

Unit-5 Time Value of Money

QN1 Explain what is meant by the following statement? “A rupee in hand today is worth more than a rupee to be received next year.” Or why most of us would prefer to receive cash sooner than later?

Time value of money means that the value of rupee received one year from now is not the same as the value of a rupee received today. In other words most of us would prefer to receive cash sooner rather than later, and to spend cash later rather than sooner, because intuitively we know that money has a time value.

There are various reasons that bring changes in the value of money with the passage of time. The major factors which affect the value of money are as follows:

Inflation: Inflation brings upward change in the price level with the passes of time. One cannot buy same quantity of goods and services in future with the passes of time This means the purchasing power of money diminishes with the passing of time.

Involvement of risk: Present is certain as compared to future. The degree of uncertainty (risk element) increases as the time line increases to longer period.

Time preference: It is human behavior that every one prefers to receive money as earlier as possible. Therefore on one will not prepare to lengthen the credit period, if satisfactory return is not given.

Risk free opportunity: Financial market has made risk-free opportunity for investment. One can earn certain rate at zero risk. Earlier money can earn interest on principal and previously earned interest.

Sacrifice of present consumption: For making investment one must save his earning. Saving from current earning is not possible without sacrificing present consumption and people do not like to scarify their present consumption if they do not get reward for it.

Liquidity preference: Liquidity means ability to convert the assets into spendable cash without significant loss in the value of assets. Thus cash is the liquid form of assets. When one makes investment he changes his most liquid assets into some less liquid asset.

QN2 Why is the time value of money concept so important in financial analysis?

Time value of money is one of the most important concepts in finance. It means that the value of rupee received one year from now is not the same as the value of a rupee received today. Time value of money concept is important for these reasons:

1. **Capital budgeting** (The analysis of investment projects): Capital budgeting is the process of evaluating as selecting the investment project. For the investment decision, time value of money is very important to convert the future cash flows in the present.

- The cost of capital:** Company needs the capital for long term investments. For this purpose it is necessary to calculate the cost of capital of long-term investments. Cost of capital is calculated based on time value of money concept.
- Working Capital (Short-term asset and liability) management:** Holding of inventory, receivable, payable etc are evaluated on its opportunity cost basis.
- Lease payment:** Analysis and purchase of lease is done on the time value of money basis.
- Trade off between risk and return:** A firm invests in the project for the positive return. But this return should be balanced with risk. One cannot maintain balance between risk and return without using the concept of time value of money.

QN3 Write short notes on:

Future value and compounding: The concept of future value deals with the accumulation of funds to some date in the future. The amount of money that will increase/grow within a certain time period at a given interest rate in an investment is called future value. The future value is the sum of beginning amount and interest earned. To find future value following formulae are used.

Cash Flows	Numerical Solution	Tabular Solution
Single	$FV_n = PV(1+K)^n$	$FV_n = PV(FVIF_{k,n})$
Ordinary Annuity	$FVA_n = PMT \times \frac{(1+K)^n - 1}{K}$	$FVA_n = PMT(FVIFA_{k,n})$
Annuity Due	$FVA_{n \text{ Due}} = PMT \times \frac{(1+K)^n - 1}{K} \times (1+K)$	$FVA_{n \text{ Due}} = PMT(FVIFA_{k,n}) \times (1+K)$

Where, FV_n = Future value at year n; PV = Present Value; K = Interest Rate; n = no of cash flows year; PMT = Yearly Payment.

The present value and discounting: The value today of a future cash flow or series of cash flows. The actual present value of a rupee depends on the earnings opportunities of the recipient and the point in time when the money is to be received.

Cash Flows	Numerical Solution	Tabular Solution
Single	$PV = FV_n / (1+K)^n$	$PV = FV_n \times (PVIF_{k,n})$
Ordinary Annuity	$PV = PMT \times \left(\frac{1 - \frac{1}{(1+K)^n}}{K} \right)$	$PV = PMT \times (PVIFA_{k,n})$
Annuity Due	$PV = PMT \times \left(\frac{1 - \frac{1}{(1+K)^n}}{K} \right) \times (1+K)^n$	$PV = PMT \times (PVIFA_{k,n}) \times (1+K)^n$

Where, FV_n = Future value at year n; PV = Present Value; K = Interest Rate; n = no of cash flows year; PMT = Yearly Payment.

Annuity: An annuity is a special cash flow pattern in which, a constant annual amount is to be paid or received over a defined number of periods. Annuity is of two types: ordinary annuity and annuity due.

In ordinary annuity, it is assumed that the cash flows occur at the end of the period. Ordinary annuity is also known as deferred annuity. In contrast an annuity due is one in which cash flows occur at the beginning of each period.

