

	Rate of Return	Discounting to Present Value	Net Present Value
Used to establish	The cost of capital (i.e. the interest rate) of an investment	The value of financial instruments. Calculates future earnings given a present value	The present value of property or financial holdings based on future returns of that property or holding.
Used for	Compare investment in an additional capital equipment or service to an investment in an interest bearing financial instrument (e.g. a bond or certificate of deposit).		In order to make a decision regarding a purchase, sale, or trade in the present

Basic variables

- A The "annuity" or the amount you would pay each period
- CF Cash flow: the amount you would receive at the end of the period.
- n The number of periods
- r The return per period, or Interest rate, or The discount rate
- p The principle (initial investment)

RATE OF RETURN (ROR)

What you would have to pay today instead of installments:

$$= A \left[\frac{1 - (1 + r)^{-n}}{r} \right]$$

DISCOUNTING TO PRESENT VALUE (PV)

- Use the equation below to find how much the financial instrument or other contract should cost today versus when it matures and pays out.

$$= CF(1 + r)^{-n}$$
- Then, using an interest rate from a very low risk financial instrument (U.S. Treasury bonds are often the best), find the interest rate column that matches that interest rate.
- Where the interest rate column and the number of periods coincide is the present value multiple.
- Finally, multiply the present value multiple by the sell out value. This is the present value.

NET PRESENT VALUE (NPV)

The NPV use the present value of an investment that pays out in installments of different amounts over time.

- Calculate the total present cost (value) of the capital purchase/investment.
- Determine the interest rate for this money (often, the bank's prime rate is a good choice).
- Find the number of periods of return on the capital purchase/investment.
- Using the formula below, determine each annual Present Value factor.
For example, at a 3% interest rate, year 1 factor is 0.970874, year 2 factor is 0.942596, etc.

$$= CF(1 + r)^{-n}$$
- Multiply each individual year's investment return by the factor for that year.
- Add all of these amounts together.
- Subtract the initial investment from the Total Present Value.
- This will give you the total return in present value for the investment. A negative amount is a loss on investment; a positive amount is a return on investment.