



FINANCIAL ANALYSIS

Time value of money and NPV

Why a rupee today and a rupee later are not the same, and how a discount rate links the two

Market rates as on 1 September 2026

For training and education only. Not investment advice.

A rupee today is worth more than a rupee a year from now.

Today's rupee can be put to work and earn something by next year. When prices rise, next year's rupee also buys less. So amounts must be compared at one date.

Four words to know first



Future value

What a sum today grows to at a yearly rate r over n years. $FV = PV \times (1 + r)^n$.



Present value

What a future sum is worth today at that rate. $PV = FV \div (1 + r)^n$.



Discount rate

The yearly rate r used to bring future money back to today. Somebody chooses it.



NPV

Net present value: the present value of the money coming in, minus the money going out today.

$(1 + r)^n$ means $(1 + r)$ multiplied by itself n times. At 8% for 3 years: $1.08 \times 1.08 \times 1.08$.

Forward and back with one rate

THE SET-UP

Amount today: ₹1,00,000.

Assumed rate: 8% a year, added once a year.

Period: 3 years.

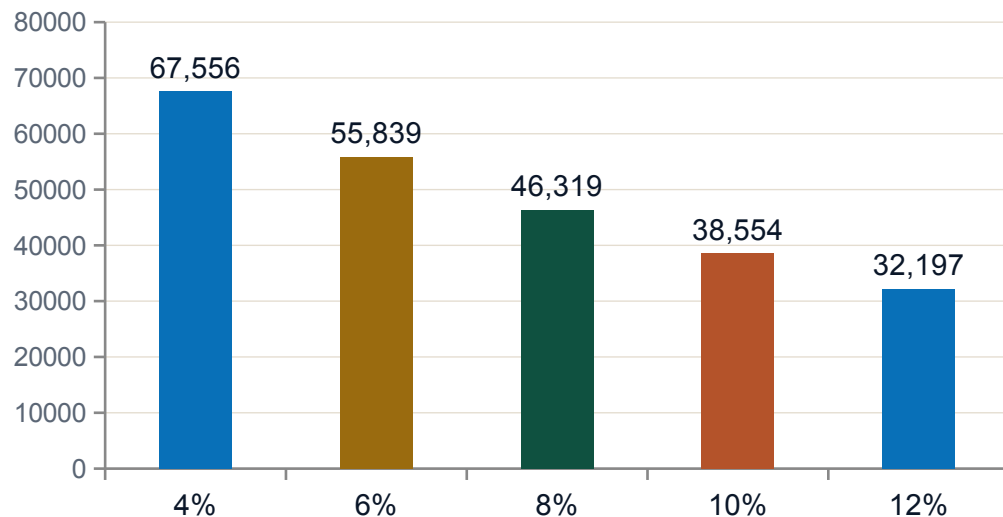
- 1 After 1 year: $₹1,00,000 \times 1.08 = ₹1,08,000$. After 2 years: $₹1,08,000 \times 1.08 = ₹1,16,640$.
- 2 After 3 years: $₹1,16,640 \times 1.08 = ₹1,25,971.20$. In one step: $₹1,00,000 \times 1.259712 = ₹1,25,971.20$. This is the future value.
- 3 Going back: $₹1,25,971.20 \div 1.259712 = ₹1,00,000$. This is the present value of ₹1,25,971.20 due in 3 years.
- 4 So at 8%, ₹1,25,000 in 3 years is worth $₹1,25,000 \div 1.259712 = ₹99,229.03$ today, a little under ₹1,00,000.

Compounding moves money forward in time. Discounting moves it back. One rate does both.

Illustration with an assumed rate of 8% a year. Not a forecast; returns are not assured.

The discount rate is an assumption

Value today of ₹1,00,000 due in 10 years



Read the chart

- The future amount is the same in each bar: ₹1,00,000 in 10 years.
- Discounted at 4% a year it is worth ₹67,556.42 today. At 12% it is worth ₹32,197.32.
- No bar is 'the' answer. Each is correct for its rate.
- The higher the rate and the longer the wait, the smaller the present value.

Illustration: $₹1,00,000 \div (1 + r)^{10}$ for each rate. Assumed rates, not forecasts of any return.

Net present value of a small project

A shop pays ₹5,00,000 today for a machine. Assumed extra cash it brings in, discounted at 10% a year.

When	Cash flow	Divide by	Present value at 10%
Today	– ₹5,00,000	1	– ₹5,00,000.00
End of year 1	+ ₹2,00,000	1.10	+ ₹1,81,818.18
End of year 2	+ ₹2,50,000	1.21 (1.10 × 1.10)	+ ₹2,06,611.57
End of year 3	+ ₹2,00,000	1.331 (1.10 × 1.10 × 1.10)	+ ₹1,50,262.96
Net present value			+ ₹38,692.71

Illustration with an invented project and assumed figures. Inflows total ₹5,38,692.71 in today's money; less the ₹5,00,000 outlay, NPV = ₹38,692.71.

Same project, a different rate

THE SAME CASH FLOWS

Pay ₹5,00,000 today.

Receive ₹2,00,000, ₹2,50,000 and ₹2,00,000 at the end of years 1, 2 and 3.

- 1 No discounting: $₹6,50,000 - ₹5,00,000 = ₹1,50,000$. This treats a rupee in year 3 as equal to a rupee today.
- 2 At 10%: inflows are worth ₹5,38,692.71 today. $NPV = ₹5,38,692.71 - ₹5,00,000 = + ₹38,692.71$.
- 3 At 15%: $₹1,73,913.04 + ₹1,89,035.92 + ₹1,31,503.25 = ₹4,94,452.21$.
 $NPV = ₹4,94,452.21 - ₹5,00,000 = - ₹5,547.79$.
- 4 The project did not change. The rate did, and the answer moved from positive to negative.

A positive NPV holds only for the rate used. Show the answer at more than one rate.

Illustration with an invented project and assumed figures. Not a forecast.

Where the same idea turns up



The price of a bond

A bond is a set of future payments. Its price is their present value. A ₹1,000 bond paying ₹100 a year for 3 years, discounted at 8%: $₹92.59 + ₹85.73 + ₹873.22 = ₹1,051.54$.



A goal calculation

₹10,00,000 is needed in 10 years. At an assumed 8% a year, $₹10,00,000 \div 1.08^{10} = ₹4,63,193.49$ set aside today would reach it. At an assumed 6%, the amount is ₹5,58,394.78.

In both, future rupees are brought back to today at a chosen rate. A new rate gives a new answer.

Illustrations with assumed figures. The rates are assumptions, not expected returns. Returns are not assured.

Market rates in view

A discount rate often starts from a bond yield plus an allowance for risk. Rates change; check the date.

INDIA 10-YEAR G-SEC YIELD

6.96%

Yield on the 6.94% GS 2036, the 10-year government bond, on 1 September 2026.

RBI POLICY REPO RATE

5.50%

Raised from 5.25% on 7 Oct 2026 (5.25% on 1 Sep 2026).

CPI INFLATION

4.82%

Year-on-year for August 2026 (provisional). RBI's target is 4%, within a band of 2% to 6%.

Sources: RBI Current Rates (10-year yield 6.9570%, 1 Sep 2026); RBI Monetary Policy Statement, 7 Oct 2026; MoSPI CPI press release, 14 Sep 2026.

When the rate is chosen carelessly

1

Too low for a project

Distant inflows are overvalued, and a weak project shows a positive NPV. The machine above passes at 10% and fails at 15%.

2

Too high for a goal

The amount needed today looks small. At an assumed 15%, ₹10,00,000 in 10 years needs ₹2,47,184.71 today; at 8%, ₹4,63,193.49.

3

Mixing in inflation

Cash flows that include price rises need a rate that includes inflation. Mixing the two kinds distorts the answer.

4

One rate for unlike risks

Uncertain cash flows are usually discounted at a higher rate than near-certain ones. One rate for both hides the risk.

State the rate, say why it was chosen, and show the answer at a second rate.

Illustration with assumed rates. The rates are assumptions, not expected returns. Returns are not assured.

Four things people get wrong



'₹1 crore in 20 years is ₹1 crore.'

Discounted at 6% a year it is worth ₹31,18,047.27 today. Compare amounts only at the same date.



'NPV is a fact about the project.'

It is the result of forecast cash flows and a chosen rate. Change either one and the NPV changes.



'A positive NPV is a sure gain.'

It says the forecast inflows are worth more than the outlay at that rate. Forecasts can turn out wrong.



'The discount rate is the inflation rate.'

Inflation is one part. The rate usually also reflects what the money could earn elsewhere and the risk taken.

Check yourself

Q1

What does ₹50,000 grow to in 2 years at 10% a year, added once a year? And what is the present value of ₹60,500 due in 2 years at the same rate?

Q2

A project costs ₹1,00,000 today and pays ₹60,000 at the end of year 1 and ₹60,000 at the end of year 2. What is its NPV at 10% a year?

Q3

A plan to reach ₹10,00,000 in 10 years assumes 15% a year. What happens to the amount needed today if 8% is assumed instead, and how would you put this to a client?

Sources and disclaimer

SOURCES FOR THE FIGURES IN THIS DECK

- 10-year government bond yield (6.94% GS 2036, 6.9570% on 1 Sep 2026): Reserve Bank of India, Current Rates, rbi.org.in (page archived 2 Sep 2026).
- Policy repo rate 5.50% from 7 Oct 2026: RBI Monetary Policy Statement, Press Release 2026-2027/1264.
- CPI inflation 4.82% for August 2026 (provisional, base 2024=100): MoSPI press release dated 14 Sep 2026.
- Inflation target of 4% with a band of 2% to 6%, 1 April 2026 to 31 March 2031: Government of India notification of March 2026.
- Every other figure in this deck is an illustration computed from assumed amounts and rates: the shop, the machine, the bond and the goal are invented.

This material is for training and investor education only. It is not investment, tax or legal advice and is not a recommendation to buy, sell or hold any security or scheme. Examples use assumed figures unless a source and date are shown. Mutual fund investments are subject to market risks; read all scheme related documents carefully. Trustner Asset Services Pvt. Ltd. is an AMFI-registered Mutual Fund Distributor (ARN-286886).