income Method and Expenditure Method.

These three methods of calculating GDP yield the same result because National Product = National Income = National Expenditure.

**1. The Product Method:**

In this method, the value of all goods and services produced in different industries during the year is added up. This is also known as the value added method to GDP or GDP at factor cost by industry of origin. The following items are included in India in this: agriculture and allied services; mining; manufacturing, construction, electricity, gas and water supply; transport, communication and trade; banking and insurance, real estates and ownership of dwellings and business services; and public administration and defense and other services (or government services). In other words, it is the sum of gross value added.

**2. The Income Method:**

The people of a country who produce GDP during a year receive incomes from their work. Thus GDP by income method is the

sum of all factor incomes: Wages and Salaries (compensation of employees) + Rent + Interest + Profit.

### **3. Expenditure Method:**

This method focuses on goods and services produced within the country during one year.

#### **GDP by expenditure method includes:**

(1) Consumer expenditure on services and durable and non-durable goods (C),

(2) Investment in fixed capital such as residential and non-residential building, machinery, and inventories (I),

(3) Government expenditure on final goods and services (G),

(4) Export of goods and services produced by the people of country (X),

(5) Less imports (M). That part of consumption, investment and government expenditure which is spent on imports is subtracted from GDP. Similarly, any imported component, such as raw materials, which is used in the manufacture of export goods, is also excluded.

Thus GDP by expenditure method at market prices =  $C + I + G + (X - M)$ , where  $(X - M)$  is net export which can be positive or negative.

***(B) GDP at Factor Cost:***

GDP at factor cost is the sum of net value added by all producers within the country. Since the net value added gets distributed as income to the owners of factors of production, GDP is the sum of domestic factor incomes and fixed capital consumption (or depreciation).

Thus GDP at Factor Cost = Net value added + Depreciation.

**GDP at factor cost includes:**

(i) Compensation of employees i.e., wages, salaries, etc.

(ii) Operating surplus which is the business profit of both incorporated and unincorporated firms. [Operating Surplus = Gross Value Added at Factor Cost—Compensation of Employees—Depreciation]

(iii) Mixed Income of Self- employed.

Conceptually, GDP at factor cost and GDP at market price must be identical/This is because the factor cost (payments to factors) of producing goods must equal the final value of goods and services at market prices. However, the market value of goods

and services is different from the earnings of the factors of production.

In GDP at market price are included indirect taxes and are excluded subsidies by the government. Therefore, in order to arrive at GDP at factor cost, indirect taxes are subtracted and subsidies are added to GDP at market price.

Thus,  $\text{GDP at Factor Cost} = \text{GDP at Market Price} - \text{Indirect Taxes} + \text{Subsidies}$ .

***(C) Net Domestic Product (NDP):***

NDP is the value of net output of the economy during the year. Some of the country's capital equipment wears out or becomes obsolete each year during the production process. The value of this capital consumption is some percentage of gross investment which is deducted from GDP. Thus  $\text{Net Domestic Product} = \text{GDP at Factor Cost} - \text{Depreciation}$ .

***(D) Nominal and Real GDP:***

When GDP is measured on the basis of current price, it is called GDP at current prices or nominal GDP. On the other hand, when GDP is calculated on the basis of fixed prices in some year, it is called GDP at constant prices or real GDP.

Nominal GDP is the value of goods and services produced in a year and measured in terms of rupees (money) at current

(market) prices. In comparing one year with another, we are faced with the problem that the rupee is not a stable measure of purchasing power. GDP may rise a great deal in a year, not because the economy has been growing rapidly but because of rise in prices (or inflation).

On the contrary, GDP may increase as a result of fall in prices in a year but actually it may be less as compared to the last year. In both 5 cases, GDP does not show the real state of the economy. To rectify the underestimation and overestimation of GDP, we need a measure that adjusts for rising and falling prices.

This can be done by measuring GDP at constant prices which is called real GDP. To find out the real GDP, a base year is chosen when the general price level is normal, i.e., it is neither too high nor too low. The prices are set to 100 (or 1) in the base year.

**Now the general price level of the year for which real GDP is to be calculated is related to the base year on the basis of the following formula which is called the deflator index:**

$$\text{Real } GDP = \frac{\text{GDP for the Current Year}}{\text{Current Year Index}} \times \frac{\text{Base Year (=100)}}{\text{Current Year Index}}$$

Suppose 1990-91 is the base year and GDP for 1999-2000 is Rs. 6, 00,000 crores and the price index for this year is 300.

Thus, Real GDP for 1999-2000 = Rs. 6, 00,000 x 100/300 = Rs. 2, 00,000 crores

### ***(E) GDP Deflator:***

GDP deflator is an index of price changes of goods and services included in GDP. It is a price index which is calculated by dividing the nominal GDP in a given year by the real GDP for the same year and multiplying it by 100. Thus,

$$\text{GDP Deflator} = \frac{\text{Nominal (or Current Prices) GDP}}{\text{Real (or Constant Prices) GDP}} \times 100$$

For example, GDP Deflator in 1997-98 =  $\frac{1426.7\text{th. crores}}{1049.2\text{th. crores at } 1993-94} \times 100 = 135.9$

It shows that at constant prices (1993-94), GDP in 1997-98 increased by 135.9% due to inflation (or rise in prices) from Rs. 1049.2 thousand crores in 1993-94 to Rs. 1426.7 thousand crores in 1997-98.

### ***(F) Gross National Product (GNP):***

GNP is the total measure of the flow of goods and services at market value resulting from current production during a year in a country, including net income from abroad.

### **GNP includes four types of final goods and services:**

(1) Consumers' goods and services to satisfy the immediate wants of the people;

(2) Gross private domestic investment in capital goods consisting of fixed capital formation, residential construction and inventories of finished and unfinished goods;

(3) Goods and services produced by the government; and

(4) Net exports of goods and services, i.e., the difference between value of exports and imports of goods and services, known as net income from abroad.

In this concept of GNP, there are certain factors that have to be taken into consideration: First, GNP is the measure of money, in which all kinds of goods and services produced in a country during one year are measured in terms of money at current prices and then added together.

But in this manner, due to an increase or decrease in the prices, the GNP shows a rise or decline, which may not be real. To guard against erring on this account, a particular year (say for instance 1990-91) when prices be normal, is taken as the base year and the GNP is adjusted in accordance with the index number for that year. This will be known as GNP at 1990-91 prices or at constant prices.

Second, in estimating GNP of the economy, the market price of only the final products should be taken into account. Many of

the products pass through a number of stages before they are ultimately purchased by consumers.

If those products were counted at every stage, they would be included many a time in the national product. Consequently, the GNP would increase too much. To avoid double counting, therefore, only the final products and not the intermediary goods should be taken into account.

Third, goods and services rendered free of charge are not included in the GNP, because it is not possible to have a correct estimate of their market price. For example, the bringing up of a child by the mother, imparting instructions to his son by a teacher, recitals to his friends by a musician, etc.

Fourth, the transactions which do not arise from the produce of current year or which do not contribute in any way to production are not included in the GNP. The sale and purchase of old goods, and of shares, bonds and assets of existing companies are not included in GNP because these do not make any addition to the national product, and the goods are simply transferred.

Fifth, the payments received under social security, e.g., unemployment insurance allowance, old age pension, and interest on public loans are also not included in GNP, because

the recipients do not provide any service in lieu of them. But the depreciation of machines, plants and other capital goods is not deducted from GNP.

Sixth, the profits earned or losses incurred on account of changes in capital assets as a result of fluctuations in market prices are not included in the GNP if they are not responsible for current production or economic activity.

For example, if the price of a house or a piece of land increases due to inflation, the profit earned by selling it will not be a part of GNP. But if, during the current year, a portion of a house is constructed anew, the increase in the value of the house (after subtracting the cost of the newly constructed portion) will be included in the GNP. Similarly, variations in the value of assets, that can be ascertained beforehand and are insured against flood or fire, are not included in the GNP.

Last, the income earned through illegal activities is not included in the GNP. Although the goods sold in the black market are priced and fulfill the needs of the people, but as they are not useful from the social point of view, the income received from their sale and purchase is always excluded from the GNP.

There are two main reasons for this. One, it is not known whether these things were produced during the current year or

the preceding years. Two, many of these goods are foreign made and smuggled and hence not included in the GNP.

### **Three Approaches to GNP:**

After having studied the fundamental constituents of GNP, it is essential to know how it is estimated. Three approaches are employed for this purpose. One, the income method to GNP; two, the expenditure method to GNP and three, the value added method to GNP. Since gross income equals gross expenditure, GNP estimated by all these methods would be the same with appropriate adjustments.

#### **1. Income Method to GNP:**

The income method to GNP consists of the remuneration paid in terms of money to the factors of production annually in a country.

**Thus GNP is the sum total of the following items:**

#### **(i) Wages and salaries:**

Under this head are included all forms of wages and salaries earned through productive activities by workers and entrepreneurs. It includes all sums received or deposited during a year by way of all types of contributions like overtime, commission, provident fund, insurance, etc.

#### **(ii) Rents:**

Total rent includes the rents of land, shop, house, factory, etc. and the estimated rents of all such assets as are used by the owners themselves.

**(iii) Interest:**

Under interest comes the income by way of interest received by the individual of a country from different sources. To this is added, the estimated interest on that private capital which is invested and not borrowed by the businessman in his personal business. But the interest received on governmental loans has to be excluded, because it is a mere transfer of national income.

**(iv) Dividends:**

Dividends earned by the shareholders from companies are included in the GNP.

**(v) Undistributed corporate profits:**

Profits which are not distributed by companies and are retained by them are included in the GNP.

**(vi) Mixed incomes:**

These include profits of unincorporated business, self-employed persons and partnerships. They form part of GNP.

**(vii) Direct taxes:**

Taxes levied on individuals, corporations and other businesses are included in the GNP.

**(viii) Indirect taxes:**

The government levies a number of indirect taxes, like excise duties and sales tax.

These taxes are included in the price of commodities. But revenue from these goes to the government treasury and not to the factors of production. Therefore, the income due to such taxes is added to the GNP.

**(ix) Depreciation:**

Every corporation makes allowance for expenditure on wearing out and depreciation of machines, plants and other capital equipment. Since this sum also is not a part of the income received by the factors of production, it is, therefore, also included in the GNP.

**(x) Net income earned from abroad:**

This is the difference between the value of exports of goods and services and the value of imports of goods and services. If this difference is positive, it is added to the GNP and if it is negative, it is deducted from the GNP.

Thus GNP according to the Income Method = Wages and Salaries + Rents + Interest + Dividends + Undistributed Corporate Profits + Mixed Income + Direct Taxes + Indirect Taxes + Depreciation + Net Income from abroad.

## **2. Expenditure Method to GNP:**

From the expenditure view point, GNP is the sum total of expenditure incurred on goods and services during one year in a country.

### **It includes the following items:**

#### **(i) Private consumption expenditure:**

It includes all types of expenditure on personal consumption by the individuals of a country. It comprises expenses on durable goods like watch, bicycle, radio, etc., expenditure on single-used consumers' goods like milk, bread, ghee, clothes, etc., as also the expenditure incurred on services of all kinds like fees for school, doctor, lawyer and transport. All these are taken as final goods.

#### **(ii) Gross domestic private investment:**

Under this comes the expenditure incurred by private enterprise on new investment and on replacement of old capital. It includes expenditure on house construction, factory- buildings, and all types of machinery, plants and capital equipment.

In particular, the increase or decrease in inventory is added to or subtracted from it. The inventory includes produced but unsold manufactured and semi-manufactured goods during the year and the stocks of raw materials, which have to be accounted for in GNP. It does not take into account the financial exchange of shares and stocks because their sale and purchase is not real investment. But depreciation is added.

**(iii) Net foreign investment:**

It means the difference between exports and imports or export surplus. Every country exports to or imports from certain foreign countries. The imported goods are not produced within the country and hence cannot be included in national income, but the exported goods are manufactured within the country. Therefore, the difference of value between exports (X) and imports (M), whether positive or negative, is included in the GNP.

**(iv) Government expenditure on goods and services:**

The expenditure incurred by the government on goods and services is a part of the GNP. Central, state or local governments spend a lot on their employees, police and army. To run the offices, the governments have also to spend on contingencies which include paper, pen, pencil and various types of stationery, cloth, furniture, cars, etc.

It also includes the expenditure on government enterprises. But expenditure on transfer payments is not added, because these payments are not made in exchange for goods and services produced during the current year.

Thus GNP according to the Expenditure Method = Private Consumption Expenditure (C) + Gross Domestic Private Investment (I) + Net Foreign Investment (X-M) + Government Expenditure on Goods and Services (G) = C + I + (X-M) + G.

As already pointed out above, GNP estimated by either the income or the expenditure method would work out to be the same, if all the items are correctly calculated.

### **3. Value Added Method to GNP:**

Another method of measuring GNP is by value added. In calculating GNP, the money value of final goods and services produced at current prices during a year is taken into account. This is one of the ways to avoid double counting. But it is difficult to distinguish properly between a final product and an intermediate product.

For instance, raw materials, semi-finished products, fuels and services, etc. are sold as inputs by one industry to the other. They may be final goods for one industry and intermediate for others. So, to avoid duplication, the value of intermediate

products used in manufacturing final products must be subtracted from the value of total output of each industry in the economy.

Thus, the difference between the value of material outputs and inputs at each stage of production is called the value added. If all such differences are added up for all industries in the economy, we arrive at the GNP by value added.  $\text{GNP by value added} = \text{Gross value added} + \text{net income from abroad}$ . Its calculation is shown in Tables 1, 2 and 3.

Table 1 is constructed on the supposition that the entire economy for purposes of total production consists of three sectors. They are agriculture, manufacturing, and others, consisting of the tertiary sector.

## **UNIT-5**

### **COMMERCIAL BANK**

A commercial bank is a type of bank that provides services such as accepting deposits, making business loans, and offering basic investment products that is operated as a business for profit.

It can also refer to a bank, or a division of a large bank, which deals with corporations or large/middle-sized business to differentiate it from a retail bank and an investment bank.

### **FUNCTIONS OF COMMERCIAL BANK**

Commercial banks are authorized to provide a variety of financial services which includes loans, savings accounts, etc.

#### **Primary Functions of Commercial Banks**

The primary functions of a commercial bank are as follows:

##### **1. Accepting Deposits**

Commercial banks accept deposits from people, businesses, and other entities in the form of:

- **Savings deposits – The commercial bank accepts small deposits, from households or persons, in order to encourage savings in the economy.**
- **Time deposits – The bank accepts deposits for a fixed time and carries a higher rate of interest as compared to savings deposits.**
- **Current deposits – These accounts do not offer any interest. Further, most current accounts offer overdrafts up to a pre-specified limit. The bank, therefore, undertakes the obligation of paying all cheques against deposits subject to the availability of sufficient funds in the account.**

## **2. Lending of Funds**

**Another important activity is lending funds to customers in the form of loans and advances, cash credit, overdraft and discounting of bills, etc.**

**Loans are advances that a bank extends to his customers with or without security for a specified time and at an agreed rate of interest. Further, the bank credits the loan amount in the customers' account which he withdraws as per his needs.**

## **CENTRAL BANK**

### **FUNCTIONS OF CENTRAL BANK.**

**Eight major functions of central bank in an economy are as follows:**

(1) Bank of Issue, (2) Banker, Agent and Advisor to Government, (3) Custodian of Cash Reserves, (4) Custodian of Foreign Balances,

(5) Lender of Last Resort, (6) Clearing House, (7) Controller of Credit, and (8) Protection of Depositor's Interest.

#### ***Function 1 # Bank of Issue:***

Central bank now-a-days has the monopoly of note-issue in every country. The currency notes printed and issued by the

central bank are declared unlimited legal tender throughout the country.

***Function 2 # Banker, Agent and Adviser to the Government:***

Central bank, everywhere, performs the functions of banker, agent and adviser to the government.

***Function 3 # Custodian of Cash Reserves:***

All commercial banks in a country keep a part of their cash balances as deposits with the central bank, may be on account of convention or legal compulsion. They draw during busy seasons and pay back during slack seasons. Part of these balances is used for clearing purposes. Other member banks look to it for guidance, help and direction in time of need.

***Function 4 # Custodian of Foreign Balances:***

Under the gold standard or when the country is on the gold standard, the management of that standard, with a view to securing stability of exchange rate, is left to the central bank.

***Function 5 # Lender of Last Resort:***

Central bank is the lender of last resort, for it can give cash to the member banks to strengthen their cash reserves position by rediscounting first class bills in case there is a crisis or panic which develops into 'run' on banks or when there is a seasonal strain. Member banks can also take advances on approved short-term securities from the central bank to add to their cash resources at the shortest time.

***Function 6 # Clearing House:***

Central bank also acts as a clearing house for the settlement of accounts of commercial banks. A clearing house is an organisation where mutual claims of banks on one another are

offset, and a settlement is made by the payment of the difference.

***Function 7 # Controller of Credit:***

The control or adjustment of credit of commercial banks by the central bank is accepted as its most important function.  
Commercial banks create lot of credit which sometimes results in inflation.

***Function 8 # Protection of Depositors Interests:***

The central bank has to supervise the functioning of commercial banks so as to protect the interest of the depositors and ensure development of banking on sound lines.