RATE OF RETURN

- THE MINIMUM ACCEPTABLE RATE OF RETURN:
- IT IS THE RATE SET BY AN ORGANISATION WHICH GIVES THE LOWEST RATE OF RETURN AT WHICH THE INVESTMENT IS ACCEPTABLE.
- WITHIN THE ENTERPRISE THE RATE OF RETURN MAY BE DIFFERENT FOR DIFFERENT PURPOSES OR ACTIVITIES, BASED ON THE RISK FACTOR INVOLVED. FOR EXAMPLE AN R&D PROJECTMAY REQUIRE A HIGHER RATE OF RETURN DUE TO LESS CERTAIN CASH FLOWS RATHER THAN A COST REDUCTION PROPOSAL OF A MACHINE ELEMENT.
- AN ORGANISATION CAN SET A MARR ABOVE THE COST OF CAPITAL BUT THE EXTENT DEPENDS ON COMPANIES ACTIVITIES AND ASPIRATIONS.

INTERNAL RATE OF RETURN (IRR)

- THIS METHOD IS THE BEST KNOWN AND MOST WIDELY USED ONE. IT IS ALSO KNOWN AS TRUE RATE OF RETURN METHOD AND THE DISCOUNTED CASH FLOW METHOD. IT IS THE RATE ON UNRECIVERED BALANCE OF INVESTMENT WHERE THE TERMINAL BALANCE IS ZERO.
- THE IRR CAN BE CALCULATED BY EQUATING ANNUAL , PRESENT WORTH OR FUTURE WORTH OF A CASH FLOW TO ZERO AND SOLVING FOR I(INTEREST) , WHICH SATISFIES THE EQUATION.

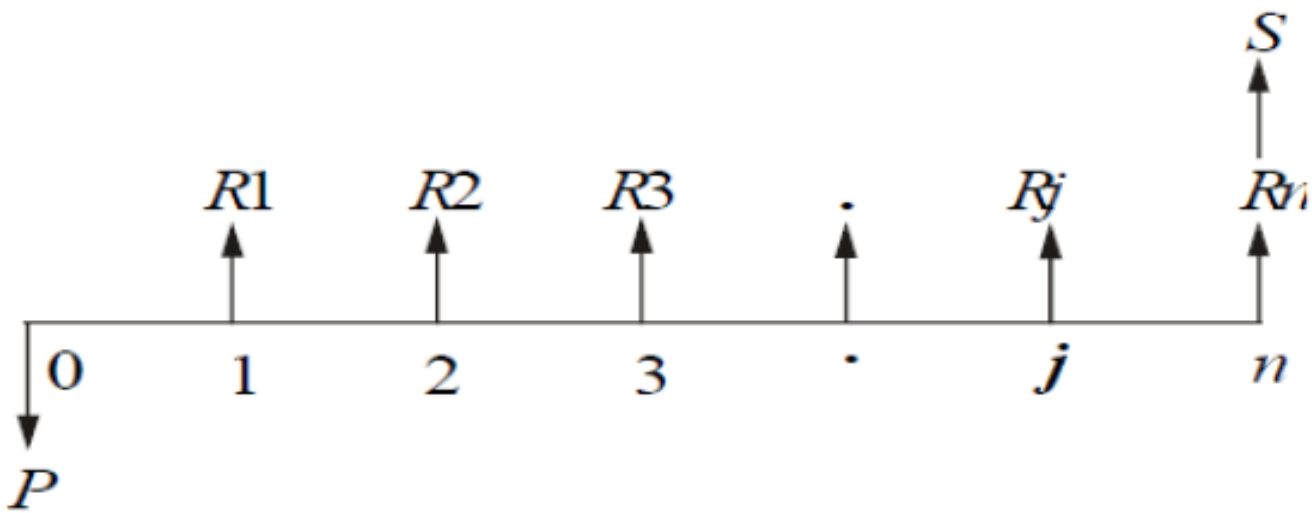
EXTERNAL RATE OF RETURN (ERR)

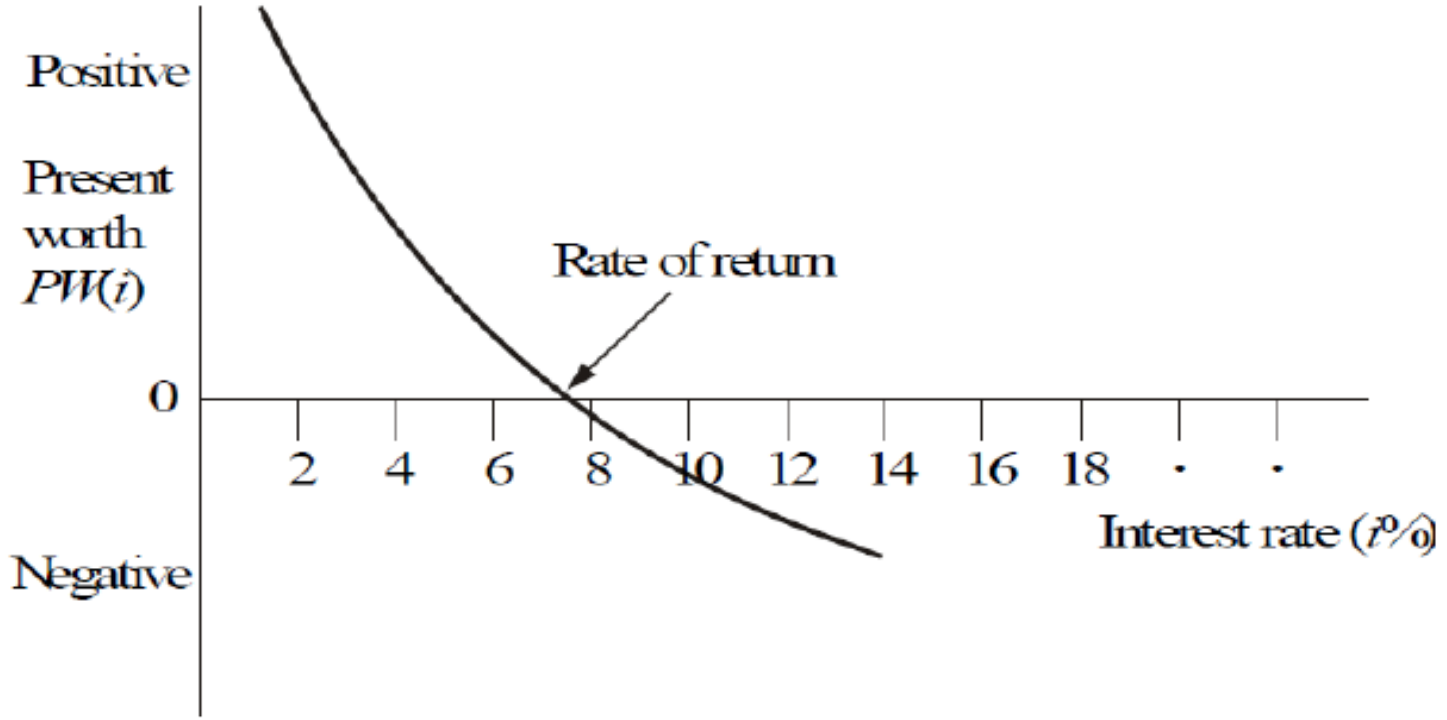
- IT IS THE POSSIBLE RATE OF RETURN FOR AN INVESTMENT UNDER THE CORRECT ECONOMIC CONDITIONS.

RATE OF RETURN METHOD

INTRODUCTION

The rate of return of a cash flow pattern is the interest rate at which the present worth of that cash flow pattern reduces to zero. In this method of comparison, the rate of return for each alternative is computed. Then the alternative which has the highest rate of return is selected as the best alternative. In this type of analysis, the expenditures are always assigned with a negative sign and the revenues/inflows are assigned with a positive sign. A generalized cash flow diagram to demonstrate the rate of return method of comparison is presented in Fig.





In the figure, the present worth goes on decreasing when the interest rate is increased. The value of i at which the present worth curve cuts the X-axis is the rate of return of the given proposal/project. It will be very difficult to find the exact value of i at which the present worth function reduces to zero.

So, one has to start with an intuitive value of i and check whether the present worth function is positive. If so, increase the value of i until $PW(i)$ becomes negative. Then, the rate of return is determined by interpolation method in the range of values of i for which the sign of the present worth function changes from positive to negative.

EXAMPLE A person is planning a new business. The initial outlay and cash flow pattern for the new business are as listed below. The expected life of the business is five years. Find the rate of return for the new business.

Period 0 1 2 3 4 5

Cash flow: -1,00,000 30,000 30,000 30,000 30,000 30,000

I1(Given)	PW1(Given)	**I=?**	
I2(Given)	PW2(Given)	PW=0	

$$I=i1+|(pw1-0)/pw1-(pw2)|$$
$$+(i2-i1)$$

Initial investment = Rs. 1,00,000

Annual equal revenue = Rs. 30,000

Life = 5 years

The present worth function for the business is

When $i = 10\%$,

$PW(10\%) = -1,00,000 + 30,000(P/A, 10\%, 5)$

$= -1,00,000 + 30,000(3.7908) =$ Rs. 13,724.

When $i = 15\%$,

$PW(15\%) = -1,00,000 + 30,000(P/A, 15\%, 5)$

$= -1,00,000 + 30,000(3.3522) =$ Rs. 566.

When $i = 18\%$,

$PW(18\%) = -1,00,000 + 30,000(P/A, 18\%, 5)$

$= -1,00,000 + 30,000(3.1272) =$ Rs. – 6,184

$i = 15\% + [(566 - 0) / 566 - (-6184)] * 3\%$

$= 15\% + 0.252\% = 15.252\%$

Therefore, the rate of return for the new business is 15.252%.

EXAMPLE: A company is planning to expand its present business activity It has two alternatives for the expansion programme and the corresponding cash flows are tabulated below. Each alternative has a life of five years and a negligible salvage value. The minimum attractive rate of return for the company is 12%. Suggest the best alternative to the company.

Initial investment Yearly revenue

Alternative 1: 5,00,000 1,70,000

Alternative 2: 8,00,000 2,70,000

Solution Alternative 1

Initial outlay = Rs. 5,00,000

Annual revenue = Rs. 1,70,000

Life of alternative 1 = 5 years

The formulae for the net present worth of alternative 1 are as follows

$PW_1(i) = -5,00,000 + 1,70,000(P/A, i, 5)$

$PW_1(15\%) = -5,00,000 + 1,70,000(P/A, 15\%, 5)$

$= -5,00,000 + 1,70,000(3.3522) = \text{Rs. } 69,874$

$PW_1(17\%) = -5,00,000 + 1,70,000(P/A, 17\%, 5)$

$= -5,00,000 + 1,70,000(3.1993) = \text{Rs. } 43,881$

$PW_1(20\%) = -5,00,000 + 1,70,000(P/A, 20\%, 5)$

$= -5,00,000 + 1,70,000(2.9906) = \text{Rs. } 8,402$

$PW_1(22\%) = -5,00,000 + 1,70,000(P/A, 22\%, 5)$

$= -5,00,000 + 1,70,000(2.8636) = \text{Rs. } -13,188$

Therefore, the rate of return of alternative 1 is = 20.78%

Alternative 2

Initial outlay = Rs. 8,00,000

Annual revenue = Rs. 2,70,000

Life = 5 years

The cash flow diagram for alternative 2 is depicted in Fig. 7.10.

The formula for the net present worth of alternative 2 is:

$PW2(i) = -8{,}00{,}000 + 2{,}70{,}000(P/A, i, 5)$

$PW2(20\%) = -8{,}00{,}000 + 2{,}70{,}000(P/A, 20\%, 5)$

$= -8{,}00{,}000 + 2{,}70{,}000(2.9906) = \text{Rs. } 7{,}462$

$PW2(22\%) = -8{,}00{,}000 + 2{,}70{,}000\ (P/A, 22\%, 5)$

$= -8{,}00{,}000 + 2{,}70{,}000\ (2.8636) = \text{Rs. } -26{,}828$

Thus, the rate of return of alternative 2 is

$i = 20\% +$

$= 20.435\%$

Since the rate of return of alternative 1 is greater than that of the alternative 2, select alternative 1.

- A FRESH ELECTRONIC ENGINEER WANTS TO BECOME AN ENTREPRENEUR. HE STARTS A CONSULTANCY CENTRE FOR SMEs AND MSMEs. HE EXPECTS HIS SOFTWARE BUSINESS WILL LAST FOR 5 YEARS. THE INITIAL OUTLAY AND CASH FLOW IS LISTED BELOW. FIND THE INTERNAL RATE OF RETURN FOR THE NEW BUSINESS, IF THE ESTIMATED SALVAGE VALUE OF Rs 100000 AT THE END OF 5 YEARS.
- PERIOD……..0……..1……2……3……..4……5
- CASH
- FLOW…-700000..180000…190000…210000….225000…..200000