

# Time Value Of Money

## What is Time Value of Money

Before you Know about Time value of money you need to understand Inflation,

**inflation** is the rate at which the general level of prices of goods and services rises over time, resulting in a decline in the purchasing power of money. When inflation increases, each rupee buys fewer goods and services than before.

The time value of money (TVM) is a financial concept that says money available today has more worth than the same amount in the future because of inflation and the opportunity to earn returns. Inflation reduces the future purchasing power of money, so ₹100 today will buy more goods and services than ₹100 after inflation decrease its value. Inflation means prices rise over time, so the same money buys less later.

**For example:** If inflation is 5% per year, ₹100 today might only buy what ₹95 buys a year later. So receiving ₹100 today is worth more than ₹100 next year in real (inflation-adjusted) terms.



## Time Value of Money Without Inflation :

For Now, assume there is no inflation. Prices remain constant over time. A chocolate that costs the same today will cost the same in the future. This assumption helps isolate the concept of time value of money and shows that it exists even without inflation.

Consider a simple choice. Would you prefer to receive ₹10,000 today or ₹10,000 one year from now. Most people choose ₹10,000 today. This preference is partly behavioral. The present feels more certain than the future. We do not know what may happen over the next year. This logic still holds even when inflation is zero. If a chocolate costs ₹20 today and will still cost ₹20 next year, ₹10,000 buys 500 chocolates in both cases.

So why is money today still considered more valuable.

The answer is not just uncertainty. It is also economically rational. Money today is said to be worth more than money in the future. This does not mean its numerical value changes. It means its usefulness over time is different.

The only difference between receiving ₹10,000 today and receiving it next year is time. If you receive the money today, you can use it during the year. You can deposit it in a bank, invest it, or use it to start a business. All these actions create the possibility of earning a return.

If you receive the money next year, you lose the chance to use it during this period. The opportunity to invest or earn is delayed.

That opportunity to earn returns is the true time value of money. Money today is worth more because it has the potential to generate income over time. This earning potential exists even when inflation does not.

### Time Value of Money calculation and Important Concepts

**Power of compounding:** The power of compounding shows the essence of the time value of money (TVM) because money grows over time not just on the initial amount, but also on the interest it earns. For example, if you invest a certain amount today, over time it earns interest, and in the next period, that interest also earns interest. This means that the longer money is invested, the more it grows exponentially. TVM is reflected here because a rupee today is worth more than a rupee in the future—the sooner it is invested, the greater the compounding effect. Compounding demonstrates that money has a time-dependent value: delaying investment reduces potential growth, while acting early magnifies wealth over time.

**Future Value (FV) :** Future value is how much an investment made today will be worth at some point in the future, which makes it crucial in making informed decisions about investments.

$$FV = PV(1+r)^n$$

PV = Present Value

r = Interest rate

n = Number of periods (years , Days , months)

**Present Value (PV) :** Present value, an estimate of the current value of a future sum of money

$$PV = \frac{FV}{(1+r^n)}$$

Calculating present value allows an investor to compare the potential performance of various investments by determining the current worth of the number of dollars that each investment will return by a future date.

Where:

FV = future value

r = discount rate ( the rate used to “bring future money back to present value.(Discounting))

n = number of periods (years , Days , months)

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### Example-1

Imagine you have Rs.100 and can invest it at an annual interest rate of 5%. How much will you have after two years?

Given: PV = Rs. 100

Interest Rate= 5% (or 0.05 as a decimal)

Number of Periods=2 years

Calculation:  $FV = Rs. 100 \times (1 + 0.05)^2$

FV = Rs. 110.25

After two years, if you invest Rs.100 at an annual rate of interest of 5%, you will have Rs.110.25. This increase in value showcases the Time Value of Money, as your money grows over time due to the interest earned.

## Risk and Returns

When you decide to invest your money, there are two important things to consider: risk and return.

## Risks Associated with an investment

**Risk** is the uncertainty surrounding an investment, stock, or company. Investments are made in a company to earn profits, but risks are the obstacles that contribute to a reduction in profit or, sometimes, even lead to losses.

Whenever capital is employed in the market by an investor, it faces various risks, such as market risk, specific risks, credit risk, and liquidity risk

### **Types of Risks:**

#### **1. Market Risk (Systematic Risk):**

Market risk is the risk of losses due to broad economic or macroeconomic factors that affect the entire financial market. It cannot be eliminated through diversification.

#### **2. Specific Risk (Unsystematic Risk):**

Specific risk is related to factors unique to a particular company or industry. It can be reduced through diversification.

#### **3. Credit Risk:**

Credit risk is the possibility that a borrower fails to meet interest or principal repayment obligations.

#### **4. Liquidity Risk:**

Liquidity risk arises when an entity cannot meet short-term obligations due to insufficient cash or inability to sell assets quickly.

#### **5. Interest Rate Risk:**

Interest rate risk is the sensitivity of asset values and earnings to changes in interest rates.

## **6. Inflation Risk:**

Inflation risk is the reduction in purchasing power of money over time, which lowers real investment returns.

# Returns on an investment

**Return**, is the *gain* or *loss* from an investment over a period of time. It tells you how much money you made, or lost, on your investment. If you have a *positive* return, that means your investment has made money. If your return is *negative*, then you have lost money

## **Types of returns:**

### **1. Capital Gains:**

Capital gains arise when an asset is sold at a price higher than its purchase cost. The gain reflects the appreciation in the asset's market value over time.

### **2. Dividend Income:**

Dividends are periodic payments made by companies to shareholders out of profits. They provide a regular income stream in addition to potential capital appreciation.

### **3. Interest Income:**

Interest is the return earned by lending money. It compensates the lender for the time value of money and credit risk taken by providing funds to a borrower.

### **4. Rental Income:**

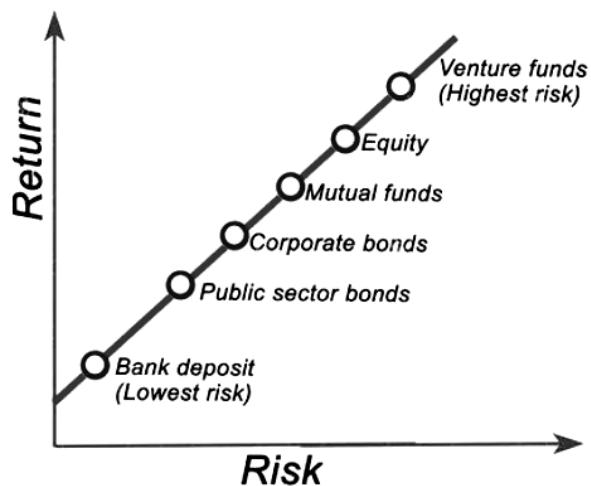
Rental income is earned by leasing property or real estate assets. It provides recurring cash flow while the asset may also appreciate in value.

### **5. Currency Trading Returns:**

Returns from currency trading result from fluctuations in exchange rates. Profits are made by buying one currency at a lower rate and selling it at a higher rate in the forex market.

## **Risk–Return relationship:**

## *Risk/Return Relationship*



**The Risk–Return relationship** is a core finance principle describing how the expected return on an investment is directly correlated with the level of risk taken. It means that investments with higher risk are expected to offer higher potential returns to compensate investors for bearing greater uncertainty, while lower-risk investments generally offer lower expected returns. This relationship is usually positive or direct, but higher risk does not guarantee higher actual returns, it only increases the potential for them. If an investor is unwilling to take on investment risk, they should not expect returns above the **risk-free rate of return**.