Time adjusted or Discounted Cash flow methods

The time-adjusted or discounted cash flow methods take into account the profitability and also the time value of money. These methods also called modern methods of capital budgeting are becoming increasingly popular day by day.

1. Net present value method.
2. Internal Rate of return method

1. Net Present Value Method

This method takes into consideration the time value of money and attempts to calculate the return on investments by introducing the factor of time element. It recognizes the fact that a rupee earned today is worth more than the same rupee.

Steps to be followed for adopting the net present value method of evaluating investment proposals.

i) First of all determine an appropriate rate of interest that should be selected as the minimum required rate of return called 'cut-off rate or discount rate.

ii) Compute the present value of total investment outlay.

iii) Compute the present values of total investment proceeds i.e. cash inflows (profit before depreciation and after tax) at above determined discount rate.

iv) Calculate the net present value of each project by subtracting the present value of cash outflows for each project.

v) If the net present value is positive or Zero i.e. when present value of cash inflows either exceeds or is equal to the present values of cash outflow, the proposal may be accepted. But incase the present value of inflows is less than the present value of cash outflow, the proposal should be rejected.

vi) To select between mutually exclusive projects should be ranked in order of net present values i.e. the first preference should be given to the project having the maximum positive net present value.

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

2. Internal Rate of Return Method

Internal rate of return method is also called as Time Adjusted Rate of Return Method. It is defined as the rate which equates the present value of each inflows with the present value of cash outflows of an investment. In other words, the IRR is that discount rate at which the NPV of the investment is Zero. Internal rate of return method, the cash flows of a project are discounted at a suitable rate by hit and trail method which equates the net present value so calculated to the amount of the investment.

$$C = \frac{A_1}{(1+r)} + \frac{A_2}{(1+r)^2} + \frac{A_3}{(1+r)^3} + \ldots \ldots + \frac{A_n}{(1+r)^n}$$

Where, C = Initial out lay at time Zero

$A_1, A_2, A_3 =$ Future net cash flows at different periods

2, 3 = Number of years

r = Rate of discount of internal rate of return

Determination of internal Rate of return

a) When the annual net cash flows are equal over the life of the asset:

$$\text{Present value factor} = \frac{\text{Initial Out lay}}{\text{Annual cash flow}}$$

b) When the annual cash flows are unequal over the life of the asset:

i) Prepare the cash flow table using an arbitrary assumed discount rate to discount the net cash flows to the present value.

ii) Find out the net present value by deducting from the present value of total cash flow calculated (i) above the initial cost of the investment.

iii) If the net present value is positive apply higher rate of discount.

iv) If the higher discount rate still gives a positive net present value, increase the discount rate further until the NPV becomes negative.

v) If the NPV is a negative at this higher rate, the internal rate of return must be between these two rates.

3. Profitability Index Method

It is also known as benefit-cost ratio. It is the relationship between present value of cash inflows and present value of cash out flows.

Present Value of cash inflows

P.I. = ---

Present value of cash out flows

Comparison of Discounting Cash flows Techniques

NPV Versus IRR Method

Similarities

- Selection decisions independent of investment proposals
- Conventional Cash outflows – Cash outflows only once in the beginning.

NPV & IRR Method - Difference

NPV	IRR
1. Rate of Interest The NPV method takes the rate of interest as a known factor	Unknown
2. Re-Investment: It assumes that the cash inflows can be reinvested at the discounting rate in the new projects.	It also assumes that the cash inflows can be reinvested at the discounting rate in the new projects.
3. Investment Amount While the NPV method attempts to find-out the amount which can be invested particular project so that its projected earning may suffice to repay this amount with interest at the maturity rate. **4. Maturity Exclusive Projects** (Selection of project)	the IRR method seeks to find-out the maximum rate of interest at which the amount invested in project could be repaid out of the cash inflows arising from that project