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The Role of Capital Budgeting Tools in Enhancing the Efficiency of Investment Decision-Making in the Public Sector

Rabab Wahhab Maseer, Prof. Dr. Taicir loukil

University of Sfax / Faculty des Sciences, Economiques et de Gestion de Sfax

Abstract: The significance of capital budgeting stems from the critical information it provides. Decision-making in general, and investment decisions in particular, serve as the starting point for implementing plans and tasks related to economic units. These decisions inherently involve risks and uncertainties. This research aims to elucidate the role of tools utilized in capital budgeting in providing information that aids in risk reduction and clarifies available alternatives, such as private sector involvement. Furthermore, it examines the economic feasibility of investment decision-making in the public sector, where competing priorities must be balanced against the limited resources allocated to public sector units.

Introduction

The need for managerial accounting information constitutes a critical component of the information systems required by all business organizations, including public sector entities. Achieving an efficient investment decision necessitates leveraging managerial accounting information, which provides insights into private sector partnerships, economic feasibility analysis, risk assessment, and evaluations of the environmental and social impacts of capital projects. This, in turn, contributes to improving the efficiency of investment decisions.

Given the uncertainties and risks facing the global economy, creating an investment environment characterized by reliable accounting information becomes imperative. Such an environment facilitates informed investment decisions, ultimately fostering economic development. Consequently, investment decisions are among the most challenging and sensitive, as they involve resource allocation on the one hand and serve as a mechanism for national income distribution on the other (Al-Mashhadani, 2014, p. 2).

1. Research Problem

Investment decision-making in public sector units is characterized by risk and uncertainty, primarily because these decisions often span long time horizons, sometimes exceeding 50 years. Given the scarcity of resources and the diverse societal needs for services and economic development, governments face significant challenges in selecting the most appropriate, efficient,

and urgent projects that align with their limited financial capacities. As a result, the process of selecting an investment project is closely tied to one of the most critical strategies: the strategy of prioritization. This study seeks to verify the extent to which the use of capital budgeting tools facilitates capital investment decision-making.

2. Research Objectives and Significance

The research aims to clarify the role of capital budgeting tools in comparing and selecting among investment projects and identifying the necessary criteria for this process. The study will establish theoretical aspects of the dimensions through which the efficiency of investment decision-making can be achieved. Additionally, a survey will be analyzed to demonstrate the role of these tools in enhancing the efficiency of investment decision-making.

3. Research Hypotheses

1. The study hypothesizes a statistically significant impact of capital budgeting tools on the investment decision-making process in the public sector. This overarching hypothesis is divided into the following sub-hypotheses:

- There is a statistically significant impact of capital budgeting tools, particularly the Net Present Value (NPV) indicator, on improving the quality of capital investment decisions in governmental units.
- There is a statistically significant impact of capital budgeting tools, particularly the Profitability Index (PI), on enhancing the accuracy of financial return predictions for public sector investment projects.
- There is a statistically significant impact of capital budgeting tools, particularly Sensitivity Analysis, on risk management for public sector investment projects.
- There is a statistically significant impact of capital budgeting tools, particularly Value-Added Techniques, on the efficient allocation of resources in public sector investment projects.

4. Research Methodology and Approach

To achieve the study's objectives and identify the best methods for addressing its problem, the deductive approach was adopted. This approach involved utilizing prior studies, research, and academic books to develop the theoretical framework of the current study. For the practical component, the inductive, descriptive, and analytical methods were employed.

5. Study Population and Sample

The study population was defined based on the methodologies applied during the practical phase of the research as follows:

1. Interviews

Interviews were conducted with general managers, division managers, and department heads in the Ministry of Planning, as well as the Roads and Bridges Directorate within the Ministry of Construction, Housing, and Municipalities.

2. Questionnaire

Two distinct samples from different populations were targeted, each contributing complementarily to verifying aspects of the thesis:

- Academic Community: This group comprised accounting specialists from 20 Iraqi universities, totaling 500 academics, of whom 142 were selected as the research sample.
- Governmental Community: This group included managers and employees from governmental units within the Investment Programs Directorate, Sector Planning Directorate, General

Government Contracts Directorate, and Economic and Financial Policy Directorate of the Iraqi Ministry of Planning, as well as the Roads and Bridges Directorate under the Ministry of Construction and Housing.

Study Boundaries

1. Spatial Boundaries: The study focused on the Iraqi Ministry of Planning and the Roads and Bridges Directorate.

2. Temporal Boundaries: The questionnaires were distributed on Sunday, November 4, 2024, and the last questionnaire was received on Monday, December 11, 2024.

3. Human Boundaries: These included senior and mid-level leaders, employees of the Ministry of Planning, the Roads and Bridges Directorate, and academics specializing in accounting from Iraqi universities.

6. Research Methods and Data Collection Sources

1. Theoretical Component

- Relevant Arabic and foreign books and sources related to the research topic.
- Arabic and foreign theses and dissertations connected to the research subject.
- Peer-reviewed scientific journals, periodicals, and published research in both Arabic and foreign languages relevant to the study.

2. Practical Component

- Questionnaire: Used to gather specific data from targeted populations.
- Survey: Conducted to collect comprehensive insights and feedback.
- Field Visits and Personal Interviews: Conducted with key personnel for in-depth information and practical observations.

Previous Studies

1. Study by Kee & Robbins (1991): "Capital Budgeting in the Public Sector: A Comparative Analysis"

The study aimed to survey capital budgeting practices among municipal and county officials and compare them with those employed by private sector organizations. The findings reveal that both sectors are highly organized in their capital budgeting procedures and rely heavily on formal decision-making processes to evaluate proposed capital investments. However, complex investment and risk-adjustment models used in the private sector are rarely adopted in the public sector. This discrepancy appears partly due to the dominant influence of political and qualitative considerations in public sector investment decisions. Furthermore, the study indicates significant differences in the perceptions of firms and general managers regarding the most critical and challenging aspects of capital budgeting.

2. Study by Nasr El-Din Nemri (2009): "Investment Budgeting and Its Role in Rationalizing Investment Spending: A Case Study of the Electrification of the Railway Project in Algiers Suburb"

This study sought to highlight the scientific concepts of investment and apply tools and techniques of investment budgeting to demonstrate optimal allocation of financial resources for physical investments rather than financial deployments. It emphasized the importance of adopting scientific methods to evaluate alternatives and showed that inaccuracies in estimating project requirements lead to additional expenses for economic units. The findings indicate that investment decisions achieved national profitability, which was the basis for the state's higher authorities to

fund the project's expenses. Moreover, delays in completing the railway electrification project resulted in missed profits that could have been maximized had the project been completed on schedule.

3. Study by Cooremans, C. (2009): "The Role of Formal Capital Budgeting Analysis in Corporate Investment Decision-Making: A Literature Review"

The study aimed to shed light on new methods to influence decision-making in energy investment and move away from unproductive debates on the profitability of energy efficiency investments. It revealed the partial impact of financial factors and the significance of strategic considerations in investment decisions. The study provided practical recommendations for public policy programs aiming to enhance corporate investments in energy efficiency. It concluded that improving investment profitability alone does not guarantee positive decisions, as profitability information often does not aid decision-makers in comparing projects. The study recommended emphasizing the strategic nature of investments and the impact of competitive advantages on energy efficiency investment decisions.

4. Study by Joudah, Zahraa (2022): "Development of a Management System for Feasibility Studies of Infrastructure Projects"

This study aimed to enable project owners to understand the key risks and pitfalls their projects might face and assist them in identifying critical details of feasibility before project initiation. The findings underscored the importance of conducting detailed feasibility studies for infrastructure projects and the necessity of developing an effective system to support investment decision-making. Through a survey, it was revealed that the absence or neglect of detailed studies leads to increased costs and delays in project implementation.

First Section: Theoretical Framework of Capital Budgeting Tools and Investment Decision Efficiency

Capital budgeting (investment budgeting) is considered one of the most important and complex types of budgets in financial management. This type of budgeting focuses on planning the activities related to capital operations within the economic unit and clarifies the methods of financing and controlling their execution, relying on the established capital budget. Capital projects refer to the funds allocated by the economic unit for acquiring fixed assets or improving and increasing their efficiency to generate future benefits. (Al-Mahainah, 2022: 251)

To achieve the objectives of the economic unit, management must carry out planning, organizing, directing, and administrative control processes. In this context, the planning budget, of which capital budgeting is one of its most significant types, is seen as a financial and quantitative translation aimed at achieving the objectives sought by the management of the economic unit. Some view the budget as an effective tool for controlling planning and execution processes of plans previously established by the management of the economic unit. Senior management sets the strategic goals of the economic unit, and these goals are translated into actionable steps that are measurable and achievable by middle management. Subsequently, the lower management is responsible for execution, and all of this is accomplished through the planning budget, which determines the aspects of different activities and the expected performance of various departments within the economic unit. (Noor & Alyan, 2012: 8)

Capital budgeting is defined as the decision-making process regarding the amount and type of investment in new projects. This process includes evaluating past, current, and future factors to make a complex strategic decision based on potential acceptance or rejection, rather than relying on trial and error or financial manager performance factors. (Gervais, 2009: 1)

It is also defined as the best option for making decisions about sources of financing for long-term financial investments. (Bester, 2006: 3)

Abdel-Nasser provided a broader definition, describing capital budgeting as a quantitative expression of the economic unit's investment programs over the long term. These programs are approved by and linked to responsible individuals, who use them as a basis for control, ultimately aiming for the optimal use of available resources. Based on this definition, Khanjain identified the key characteristics of investment budgeting as follows:

- The ability to predict financial returns (cash flows).
- A high-risk indicator.
- A relatively long period between the investment expenditure and the expected financial returns. (Khamisi, 2012: 405)

While Sabah defined capital budgeting as the investment in fixed assets, describing it as a plan for investment projects, whether in the purchase of fixed assets or in entering into long-term projects, through which analysis and planning are conducted to make appropriate investment decisions. (Sabeel et al., 2017: 18)

In 2017, Hamdoun disagreed with the previous perspective and clarified that capital budgeting is an integrated system. He based his explanation on several justifications, the first of which was the emergence of external factors that were previously absent, such as macroeconomic, political, behavioral, and social factors, which touched every phase of this system. This includes the study of alternatives between projects, selecting the most suitable one, determining the allocation and guidance, considering future scenarios and alternatives. Even beliefs, attitudes, values, and behaviors contributed to aspects that were previously not taken into account. On the other hand, the evaluation criteria and the process of risk and uncertainty assessment, selection methods, implementation controls, and final evaluation needed constant financial and non-financial information, setting it apart from other financial decisions that are based solely on financial information. (Al-Sayegh & Hamdoun, 2022: 101)

Based on all of the above, the researcher believes that investment budgeting in the public sector is part of the financial planning process, focusing on the allocation of financial resources to support long-term projects. It includes procedures, methods, and techniques used to select between investment opportunities, developing initial ideas into specific investment proposals for comparison and evaluation to select the best options, ensuring the accuracy of predictions. The goal is to enhance economic development and infrastructure development through the proposed investments that will contribute to achieving government objectives.

The characteristics of capital budgeting can be identified in the following points:

- Helps improve the timing of asset acquisition and the quality of purchased assets: An effective capital budgeting process enhances the timing of asset acquisitions and ensures the assets are purchased in a well-organized manner. (Awomewe, 2008: 16)

Capital budgeting has many notable features and characteristics, as outlined below:

- Focuses on long-term projects with high expected financial returns.
- Involves high risks: Capital budgeting is based on projections of the financial returns from projects, and the actual results may differ from what was planned in the budget.
- Represents long-term fixed investments.
- Determines the future financial position of the company.
- Requires substantial financial investment for funding.
- Defines the profitability of the economic unit. (Saloum & Al-Mahaini, 2007: 96)

Capital Budgeting Tools and Evaluation Criteria under Certainty:

There are several tools used in capital budgeting and investment evaluation to make decisions regarding long-term projects. These tools are applied scientifically and precisely to make informed decisions based on financial analysis and the estimation of expected returns and risks.

- Net Present Value (NPV): This method shows the difference between the present value of the outflows (cash payments) and the present value of the inflows (cash receipts) for the project. It measures the profitability of an investment. A positive NPV indicates an increase in the economic unit's value due to the investment. There are four key points to determine the NPV to decide whether to accept or reject an investment project. (Al-Abidi, 2021: 151)

Internal Rate of Return (IRR)

The Internal Rate of Return (IRR) is defined as "the discount rate at which the present value of the net cash inflows from an investment proposal equals the present value of the net investment." It is the rate at which the net present value (NPV) of an investment is equal to zero. Therefore, the IRR depends on selecting the interest rate at which the present value equals the cost of investment.

(Al-Jazrawi & Al-Qarah Lousi, 2007: 207)

Payback Period

The payback period is a traditional and commonly used method, especially in both the UK and the United States. It has been shown that its use is positively correlated with the size of the capital budget. However, some researchers have found that it is inversely related to the size of the capital budget. The use of the payback period is positively correlated with the size of the investment project, but its use is not significantly affected by the size of the investments.

(Lefley, 1996: 207-208)

Profitability Index

The Profitability Index (PI) represents the ratio of the present value of expected cash inflows and outflows after starting the investment, divided by the original investment amount. The acceptance or rejection criterion for this indicator is as follows: the alternative is accepted if its profitability index is greater than 1 and rejected if it is less than 1. The alternative with the higher profitability index is preferred.

(Ross & El et al., 2002: 157-158)

Economic Value Added (EVA)

The feasibility study of investment opportunities is crucial for development decisions, as it determines the technical and economic outlook of the project after the technical study. Economic evaluation techniques in the public sector are used to analyze government policies and public programs. The estimation of budgets prepared within the feasibility study of the project represents long-term financial planning for the required funds and their financing. This includes expenses for acquiring machinery, equipment, and construction, as well as funds required for initial operational costs. All of this represents investment decisions concerning the use of funds needed to implement the project. Since project implementation requires invested capital, which should generate returns, a specialized study is required to decide whether or not to proceed with such decisions. At the national level, investments are carefully planned and managed at the ministry level.

(Bl-Ajooz & Al-Saatouri, 2013: 69-73)

Evaluation Criteria for Investment Projects under Uncertainty Conditions

Uncertainty conditions refer to the lack of sufficient information required for the evaluation and comparison process. Due to the numerous potential variables in the factors used for evaluation,

which are linked to the future—always shrouded in ambiguity and uncertainty—it is crucial to focus on the most important variables. These variables are related to commercial profitability, which reduces the level of risk and uncertainty associated with the proposed project. In these circumstances, we face conditions of certainty. However, in the absence of defined objective probabilities accompanying the prevailing circumstances, which are expected to prevail, we may find ourselves in a state of doubt and uncertainty. Some indicators that can help in evaluating investment projects and comparing them under conditions of uncertainty include: (Al-Shaib & Ahmed, 2023: 143). These include capital adequacy analysis, working capital cycle analysis, balanced analysis, and sensitivity analysis.

Investment Decision in the Public Sector

Investment, in general, is a crucial part of the economy that contributes to the progress and development of the state and society. It has become one of the most important economic issues due to its positive impact on the lives of communities, economic units, and individuals, with the aim of achieving set objectives. The investment decision is considered the optimal choice in determining success or failure in the lives of individuals and economic units, as long as there is a motivation to choose the best alternative to achieve the investment goal. (Al-Yassari, 2023: 28)

Investment is one of the most important economic factors at both the national level and the private sector level, as it is a key driver for community progress. This progress is achieved by investing assets over specific periods to obtain future financial or non-financial flows, benefiting both individuals and society. Investment involves a range of economic activities related to how to allocate capital assets—material, human, and financial. It represents a high degree of risk for investors because it involves allocating capital to achieve future profits that may or may not materialize.

(Massoudi et al., 2020: 20)

The success of an investment project largely depends on the soundness and accuracy of the investment decisions made at the start of the project's life. This is because investment decisions are distinct from operational decisions in that they possess characteristics that make them riskier. Investment decisions result in a series of fixed burdens that are not easily altered or reversed if they are found to be incorrect. The cash flows associated with these investment projects are realized over a long period, which necessitates taking the time value of money into consideration. Moreover, investment decisions often involve large expenditures, which may require the project to borrow or increase its capital, affecting the project's financial structure. The future success of the project depends on the investment decisions made. Therefore, the investment decision is one of the most important, and perhaps the most critical, decisions, as there is no decision more important or riskier than the investment expenditure decision. In this context, it is essential that the investment decision is based on comprehensive feasibility studies for the entire lifecycle of the project, employing a robust scientific methodology to ensure the success of the proposed investment project. This project represents an investment opportunity, and the success of any project depends on the accuracy and efficiency of this selection.

(Al-Kinani, 2020: 6)

Therefore, based on the above, it is necessary to address the definition of the investment decision and identify the main patterns of the decision-making process.

Abdel-Motleb defines the investment decision as the decision to choose the investment alternative by comparing at least two alternatives. This decision is based on a series of economic feasibility studies that precede the selection process, and the criterion for choosing is the highest financial return. The selection process goes through several stages, ultimately leading to the choice of the

feasible alternative according to the objectives and nature of the investment project. (Abdel-Motleb, 2000: 37)

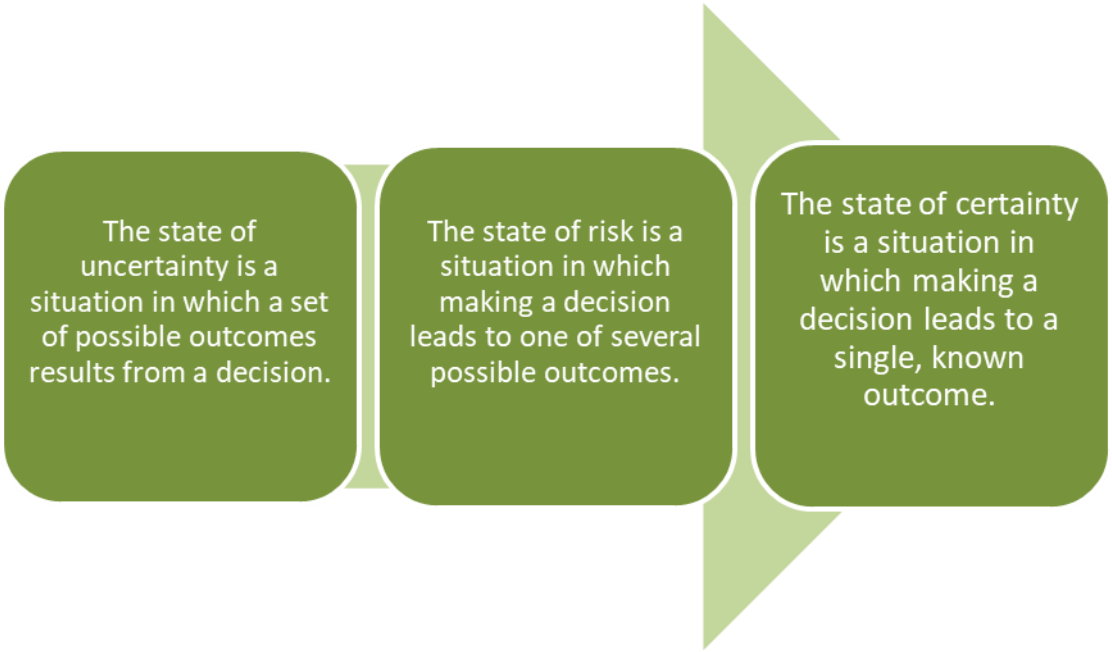
Taher defines the decision from an administrative and accounting perspective as an expression of a specific will and design from a party known as the decision-maker or the responsible manager. This will or desire is transformed into an actual act to accomplish tasks or make specific changes in the environment related to the decision. (Taher, 2005: 19)

The investment decision is defined as the allocation of a known amount of funds and resources of the establishment, with a sacrifice in the present, based on a pre-determined rational method of analysis, division, and comparison, with the aim of obtaining or achieving appropriate benefits expected to occur over relatively long future periods. (Shaheira & Nazihah, 2019: 14)

Based on the above, the researcher believes that the investment decision is one of the most important financial decisions due to its significant financial impact on future returns. It is made from several available alternatives in front of the economic unit. It can be defined as a future decision with high risks, relying on a large capital investment, and requiring a substantial amount of information to reduce uncertainty.

The circumstances under which the investment decision is made can be classified as shown in Figure 1.

Figure 1: Decision-Making Scenarios



Source: Prepared by the researcher

From Figure (1), we can see that the difficulty of making a decision arises from selecting the most suitable alternative. This difficulty increases when the alternatives are similar and the trade-off is challenging. A decision cannot be made based solely on individual knowledge; instead, the investor must consistently have access to all necessary resources to achieve the desired goal. Investment decisions have long-term effects due to the time gap between the start of the investment, the expenditure involved, and the expected financial returns over the coming periods, which often exceed one year. This time difference leads to many challenges, including:

A. Problem of Time Value of Money: The dinar the investor possesses today is worth more than the dinar they will receive or spend after a year or several years. Time is an important variable that must be considered when evaluating any investment project. When the current value is used to

assess the project, the result is a profit. However, when considering the price level and the increase in prices over time at a rate higher than the increase in net returns from the project, the real value of the net return flows from the project will be lower than the current value, which in turn will cause the project to incur a loss. Additionally, the impact of inflation and its negative effects, which hinder development programs and plans in developing countries, cannot be ignored, as it leads to inflation of investments and consequently a decrease in the rate of achievement and the actual value of investment. (Eider and Susi, 2017: 22)

B. Perfect Certainty: In a situation of perfect certainty, the decision-maker has sufficient information, and the circumstances are well known, providing complete confidence in the decision. There are no uncertainties regarding the expected events, whether subjective (personal) or objective, leading to complete certainty in the outcome.

C. Risk Situation: In the case of risk, the decision-maker makes the decision based on an evaluation of the potential consequences of alternative options. The decision-maker estimates the potential variables and circumstances that could occur in the future. While they are uncertain about which events will happen, they have a clear understanding of the probabilities of these events occurring.

D. Uncertainty Situation: All the required information regarding the decision problem may not be available to the decision-maker, which makes the probabilities of the expected events unknown. The dimensions, elements, and information about the problem are vague, which undermines confidence and the ability to make a decision. (Al-Isari, 2023: 52)

The researcher, based on the above, believes that investment decisions are long-term decisions. When selecting projects requiring such decisions, the decision-maker weighs both the short-term objectives of the economic unit and its long-term goals and strategies. Investment decisions are fundamental, and due to their importance, decision-makers must have sufficient experience to make investment decisions based on scientific principles and practical expertise, especially in governmental units and among investors initiating new projects or making managerial decisions within the economic unit.

Investment decisions represent a vital and important area of strategic decision-making, which is a key focus for investors or organizers, particularly in the financial management of any project. The concept of decision-making involves choosing between multiple alternatives to achieve a specific goal. Therefore, investment decisions lead to a set of fixed burdens that are not easy to modify or reverse due to the significant expenditures involved at the start of the investment project's life (Tartaar and Al-Yazid, 2021: 53). A successful investment decision, whether in the public or private sector, is based on two fundamental components:

- ✓ First Component: Investment decisions should be based on scientific principles. To achieve this, the following steps must be taken:
- ✓ Define the primary goal of the investment and gather the necessary information for making the decision.
- ✓ Evaluate the expected returns of the proposed investment opportunities.
- ✓ Select the appropriate investment alternative or opportunity that aligns with the defined goals.
- ✓ Second Component: The decision-maker must consider certain principles when making the investment decision.

Lee & Joyce argue that accounting information significantly influences the allocation of resources between projects in the public sector, as it is an effective tool in determining financial allocations in the budget in a way that contributes to achieving government goals. By analyzing accounting data, sound investment decisions can be made that ensure the efficient and equitable distribution

of resources among various projects (Lee et al., 2014). Accounting information is used in government investment decisions through its application in financial performance indicators, such as profit margin, return on investment, and return on assets, which are the main tools through which financial objectives of investment projects are ensured. These indicators help identify the projects that generate the highest financial returns, contributing to making precise decisions regarding resource allocation and prioritizing projects (Subramanyam, 2013).

Second Section: Description and Analysis of the Relationship Between Study Variables and Testing of Hypotheses / Practical Approach

Statistical Methods

The researcher employed the following statistical methods:

- ✓ Percentages and Frequency Distributions (Descriptive Study) and Relative Weight.
- ✓ One-Sample T-Test.
- ✓ Simple Linear Regression for Sub-Hypotheses.
- ✓ Multiple Linear Regression for Main Hypotheses.

The researcher conducted a statistical analysis of the study's statements and sections, addressing the research questions after determining the measurement level for the study sample's opinions.

The researcher focused on reviewing everything related to the methodological framework for the practical study, by first defining the study approach adopted by the researcher (descriptive analytical), then introducing the study population, the sample, and the characteristics of the sample to which the questionnaire was distributed. Following this, the study tool (the questionnaire) and its components were explained, followed by an explanation of the statistical methods to be applied.

1. What is the level of evaluation of capital budgeting tools in terms of the tools used in capital budgeting in public sector units, according to the opinions of the study sample (academics)?

To assess the evaluation and contribution of capital budgeting tools, it was measured through a set of dimensions (Profitability Index, Sensitivity Analysis, Economic Value Added techniques, and Net Present Value Index) that contribute to the quality of capital decision-making in government units. This was measured through a series of statements that highlight the level of this evaluation by calculating the means, standard deviations, relative importance, and the level of importance of the statements, as follows:

- ➢ Net Present Value Index contributes to the quality of capital decision-making in government units, sample (academics).

Table (13) presents the statistical results for evaluating the level of Net Present Value.

	N	**Arithmetic Mean**	**The standard deviation**	**T**	**The relative weight %**	**Statistical significance (SIG)**
The Net Present Value (NPV) index contributes to improving the accuracy of cost estimates for	142	4.25	0.72	20.73	85	0.000

infrastructure investment projects.						
The NPV index contributes to the quality and accuracy of investment decisions in public sector units.	142	4.18	0.69	20.39	84	0.000
The NPV index assists in the accuracy of making long-term investment decisions.	142	4.18	0.75	18.81	84	0.000
The NPV index helps in capital project financing decisions.	142	4.20	0.69	20.78	84	0.000
The NPV index contributes to enhancing the transparency of capital decision-making processes**.**	142	4.09	0.78	16.67	82	0.000
The Net Present Value (NPV) Index	142	4.18	0.55	25.36	84	0.000

Source: SPSS Program Outputs, Prepared by the Researcher

The overall mean of the sample members' estimates for all the statements related to the independent variable (Net Present Value Index contributes to improving the accuracy of capital decision-making in public sector units) as one of the (capital budgeting tools) was (4.18) out of 5 points. The relative agreement level on this evaluation was (84%), corresponding to a high level of evaluation for the contribution of the Net Present Value Index. The total standard deviation from the mean was (0.55), indicating that the responses are clustered around the mean and that this evaluation is statistically significant at a high level.

The first-ranked statement in the evaluation of the Net Present Value Index was: “The Net Present Value Index contributes to improving the accuracy of cost estimates for infrastructure investment projects,” with a mean of (4.25) and a relative weight of (85%). The statistical significance level for this statement was (0.000), which is smaller than the assumed significance level of 0.05. The evaluation of this statement as part of the Net Present Value Index was deemed (high) and statistically significant.

The second-ranked statement was: “The Net Present Value Index helps in capital project financing decisions,” with a mean of (4.20) and a relative weight of (84%). The evaluation of this statement’s contribution was (high) and statistically significant.

The last-ranked statement was: “The Net Present Value Index contributes to enhancing the transparency of the capital decision-making process,” with a mean of (4.09) and a relative weight of (82%). The evaluation of this statement’s contribution was (high) and statistically significant.

B. Profitability Index contributes to the accuracy of predicting financial returns for investment projects in the public sector (academics sample)

Table (14): Statistical measures for evaluating the level of the Profitability Index.

	N	Arithmetic Mean	Standard Deviation	T	Relative Weight (%)	Statistical Significance (SIG
The profitability index enhances the accuracy of financial return estimates for capital projects.	142	4.20	0.69	20.81	84	0.000
The profitability index helps increase management's confidence in projected financial returns.	142	4.16	0.79	17.60	83	0.000
The profitability index improves the accuracy of cost and benefit analysis for capital projects.	142	4.10	0.81	16.15	82	0.000
The profitability index reduces the deviation or gap between initial return estimates and actual outcomes.	142	4.07	0.85	15.05	81	0.000
The profitability index helps identify and analyze potential risks and their impact on financial returns.	142	4.13	0.82	16.47	83	0.000
Profitability Index	142	4.13	0.58	23.40	83	0.000

Source: SPSS Program Outputs, Prepared by the Researcher

The overall mean for the sample's responses regarding all the statements related to the independent variable (The Profitability Index Contributes to the Accuracy of Predicting Financial Returns for Investment Projects in the Public Sector) as one of the (capital budgeting tools) was (4.13) out of 5 points. The relative approval percentage for this evaluation was (83%), corresponding to a high level of evaluation for the contribution of the Profitability Index. The overall standard deviation from the mean was (0.58), indicating that the responses are clustered around the mean, and this evaluation is statistically significant at a high level.

The first-ranked statement in the evaluation of the Profitability Index was: "The profitability index enhances the accuracy of financial return estimates for capital projects," with a mean response of (4.20) and a relative weight of (84%) and a statistical significance level (0.000), which is smaller than the assumed significance level of 0.05. The evaluation of this statement as part of the Profitability Index is high and statistically significant.

In the second place was the statement: "The profitability index helps increase management's confidence in the expected financial return estimates," with a mean response of (4.16) and a relative weight of (83%), and the evaluation of the contribution of this statement was high and statistically significant.

Lastly, the statement: "The profitability index reduces the deviation or gap between initial financial return estimates and actual outcomes" ranked third, with a mean of (4.07) and a relative weight of (81%), with a high evaluation and statistically significant.

C- Sensitivity analysis helps in risk management for investment projects in the public sector (academic sample).

Table (15) Statistical indicators for evaluating the level of sensitivity analysis.

	N	Arithmetic Mean	Standard Deviation	T	Relative Weight (%)	Statistical Significance (SIG)
The sensitivity analysis index contributes to identifying and analyzing cost risks associated with capital projects.	142	4.12	0.79	16.99	82	0.000
The sensitivity analysis index helps identify price changes for raw materials or foreign currencies and the likelihood of exposure to market risks through sensitivity analysis.	142	4.15	0.77	17.98	83	0.000
The sensitivity analysis index assists in evaluating strategic risks associated with capital projects by avoiding objectives.	142	4.06	0.81	15.62	81	0.000
Expertise in sensitivity analysis enhances the effectiveness of	142	4.08	0.89	14.57	82	0.000

risk management in capital projects.						
The sensitivity analysis index helps improve decisions regarding dealing with unforeseen risks in capital projects.	142	4.10	0.84	15.50	82	0.000
Sensitivity Analysis	142	4.10	0.60	21.85	82	0.000

Source: SPSS Program Outputs, prepared by the researcher.

The overall arithmetic mean for the sample's assessments of all statements related to the independent variable (Sensitivity Analysis helps in risk management for investment projects in the public sector) as one of the (capital budgeting tools) was (4.10) out of 5, with a relative approval importance of (82%), indicating a high level of contribution of sensitivity analysis. The standard deviation from the mean was (0.60), suggesting that the answers are clustered closely around the mean, and this assessment is statistically significant with a high rating.

The first-ranked statement in assessing sensitivity analysis was: "The Sensitivity Analysis Indicator helps identify price changes for raw materials or foreign currencies and the likelihood of exposure to market risks through sensitivity analysis." The average response for this statement was (4.15), with a relative weight of (83%) and a statistical significance level of (0.000), which is smaller than the expected significance level of 0.05, indicating that this statement is highly significant.

The second-ranked statement was: "The Sensitivity Analysis Indicator contributes to identifying and analyzing cost risks associated with capital projects." The average response for this was (4.12), with a relative weight of (82%) and the statement's contribution rating being high and statistically significant.

Finally, the last statement was: "The Sensitivity Analysis Indicator helps assess the strategic risks associated with capital projects by moving away from goals." The arithmetic mean for this statement was (4.06), with a relative weight of (81%), indicating a high evaluation that is statistically significant.

4. Techniques for Added Value Contribute to the Efficient Allocation of Resources in Public Sector Capital Projects (Sample: Academics)

Table (16) Statistical Indicators for Evaluating Added Value Techniques

	N	**Arithmetic Mean**	**Standard Deviation**	**T**	**Relative Weight (%)**	**Statistical Significance (SIG)**
Value-added techniques contribute to reducing waste in the financial	142	4.19	0.79	17.97	84	0.000

resources of capital projects.						
Value-added techniques contribute to improving performance tools for resource allocation in investment projects.	142	4.08	0.78	16.65	82	0.000
Value-added techniques guide financial resources toward high-priority projects in terms of economic and social importance.	142	4.22	0.78	18.56	84	0.000
Value-added techniques analyze the returns resulting from resource allocation in capital projects.	142	4.08	0.82	15.71	82	0.000
Value-added techniques help evaluate the impact of economic changes (inflation and recession) on the efficiency of capital resource allocation.	142	4.00	0.95	12.61	80	0.000

Value-Added Techniques	142	4.11	0.64	20.79	82	0.000

The source: SPSS program outputs prepared by the researcher

The overall mean of the sample members' evaluations for all statements related to the independent variable (value-added techniques contribute to the efficiency of resource allocation in public sector capital projects as one of the capital budgeting tools) reached 4.11 out of 5, with a relative agreement importance of 82%, which corresponds to a high level of evaluation of the contribution of value-added techniques. The total standard deviation from the mean was only 0.64, indicating that the responses were closely clustered around the mean, and this high-level evaluation is statistically significant.

The statement "Value-added techniques contribute to directing financial resources toward high-priority projects in terms of economic and social importance" ranked first in the evaluation of value-added techniques, with a mean response of 4.22 and a relative weight of 84%, indicating a statistically significant high contribution.

The statement "Value-added techniques contribute to reducing waste in the financial resources of capital projects" ranked second, with a mean response of 4.19, a relative weight of 84%, and a p-value of 0.000, which is smaller than the assumed significance level of 0.05. This signifies a statistically significant high evaluation of this statement as one of the value-added techniques.

Finally, the statement "Value-added techniques help evaluate the impact of economic changes (inflation and recession) on the efficiency of capital resource allocation" had a mean of 4.0 and a relative weight of 80%, also with a statistically significant high evaluation.

What is the evaluation level of capital budgeting tools in terms of the tools used in capital budgeting within public sector units and their role in the efficiency of investment decisions, according to the views of the study sample (government employees)?

To determine the evaluation level and contribution of capital budgeting tools, they were measured through a set of dimensions (Profitability Index, Sensitivity Analysis, Value-Added Techniques, and the Net Present Value Index, which contributes to the quality of capital decision-making in government units). These dimensions were assessed using statements that highlight the evaluation level by extracting means, standard deviations, relative importance, and the significance level of the statements, as follows:

A. The Net Present Value Index contributes to the quality of capital decision-making in government units (government employees).

Table (25): Statistical functions for evaluating the level of the Net Present Value Index.

	N	**Arithmetic Mean**	**Standard Deviation**	**T**	**Relative Weight %**	**Statistical Significance (SIG)**
The Net Present Value (NPV) index contributes to improving the accuracy of cost estimates for infrastructure	147	4.20	0.71	20.49	84	0.000

investment projects.						
The NPV index enhances the quality and accuracy of investment decisions in government units.	147	4.16	0.63	22.36	83	0.000
The NPV index assists in making accurate long-term investment decisions.	147	4.15	0.79	17.68	83	0.000
The NPV index aids in financing decisions for capital projects.	147	4.05	0.72	17.77	81	0.000
The NPV index contributes to enhancing the transparency of the capital decision-making process.	147	4.07	0.86	15.14	81	0.000
Net Present Value (NPV) Index	**147**	**4.13**	**0.58**	**23.56**	**83**	**0.000**

Source: Outputs of the SPSS program, prepared by the researcher.

The overall arithmetic mean of the sample respondents' evaluations regarding all statements related to the independent variable (the Net Present Value (NPV) index contributes to the quality of capital decision-making in government units) as one of the capital budgeting tools reached 4.13 out of 5 points. The relative importance of agreement with this evaluation was 83%, corresponding to a high level of evaluation for the contribution of the NPV index. The total standard deviation from the arithmetic mean was only 0.58, indicating the closeness of responses around the mean. This evaluation, rated as high, is statistically significant.

The statement "The Net Present Value (NPV) index contributes to improving the accuracy of cost estimates for infrastructure investment projects" ranked first in the evaluation of the NPV index, with an average response score of 4.20 and a relative weight of 84%. The statistical significance level was 0.000, which is smaller than the assumed significance level of 0.05, indicating that the

adoption of this statement as part of the NPV index is evaluated as high and statistically significant.

The second-ranked statement was "The NPV index enhances the quality and accuracy of investment decisions in government units", with an average response score of 4.16 and a relative weight of 83%, indicating a high contribution and statistical significance.

The statement "The NPV index aids in financing decisions for capital projects" ranked last, with an arithmetic mean of 4.05 and a relative weight of 81%, yet its contribution was still evaluated as high and statistically significant.

B- The Profitability Index Contributes to the Accuracy of Forecasting Financial Returns for Investment Projects in the Public Sector (Opinions of Government Employees)

Table (26): Statistical Indicators for Evaluating the Level of the Profitability Index

	N	Arithmetic Mean	Standard Deviation	T	Relative Weight %	Statistical Significance (SIG)
The profitability index enhances the accuracy of financial return estimates for capital projects.	147	4.16	0.78	18.16	83	0.000
The profitability index helps increase management's confidence in the expected financial return estimates.	147	4.08	0.62	20.98	82	0.000
The profitability index improves the accuracy of cost-benefit analyses for capital projects.	147	4.22	0.64	23.24	84	0.000
The profitability index reduces the deviation or gap	147	4.29	0.64	24.32	86	0.000

between initial financial return estimates and actual results.						
The profitability index assists in identifying and analyzing expected risks and their impact on financial returns.	147	4.22	0.69	21.50	84	0.000
Profitability Index	**147**	**4.20**	**0.47**	**30.76**	**84**	**0.000**

Source: Outputs of the SPSS program, prepared by the researcher.

The overall arithmetic mean of the sample respondents' evaluations regarding all statements related to the independent variable (the profitability index contributes to the accuracy of forecasting financial returns for investment projects in the public sector), as one of the capital budgeting tools, reached 4.20 out of 5 points. The relative importance of agreement with this evaluation was 83%, corresponding to a high level of evaluation for the contribution of the profitability index. The total standard deviation from the arithmetic mean was only 0.47, indicating the closeness of responses around the mean. This evaluation, rated as high, is statistically significant.

The statement "The profitability index reduces the deviation or gap between initial financial return estimates and actual results" ranked first in the evaluation of the profitability index, with an average response score of 4.08, a relative weight of 86%, and a statistical significance level of 0.000, which is smaller than the assumed significance level of 0.05. This indicates that the adoption of this statement as part of the profitability index is evaluated as high and statistically significant.

The second-ranked statement was "The profitability index improves the accuracy of cost-benefit analyses for capital projects", with an average response score of 4.08, a relative weight of 84%, and a high contribution rating that is statistically significant.

The statement "The profitability index helps increase management's confidence in the expected financial return estimates" ranked last, with an average score of 4.08 and a relative weight of 82%, yet its contribution was still evaluated as high and statistically significant.

C- Sensitivity Analysis Assists in Risk Management for Investment Projects in the Public Sector (Government Employees)

Table (27): Statistical Indicators for Evaluating the Level of Sensitivity Analysis

	N	**Arithmetic Mean**	**Standard Deviation**	**T**	**Relative Weight %**	**Statistical Significance (SIG)**
The sensitivity	147	4.28	0.64	24.28	86	0.000

analysis index contributes to identifying and analyzing cost-related risks associated with capital projects.						
The sensitivity analysis index helps determine price changes for raw materials or foreign currency and assesses market risk exposure through sensitivity analysis.	147	4.09	0.61	21.73	82	0.000
The sensitivity analysis index aids in evaluating strategic risks associated with capital projects by avoiding deviations from objectives.	147	4.06	0.61	21.07	81	0.000
Expertise in sensitivity analysis enhances the effectiveness of risk management in capital projects.	147	4.20	0.69	21.10	84	0.000
The sensitivity analysis index	147	4.18	0.69	20.72	84	0.000

helps improve decision-making in dealing with unexpected risks in capital projects.						
Sensitivity Analysis	**147**	**4.16**	**0.44**	**31.98**	**83**	**0.000**

Source: Outputs of the SPSS program, prepared by the researcher.

The overall arithmetic mean of the sample respondents' evaluations regarding all statements related to the independent variable (Sensitivity Analysis Assists in Risk Management for Investment Projects in the Public Sector), as one of the capital budgeting tools, reached 4.16 out of 5 points. The relative importance of agreement with this evaluation was 82%, corresponding to a high level of evaluation for the contribution of sensitivity analysis. The total standard deviation from the arithmetic mean was only 0.44, indicating the closeness of responses around the mean. This evaluation, rated as high, is statistically significant.

The statement "The sensitivity analysis index contributes to identifying and analyzing cost-related risks associated with capital projects" ranked first in the evaluation of sensitivity analysis, with an average response score of 4.28, a relative weight of 86%, and a statistical significance level of 0.000, which is smaller than the assumed significance level of 0.05. This indicates that the adoption of this statement as part of the sensitivity analysis index is evaluated as high and statistically significant.

The second-ranked statement was "Expertise in sensitivity analysis enhances the effectiveness of risk management in capital projects", with an average response score of 4.20, a relative weight of 84%, and a high contribution rating that is statistically significant.

The statement "The sensitivity analysis index helps evaluate strategic risks associated with capital projects by avoiding deviations from objectives" ranked last, with an average score of 4.06 and a relative weight of 81%, yet its contribution was still evaluated as high and statistically significant.

C- Value-Added Techniques Contribute to Resource Allocation Efficiency in Capital Projects in the Public Sector

Table (28): Statistical Indicators for Evaluating the Level of Value-Added Techniques

	N	**Arithmetic Mean**	**Standard Deviation**	**T**	**Relative Weight %**	**Statistical Significance (SIG)**
Value-added techniques contribute to reducing waste in financial resources for capital projects.	147	4.22	0.64	23.22	84	0.000
Value-added techniques	147	4.24	0.77	19.48	85	0.000

help improve performance tools related to resource allocation in investment projects.						
Value-added techniques contribute to directing financial resources toward high-priority projects in terms of economic and social importance.	147	4.27	0.69	22.42	85	0.000
Value-added techniques analyze the returns resulting from resource allocation in capital projects.	147	4.29	0.65	23.92	86	0.000
Value-added techniques assist in evaluating the impact of economic changes (inflation and recession) on the efficiency of capital resource allocation.	147	4.27	0.63	24.66	85	0.000
Value-Added Techniques	**147**	**4.26**	**0.49**	**30.87**	**85**	**0.000**

Source: SPSS Program Outputs Prepared by the Researcher

The overall arithmetic mean of the estimates of the sample members as a whole for all statements related to the independent variable (value-added techniques contribute to the efficiency of resource allocation in public sector capital projects) as one of the (capital budgeting tools) reached (4.26) out of 5. The relative importance of agreement on this evaluation was (85%), corresponding to a high level of assessment of the contribution of value-added techniques. The overall standard

deviation from the arithmetic mean was only (0.49), indicating a convergence of responses around the mean and that this high-level evaluation is statistically significant.

The statement "Value-added techniques analyze the returns resulting from resource allocation in capital projects" ranked first in the evaluation of value-added techniques, with an average response of (4.29) and a relative weight of (86%). The contribution of this statement was assessed as high and statistically significant. The statement "Value-added techniques help evaluate the impact of economic changes (inflation and recession) and thus the efficiency of capital resource allocation" ranked second, with an average response of (4.27) and a relative weight of (85%). The significance level was (0.000), smaller than the assumed significance level of 0.05, making the reliance on this statement as part of value-added techniques statistically significant at a high level. Finally, the statement "Value-added techniques contribute to reducing waste in the financial resources of capital projects" had an arithmetic mean of (4) and a relative weight of (84%), with a high and statistically significant evaluation.

Study Hypotheses Testing (Academics and Employees) (Entire Sample)

Main Hypothesis 1:

PH1: There is a statistically significant impact relationship between the tools used in capital budgeting and the investment decision-making process in the public sector.

Multiple Linear Regression Analysis

Multiple linear regression was used to measure the impact of the tools used in capital budgeting on investment decisions, as follows:

Table (40): Statistical Significance of Testing the Relationship Between the Independent Variable (Tools Used in Capital Budgeting) and the Dependent Variable (Investment Decision)

Model Summary				
Std. Error of the Estimate	Adjusted R Square	R Square	R	Model
0.29672	**0.571**	**0.577**	**.760[a]**	1
a. Predictors: (Constant), Value-Added Techniques, Profitability Index, Sensitivity Analysis, Net Present Value Index				

Source: SPSS Program Outputs Prepared by the Researcher

The R measure, which represents the correlation coefficient, has a value of 76.0%. The coefficient of determination (R^2) is approximately 57.7%, indicating that the independent variable, tools used in capital budgeting, explains 57.7% of the variation in the dependent variable (investment decision) in this model. This means that the independent variable (tools used in capital budgeting) accounts for only 57.7% of the changes in the dependent variable (investment decision) (Y), while the remaining variation is attributed to other factors.

Table (41): Analysis of Variance (ANOVA) Between the Independent Variable (Tools Used in Capital Budgeting) and the Dependent Variable (Investment Decision)

NOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.136	4	8.534	96.932	.000[b]
	Residual	25.004	284	0.088		
	Total	59.140	288			
a. Dependent Variable: القرار الاستثماري						

b. Predictors: (Constant), Value-Added Techniques, Profitability Index, Sensitivity Analysis, Net Present Value Index

The table also shows the analysis of variance (ANOVA), which provides insight into the explanatory power of the model as a whole. The F-statistic is 96, and the significance level (Sig = 0.000) is smaller than the standard significance threshold (Sig = 0.05). This confirms the statistical explanatory power of the multiple linear regression model, meaning the model as a whole is statistically significant.

Table (42): Statistical Significance of the Impact Equation in the Main Hypothesis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	**1.223**	**0.159**		**7.693**	**0.000**
	Net Present Value Index	**0.205**	**0.045**	**0.257**	**4.517**	**0.000**
	Profitability Index	**0.071**	**0.048**	**0.082**	**1.482**	**0.140**
	Sensitivity Analysis	**0.113**	**0.047**	**0.131**	**2.405**	**0.017**
	Value-Added Techniques	**0.319**	**0.045**	**0.403**	**7.036**	**0.000**
a. Dependent Variable: Investment Decision						

Source: SPSS Program Outputs Prepared by the Researcher

From Table (42), it is evident that the independent variable components (Net Present Value Index, Sensitivity Analysis, and Value-Added Techniques) are statistically significant in this model based on the t-test, as the significance level (Sig < 0.05) with a value of Sig = 0.000. However, the Profitability Index showed weak influence in the model. The estimated regression equation is as follows:

Investment Decision = 1.22 + 0.31(Value-Added Techniques) + 0.11(Sensitivity Analysis) + 0.20(Net Present Value Index) + 0.71(Profitability Index)

Based on the above, we reject the null hypothesis and accept the alternative hypothesis:

There is a statistically significant impact relationship for the tools used in capital budgeting on the investment decision-making process in the public sector.

The main hypothesis (PH1) is further divided into a set of sub-hypotheses, including:

PH1.1: There is a statistically significant impact relationship for the tools used in capital budgeting, specifically the Net Present Value Index, in contributing to the quality of capital decision-making in governmental units regarding the investment decision.

Linear regression was used to measure the impact of the Net Present Value Index on the investment decision, as follows:

Table (43): Statistical Significance of Testing the Relationship Between the Independent Variable (Net Present Value Index) and the Dependent Variable (Investment Decision)

Model	R	R Square	Adjusted R Square	F	Sig.
1	**.652[a]**	**0.426**	**0.424**	**212.610**	**.000[b]**
a. Predictors: (Constant), Net Present Value Index					

Source: SPSS Program Outputs Prepared by the Researcher

The R measure, representing the correlation coefficient, has a value of 65.2%. The coefficient of determination (R^2) is approximately 42.6%, indicating that the independent variable, Net Present Value Index, explains 42.6% of the variation in the dependent variable (investment decision) in this model. This means that the independent variable (Net Present Value Index) accounts for only 42.6% of the changes in the dependent variable (investment decision) (Y), while the remaining variation is attributed to other factors.

The table also shows the analysis of variance (ANOVA), which highlights the explanatory power of the model as a whole. The F-statistic is 212, and the significance level (Sig = 0.000) is smaller than the standard significance threshold (Sig = 0.05). This confirms the statistical explanatory power of the linear regression model, meaning the model as a whole is statistically significant.

Table (44): Statistical Significance of the Impact Equation in the First Sub-Hypothesis

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.009	0.150		13.407	0.000
	Net Present Value Index	0.521	0.036	0.652	14.581	0.000
a. Dependent Variable: Investment Decision						

Source: SPSS Program Outputs Prepared by the Researcher

From Table (44), it is clear that the independent variable (Net Present Value Index) is statistically significant in this model according to the t-test, as the significance value (Sig) is less than 0.05, with a value of Sig = 0.000. The estimated regression equation is as follows:

Investment Decision = 2.0 + 0.52(Net Present Value Index)

Based on this, we reject the null hypothesis and accept the alternative hypothesis:

There is a statistically significant impact relationship for the tools used in capital budgeting, specifically the Net Present Value Index, in contributing to the quality of capital decision-making in governmental units regarding the investment decision.

PH1.2: There is a statistically significant impact relationship for the tools used, specifically the Profitability Index, in contributing to the accuracy of predicting financial returns of investment projects in the public sector in the investment decision-making process.

Linear regression was used to measure the impact of the Profitability Index on the investment decision, as follows:

Table (45): Statistical Significance of Testing the Relationship Between the Independent Variable (Profitability Index) and the Dependent Variable (Investment Decision)

Model	R	R Square	Adjusted R Square	F	Sig.
1	**.575[a]**	**0.331**	**0.329**	**142.026**	**.000[b]**
a. Predictors: (Constant), Profitability Index					

Source: SPSS Program Outputs

The R measure, representing the correlation coefficient, has a value of 57.5%. The coefficient of determination (R^2) is approximately 33.1%, indicating that the independent variable, Profitability Index, explains 33.1% of the variation in the dependent variable (investment decision) in this

model. This means that the independent variable (Profitability Index) accounts for only 33.1% of the changes in the dependent variable (investment decision) (Y), while the remaining variation is attributed to other factors.

The table also shows the analysis of variance (ANOVA), which highlights the explanatory power of the model as a whole. The F-statistic is 142, and the significance level (Sig = 0.000) is smaller than the standard significance threshold (Sig = 0.05). This confirms the statistical explanatory power of the linear regression model, meaning the model as a whole is statistically significant.

Table (46): Statistical Significance of the Impact Equation in the Second Sub-Hypothesis

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.108	0.175		12.066	0.000
	Profitability Index	0.496	0.042	0.575	11.917	0.000
a. Dependent Variable: Investment Decision						

Source: SPSS Program Outputs Prepared by the Researcher

From Table (46), it is clear that the independent variable (Profitability Index) is statistically significant in this model according to the t-test, as the significance value (Sig) is less than 0.05, with a value of Sig = 0.000. The estimated regression equation is as follows:

Investment Decision = 2.1 + 0.49(Profitability Index)

Based on this, we reject the null hypothesis and accept the alternative hypothesis:

There is a statistically significant impact relationship for the tools used in capital budgeting, specifically the Profitability Index, in contributing to the accuracy of predicting financial returns of investment projects in the public sector in the investment decision-making process.

PH1.3: There is a statistically significant impact relationship for the tools used, specifically the Sensitivity Analysis Index, in helping manage risks for investment projects in the public sector in the investment decision-making process.

Linear regression was used to measure the impact of the Sensitivity Analysis Index on the investment decision, as follows:

Table (47): Statistical Significance of Testing the Relationship Between the Independent Variable (Sensitivity Analysis Index) and the Dependent Variable (Investment Decision)

Model	R	R Square	Adjusted R Square	F	Sig.
1	.592[a]	0.350	0.348	154.569	.000[b]
a. Predictors: (Constant), Sensitivity Analysis Index					

Source: SPSS Program Outputs Prepared by the Researcher

The R measure, representing the correlation coefficient, has a value of 59.2%. The coefficient of determination (R^2) is approximately 35.0%, indicating that the independent variable, Sensitivity Analysis Index, explains 35.0% of the variation in the dependent variable (investment decision) in this model. This means that the independent variable (Sensitivity Analysis Index) accounts for only 35.0% of the changes in the dependent variable (investment decision) (Y), while the remaining variation is attributed to other factors.

The table also shows the analysis of variance (ANOVA), which highlights the explanatory power of the model as a whole. The F-statistic is 154, and the significance level (Sig = 0.000) is smaller than the standard significance threshold (Sig = 0.05). This confirms the statistical explanatory power of the linear regression model, meaning the model as a whole is statistically significant.

Table (48): Statistical Significance of the Impact Equation in the Third Sub-Hypothesis

Coefficients [a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	2.066	0.171		12.096	0.000
	Sensitivity Analysis	0.510	0.041	0.592	12.433	0.000
a. Dependent Variable: Investment Decision						

Source: SPSS Program Outputs Prepared by the Researcher

From Table (48), it is clear that the independent variable (Sensitivity Analysis Index) is statistically significant in this model according to the t-test, as the significance value (Sig) is less than 0.05, with a value of Sig = 0.000. The estimated regression equation is as follows:

Investment Decision = 2.0 + 0.51(Sensitivity Analysis Index)

Based on this, we reject the null hypothesis and accept the alternative hypothesis:

There is a statistically significant impact relationship for the tools used, specifically the Sensitivity Analysis Index, in helping manage risks for investment projects in the public sector in the investment decision-making process.

PH1.4: There is a statistically significant impact relationship for the tools used, specifically the Value-Added Techniques Index, in contributing to the efficiency of resource allocation in capital projects for the public sector in the investment decision-making process.

Linear regression was used to measure the impact of the Value-Added Techniques Index on the investment decision, as follows:

Table (49): Statistical Significance of Testing the Relationship Between the Independent Variable (Value-Added Techniques Index) and the Dependent Variable (Investment Decision)

Model	**R**	**R Square**	**Adjusted R Square**	**F**	**Sig.**
1	**.706[a]**	**0.498**	**0.496**	**284.893**	**.000[b]**
a. Predictors: (Constant), Value-Added Techniques					

Source: SPSS Program Outputs Prepared by the Researcher

The R measure, representing the correlation coefficient, has a value of 70.6%. The coefficient of determination (R^2) is approximately 49.8%, indicating that the independent variable, Value-Added Techniques Index, explains 49.8% of the variation in the dependent variable (investment decision) in this model. This means that the independent variable (Value-Added Techniques Index) accounts for only 49.8% of the changes in the dependent variable (investment decision) (Y), while the remaining variation is attributed to other factors.

The table also shows the analysis of variance (ANOVA), which highlights the explanatory power of the model as a whole. The F-statistic is 284, and the significance level (Sig = 0.000) is smaller

than the standard significance threshold (Sig = 0.05). This confirms the statistical explanatory power of the linear regression model, meaning the model as a whole is statistically significant.

Table (50): Statistical Significance of the Impact Equation in the Fourth Sub-Hypothesis

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	**(Constant)**	**1.836**	**0.140**		**13.138**	**0.000**
	Value-Added Techniques	**0.558**	**0.033**	**0.706**	**16.879**	**0.000**
a. Dependent Variable: Investment Decision						

Source: SPSS Program Outputs Prepared by the Researcher

From Table (50), we find that the independent variable (Value-Added Techniques Index) is statistically significant in this model according to the t-test, with a significance value (Sig) less than 0.05, where Sig = 0.000. The estimated regression equation is as follows:

Investment Decision = 1.8 + 0.55(Value-Added Techniques Index)

Based on this, we reject the null hypothesis and accept the alternative hypothesis:

There is a statistically significant impact relationship for the tools used, specifically the Value-Added Techniques Index, which contributes to the efficiency of resource allocation in capital projects for the public sector in the investment decision-making process.

Section Four: Conclusions and Recommendations

Conclusions:

1. There is a statistically significant relationship between the tools used in capital budgeting, including the Net Present Value (NPV) Index, Profitability Index, Sensitivity Analysis Index, and Value-Added Techniques Index, in the investment decision-making process in the public sector. These tools impact the quality of investment decisions, the accuracy of financial forecasts for capital projects, risk management for the projects, and the efficiency of resource allocation for capital projects.
2. The absence of an established system for evaluating capital projects reduces the efficiency of capital budgeting implementation. This, in turn, leads to the need for additional efforts, and the lack of a standardized system causes confusion and weak coordination between government units.
3. The prioritization of capital projects is highly influenced by political aspects and dimensions rather than by technical analysis.
4. The study shows that the use of capital budgeting tools helps reduce time and effort, minimizing delays caused by lengthy discussions related to financial feasibility studies. Capital budgeting indicators are tools that combine financial efficiency with sustainable development commitments.
5. The use of risk analysis tools contributes to the accuracy of capital decisions and reduces the risk of failure when implementing government projects.

Recommendations:

1. Rely on capital budgeting tools (Net Present Value, Sensitivity Analysis, Profitability Index, Value-Added Techniques) for investment decision-making, as the results of the practical study

have proven their impact and role. It is also essential to incorporate other techniques such as Internal Rate of Return (IRR) and Payback Period.

2. In the investment decision-making process, focus on a crucial and sensitive aspect, which is consulting with stakeholders and all involved parties, including the local community and project beneficiaries, to ensure goal alignment and the achievement of the public good.
3. Use the capital budgeting tools studied to evaluate projects from various perspectives and to make the optimal choice among alternatives. Additionally, expand the application of multiple evaluation techniques and risk assessments that affect project success.
4. Adopt budgets based on results and achieved performance, moving away from traditional methods based solely on inputs, by improving resource allocation systems to adapt to rapid changes in economic priorities.
5. Support research by developing new financial planning tools that align with local needs to enhance transparency and efficiency in decision-making. Also, organize awareness campaigns for employees and private sector companies regarding the importance of capital budgeting tools and their role in improving the quality of public sector projects.

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