Review

An Overview on Capital Investment

Sibi Mathew *

Posted Date: 15 April 2024

doi: 10.20944/preprints202404.0987.v1

Keywords: Investment; cost analysis; investment decision; investment budgeting

 doi:10.20944/preprints202404.0987.v1

Review

An Overview on Capital Investment

Sibi Mathew

MTech Scholar, Department of CSE, TKM College of Engineering, Kollam,Kerala,India,691005; 22082@tkmce.ac.in

Abstract: This review examines the quality of capital investment. It explores the essential components and analysis involved in financially assessing an engineering project, including an assessment of various associated risks. Additionally, the review delves into the historical progression of current capital budgeting practices and surveys academic research in the field. The evaluation of investments has been a recognized challenge for the past thirty years, but it has recently gained renewed attention from both management and scholars. Investments constitute a significant and growing portion of organizations' capital expenditures. However, assessing the impact of investments on pursued goals is challenging. Consequently, there is a strong demand for methods and techniques that can aid in evaluating investments during the proposal stage. This paper explores several investment strategies and Examines the criteria for investment.

Keywords: investment; cost analysis; investment decision; investment budgeting

1. Introduction

In every business, various functional areas of management collaborate to make decisions regarding significant investment proposals, including production, marketing, data processing, and personnel. It is essential to formally integrate all these areas into the evaluation process, as capital budgeting decisions have a significant impact on them.

Once investment decisions are made, they commit a firm to a particular course of action in the future. These decisions have a lasting impact on the organization for several years to come, playing a crucial role in shaping the firm's long-term strategy. However, one significant consequence of such decisions is the reduction in flexibility due to the allocation of resources.

The payback (PB) method of investment appraisal has been the subject of considerable comment and criticism. Therefore, it is important to consider both payback and investment together when evaluating investment opportunities. Payback refers to the length of time required for an investment to recover its initial cost or investment outlay. It is a simple and commonly used financial metric that assesses the time it takes to recoup the cash invested in a project. The payback period, usually measured in years or months, is calculated by dividing the initial investment by the annual cash inflows generated by the investment. A shorter payback period is generally considered favorable, indicating a quicker recovery of the initial investment.

Investment, on the other hand, refers to the allocation of financial resources, such as capital, with the expectation of generating returns or profits over time. Investments can take various forms, including stocks, bonds, real estate, businesses, or other assets. The primary objective of an investment is to grow the invested capital or generate income through interest, dividends, rent, or appreciation. When analyzing investment opportunities, investors carefully consider factors such as risk, potential returns, market conditions, and their own financial goals to make informed decisions about where to allocate their funds.

Thus, investment decisions have a lasting impact on organizations and should be carefully evaluated by integrating various functional areas of management. Both payback and investment play crucial roles in the decision-making process. Payback helps assess the time required to recoup the initial investment, while investment analysis involves a comprehensive evaluation of various factors to determine the feasibility and potential returns of an investment opportunity. By considering these aspects together, businesses can make informed decisions that align with their long-term strategy and financial objectives. [3,13,16]

 doi:10.20944/preprints202404.0987.v1

2. Historical Development of Modern Capital Budgeting

The historical development of modern capital budgeting and investment practices can be traced back to several key milestones and influences. Here are some significant aspects and events in the historical development of capital budgeting:

1. Emergence of Corporate Finance: The field of corporate finance began to gain prominence in the early 20th century, focusing on financial decision-making within companies. This laid the foundation for later developments in capital budgeting.
2. Capital Asset Pricing Model (CAPM): In the 1960s, the CAPM was introduced as a model for estimating the expected return on an investment based on its risk. This model played a crucial role in quantifying risk and return trade-offs in capital budgeting decisions.
3. Introduction of Discounted Cash Flow (DCF) Analysis: The DCF analysis, particularly the concept of present value, gained prominence in the 1950s and 1960s. It provided a systematic approach to evaluating the profitability of investments by discounting future cash flows to their present value.
4. Development of Risk Management Techniques: As financial markets became more sophisticated, risk management techniques, such as scenario analysis, sensitivity analysis, and Monte Carlo simulation, were developed to assess the impact of uncertain variables on investment outcomes.
5. in Information Technology: The advent of computer technology and financial software in the late 20th century significantly enhanced the analytical capabilities and efficiency of capital budgeting processes. Spreadsheet applications allowed for more complex financial modeling and analysis.
6. Integration of Real Options Analysis: In the 1980s and 1990s, the concept of real options analysis gained attention. It recognized that investment decisions could have embedded options, such as the option to expand, defer, or abandon a project. Real options analysis provided a more comprehensive approach to evaluating investment opportunities.
7. Corporate Governance and Capital Allocation: Corporate governance practices, including the role of boards of directors and shareholder activism, have influenced the capital budgeting process. Increased emphasis on shareholder value and accountability has shaped investment decision-making within organizations.
8. Evolution of Behavioral Finance: The emergence of behavioral finance in the late 20th century shed light on the psychological biases and irrational behavior that can influence investment decisions. Understanding these biases has led to a more nuanced approach to capital budgeting and investment analysis. [2,4]

Overall, the historical development of modern capital budgeting and investment practices reflects a progression towards more sophisticated techniques and a greater understanding of risk and uncertainty. The integration of quantitative models, advances in technology, and insights from various fields have contributed to the evolution of capital budgeting as a strategic tool for making informed investment decisions.

3. Steps Leading to Good Investment Decisions

The major steps involved in the investment process include:

1. Identifying Investment Opportunities: This step involves searching for potential investment opportunities that align with the investor's objectives and risk tolerance. It may involve market research, financial analysis, and evaluation of various investment options.
2. Conducting Due Diligence: Once potential investment opportunities are identified, thorough due diligence is conducted. This includes gathering relevant information, assessing financial statements, analyzing market conditions, evaluating risks, and examining the feasibility of the investment.
3. Risk Assessment: Before making an investment, it is crucial to assess the associated risks. This involves identifying and evaluating various risk factors that could impact the investment, such as market volatility, economic conditions, regulatory changes, and industry-specific risks.

 doi:10.20944/preprints202404.0987.v1

4. Financial Analysis: A comprehensive financial analysis is conducted to evaluate the potential returns and profitability of the investment. This includes analyzing financial statements, projecting cash flows, assessing the valuation of the investment, and estimating the expected return on investment.
5. Making the Investment Decision: Based on the findings from the previous steps, an investment decision is made. This involves weighing the potential returns against the associated risks and considering factors such as investment objectives, time horizon, and liquidity requirements. [5–7]
6. Monitoring and Managing the Investment: Once the investment is made, it is important to monitor its performance regularly. This involves tracking financial indicators, evaluating market conditions, and making necessary adjustments to the investment strategy if required.
7. Exit Strategy: In some cases, investors may plan an exit strategy in advance, determining how and when they intend to divest their investment. This could involve selling the investment, merging with another entity, or taking the investment public through an initial public offering (IPO).

It is important to note that these steps may vary depending on the type of investment (e.g., stocks, real estate, bonds) and the individual investor's preferences and goals

4. Investment Factors

4.1. Equipment Supply

The costs associated with Equipment Supply can be broadly categorized into two main categories: Foreign Supply and Domestic Supply. The calculation of costs for foreign-supplied equipment depends on the basis of delivery, which is specified in the supply document and governed by INCOTERMS. According to INCOTERMS 2010, the basis of delivery is classified as follows: [14–16]

1. EXW - Ex Works: The seller delivers the goods at their premises, without loading. This term represents a minimum liability for the seller and requires limited export information from the buyer.
2. FCA - Free Carrier: The seller delivers the goods to the carrier and may be responsible for clearing the goods for export. This term includes loading at pick-up, which is commonly expected.
3. FAS - Free Alongside Ship: The risk passes to the buyer, including payment of transportation and insurance costs, once the goods are delivered alongside the ship at the named port terminal. The seller is responsible for export clearance.
4. FOB - Free On Board: The risk passes to the buyer, including payment of transportation and insurance costs, once the goods are delivered on board the ship by the seller.
5. CFR - Cost and Freight: The seller delivers the goods and the risk passes to the buyer when the goods are on board the vessel. The seller arranges and pays for the cost and freight to the named destination port.
6. CIF - Cost, Insurance and Freight: The risk passes to the buyer when the goods are delivered on board the ship. The seller arranges and pays for the cost, freight, and insurance to the destination port.
7. CPT - Carriage Paid To: The seller delivers the goods to the carrier at an agreed place, shifting the risk to the buyer. However, the seller is responsible for paying the cost of carriage to the named place of destination.
8. CIP - Carriage and Insurance Paid To: The seller delivers the goods to the carrier at an agreed place, shifting the risk to the buyer. The seller also pays for the carriage and insurance to the named place of destination.
9. DAT - Delivered at Terminal: The seller bears the cost, risk, and responsibility until the goods are unloaded at the named quay, warehouse, yard, or terminal at the destination. The seller is responsible for export clearance, but not import.

 doi:10.20944/preprints202404.0987.v1

10. DAP - Delivered at Place: The seller bears the cost, risk, and responsibility for the goods until they are made available to the buyer at the named place of destination. The seller is responsible for export clearance, but not import.
11. DDP - Delivered Duty Paid: The seller bears the cost, risk, and responsibility for cleared goods at the named place of destination. The buyer is responsible for unloading, while the seller takes care of import clearance, duties, and taxes.

    Within a territory, the rules and regulations of the respective state or country govern the supply. Transportation/logistic costs, taxes, and duties applicable as per the specific state or country must be taken into account.

4.2. Operating Cost Estimation

The estimated production cost or operating cost for a proposed project needs to be [8,9]calculated on a yearly basis, considering the following indicative categories:

1. Fixed Expenditure:

    - Manpower: The cost of labor or employee wages required for the project on an annual basis.
    - Annual Repair & Maintenance Cost: The expenses associated with repairing and maintaining equipment or facilities annually.
    - Other Overheads: This includes additional costs such as plant insurance, annual sales expenses, and annual environmental costs. These overhead expenses are incurred on an annual basis and are not directly tied to production volume.

2. Variable Expenditure:

    - Power Consumption: The cost of electricity or power required for the project, which may vary based on production levels or usage.
    - Water & Utility: The expenses related to water usage and other utilities required for the project, can vary depending on production requirements.
    - Consumables: The cost of materials or supplies consumed during the production process, which can fluctuate based on production volume.

4.3. Economic Analysis

The financial projections for the future operational/production period need to be determined based on the estimated capital and production costs mentioned in the previous section, as well as income from sales and other sources. The analysis of projected financial performance relies heavily on the production buildup and serves as a crucial component of the financial analysis.

4.4. Financial Analysis

The financial analysis consists of Depreciation, Repayment of Borrowings, Working Capital, Interest charges, and Corporate Tax. Depreciation for plant and equipment including other facilities has to be calculated on the basis of operation. Depreciation may be calculated on Straight Line Method (SLM) or on the Written down Value principle (WRDV). Many countries in the world follow the Written down Value principal (WRDV) for tax applicability.

4.5. Financial Statements

To assess the economic viability of the project, it is necessary to prepare the income statement and cash-flow statement, taking into account the total income, annual manufacturing expenses, and depreciation charges. The calculations of key indicators such as the internal rate of return (IRR), net present value (NPV), and payback period serve as crucial measures.

The internal rate of return (IRR) is the interest rate at which the net present value of all cash flows, including both positive and negative, from a project or investment becomes zero. It is used to evaluate the attractiveness of a project or investment. Ideally, a project with an IRR higher than

 doi:10.20944/preprints202404.0987.v1

its cost of capital is considered profitable, making it advantageous for a company to pursue such projects. Companies typically establish a required rate of return (RRR) as a benchmark to determine the minimum acceptable return percentage that an investment must earn to be considered worthwhile. If the IRR exceeds the RRR, the project is likely to be profitable, although companies consider other factors in addition to IRR when deciding to pursue a project. Generally, companies prioritize projects with the highest difference between IRR and RRR, as they are expected to be the most profitable.

4.6. Risk Assessment and Management

Proper risk assessment and management are crucial for ensuring the effectiveness of financial analysis. Despite the growing participation of SMEs in the industry, many of them still encounter challenges in resource allocation, risk assessment, and strategic planning, both from a financial and non-financial perspective. Emphasizing risk assessment in managerial activities is of utmost importance.

Firms engage in risk management for various reasons. Risks can arise from factors such as higher input costs for production in the future, potential earnings shortfall, market volatility in terms of demand, increased competition, and other macro and microeconomic conditions. It is essential to identify and assess the risks associated with a specific investment decision. [2,3]

Key risks to consider in a project include operational hazards, input and output risks (relating to the cost of raw materials and revenue generation), technical risks (stemming from technology obsolescence in production processes), financial risks encompassing debt and borrowing costs, interest rates, and currency exchange rates, as well as legal, taxation, environmental, and other government regulations. Identifying and managing these risks is critical for the overall success and sustainability of a project.

5. Criteria for Investment

When making major investment decisions, several criteria should be considered to ensure a thorough and informed evaluation. The following are common criteria used in assessing major investment opportunities:

1. Return on Investment (ROI): ROI measures the profitability of an investment by comparing the expected returns to the initial investment cost. It helps determine whether the investment is financially viable and generates satisfactory returns.
2. Payback Period: The payback period calculates the time required to recover the initial investment through the cash flows generated by the investment. It provides insights into the project's liquidity and the speed at which it generates returns.
3. Net Present Value (NPV): NPV assesses the present value of expected cash flows by discounting them at an appropriate rate of return. A positive NPV indicates that the investment is expected to generate more value than the cost of capital, making it potentially profitable.
4. Internal Rate of Return (IRR): IRR represents the discount rate at which the NPV of an investment becomes zero. It indicates the rate of return the investment is expected to yield and helps assess its attractiveness compared to the cost of capital.
5. Risk and Uncertainty: The assessment of risk and uncertainty associated with an investment is crucial. Factors such as market volatility, competition, regulatory changes, and technological advancements need to be evaluated to understand the potential risks and mitigate them effectively.
6. Strategic Alignment: The investment should align with the overall strategic goals and objectives of the organization. It is important to assess how the investment contributes to the company's long-term growth, competitive advantage, and strategic positioning.
7. Market and Industry Analysis: Analyzing the market conditions, industry trends, customer demand, and competitive landscape provides insights into the potential growth and sustainability of the investment.

 doi:10.20944/preprints202404.0987.v1

8. Capital and Resource Requirements: Evaluating the capital and resource requirements of the investment is essential to ensure the availability and allocation of necessary funds, personnel, infrastructure, and technology.
9. Social and Environmental Impact: Considering the social and environmental implications of the investment is increasingly important. Assessing the potential positive or negative impact on stakeholders, communities, and the environment helps make responsible investment decisions.
10. Flexibility and Adaptability: Assessing the investment's flexibility and adaptability to changing market dynamics, technological advancements, and future business needs is crucial to ensure long-term success and the ability to respond to evolving conditions.

Considering these criteria and conducting a comprehensive analysis can facilitate informed decision-making when evaluating major investment opportunities.

6. Investment Approaches

There are several investment approaches or strategies that individuals and organizations employ to achieve their investment objectives. These approaches vary in their risk levels, investment horizons, and methodologies. Here are some common investment approaches: [16,17]

1. Value Investing: Value investing involves identifying undervalued stocks or assets that are trading below their intrinsic value. Investors using this approach look for opportunities to buy assets at a discount and hold them until the market recognizes their true worth.
2. Growth Investing: Growth investing focuses on investing in companies or sectors that are expected to experience above-average growth in earnings or revenue. Investors using this approach seek companies with strong growth prospects and are willing to pay a premium for their potential future returns.
3. Income Investing: Income investing emphasizes generating a steady stream of income through investments. This approach often involves investing in assets such as bonds, dividend-paying stocks, real estate investment trusts (REITs), or other income-generating securities.
4. Index Investing: Index investing involves replicating the performance of a specific market index, such as the S&P 500 or FTSE 100. This approach aims to achieve broad market exposure and typically involves investing in index funds or exchange-traded funds (ETFs) that track the chosen index.
5. Dividend Investing: Dividend investing focuses on investing in companies that consistently pay dividends to shareholders. Investors using this approach seek companies with a history of stable or growing dividend payments, aiming to generate a regular income stream.
6. Momentum Investing: Momentum investing involves identifying assets that have exhibited upward price trends and investing in them with the expectation that the trends will continue. This approach relies on the belief that assets that have performed well in the past will continue to perform well in the future.
7. Contrarian Investing: Contrarian investing involves going against the prevailing market sentiment and investing in assets that are currently out of favor or undervalued. Investors using this approach believe that markets are sometimes driven by irrational behavior, creating opportunities to profit from mispriced assets.
8. Socially Responsible Investing (SRI): SRI, also known as sustainable or ethical investing, involves considering environmental, social, and governance (ESG) factors when making investment decisions. Investors using this approach aim to align their investment choices with their values and prioritize companies that demonstrate responsible and sustainable practices.

It's important to note that these investment approaches can be combined or customized based on individual preferences, risk tolerance, and investment goals. Additionally, the suitability of each approach may vary depending on market conditions and the investor's time horizon.

 doi:10.20944/preprints202404.0987.v1

7. Investment Challenges

Investment challenges refer to the difficulties and obstacles that investors encounter when making investment decisions and managing their investment portfolios. Here are some common challenges in the realm of investments:

1. Risk and Uncertainty: Investing always involves a certain level of risk. Market volatility, economic uncertainties, geopolitical events, and unforeseen factors can impact investment performance. Assessing and managing risks is a key challenge for investors.
2. Market Timing: Determining the right time to enter or exit the market is a challenge. Timing the market accurately is difficult, and mistimed decisions can result in missed opportunities or losses. Market timing requires accurate predictions of market movements, which is a complex task.
3. Information Overload: Investors are inundated with vast amounts of information from various sources, including financial news, research reports, and market data. Analyzing and interpreting this information can be overwhelming, making it challenging to make well-informed investment decisions.
4. Emotional Bias: Emotions, such as fear and greed, can influence investment decisions and lead to irrational behavior. Emotional biases, such as loss aversion or herding mentality, can cloud judgment and lead to poor investment choices.
5. Lack of Diversification: Failing to diversify investments across different asset classes, industries, or regions can expose investors to concentration risk. Lack of diversification can make portfolios vulnerable to the performance of a single investment or market segment.
6. Investment Fees and Costs: Transaction costs, management fees, and other expenses associated with investing can eat into investment returns. Managing costs and finding cost-effective investment options is a challenge, particularly for individual investors.
7. Regulatory and Compliance Issues: Investments are subject to regulatory requirements, tax obligations, and legal compliance. Keeping up with changing regulations and ensuring compliance can be complex, especially for investors operating in multiple jurisdictions.
8. Long-Term Planning and Patience: Successful investing requires a long-term perspective and patience. Many investors struggle with short-term thinking and the temptation to chase quick returns, which can undermine long-term investment goals.
9. Access to Quality Investment Opportunities: Identifying and accessing quality investment opportunities can be a challenge, especially for individual investors with limited resources. Finding investment options that align with investment objectives and risk tolerance can be time-consuming.
10. Investment Knowledge and Education: Lack of investment knowledge and financial literacy can hinder investment decision-making. Understanding investment concepts, financial markets, and different investment vehicles is essential for making informed choices. [1–3]

    Addressing these investment challenges requires careful research, ongoing learning, diversification, risk management strategies, and seeking professional advice when needed. It is important for investors to assess their individual circumstances, goals, and risk tolerance before making investment decisions.

8. Conclusion

In conclusion, this review has explored various key aspects of capital investment. It began by discussing the historical development of modern capital budgeting, highlighting the evolution and significance of financial decision-making in the context of long-term strategic planning.

The review then delved into the major steps involved in making good investment decisions. It emphasized the importance of integrating different functional areas of management and considering factors such as production, marketing, data processing, personnel, and resource allocation. The thorough evaluation of investment proposals is essential to ensure optimal resource utilization and long-term success.

 doi:10.20944/preprints202404.0987.v1

Furthermore, the review examined the criteria and factors that play a crucial role in investment decisions. It stressed the need for comprehensive analysis and interpretation of data, considering both financial and non-financial indicators. Risk assessment and management were identified as critical components in the decision-making process, as investments are inherently associated with uncertainties and challenges.

The review also explored different investment approaches, including traditional methods such as payback period, internal rate of return (IRR), and net present value (NPV). Additionally, it highlighted the significance of considering investment challenges, ranging from market volatility and lack of information to emotional biases and regulatory compliance.

Overall, this review provides valuable insights into the complex world of capital investment. It underscores the importance of a systematic and informed approach to decision-making, taking into account historical context, investment factors, criteria, approaches, and challenges. By considering these aspects and implementing effective risk management strategies, investors can enhance their ability to make sound investment decisions and achieve their long-term financial goals.

References

1. Madaan, Geetika, and Sanjeet Singh. "A Systematic Review of Investment Influences of Individual Investors." TEST: Engineering & Management 83 (2020): 15324-15341.
2. Roychowdhury, Sugata, Nemit Shroff, and Rodrigo S. Verdi. "The effects of financial reporting and disclosure on corporate investment: A review." Journal of Accounting and Economics 68.2-3 (2019): 101246.
3. Bayguzina, L. Z., G. A. Galimova, and A. A. Sukiasyan. "Tools for estimating the risk effect on the investment project efficiency." International Scientific Conference" Far East Con"(ISCFEC 2020). Atlantis Press, 2020.
4. Prodanova, Natalia A., et al. "Modern tools for assessing the investment attractiveness of a commercial organization." Amazonia Investiga 8.24 (2019): 145-151.
5. Poggensee, Kay, et al. "Dynamic Investment Calculation Methods." Investment Valuation and Appraisal: Theory and Practice (2021): 85-140.
6. Vrbka, Jaromír, Tomáš Krulický, and Tomáš Brabenec. "Determining the amount of past investment property using the synthesis of cost evaluation methods." IOP Conference Series: Materials Science and Engineering. Vol. 960. No. 4. IOP Publishing, 2020.
7. Li, Zu-Xin, et al. "Study of evaluation method for the overseas oil and gas investment based on risk compensation." Petroleum Science 17 (2020): 858-871.
8. Alkaraan, Fadi. "Strategic investment decision-making practices in large manufacturing companies: a role for emergent analysis techniques?." Meditari accountancy research (2020).
9. Baum, Andrew E., Neil Crosby, and Steven Devaney. Property investment appraisal. John Wiley & Sons, 2021.
10. Alfredsson, Eva C., and J. Mikael Malmaeus. "Real capital investments and sustainability-The case of Sweden." Ecological Economics 161 (2019): 216-224.
11. Gorshkov, A. S., et al. "Payback period of investments in energy saving." Magazine of Civil Engineering 2 (78) (2018): 65-75.
12. Andrews, G. S., and F. Butler. "Criteria for major investment decisions." Investment Analysts Journal 15.27 (1986): 31-37.
13. Biezma, M. V., and J. R. San Cristobal. "Investment criteria for the selection of cogeneration plants—a state of the art review." Applied Thermal Engineering 26.5-6 (2006): 583-588.
14. Canada, John R., and Nancy F. Miller. "Review of Surveys on Use of Capital Investment Evaluation Techniques." The Engineering Economist 30.2 (1984): 193-200.
15. Haka, Susan F. "A review of the literature on capital budgeting and investment appraisal: Past, present, and future musings." Handbooks of management accounting research 2 (2006): 697-728.
16. Lefley, Frank. "The payback method of investment appraisal: A review and synthesis." International Journal of Production Economics 44.3 (1996): 207-224.
17. Renkema, Theo JW, and Egon W. Berghout. "Methodologies for information systems investment evaluation at the proposal stage: a comparative review." Information and Software Technology 39.1 (1997): 1-13.

 doi:10.20944/preprints202404.0987.v1

18. Wong, Ing Liang, P. C. Eames, and R. S. Perera. "A review of transparent insulation systems and the evaluation of payback period for building applications." Solar Energy 81.9 (2007): 1058-1071.
19. Yang, Zhilin, Xuehua Wang, and Chenting Su. "A review of research methodologies in international business." International Business Review 15.6 (2006): 601-617.