

4. Profitability Index (PI) or Benefit Cost Ratio 4.1. Meaning There is yet another modern approach to create investment decision. This is also based on all cash inflows and also takes into account the time value of money concept. This approach is in contrast with the net present value method in the sense that it rates the projects in relative terms. In case of NPV, we get the absolute amount of benefits which will arise due to a specific project whereas in case of profitability index, we compute a relative factor to take an investment decision. Profitability index, is also called as profit investment ratio and value investment ratio, can be defined by the ratio of returns

5: NPV technique is related to the basic objective of financial management, i.e. maximisation of the wealth of the shareholders. The wealth of the shareholders will be maximized when firm takes up the project which is generate extra cash flows in present value terms. In order to answer the question whether a particular project generates value to the shareholders, we use NPV analysis.

This is very helpful and most sophisticated tool of making investment decision by the firm.

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generated to amount investment in a proposed project. It is a necessary tool for the ranking of projects as it permits you to quantify the amount of value generated per unit of investment.

4.2. Computation

Profitability index is calculated by dividing the present value of cash inflows by the present value of cash outflows. The formula is given below:
$$PI = \frac{\text{Present Value of Cash Inflows}}{\text{Present Value of Cash Outflows}}$$

4.3. Decision Making Criteria

The explained phenomenon is the decision making criteria by using the profitability index: • When $PI > 1$, accept the project • When $PI < 1$, reject the project • When $PI = 1$, indifferent

The reason behind this decision rule is simple to understand. The profitability index will be more than one only when the present value of cash inflows is greater than present value of cash outlay. It means that the project will generate excess wealth for the shareholder which is the main purpose of financial management. Therefore, we should accept these types of projects. We can further note that under this situation, NPV will be positive, thus both the methods would lead to the identical result. However, when PI is less than one, under this situation the present value of cash inflows is

less than the present value of cash outflow and we should not accept this kind of investment proposals. Under this scenario, the NPV will be negative and we get the identical decision rule by both the techniques. When cash inflows are equal to the cash outflows, then the PI value will be equal to one and NPV would be zero and we are in indifferent situation. In case of more than one machine is available or more than one investment option is available, we can use profitability index to rank the projects. On the basis of ranking, we can select the project with highest ranking.

Example: There is machine available to a firm to start its operations. The followings are the cash flows related to the machine: Year Cash Flow 0 -1,00,000 1 20,000 2 35,000 3 30,000 4 20,000 5 25,000

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Compute the PI of the machine when the required rate of return from the investment is 10%.

Solution: Year Cash Flow PVF (10%) Present Value (PV)

1 20,000 0.909 18,182

2 35,000 0.826 28,926

3 30,000 0.751 22,539

4 20,000 0.683 13,660

5 25,000 0.621 15,523

Total 98,830 =98,830 1,00,000 = .988 The value of profitability index for this machine is 0.988 which is less than one, thus we should