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A Study on Capital Budgeting Technique: Net Present Value

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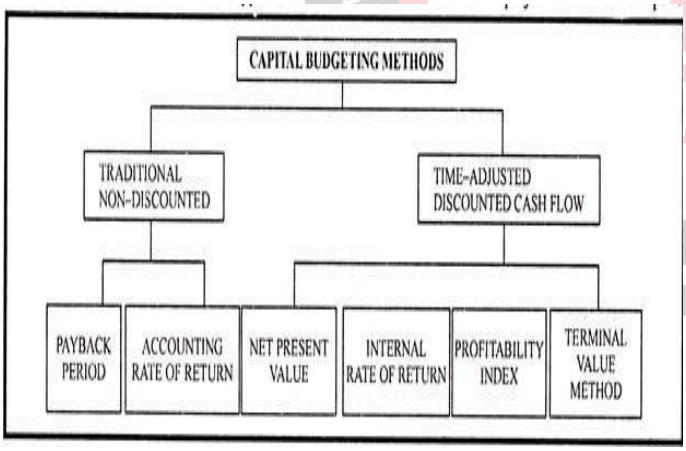
Abstract - The Capital Budgeting Techniques are employed to evaluate the viability of long-term investments. The capital budgeting decisions are one of the critical financial decisions that relate to the selection of investment proposal or the course of action that will yield benefits in the future over the lifetime of the project. The net present value is one of the discounted cash flow technique. It is an amount indicating how much value an investment will result in. This is calculated by subtracting the initial investments from sum of the discounted cash flows. If the result yields positive, then the project should be undertaken. This study is undertaken to study the importance of capital budgeting or long term investment decisions using NPV as a tool.

Keywords: capital budgeting, discounted cash flow technique, initial investment, long term investment.

I. INTRODUCTION

Capital budgeting is the process in which a business determines and evaluates potential expenses or investments that are large in nature. These expenditures and investments include projects such as building a new plant or investing in a long-term venture. Often times, a prospective project's lifetime cash inflows and outflows are assessed in order to determine whether the potential returns generated meet a sufficient target benchmark, also known as "investment appraisal."



In finance, the **net present value** (**NPV**) or **net present worth** (**NPW**) is a measurement of profit calculated by subtracting the present values (PV) of cash outflows (including initial cost) from the present values of cash inflows over a period of time. Incoming and outgoing cash flows can also be described as benefit and cost cash flows, respectively.

Net present value (NPV) is determined by calculating the costs (negative cash flows) and benefits (positive cash flows) for each period of an investment. The period is typically one year, but could be measured in quarter-years, half-years or months. After the cash flow for each period is calculated, the present value (PV) of each one is achieved by discounting its future value at a periodic rate of return (the rate of return dictated by the market). NPV is the sum of all the discounted future cash flows. Because of its simplicity, NPV is a useful tool to determine whether a project or investment will result in a net profit or a loss. A positive NPV results in profit, while a negative NPV results in a loss. The NPV measures the excess or shortfall of cash flows, in present value terms, above the cost of funds. In a theoretical situation of unlimited capital budgeting a company should pursue every investment with a positive NPV.

However, in practical terms a company's capital constraints limit investments to projects with the highest NPV whose cost cash flows, or initial cash investment, do not exceed the company's capital. NPV is a central tool in discounted cash flow (DCF) analysis and is a standard method for using the time value of money to appraise long-term projects. It is widely used throughout economics, finance, and accounting.

Net present value (NPV) is the difference between the present value of cash inflows and the present value of cash outflows. NPV compares the value of a dollar today to the value of that same dollar in the future, taking inflation and returns into account. NPV analysis is sensitive to the reliability of future cash inflows that an investment or project will yield and is used in capital budgeting to assess the profitability of an investment or project.

OBJECTIVE

- To understand the concept of NPV Analysis.
- To analyze the profitability of a projected investment or project.

IMPORTANCE

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In very simple terms, the Net Present Value, or short NPV, is important because it tells you what dollar value a project adds to your company, taking into account the money you have to spend to realize the project (initial spending to acquire equipment or whatever you are investing in, and all the money you will earn subsequently with the initial investment). What makes the NPV more meaningful than just deducting the cash out from the subsequent cash ins (which would give you the payback) is that the NPV takes into account when you spend the money and when you get how much money back.

SCOPE

Scope of the study is limited to only one company by considering its five years data. It concentrates on only net present value but does not try to forecast any future estimations.

Sample Size: One company, 2 projects
Sample Duration: 5 years.

II. REVIEW OF LITERATURE

The Net Present Value, abbreviated simply as NPV, is one of the most important concepts in finance and commercial real estate. Compared to the Internal Rate of Return, the concept of NPV is easy to understand, yet it's also still commonly misunderstood by many commercial real estate and finance professionals. In this article we'll discuss the concept NPV in depth and leave you with a solid understanding of the logic and intuition behind the Net Present Value.

What Is NPV?

First of all, what exactly is NPV? **Net present value (NPV)** is defined as an investment measure that tells an investor whether the investment is achieving a target yield at a given initial investment. NPV also quantifies the adjustment to the initial investment needed to achieve the target yield assuming everything else remains the same. Formally, the net present value is simply the summation of cash flows (C) for each period (n) in the holding period (N), discounted at the investor's required rate of return (r):

$$\mathrm{NPV} = \sum_{n=0}^{N} \frac{C_n}{(1+r)^n}$$

If all of this math scares you don't worry, we'll walk through some detailed examples next that will leave you with a solid intuition and understanding of NPV.

NPV Intuition

What's the intuition behind NPV? Here's a simple way to think about the net present value:

NPV = Present Value – Cost

The net present value is simply the present value of all future cash flows, discounted back to the present time at the appropriate discount rate, less the cost to acquire those cash flows. In other words **NPV is simply value minus cost**.

What's does NPV mean? When NPV is viewed as value minus cost, then it's easy to see that the NPV tells you whether or not what you are buying is worth more or less than what you're paying.

There are only 3 possible categories NPV will fall into:

- **Positive NPV.** If NPV is positive then it means you're paying less than what the asset is worth.
- **Negative NPV.** If NPV is negative then it means that you're paying more than what the asset is worth.
- **Zero NPV.** If NPV is zero then it means you're paying exactly what the asset is worth.

III. DATA ANALYSIS & INTERPRETATION

INVESTMENT – 50000
LIFE - 5
COST OF CAPITAL – 10%
TAX RATE - 50%

PROJECT A

YEAR	CFBT	DEP	PBT	TAX50%	PAT	DEP	CFAT
1	20000	10000	10000	5000	5000	10000	15000
2	22000	10000	12000	6000	6000	10000	16000
3	28000	10000	18000	9000	9000	10000	9000
4	25000	10000	15000	7500	7500	10000	17500
5	30000	10000	20000	10000	10000	10000	20000

CFBT - DEP = PBT – TAX = PAT + DEP = CFAT

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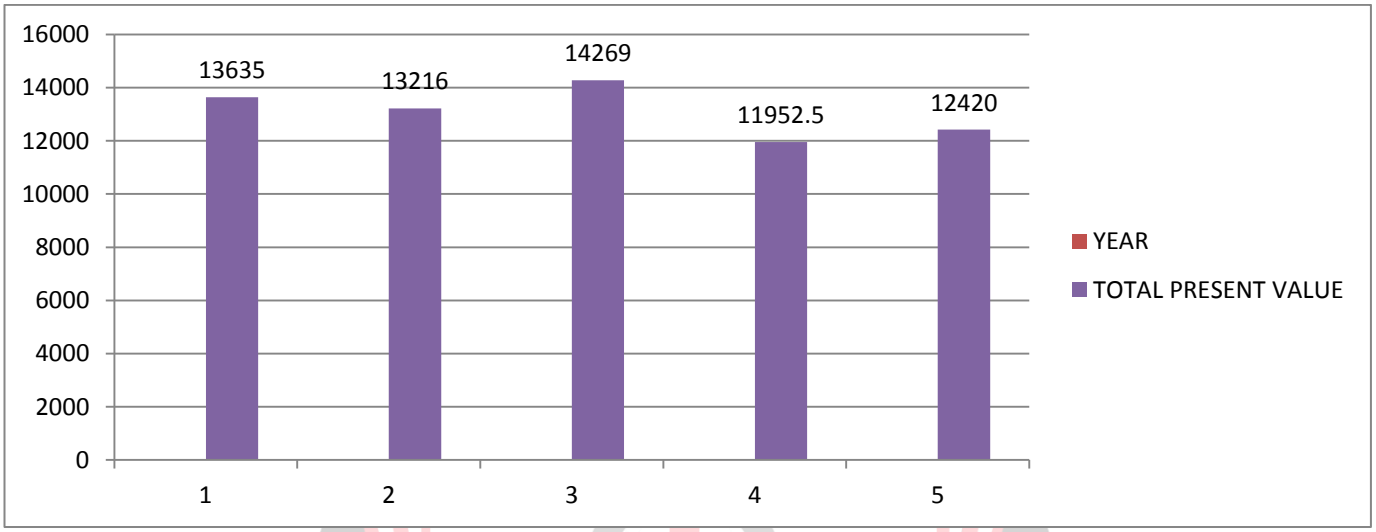
CALCULATION OF NET PRESENT VALUE:

YEAR	CFAT	DISCOUNT FACTOR @10%	TOTAL PRESENT VALUE
1	15000	0.909	13635.00
2	16000	0.826	13216.00
3	19000	0.751	14269.00
4	17500	0.683	11952.50
5	20000	0.621	12420.00

TOTAL PRESENT VALUE – INVESTMENT = NET PRESENT VALUE
65492.50 – 50000 =15492.00



PROJECT B:

YEAR	CFBT	DEP	PBT	TAX50%	PAT	DEP	CFAT
1	30000	10000	20000	10000	10000	10000	20000
2	27000	10000	17000	8500	8500	10000	18500
3	22000	10000	12000	6500	6000	10000	16000
4	25000	10000	15000	7500	7500	10000	17500
5	20000	10000	10000	5000	5000	10000	15000

CFBT - DEP = PBT – TAX = PAT + DEP = CFAT

CALCULATION OF NET PRESENT VALUE:

YEAR	CFAT	DISCOUNT FACTOR @10%	TOTAL PRESENT VALUE
1	20000	0.909	18180.00
2	18500	0.826	15281.00
3	16000	0.751	12016.00
4	17500	0.683	11952.00
5	15000	0.621	9315.00

TOTAL PRESENT VALUE – INVESTMENT = NET PRESENT VALUE
66774.50– 50000 =16744.50

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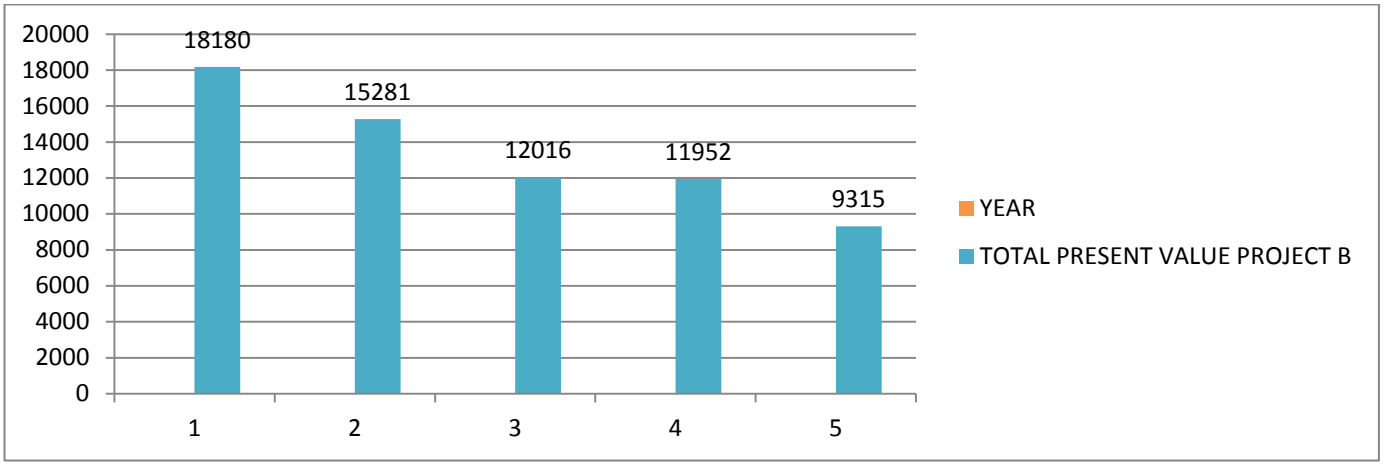
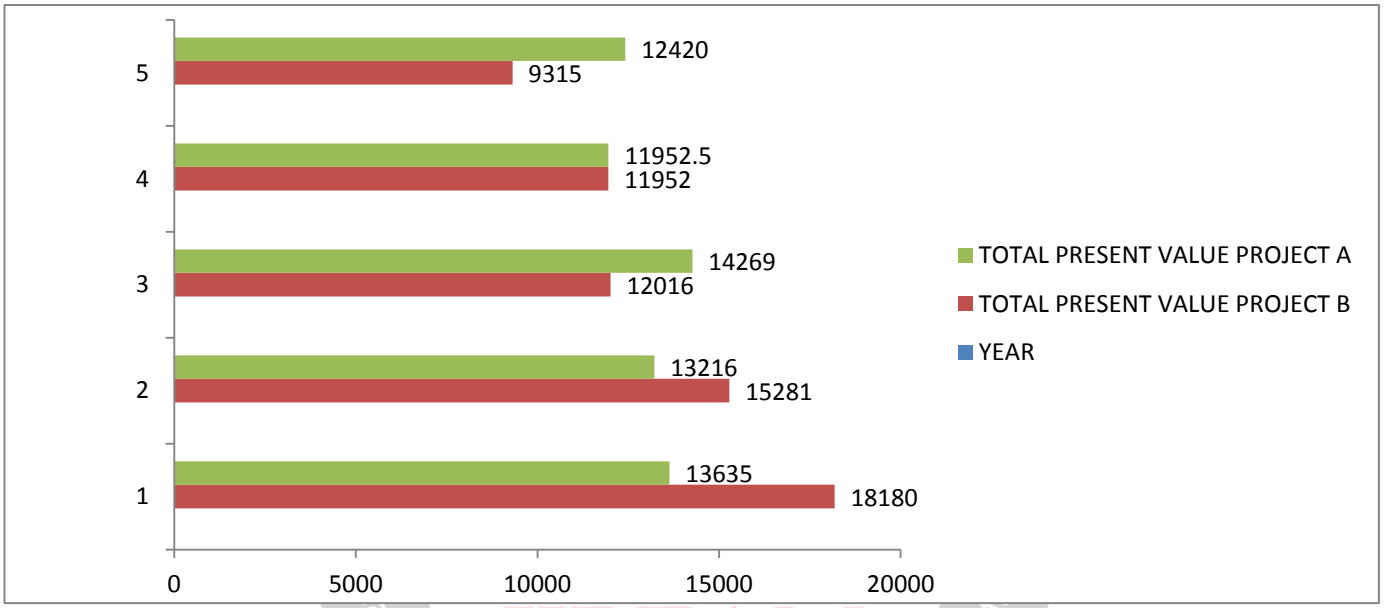
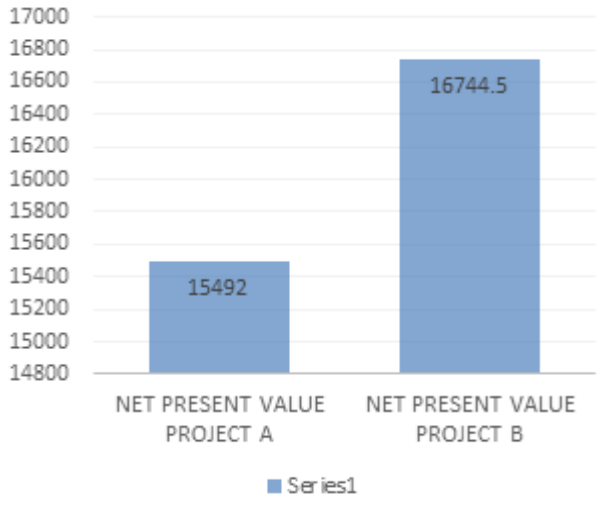


Comparation between project A and project B



INTERPRETATION

The decision criteria of NPV is accept if NPV>0 and reject if NPV<0.In this research paper NPV of both the projects are positive i.e. they are greater than zero and both are acceptable. NPV of project B is higher than that of project A, it is advisable to select project B.



IV. CONCLUSION

Net Present Value (NPV) is the value of all future cash flows (positive and negative) over the entire life of an investment discounted to the present. NPV analysis is a form of intrinsic valuation and is used extensively across finance and accounting for determining the value of a business, investment security, capital project, new venture, cost reduction program, and anything that involves cash flow.

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