

CAPITAL BUDGETING: A SYSTEMATIC REVIEW OF THE LITERATURE

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ABSTRACT

Aims: *The objective of this article is to identify the research opportunities in capital budgeting.*

Originality: *This study adds to the body of knowledge by presenting an approach for perhaps identifying budgetary shortfalls. According to the scientific literature currently accessible, understanding the difficulties that engineering manager's face and how they affect capital budgeting practices is helpful.*

Research Method: *The corpus of existing scientific literature states that researchers use it as a Knowledge Development Process-Constructivist (Pro know-C) approach to potentially find budget shortfalls. It clearly identifies the limits of current knowledge as well as any open doors for future research.*

Main Findings: *For the academics, capital budgeting is not included as a macro study topic. Only a few numbers of authors have produced studies with the same depth or are actively researching the subject.*

Implications for Theory and Practice: *According to proponents of the academy, managers must employ more advanced analytic techniques since capital budgeting plays a significant role in corporate management. Companies should look for individuals with experience in capital project assessment who are knowledgeable about and skilled in the use of appropriate decision-making practices.*

Keywords: *Budgeting Practices, Investment, Capital Budgeting, Engineering Managers, Scientific Production.*

Introduction

Organizations use it as a planning tool to assess investment projects and choose how to distribute resources. Additionally, it assesses investment initiatives that will benefit the company in the long run and contribute to future cost- or revenue-saving measures. The method of capital budgeting may be used to more complex plans like the construction of a new facility as well as to relatively simple operating decisions like updating equipment. However, it is crucial that managers employ the right approach to ensure prudent choice, even while taking into account the significance of capital investment decisions. Advanced capital planning techniques include discounted cash flow (DFC) practices, which take into account the value of money over time and incorporate NPV and IRR. Two of the simplest are payback (PB) and accounting return rate (ARR). The need to understand how corporations manage their capital budgets grew starting in the 1960s. The use of theoretically better discounted cash flow models by management has been observed since the 1960s and 1970s, according to evidence from those decades.

- **The Fields Capital Budgeting:** This study adds to the body of knowledge by outlining a methodology for identifying budgeting gaps in light of the body of scientific literature already in existence. It also advances engineering management practice by highlighting the challenges faced by engineering managers when it comes to capital budgeting.

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Capital Budgeting

Since the 1960s, there has been an increase in the use of these analytical methods in the literature on capital budgeting. Although managers may use the present budgeting processes to decide which investments to make, this doesn't seem to be the case frequently. The theory's predictions and real practices still differ, which is why researchers are constantly working to explain why. The bulk of defenses centre on the management approach, preferences, and limitations. Despite the fact that many alternative tactics have been proposed, subjective procedures have gotten less attention in the literature. It claims that this gap has to be looked at and researched further. The goal of this essay is to compile a thorough analysis of the capital budgeting literature. In these terms, it is intended to respond to the following questions: Who are the most well-known local authors and journals among scientists? What research opportunities are there in capital budgeting? This report outlines existing gaps that may prompt future research that improves the capital budgeting process in both theoretical and practical aspects based on a thorough analysis of the global literature review. Data collection into one source is anticipated to result in (i) a method for selecting publications on capital budgeting, (ii) a bibliometric study of the relevant public budgeting acts on this subject, and (iii) a systematic examination of the articles in the bibliographic portfolio. According to the knowledge created and offered thoughts, these methods will enable researchers and professionals focus their efforts on those studies that make scientific and useful contributions.

Capital Budgeting

Capital budgeting is the financial evaluation of a company's planned capital investment plans. To put it another way, capital budgeting means assessing whether projected cash flows from an investment are sufficient to warrant doing it, while also taking risks and unknowns into consideration. In the end, the efficiency of a company's capital budgeting procedure and the associated financial analysis methods rests on how it influences managers' choices on how to allocate scarce resources among competing investment possibilities. First, how rapidly a company expands is greatly influenced by the choice of capital inputs; a poor option might result in the failure of the enterprise. Second, such decisions are quite expensive. Evaluating the capital budgeting suggestions is part of the investment decision-making process. This relevance helps to explain why different organizations use different capital budgeting strategies and procedures, as well as how they handle complex networks of interdependencies among the budgeting variables. Given that there are several ways to boost the efficiency of the decisions (such as qualification, recruiting incentives, etc.), the capital budgeting techniques and procedures are seen as key components in that respect. The financial literature now includes more theoretical and empirical studies on capital budgeting. The primary objective of this literature is to examine the most often used tactics and the justifications for picking some over others.

Methodological Procedures

A systematic review is a process for examining and understanding all the information that is currently available on a certain subject, problem, or research question. Its main goal is to provide a study issue analysis using a reliable and accurate method. A systematic review of the literature is the process by which the reviewer moves through each phase with total transparency and explicitness about what is done, typically using a protocol to direct the process. It offered a detailed method for gathering well-organized findings from a big, useable sample of publications.

The requirements for content analysis did not, however, materialize precisely. (2009) Kitchen Ham et al. developed a subjective method for selecting papers for particular publications. However, it is proposed the Proknow-C, a thorough and in-depth method for choosing a sizable sample of possible articles with the incorporation of worldview-based criteria, allowing for a full perspective of the analysis. According to the constructivist viewpoint, Proknow-C offers an organized procedure for gaining knowledge about the researcher's field of interest. A series of continuous processes make up the procedure, which starts with the use of a search engine for scientific publications, followed by the screening and selection of an adequate bibliographic portfolio in accordance with set guidelines. The bibliographic information on a given topic is filtered and examined using a set of phases or leads known as Proknow-C. The procedure is further divided into the following four steps: Choosing the bibliographical portfolio, bibliometric analysis of the chosen articles, systematic examination of the chosen articles, definition of the research question, and research aim are the first three steps. The method for selecting the article is particular, limited by the researchers' resources and the area of interest. These are the drawbacks of this process: 1) The keyword as defined by the researchers 2) Using Google Scholar to calculate the number of citations for each publication. 3) Assessment of the article's title, summary, and entire text.

Bibliographic Portfolio Selection

The selection of the items that make up the bibliographic portfolio (BP) is the initial stage. Determining the research's keywords and picking the databases are necessary steps in choosing the portfolio. i) defining the keywords for the research ii) selecting the databases iii) Searching for the articles in the chosen databases, and iv) Ensuring the keyword consistency. Proknow-C claims that while capital budgeting is taken into account when defining the keywords (KW) for this research, only one axis is taken into account. The axis makes it possible to concentrate on creating the pertinent context-related information. Since capital budgeting comprises monitoring long-term investment projects, the keywords "investment budget" and "investment appraisal" are also frequently employed. To cover all expressions with different wording, the terms "capital budget," "investment budget," and "investment appraisal" were used with an asterisk. The Boolean operator "or" is used in databases to select the articles that include either catchphrase.

After installation, the adherence to KW was assessed. This stage verifies that the KWs being utilized align with the ones being cast by researchers to address the problem. In order to check the keywords, five articles were chosen at random. If the terms ignored in the selected articles matched those used in the search for the articles, the compliance was considered genuine. If any current words are detected, the search must be done. After carefully examining and analyzing the three keywords in the article titles, it was determined if they were relevant to the subject of the use of capital budgeting.

The keywords were not utilized in searches for capital budgeting procedures since the goal is to build a generic theoretical framework. The keywords used for carrying out the method and the keywords used by the researchers of the articles in the Gross Articles Database are thought to be related.

Bibliometric Analysis

The method's second step entails bibliometric analysis. The referenced analysis examines the traits of the 80 references with aligned titles and the 45 articles in the portfolio on a quantitative and qualitative level. The bibliometric analysis includes i) Researchers with experience in the field and ii) Journals that have included papers on the topic in their archives.

Prior to anything else, note the keywords that researchers have used to describe their research. In all, 84 keywords were dropped from the BP articles and 79 keywords from the BP references. The term "capital budgeting" stands out since it is used in 9 BP articles and 7 references. Reference articles used the term "investment appraisal" frequently. This suggests that the terms used for the raw articles are consistent with the terminology used by the researchers in the field. While 122 writers contributed to the aligned references, only 72 authors contributed to the 45 publications in BP. There are authors who have contributed to more than one of the chosen articles in the portfolio. In a similar vein, several of the 45 pieces in the portfolio have authors who appeared more than once. Two of the 72 writers are highlighted. Professor of finance and accounting at the School of Management at the University of Bradford in the United Kingdom, Pike, R. H., stands out as the most accomplished author with seven papers in BP. In the areas of risk and investment, credit management, strategic management accounting, investment in new technologies, and intellectual capital, Pike, R. H. manages the research. The majority of the capital budgeting declarations date from the 1980s and 1990s. The fact that the creator wrote at least one of the second most well-known writers does not imply that he lacks experience in the field. This shows that Pike, R. H., conducted capital budgeting research earlier than the rest of the scholarly community. Additionally, it should be noted that the well-known writers are professionals in the fields of finance, capital budgeting, financial management, and investment and risk. Since this topic is covered in the context of finance, the authors do not identify capital budgeting as a macro study subject. Finding the journals that have space specifically set out for articles on the study subject is the goal of the analysis of the well-known journals. This analysis identifies the publications that support scientific understanding on the topic and are more open to capital budgeting research. It was noted that whereas the articles from the aligned references in the BP were dispersed among 49 publications, the papers in the BP were published in 33 distinct journals. It states that "Financial Management" (FM) from the Financial Management Association (FMA) was the dominant journal in the BP with six articles and concurrently with five articles on the BP references. FM's goal is to produce high-caliber research that will have a substantial impact on financial investigations and company practices. Since FM is not a specialized magazine, it publishes articles in all fields of finance once every three months. The magazine "The Engineering Economist" from the Institute of Industrial Engineers (IIE) is most frequently cited in the BP references, accounting for 9 articles. Long Range Planning, Journal of Finance Economics, and International Journal of Production are a few further pertinent periodicals in the field.

Systematic Review

The final step of Proknow-C displays the articles' systematic analysis in the bibliographic portfolio as their content. The papers are subjected to a critical analysis using the underlying lenses of an issue. In order to examine the research issues in capital budgeting, the researcher defines these lenses (or viewpoints).

Simple operational choices, like replacing equipment, or more substantial plans, like constructing a new facility, might be cast off as capital budgeting. When making capital investment decisions, executives must be sure to employ the best methods and resources available to them in order to make an informed choice. This made it noteworthy because 14 articles described the managers responsible for capital budgeting, and a select number of them attempted to establish a connection with decision-making. Only 12 studies discussed whether the financial director, president, controller, or treasurer was subject to a questionnaire or cross-examination.

It has been seen in some instances that senior roles within the organization that are defined by a particular management and the capital budgeting activity may be separated into the various divisions of a corporation. This affects the results reported in the articles since those who have never had to evaluate investment offers are likely to be unfamiliar with the procedure and approach to be followed. With proper consideration for the characteristics of the research participants, it was noted that the vice president of finance, financial director, controller, and treasurer were all accepted; each of these roles has a direct impact on choices about capital budgeting. According to research, professionals with more education are more likely than those with less education to employ the discounted cash flow approach. Directors with a Master's in Business Administration (MBA) or another advanced degree tend to apply concepts that are more complex than those without a degree.

Issues with Capital Budgeting Research

The literature on capital budgeting observes the standard shift in corporate investment exercise during the past fifty years. Capital budget practices are defined as approaches and tools that aid in a project's feasibility analysis. According to research, managers are unable to identify the practices that should be employed in the evaluation of investment projects, therefore the distinction between practice and theory in capital budgeting is fully led by the user of the practices. In truth, it appears that the decision-makers lack simplicity or are unaware of the best approaches. However, this is only a little evidence that the company's specific circumstances will affect how well abandoning advanced capital budget practices will work. This circumstance affects capital budgeting practices and the decision-making process since it also takes into consideration the company's characteristics and the managers' profiles. Also influencing capital budgeting decisions are factors like profile, preferences, cognitive capacity, management training, and experience function. We want to examine two lenses in the systemic analysis from the viewpoints of managers and practices in light of the theoretical controversy surrounding the usage of capital budgeting practices by managers. Systematic analysis focuses on examining the theoretical lenses (perspectives) of publications in the bibliographic portfolio in relation to the research topic of the discrepancy between practice and theory in capital budgeting.

Review of the Literature

Capital budgeting is the process of acquiring a long-term venture or constructing a new facility for a corporation. The term "investment appraisal" also applies to capital budgeting. For capital planning, a significant sum is needed. Once an investment plan is underway, significant costs begin to accrue, which cannot be disregarded. It is also difficult to change a project once it is underway. Capital investments are opportunities for investment that have a longer-term potential for profit. It is additionally described as the best option for funding long-term investment decisions. It goes on to say that it is an investment evaluation carried out by Managers to determine which idea yield the maximum would return in future cash flows.

Investment selection, screening, proposal, authorization, and approval are all steps in the capital budgeting process.

The importance of capital budgeting cannot be overstated; if improperly planned, these guesses may have negative financial and cash-flow effects.

Criteria for Capital Budgeting Decisions

The three most well-known capital budgeting choice factors are payback period, internal rate of return, and net present value (NPV). When taking into account the timing of these cash flows as well as the usage of pertinent cash flows, NPV is consistent with the objective of maximizing shareholder wealth.

- Future cash flows are discounted in NPV, and a project will be considered acceptable if NPV is positive.
- If there are many potential projects, the project with the highest NPV is chosen.

Payback Period

It is an extremely easy procedure. It provides the appropriate window for investment return. If the predicted payback time (PB) is equal to or less than the period required by the firm, the proposal should be accepted. Payback is the length of time it will take for the initial cash withdrawals to be offset by the amount of annual cash inflows. The project should be started if the time interval is equal to or less than the cutoff period; if it exceeds the cutoff period, the project should be rejected.

Internal Rate of Return (IRR)

An indicator used in financial analysis to assess the viability of investments is the internal rate of return (IRR). In a discounted cash flow analysis, it is a reduction that results in the net present value (NPV) of all financial flows being equal to zero. The rate at which the current value of projected future cash flow is determined for each project is known as the internal rate of return. When rating projects that are mutually exclusive, IRR and NPV are best, however they can provide contradictory outcomes. Conflict occurs when the project's timeline and cash flow diverge. The project must be rejected if the IRR is less than the needed rate of return since the NPV will be negative.

Profitability Index

The profitability index (PI) is derived by dividing the project's original investment by the present value of predicted future cash flows. The profitability index aids in rating various propositions. Project is taken into consideration if the Profitability Index is at its maximum and equal to 1. The change in the net predicted future cash inflows is what determines PI. The change is then discounted back to the present value using the needed rate of return, added along with the discounted inflows, and divided by the cost of the initial investment.

Process of Capital Budgeting

Capital budgeting process consist of these steps (a) establishing goals, (b) developing strategies, (c) Searching for investment opportunities, (d) evaluating investment opportunities, (e) selecting the investments, (f) Implementing, (g) monitoring the various project, (h) conducting a post audit.

Hypothesis

- H₁₀:** There is no relation between total assets and primary capital budgeting techniques used by firms
- H₁:** There is relation between total assets and primary capital budgeting techniques used by firms
- H₂₀:** There is no relation between total turnover and primary capital budgeting techniques used by firms
- H₂:** There is relation between total turnover and primary capital budgeting techniques used by firms
Size of the firm is taken as independent variable and primary capital budgeting techniques used as Dependent variables.

Sales and total assets of the firm are taken as indicator of size of the firm and purpose is to find out the relationship between size of firm and primary capital budgeting techniques used by the firm.

Factors Influencing Capital Budgeting

Numerous factors commonly have a significant impact on capital budgeting decisions. The concept of behavioral finance has grown in significance, influencing capital budgeting theory and the understanding of behavioral finance that comes from sociology and psychology. According to behavioral finance, decisions about capital investments are not only influenced by quantitative data but also significantly by qualitative data, such as an individual's personal beliefs and institutions, the situational environment, their risk tolerance, and other factors.

One of the key considerations when creating a capital budget is the size and makeup of the business. Because they have the means and capacity, major companies may employ sophisticated capital budgeting techniques. The industry a firm operates in, such as the financial services sector or the building, construction, and utility industries, is frequently noted as a factor in capital budgeting practises.

The level of CFO education has a significant impact on capital budgeting. It was claimed that CFOs with greater education had an easier time comprehending and are hence more likely to employ more complex capital budgeting procedures.

Since making a capital investment choice is a long-term one, risk and uncertainty are important considerations. Uncertainty is most often used to describe the discrepancy between the data at hand and the data needed to make a decision. Since there are no absolutes in the long run, uncertainty is the most important variable in capital investment.

Research Problems in Capital Budgeting

According to the capital budgeting literature, there has been a significant change in corporate investment practices during the past 50 years. Capital budget practices are approaches and strategies that help determine a project's feasibility. According to research, the user of the practices largely determines how theory and practice differ. The procedures that should have been used in the appraisal of investment projects were not used by managers. In truth, it appears that the decision-makers lack information or are unaware of the best practices. There is, nevertheless, some tenuous evidence that a company's unique circumstances will influence how well a smart capital budget practice works. In this situation, it is also thought that the company's traits and the managerial profile have an impact on the capital budgeting procedures.

Main Contributions

All previous empirical studies may be divided into two basic categories:

- In the first, researchers looked into the most popular methods of investment appraisal.
- In the second, researchers attempt to establish a link between the enterprise and the usage of certain investment assessment procedures.

Some researches on this approach were originally affected by the gap between theory and practice. The overall goal is to determine whether capital budgeting is being used and which procedures are being used less and less. The majority of papers in the latter subject covered businesses with locations in the United Kingdom, Sweden, the United States, Canada, and Spain. Although research on capital budgeting in developing economies are relatively few, it is easy to see that they exist in all emerging nations, including South Africa, India, Indonesia, and Jordan.

Research Agenda

After examining managers' viewpoints and capital budgeting practices, it is easy to identify areas that want more research and a more full and in-depth assessment in order to progress theory and practice. Companies from different sectors or makeup's could come to different findings. This is the case because larger companies frequently invest for the long term and for higher values, as opposed to smaller companies, which frequently invest for the short term and for lower values with less thorough study.

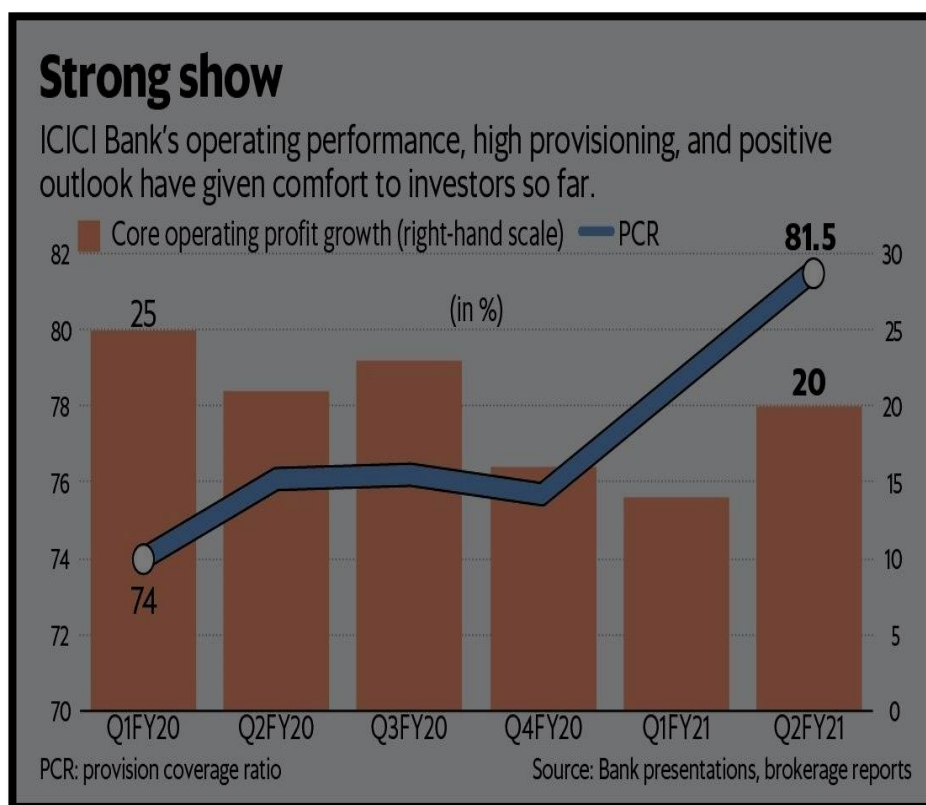
Difference between HDFC Bank and ICICI Bank Data in Capital Budgeting

ICICI Bank Data

ICICI					
Bank Q3 FY2019-20 Results					
Rs. Crore	Q3 FY20	Q3 FY19	Y-o Y %	Q2 FY20	Q-o-Q %
Net Interest Income	8,545	6,875	24%	8,057	6%
Non-Interest Income	4,043	3,404	19%	3,854	5%
Core Operating Income	12,588	10,279	22%	11,911	5.7%
Operating Expenses	5,571	4,612	21%	5,378	3.6%
Core Operating Profit	7,017	5,667	24%	6,533	7.4%
Operating Profit Including Treasury Income	7,548	6,146	23%	6,874	9.80%
Provisions & Contingencies	2,083	4,244	-51%	2,507	-17%
PBT	5,465	1,902	187%	4,367	25%
Net Profit	4,146	1,605	158%	655	532%

HDFC Bank Capital Budgets

HDFC Bank Q4 FY2019-20 Results					
Rs. Crore	Q4 FY20	Q4 FY19	Y-o-Y %	Q3 FY20	Q-o-Q 0
Interest Earned	29,885	26,333	13.5%	29,370	1.8%
Interest Expended	14,681	13,244	10.8%	15,197	-3.4%
Net Interest Income	15,204	13,089	16.2%	14,173	7.3%
Non-Interest Income	6,032	4,871	24%	6,669	-10%
Net Revenues	21,237	17,960	18.2%	20,842	1.9%
pre-provisioning Operating Profit (PPOP)	12,959	10,844	19.50%	12,945	0.10%
provisions & Contingencies	3,784	1,889	100%	3,043	24%
PBT	9,174	8,954	2.5%	9,902	-7.3%
Net Profit	6,927.7	58,851.2	17.7%	7,416.5	-6.6%

**Conclusion**

It focuses on the following: (i) The research area for researchers; (ii) The observation that most journals do not have a specific focus on this subject and, although they publish articles on the theme, they are not specialized in it; and (iii) The fact that few authors have developed research with the same scopes or few of them still research on the theme. Future research prospects were found by the methodical examination. The organizational and management set of traits must be examined. Exploring the link between industry and business size and a capital budget choice is important from an organizational perspective. From a management perspective, some academics contend that the practitioner is to blame for the capital budgeting issue since they lack the necessary knowledge to adopt the most effective approaches and instead continue to employ the simplest ones for many years. According to this study, businesses should give managers and analysts ongoing, targeted training to guarantee that sound capital budgeting methods in general and discounted cash flow methodologies in particular are used. The lack of personnel, time, and expertise to manage capital expenditures is one of

the factors contributing to the inability to make complex decisions. Because of this, advances in the ongoing training of engineering professionals (in which capital budgeting is considered as a component of the organizational culture and by a trained team, both in an integrated manner) may result in better judgments about capital investments. Additionally, the implementation of Proknow-C contains researcher bias. The author chooses the articles by examining the titles, abstracts, and full texts of those that are believed to be relevant to the study subject.

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