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A Study on Long Term Capital Budgeting in Indian Manufacturing

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ABSTRACT

Decisions on the allocation of capital over the long term have a significant impact on the development, success, and longevity of manufacturing companies. Systematic appraisal of long-term investment projects is necessary to guarantee optimal use of financial resources in the capital-intensive operations and rapidly evolving technology of India's manufacturing industry. The purpose of this research is to assess the effect on financial performance of long-term capital budgeting strategies used by a subset of Indian manufacturing firms. Methods for evaluating risks and capital budgeting tools such the Net Present Value (NPV), Profitability Index, Payback Period, and Internal Rate of Return (IRR) are the primary areas of study. The research relies on secondary data culled from the yearly reports and financial accounts of chosen industrial companies, with primary data supplied as needed. Ratio analysis, correlation, and regression approaches are some of the analytical and descriptive tools used to examine the link between capital budgeting strategies and financial performance metrics like ROA and ROE.

Introduction—

Capital budgeting is an essential financial process that businesses use to evaluate potential long-term investments and determine the value of projects. Investment in new machinery, expansion of current facilities, introduction of new commodities, or penetration of unexplored markets are all examples of projects or investments that may be considered long-term investments that a firm might put its money into. Decisions taken during capital budgeting sometimes include substantial quantities of money, long-term obligations, and a significant impact on the future development and profitability of the business. In contrast to the smaller amounts spent on operational expenses on a daily basis, capital investments are often more substantial and affect the organization over the long run.

Reasons Why Capital Budgeting Is Crucial

- Assisting with Strategic Decision-Making: Capital budgeting helps businesses with strategic decision-making by identifying projects with long-term advantages.
- Efficient Use of Resources: With limited funds, businesses need to decide where to spend for the most return. Thanks to capital budgeting, investments are distributed to the projects with the highest likelihood of success.

Risk management: By analyzing future cash flows, expenditures, and possible dangers, capital budgeting helps firms identify which ventures have positive returns and which pose unacceptable risk.
One of the main purposes of capital budgeting is to increase the wealth of shareholders by selecting initiatives that will increase the firm's worth.

When creating a capital budget, there are generally several steps:

• Discovering Potential Investment Opportunities: the company finds projects or investments that will help it achieve its long-term goals. Improvements to infrastructure, new product launches, and increased manufacturing capacity are all examples of what may fall under this category.

It is essential for the organization to plan ahead for potential financial inflows and outflows for any project that might be considered. It is common practice to need to forecast income, expenditures, and the timing of these cash flows in order to do this.

• Deciding on the optimal approach: Projects are evaluated using a variety of techniques, such as several forms of internal rate of return, payback period, net present value, and others. Each approach provides data on the project's potential for loss and gain.

Projects with the highest possible returns and the lowest acceptable risk are often the ones that the firm chooses after reviewing its financial objectives and constraints in light of the evaluation.

The next step is to put the project into action after selection, which is called monitoring and execution. In order to guarantee that the project is yielding the expected financial benefits, its performance is monitored throughout its lifetime.

Capital Budgeting Decision Categories

The three main categories into which capital budgeting decisions often fall are:

• Expansion decisions: they include endeavors that increase a company's capacity or capabilities. For example, building a new factory to meet the increasing demand for products.In order to boost efficiency or decrease costs, it may be necessary to make replacement decisions, which include replacing old or useless assets with newer versions. Changing out outdated machinery for newer, more cost-effective models is one example.

• Choosing to diversify means allocating resources to projects that aren't core to the company's operations in order to explore new markets or reduce risk. One strategy for a company looking to diversify its revenue streams is to enter a previously unexplored market.

Difficulty in Establishing Capital Budgets

Working with capital budgets may be challenging. Here are some common obstacles:

Making accurate projections of future cash flows is challenging because it necessitates assumptions about the dynamics of the market, the level of competition, costs, and revenues

By factoring in the cost of capital for the business and the project's level of risk, an appropriate discount rate can be used to calculate the current value of future cash flows.

Every investment in capital carries with it some degree of risk and uncertainty. Alterations to the market, rules, and technology can affect the outcome of a project.

Capital investments sometimes have a long time horizon, making it difficult to forecast trends and accurately measure the project's long-term impact.

Decision-Making Effects

Decisions are significantly impacted by the capital budgeting approach selection since it influences how organizations perceive potential investments and risk. Among the most notable outcomes are:

• IRR and NPV encourage a focus on the long term by drawing attention to future cash flows. These tactics increase the likelihood that businesses would invest in projects with a high upfront cost but significant potential returns down the road.

• Risk management: The discounted payback time and other real alternatives help firms manage risk by considering liquidity and flexibility constraints. In industries where there is a high degree of volatility and unpredictability, these methods shine.

The profitability index and net present value (NPV) help companies make the most of their money by making sure they're allocating it wisely. This is of the utmost importance when dealing with natural environments.

• A Predilection for the Near Future: Companies that rely heavily on simple methods, like the payback time, run the risk of neglecting their long-term growth and financial potential in favor of immediate profits.

Research Gap

If both small and large businesses want to make better decisions, this study is essential. If the knowledge gaps can be filled, managers will be able to better understand which capital budgeting procedures are effective in different situations, which should lead to better investment decisions. Superior capital budgeting decisions lead to enhanced efficiency, longer-term financial viability, and higher returns on investment. Capital allocation is a common challenge for SMEs because of their lack of knowledge and limited financial resources. This research is especially important for small and medium-sized enterprises (SMEs) since it may guide them in finding a happy medium between overly complicated analyses and overly simplistic ones. If the knowledge gap is filled, small and medium-sized enterprises (SMEs) will be able to improve their capital budgeting processes and achieve longer-term growth.

Objective of the Study

- To study the long-term capital budgeting practices adopted by selected Indian manufacturing companies.
- To identify the capital budgeting techniques (NPV, IRR, Payback Period, etc.) commonly used in project evaluation.
- To examine the factors influencing capital budgeting decisions in manufacturing firms (risk, cost of capital, management attitude, etc.).
- To analyze the relationship between long-term capital budgeting practices and the financial performance of selected companies.
- To suggest measures to improve the effectiveness of capital budgeting decisions in the Indian manufacturing sector.

Research Methodology

The study on capital budgeting strategies and how they affect decision-making will be carried out in an organized manner thanks to the research methodology. It contains the sample plans, data collecting procedures, analytic plans, and research design that will be employed to meet the goals of the study.
In this Study there is no Primary Data, Data is collected from the secondary source of company's financial reports
Research Design: Descriptive Design
Sample Size: Companies Financial Report for 5years
Analytical Tool: Capital Budgeting Techniques
Financial Reports and Databases: In order to assess how well businesses are performing while employing various capital budgeting strategies, the research will gather financial information from publicly accessible reports, including yearly financial statements and investor presentations.

Limitations of the Study

- The data selected for the analysis is very limited
- The analysis made on the historical data of the company through capital budgeting techniques may or may not provide accurate results to make decision
- Time factor is very less for studying this topic
- The results of the analysis may or may not provide accurate results

Literature Review

AN Empirical Study of the Adoption of Sophisticated Capital Budgeting Practices and Decision – Making Effectiveness by Richard H. Pike, (Feb 2012): Capital budgeting decision efficacy is examined in this article along with the trend towards more sophisticated investment selection methodologies and control mechanisms. The study looks at the capital budgeting procedures used over 11 years by 100 big UK enterprises. The use of advanced investing techniques has reportedly increased dramatically, especially for assessing project risk. The fast advancements in computing within capital budgeting help to explain these phenomena. It is evident that senior finance executives hold the belief that more efficient appraisal and control of large capital projects result from using sophisticated investment procedures.

DCF Techniques and Nonfinancial Measures in Capital Budgeting: A Contingency Approach Analysis by Shimin Chen, (Jan 2008): Capital budgeting approaches are empirically examined in this study. Three primary conclusions are drawn from this study, which uses 115 responses from a cross-sectional survey and two methods to determine contingency fit. In capital budgeting, non-financial metrics and discounted cash flow (DCF) methods are both commonly utilized. While DCF methods take precedence over non-financial metrics, the latter seem to fill in somewhat when DCF analysis falls short. Secondly, non-monetary metrics and DCF methods are not always applicable. The analysis confirms the expected effect of product standardization on both capital budgeting approaches, but it does not provide evidence that corporate strategy influences both methods. Companies that standardize their products heavily are more likely to use DCF analysis, whereas those that don't tend to prioritize non-financial metrics. Third, a firm's satisfaction with the capital budgeting process is substantially correlated with how well product standardization and the two techniques fit together according to contingency theory.

Capital Budgeting in information systems development by Kar Yan Tam, (Dec 1992): Empirical research was conducted to examine how capital budgeting approaches are currently being used to assess, terminate, and audit investments in information systems. The findings will be given here. Results from a survey of 134 MIS professionals and upper-level managers show that IS investments are unaffected by capital budgeting, and that simpler methods, including the payback time and the cost benefit ratio, are favored to more complex discount cash-flow models.

The main reasons that restrict their utilization are the issues with cost and return estimates. The significance of the project and the nature of the decisions being made should inform the distribution of decision-making authority.

Multicriteria Decision – Maming based on goal Programming and Fuzzy analytic hierarchy process: An application to Capital Budgeting Problem by Yu-Cheng Tang, Ching-Ter Chang, (Feb 2012): To help academics and decision-makers comprehend the impact of making a decision based on numerous factors on a capital budgeting investment, our goal in this study is to create a decision-making model. In order to save time and make an investment in capital budgeting that fits in with the company's goals, restrictions, and strategy, this decision-making approach is useful. Goal programming (GP) and fuzzy analytical hierarchy process (FAHP) are the approaches used in this work. We use a modest automobile rental firm as a case study to illustrate the capital budgeting investment.

The Influence of Affect on Managers' Capital Budgeting Decisions by Thomas E Kida, Kimberly K Moreno, (Sep 2001): To better understand the behavior of accounting decision makers, academics should take affect and cognition into consideration simultaneously, as emotional reactions are fundamental to accounting decision settings such as capital budgeting. We contend that many settings involving capital budgeting involve interpersonal connections, and that these interactions can cause emotional and affective reactions. Anger and fury are common responses among managers when they feel wronged by those working on a capital project. Our prediction is based on research in neurobiology and psychology, which suggests that managers' capital-budgeting decisions might be impacted by these emotional reactions. We provide four case studies that show how emotional responses affect capital budgeting choices. Our projections were confirmed by the results, which show that managers assess the practicality of an investment option using both hard numbers and subjective feelings. In order to gain a better understanding of accounting decision making, our findings indicate that academics should take emotion and cognition into consideration simultaneously.

Data Analysis and Interpretation

Calculation of the Cash inflows (From March 2020 to March 2025)

Particulars	**---------- in Rs. Cr. ----------**				
	Mar-25	**Mar-24**	**Mar-23**	**Mar-22**	**Mar-21**
	12 mths	**12 mths**	**12 mths**	**12 mths**	**12 mths**
Revenue From Operations [Net]	21,289.96	17,661.10	25,881.73	15,370.05	11,698.79
(-) Cost	11869.27	9811.1	10784.99	4316.4	3493.5
EBDT	9,420.69	7,850.00	15,096.74	11,053.65	8,205.29
(-) Depreciation	337.05	335.41	286.85	227.83	294.38
EBT	9,083.64	7,514.59	14,809.89	10,825.82	7,910.91
Tax	2,380.42	2,108.21	3,582.25	2,648.45	2,512.57
Profit after Tax (Annual Cash Inflows)	6,703.22	5,406.38	11,227.64	8,177.37	5,398.34

Source from secondary data

Calculation of the Cash inflows (From March 2020 to March 2025)

Particulars	---------- in Rs. Cr. ----------				
	Mar-20	Mar-19	Mar-18	Mar-17	Mar-16
	12 mths	12 mths	12 mths	12 mths	12 mths
Revenue From Operations [Net]	12,152.15	11,490.93	8,708.90	6,455.49	12,353.73
(-) Cost	3427.8	3551.41	2887	2041.95	2485.27
EBDT	8,724.35	7,939.52	5,821.90	4,413.54	9,868.46
(-) Depreciation	278.89	256.04	196.18	207.75	162.23
EBT	8,445.46	7,683.48	5,625.72	4,205.79	9,706.23
Tax	2,556.53	2,373.34	1,704.04	1,477.19	3,346.21
Profit after Tax (Annual Cash Inflows)	5,888.93	5,310.14	3,921.68	2,728.60	6,360.02

Source from secondary data

Calculation of Capital Budgeting techniques

1. Traditional Methods
a. Pay Back Period Method
b. Accounting Rate of Return
2. Modern Method / Discounted Cash Flow Method
a. Net Present Value
b. Internal Rate of Return
c. Profitability Index

Calculations of Pay Back Period

PBP = Initial Investment / Annual Cash Inflow

Year	Cash inflows	Investment	Payback Period
Mar-16	6360.02	433.39	0.07
Mar-17	2728.6	569.47	0.21
Mar-18	3921.68	622.86	0.16
Mar-19	5310.14	695.91	0.13
Mar-20	5888.93	823.57	0.14
Mar-21	5398.34	859.81	0.16
Mar-22	8177.37	1127.99	0.14
Mar-23	11227.6	1431.35	0.13
Mar-24	5406.38	1183.85	0.22
Mar-25	6703.22	1356.27	0.20

Source from secondary data

Interpretation

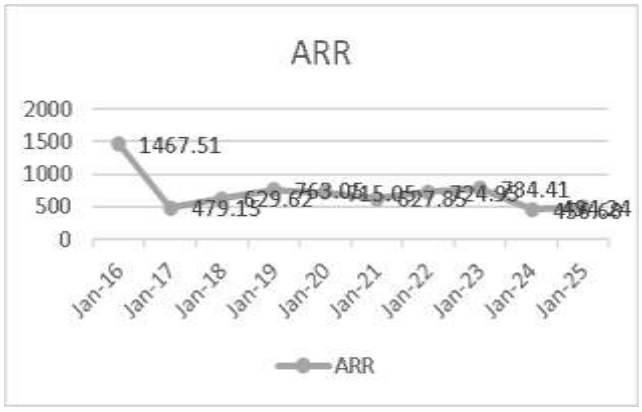
From the above table and graph we can state that, Payback period for the year March 15 was received the intital Investment in very less time i.e 0.07 and in the March 23 Intital Investment was received with very high time i.e. 0.22.

Calculations of ARR

$$ARR = \frac{\text{Cash Inflows}}{\text{Initial Investment}} \times 100$$

Year	Cash inflows	Investment	ARR
Mar-16	6360.02	433.39	1467.51
Mar-17	2728.6	569.47	479.15
Mar-18	3921.68	622.86	629.62
Mar-19	5310.14	695.91	763.05
Mar-20	5888.93	823.57	715.05
Mar-21	5398.34	859.81	627.85
Mar-22	8177.37	1127.99	724.95
Mar-23	11227.6	1431.35	784.41
Mar-24	5406.38	1183.85	456.68
Mar-25	6703.22	1356.27	494.24

Source from secondary data



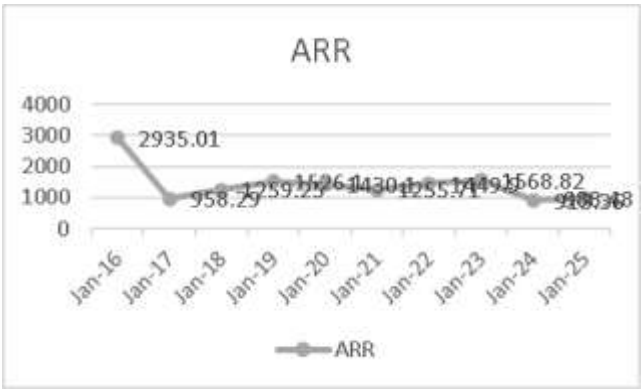
Interpretation
From the above table and graph we can state that, ARR for the mentioned period of April 2014 to March 2025 for Actual Investment is high in the year March 2015 i.e. 1467.51 and lowest in the year March 2024 i.e. 456.68

Calculations of ARR

$$ARR = \frac{\text{Cash Inflows}}{\text{Average Investment}} \times 100$$

Year	Cash inflows	Investment	Avg Investment	ARR
Mar-16	6360.02	433.39	216.695	2935.01
Mar-17	2728.6	569.47	284.735	958.29
Mar-18	3921.68	622.86	311.43	1259.25
Mar-19	5310.14	695.91	347.955	1526.10
Mar-20	5888.93	823.57	411.785	1430.10
Mar-21	5398.34	859.81	429.905	1255.71
Mar-22	8177.37	1127.99	563.995	1449.90
Mar-23	11227.6	1431.35	715.675	1568.82
Mar-24	5406.38	1183.85	591.925	913.36
Mar-25	6703.22	1356.27	678.135	988.48

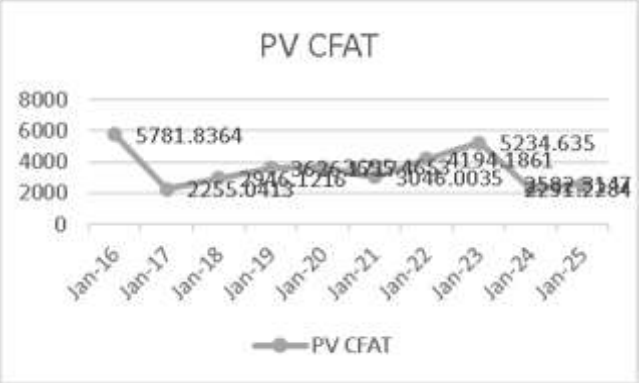
Source from secondary data



Interpretation
From the above table and graph, we can state that, ARR for the mentioned period of April 2014 to March 2025 for Average Investment is high in the year March 2015 i.e. 2935.01 and lowest in the year March 2024 i.e. 913.36

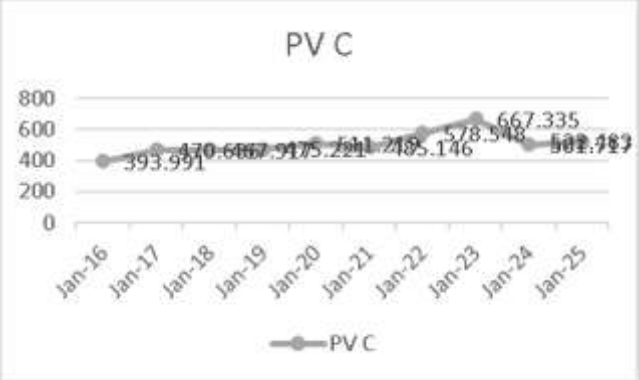
Calculations of NPV
(Assuming the Present Value as 10%)

Year	Cash inflows	Pv @ 10%	PV CFAT
Mar-16	6360.02	0.909	5781.8364
Mar-17	2728.6	0.826	2255.0413
Mar-18	3921.68	0.751	2946.1216
Mar-19	5310.14	0.683	3626.1717
Mar-20	5888.93	0.621	3655.4653
Mar-21	5398.34	0.564	3046.0035
Mar-22	8177.37	0.513	4194.1861
Mar-23	11227.64	0.466	5234.635
Mar-24	5406.38	0.424	2291.2284
Mar-25	6703.22	0.385	2582.3147
			35613.004



Calculations of PVc

Year	Investment	Pv @ 10%	PV C
Mar-16	433.39	0.909	393.991
Mar-17	569.47	0.826	470.636
Mar-18	622.86	0.751	467.917
Mar-19	695.91	0.683	475.221
Mar-20	823.57	0.621	511.219
Mar-21	859.81	0.564	485.146
Mar-22	1127.99	0.513	578.548
Mar-23	1431.35	0.466	667.335
Mar-24	1183.85	0.424	501.717
Mar-25	1356.27	0.385	522.483
			5074.212



NPV = PV_{CFAT} - PV_C
NPV = 35613.004 - 5074.212

NPV = 26508.534

Interpretation
From the above calculations we can state that, NPV of the above mentioned period show case positive value so the investment made by the company for the above period was profitable for the organisation i.e from March 2014 to March 2025

Calculations of Internal Rate of Return

Rate of Return assume was 10%

$$IRR = R1 + \frac{NPV1}{NPV\ 1\ -NPV2}\ .\ (R2 - R1)$$

So considering the R1 = 6% & R2 = 94%

Rate of Return R1 = 6%

Year	**Cash inflows**	**PV @ 6%**	**PV CFAT**
Mar-16	6360.02	0.943	6000.0189
Mar-17	2728.6	0.890	2428.4443
Mar-18	3921.68	0.840	3292.7181
Mar-19	5310.14	0.792	4206.1282
Mar-20	5888.93	0.747	4400.5511
Mar-21	5398.34	0.705	3805.6167
Mar-22	8177.37	0.665	5438.4181
Mar-23	11227.64	0.627	7044.3602
Mar-24	5406.38	0.592	3200.028
Mar-25	6703.22	0.558	3743.043
			43559.327

Source from secondary data

NPV1 = PV_{CFAT} - PV_C
NPV1 = 43559.327 - 5074.212

NPV1 = 38485.515
Rate of Return R2 = 94%

Year	Cash inflows	PV @ 94%	PV CFAT
Mar-16	6360.02	0.515	3278.3608
Mar-17	2728.6	0.266	724.99734
Mar-18	3921.68	0.137	537.11461
Mar-19	5310.14	0.071	374.88585
Mar-20	5888.93	0.036	214.30275
Mar-21	5398.34	0.019	101.26278
Mar-22	8177.37	0.010	79.068143
Mar-23	11227.64	0.005	55.959605
Mar-24	5406.38	0.003	13.88964
Mar-25	6703.22	0.001	8.8769991
			5388.7185

Source from secondary data

NPV2 = PV_{CFAT} - PV_C
NPV2 = 5388.7185 - 9104.47

NPV2 = 3715.75

Calculations of PVc

Year	Investment	Pv @ 10%	PV C
Mar-16	433.39	0.909	393.991
Mar-17	569.47	0.826	470.636
Mar-18	622.86	0.751	467.917
Mar-19	695.91	0.683	475.221
Mar-20	823.57	0.621	511.219
Mar-21	859.81	0.564	485.146
Mar-22	1127.99	0.513	578.548
Mar-23	1431.35	0.466	667.335
Mar-24	1183.85	0.424	501.717
Mar-25	1356.27	0.385	522.483
	9104.47		5074.212

Source from secondary data

Calculations of IRR

$$IRR = R1 + \frac{NPV1}{NPV1 - NPV2} (R2 - R1)$$

Where
R1 = 6%
R2 = 94%
NPV1 = 38485.515
NPV2 = 3715.75

IRR Calculations

$$IRR = 6\% + \frac{38485.515}{38485.515 - 3715.75} x (94 - 6)$$

$$IRR = 6\% + \frac{38485.515}{34769.765} x 88$$

IRR = 6% + 1.106 x 88

IRR = 6% + 97.328

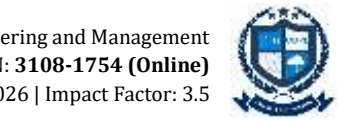
IRR = 103.328%

Interpretation
From the above calculations we can state that, IRR for the mentioned period from April 2014 to March 2025 is 103.328% which is very much high profitable for the company.

Calculations of Profitability Index

$$\text{Profitability Index} = \frac{\text{Present value (PV) of Future Cash Flows}}{\text{Initial Investment}}$$

Year	Cash inflows	Pv @ 10%	PV CFAT	Investment	Profitability Index
Mar-16	6360.02	0.909	5781.836	433.39	13.341
Mar-17	2728.6	0.826	2255.041	569.47	3.95989
Mar-18	3921.68	0.751	2946.122	622.86	4.72999
Mar-19	5310.14	0.683	3626.172	695.91	5.21069
Mar-20	5888.93	0.621	3655.465	823.57	4.43856
Mar-21	5398.34	0.564	3046.003	859.81	3.54265
Mar-22	8177.37	0.513	4194.186	1127.99	3.71828
Mar-23	11227.6	0.466	5234.635	1431.35	3.65713
Mar-24	5406.38	0.424	2291.228	1183.85	1.9354



Mar-25	6703.22	0.385	2582.315	1356.27	1.90398
			35613	9104.47	46.4375

Source from secondary data

Interpretation

From the above table and graph, we can state that, Profitability Index for the mentioned period of April 2014 to March 2025 for Average Investment is high in the year March 2015 i.e. 2935.01 and lowest in the year March 2024 i.e. 913.36

Findings

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- Payback period for the year March 15 was received the intital Investment in very less time i.e 0.07 and in the March 23 Intital Investment was received with very high time i.e. 0.22.
- ARR for the mentioned period of April 2014 to March 2025 for Actual Investment is high in the year March 2015 i.e. 1467.51 and lowest in the year March 2024 i.e. 456.68
- ARR for the mentioned period of April 2014 to March 2025 for Average Investment is high in the year March 2015 i.e. 2935.01 and lowest in the year March 2024 i.e. 913.36
- NPV of the above mentioned period show case positive value so the investment made by the company for the above period was profitable for the organisation i.e from March 2014 to March 2025
- IRR for the mentioned period from April 2014 to March 2025 is 103.328% which is very much high profitable for the company.
- Profitability Index for the mentioned period of April 2014 to March 2025 for Average Investment is high in the year March 2015 i.e. 2935.01 and lowest in the year March 2024 i.e. 913.36

Suggestions

- MAHINDRA & MAHINDRA could make adopting more advanced financial models or incorporating scenario of analysis to better assess project risks
- Technology Integration would be better to use digital tools like financial modeling software to improve capital budgeting accuracy and efficiency
- Training and development is required to make the decision for the project adoption by the project managers
- All the strategies which have been made by the MAHINDRA & MAHINDRA for the long-term strategic goals, such as diversification into different geographies as got success
- MAHINDRA & MAHINDRA should take care about the fluctuating minerals prices, geopolitical risks and environmental challenges when making capital budgerting decisions
- MAHINDRA & MAHINDRAs capital Investment decisions are Increasinglu incoriporating Environmental, Social and GOverance (ESG) factors in line with Industry trends
- Despite MAHINDRA & MAHINDRAs effective use of traditional capital budgeting techniques the study identifies areas of improvement in modern financial modeling tools and real options for better flexibility in decision making
- Ongoing training and development programs for MAHINDRA & MAHINDRAs finance and Project Manageemnt teams could enhance the application of more advanced budgeting techniques
- MAHINDRA & MAHINDRA can further strenthen its position in the competitive mining Industy and achieve more resilent and sustainable growth

Conclusion

"Capital Budgeting Techniques and Their Impact on Decision-Making in MAHINDRA & MAHINDRA" showed that strong capital budgeting is important for MAHINDRA & MAHINDRA's financial and strategic results. Complex decisions involving large-scale, long-term capital investments have considerable repercussions for the growth and sustainability of MAHINDRA & MAHINDRA, a leading participant in the mining industry. MAHINDRA & MAHINDRA's long-term strategic objectives, solid financial performance, and decision-making have all been driven by its capital budgeting procedures. In order to achieve more robust and sustainable growth, MAHINDRA & MAHINDRA can further improve its position in the competitive mining business and incorporate sustainability considerations more completely into their financial models. They can also employ more sophisticated methods for risk analysis.

The study also paves the way for more research in this area, specifically looking at how MAHINDRA & MAHINDRA's capital budgeting methods compare to those of its worldwide competitors in order to find the best ones and improve their decision-making even more.

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