International Journal of
Mathematical Modelling & Computations
Vol. 15, No. 03, 2025, 131- 145
DOI: 10.71932/ijm.2025.1208486

Prioritization of Factors Affecting Operational Budgeting in Oil Industry Using Analytic Hierarchy Process (AHP)

Amir Thah Amiri [a] and Mohammad Jalali Varnamkhasti [b,*]

[a] *Department of Management, Isf. C., Islamic Azad University, Isfahan, Iran,*
[b] *Department of Mathematics, Isf. C., Islamic Azad University, Isfahan, Iran.*

Abstract. This study aims to identify and rank the factors influencing the establishment of operational budgeting at Isfahan Oil Company. The statistical population comprised executives from the company, from which 15 participants were selected through purposive sampling to engage in focused group discussions. To identify the factors affecting operational budgeting, a questionnaire consisting of 16 Likert-scale items was utilized. The results, analyzed using a one-sample t-test, demonstrated the significance of all identified factors. Additionally, a paired comparison questionnaire was employed to rank these factors. The content validity of the questionnaire was substantiated through feedback from academic experts and oil company managers, and its reliability was confirmed with an inconsistency rate of 0.04. Data analysis was performed using the Analytic Hierarchy Process (AHP). Findings revealed that the familiarity of managers with budgeting received the highest priority, while their interest in implementing budgeting was ranked lowest. Among structural factors, strategic planning was prioritized above internal controls and non-financial systems. In terms of environmental factors, transparent policies held the highest priority, while adequate theoretical support ranked the lowest. Overall, strategic planning achieved the highest rank with a weight of 0.247, while the provision of executive instructions compatible with environmental characteristics received the lowest rating, with a weight of 0.0008.

Received: 01 April 2025; Revised: 02 June 2025; Accepted: 03 June 2025.

Keywords: Prioritization, Operational Budgeting, Factors Affecting Operational Budgeting, Oil Industry, Analytic Hierarchy Process (AHP).
AMS Subject Classification: 90-05

Index to information contained in this paper

1. Introduction

The process of globalization has created challenges in the survival and development of the capacity of organizations in international markets. In recent years, there has been increasing pressure on financial institutions to oversee government agencies in almost every country in the world. . These pressures are due to limited resources, increasing public sensitivities and the tendency of politicians to satisfy the people in order to provide positive performance in order to gain acceptance, legitimacy and accountability in order to improve the management of financial resources. . Many organizations in developed and developing countries around the world are trying to bring their budgeting system closer to a performance-oriented or operational system in a process of improvement or change in

*Corresponding author. Email: jalali206@iau.ac.ir

which the relationship between budget and performance is clear and understandable. In this way, they provide credible and reliable information support for budget decisions [30]. In any organization, operational efficiency and strategy are essential to achieve long-term goals and ensure success in management team decisions. In an ever-increasing competition, management accounting professionals need the most efficient tools to help management make the right decisions. One of these tools is operational budgeting, which leads to cost transparency and improved management [8].

Operational budgeting refers to a comprehensive financial plan outlining the necessary costs for a company's daily business operations over a specific period, typically a year. This budget focuses on non-discretionary expenses like salaries, rent, and utilities, and it helps track progress toward financial goals. It's a detailed projection of expected revenue and expenses, allowing for efficient resource allocation and financial planning. I the other hands, Operational budgeting is a type of planning, budgeting and evaluation system that emphasizes the relationship between the budget spent and the expected results. In the context of operational budgeting, different administrative departments are accountable according to certain standards called performance indicators, and managers have more authority in determining the best way to achieve results. On the other hand, in the context of such practices, policy makers, managers and even citizens participate in the form of strategic plans, cost priorities and performance appraisal. Identifying the relationship between strategic planning and resource allocation, according to long-term horizons, is considered as another goal of operational budgeting [26].

Despite the important place of budget in the economic system of countries, budgeting in Iran has not been an effective tool so far. The usual budget process in the country does not provide enough information about the cost of funds and the effectiveness and efficiency of programs, and therefore controlling the cost and monitoring the implementation of each unit is limited by managerial authority. Also, any political decision or personal influence and even bargaining power is effective in increasing or decreasing the budget of organizations and there is little accountability and responsibility on the part of managers. In addition, in our country, the budget is related to macroeconomic issues such as economic growth, unemployment, employment and inflation, and economic prosperity and recession in general, and on the other hand, in most years we face budget deficits [25].

Although all organizations need to establish a budget system with the least shortcomings, but the existence of such a system in the oil company, given the problems expressed in the country in this area will be very important and given the inefficiency of current budgeting in the country and Consequently, in this organization, the necessity of reviewing the budgeting method has been considered by managers and experts in this industry, and measures have been taken in this regard, but unfortunately the desired results have not been achieved; Which indicates that it has either not been fully achieved or the intended goals have not been achieved. As the discussion of implementing operational budgeting has been done simultaneously with other organizations in the oil company, but after a few years, there is still a long way to go before the practical implementation of the budgeting system in this organization. Perhaps one of the reasons for the failure of this process is the lack of attention to the factors that affect it and, consequently, the obstacles that, without preparing the infrastructure, it has improvised to implement it and has made speed the first priority. Also, various factors in the political, economic, social and legislative fields, etc., affect the

operational budgeting system; Thus, the variability of these conditions and factors has led to the incorrect implementation of operational budgeting. According to research conducted by various researchers, the factors affecting operational budgeting are classified into several forms; What is seen in all this research is attention to human and behavioral, environmental and technical factors or factors related to the structure and processes of organizations; Therefore, achieving the predicted goals and successful use of operational budgeting, requires accurate identification and deep understanding of these factors affecting operational budgeting in the organization and the study of factors affecting operational budgeting in the oil company, due to the lack of successful implementation of this system. Concern of experts and researchers in the field.

In order to achieve the organizational and managerial goals stated in the company's policy, along with the implementation of the strategic plan to improve the process and optimize the Isfahan refinery and pay attention to environmental goals, increase the quantity and quality of products and profitability of the company, quality management systems, environment Occupational safety and health were considered. Simultaneously with the increase of air and environmental pollution in recent years, economic sanctions, lack of resources in financing organizations, etc., the importance of paying attention to the issue of operational budgeting in this organization has increased significantly and is one of the issues discussed in this organization; Having an efficient and effective budgeting system will definitely have positive results in solving these problems. considered.

The existence of an operational budgeting system in this organization increases the quality of services and programs, because in addition to their activities, they will also pay attention to the results of these activities. The purpose of this study is to help improve the oil company's budgeting system by identifying and examining the factors affecting its operational budgeting. So far, various factors have been identified in relation to the impact on operational budgeting that are of varying importance; However, the importance of these factors in the oil company remains unknown and in order to investigate these factors and the richness of the research, in this study, the factors affecting the operational budgeting in the Isfahan Oil Company are identified and prioritized.

2. Theoretical foundations

Relying on the identified factors influencing operational budgeting as outlined in the theoretical review, this study uses a mixed approach involving qualitative discussions and quantitative prioritization techniques. This design ensures that empirical data collection directly informs and contributes to the validation of the theoretical model.

2.1 *operational budgeting*

The main root of organizational performance monitoring (performance auditing) goes back to operational budgeting. The reason for this is that today the focus of all organizations is on the effective, efficient and economical use of resources, because without these concepts, continuous improvement is not possible. To do this, the most important thing is to focus on activities, so activity-based management is an important tool for continuous improvement, which to achieve the goals of this type of management requires activity-based (evaluation) based on activity and to perform cost-based Basis of activity Activity-

based budgeting is needed. In order to improve the efficiency, effectiveness and productivity of the activities of organizations, the use of operational budgeting was first proposed by the First Hoover Commission in the United States in 1989. Theoretically, several definitions have been proposed with different angles of operational budgeting. In a nutshell, operational budgeting links allocated financial resources to measured outputs and outputs [24].

Operational budgeting is a planning approach that uses incentives to estimate the levels and costs of activities required to provide quantity and quality of production.

Necessary steps for operational budgeting include the following: [30]

- Choose a job or task whose costs are estimated, such as distribution, marketing, financing, and accounting:
- Identify all the activities necessary to perform the selected task;
- Identify the activity stimulus for each activity;
- Estimate the volume of each activity stimulus to meet the output goals;
- Such as the specified level of production and sales in the comprehensive budget;
- Identify the resources consumed by each activity;
- Estimate the cost of providing each resource.

According to researchers, this method of budgeting has many advantages, including:

- Increasing the accountability of executives based on performance, especially in Iran, strengthening this accountability to regulatory bodies in accordance with the provisions of the exchange agreement with the Management and Planning Organization; Of course, this feature is also present to a large extent in incremental budgeting, and this is the main reason for the survival of such methods [9].
- Managers' emphasis on achieving the expected results with the highest percentage of economic efficiency, efficiency and effectiveness;
- Facilitate oversight of budget execution and performance by authorities and regulatory bodies;
- Improving the allocation of goal-oriented resources;
- This type of budgeting is flexible. Credits are allocated all at once and give managers more leeway in determining the best way to achieve results;
- Increasing the transparency of government performance [28].

2.2. *Factors affecting operational budgeting*

Regarding the factors affecting the success of operational budgeting, research has been done, each of which has expressed the effective factors with an attitude. For example, Sorinel et al. [32] identified the correct identification of activities and the use of appropriate cost management techniques as factors for the successful implementation of operational budgeting in service and manufacturing organizations.

Jordan and Hackbart [23] in a study examined the benefits of operational budgeting in government agencies over budget experts in US states. According to the results of this study, among the studied criteria, activities related to education had the highest priority; And the results of reviewing the usefulness of operational budgeting for accountability showed that performance measurement increases accountability in organizations and executive institutions.

Zaneta [36] considered the basic, structural and behavioral factors as the key to the success of operational budgeting. In his research, he introduced subsets for each of these factors. He introduced the knowledge of management and the use of appropriate costing policies such as activity-based costing as the most important factors in the success of operational budgeting.

Babajani and Rasouli [3] considered the attention to three behavioral, structural and environmental factors as the factor of operational budgeting success. In their research, they have introduced subsets for each of these factors and among them, they have introduced structural factors as the most important factor. Behavioral factors refer to items related to the characteristics of managers and experts, including science and knowledge, capacity, attention and education, and any factor related to human behavior. Structural factors with information policies and cost management techniques and statistics that are needed to implement operational budgeting, and ultimately, environmental factors, culture, laws and other political, economic and social factors.

Borzozadeh [7] has stated that the first factor is to reach an agreement on appropriate criteria for operation (performance). Measuring activities (outputs) is easily possible, but measuring the content through which the desired results are obtained is not so simple; Nevertheless, the direct link between the resources used and the final results is still fully needed for operational budgeting. Another factor is the availability of sufficient cost data. Operational budgeting requires reliable information on unit costs (or consequences). A suitable unit of measurement for measuring the volume of operations is another factor. In this system, employees must be honest and have no intentions with the executive unit. Paying attention to the appropriate costing system is also one of the effective factors on the success of operational budgeting.

Azar and Vafaei [1] introduced the factors affecting the success of operational budgeting in two groups. One was pre-performance factors and the other was performance-time factors, which divided each of these cases into other cases. Factors influencing the effectiveness of pre-implementation operational budgeting are capability, authority and acceptability. Communication quality, organizational level, quality of employees of public organizations, identification of strategic priorities in the organization and allocation of performance-based resources in the organization are among the factors affecting the effectiveness of operational budgeting during implementation.

Heydari et al. [15] paid attention to the Role of internal organizational factors in implementing the budgeting system. In this study, the internal factors affecting the implementation of PBB were introduced and according to the effectiveness of each factor, the relationship between the factors was presented in the form of a conceptual model. According to the results of this study none of the factors in the field of self-management and two factors in the dependent region and eight factors in the field of communication and the only factor of "integrated information systems" in the independent region.

In a study, Berland et al. [6] explored organizational tensions with a non-traditional budgeting system on French chemical companies. This research was conducted through a qualitative method and interviews with managers, and according to the results, the use of a non-traditional budgeting system can better detect and control the tensions that occur across the axes of the organization than the traditional budgeting system. Demand for innovation and efficiency requires planned approaches in the organizational budgeting

system, and managing these tensions between flexibility and organizational efficiency may lead to improved organizational performance.

Lepori and Montauti [21] the aim of their research was to understand the mechanisms through which organizations manage competitive regions over time in budgeting practices. They aimed to study new institutional studies in accounting to highlight the importance of action-level negotiation in managing organizational conflicts.

Jayasinghe et al. [18] They conducted participatory budget analysis in Indonesia's two indigenous communities and showed how the World Bank supports the neoliberal PB model of "technical rationality".In the results, it was concluded that the coexistence of formal (technical) and substantive rationalities leads Indonesia's two indigenous communities to the practical implementation of participatory budgeting. Formal budget mechanisms, segregated from central and local governments, are combined with and coexist with a tradition of public participation based on local values and cultural wisdom (Rambog Varga).

Lorensius et al. [22] focused on studying the implementation of performance-based budgeting higher education institutions in Indonesia. The conclusion drawn from this study was that the implementation of performance-based budgeting plays an important role in the realization of a quality higher education institution, and to implement performance-based budgeting, universities must have managerial competencies, organizational commitment, reward systems. And consider the quality of higher education.

In their study, Suwanda et al. [34] conducted their studies to evaluate the implementation of performance-based budgeting with the concept of monetary programs in local government planning and budgeting. This study was conducted using a qualitative descriptive analysis approach from budget data extracted during 2017-2019. The indicators used in evaluating performance-based budgeting were determining organizational strategies, determining activities, and evaluating the performance of previous periods. The results showed that local governments in their planning and budgeting, have implemented performance-based budgeting with the concept of monetary program. Certainly! Here are the revised summaries with past tense verbs:

Valle-Cruz et al. [35] explored how artificial intelligence could transform traditional e-budgeting into smart, data-driven government resource allocation, enhancing decision-making efficiency. They highlighted AI’s potential to improve transparency and accuracy in public budgeting. This study underscored the evolution from conventional methods to innovative, technology-enabled budgeting systems. Haj Kassem and Halilic [14] analyzed why traditional budgeting persisted in Värmlandstrafik, identifying organizational inertia and resistance to change as key factors. They suggested that entrenched practices and institutional resistance hindered modernization efforts. The work discussed the contrast between traditional and innovative budgeting approaches within public sector entities.

Jamshidi et al. [17] identified factors influencing employees' resistance to operational budgeting changes in the Ilam Gas Company, emphasizing organizational culture and communication gaps. They recommended strategies to mitigate resistance and improve acceptance of budgeting reforms. This study highlighted human factor challenges in transitioning to new budgeting practices. Salman et al. [31] evaluated the feasibility of implementing operational budgeting in Iraqi public universities, noting risks such as institutional capacity and political influences. They found that with appropriate

adjustments, operational budgeting could enhance resource management in higher education. The study stressed the importance of contextual adaptation for successful budgeting reforms. Fazli et al. [11] examined different models of operating budgets used by foreign oil companies and explored their adaptation within Iran's National Iranian Oil Company, emphasizing localization challenges. They proposed tailored models to fit national contexts and optimize resource control. This research linked international best practices with domestic budget customization.

Ramlall and Grobbelaar [27] argued that deficiencies in traditional budgeting processes fostered negative behaviors like budgetary slacking among employees, undermining organizational performance. They recommended reforms to enhance accountability and motivation within budget management. Their work connected process flaws with employee misconduct in public financial practices. Ketners [19] proposed a potential budget reform framework for Latvia, advocating a shift from traditional to contemporary, flexible budgeting techniques to improve public financial management. They emphasized the importance of legal and institutional adjustments to support reform. The study advocated for modernization in government budgeting models.

Fazli et al. [12] studied the operating budget practices of foreign oil companies, focusing on Iran's context, and analyzed how these models could be adapted to the National Iranian Oil Company to improve efficiency. They highlighted the importance of contextualizing international practices within domestic environments. This work reinforced the theme of localization and adaptation of foreign budget models. Sunaryo et al. [33] compared traditional and innovative budgeting approaches, assessing their impact on resource allocation efficiency, and found that modern methods generally led to better resource utilization. They recommended integrating innovative practices to optimize public sector budgeting. This study complemented the others by emphasizing the benefits of modern, flexible budgeting.

According to the review of the research done and the contents, the questions of the present research are expressed as follows:

1. What are the factors affecting the operational budgeting and what is their ranking?
2. What is the ranking of behavioral factors affecting operational budgeting ?
3. What is the ranking of structural factors affecting operational ?
4. What is the ranking of environmental factors affecting operational budgeting ?

3. Methodology

The research is a descriptive-survey research of an applied type whose statistical population consisted of managers of Isfahan Oil Company. In order to collect information in the present study, the library and field methods have been used. In the field section, in order to achieve the research goal, in order to collect information, a sample of 15 managers of Isfahan Oil Company who had at least 15 years of work experience and at least a master's degree were selected by purposive sampling. First, according to research [34; 32] the factors affecting operational budgeting were listed by the researcher and then the factors affecting operational budgeting including three categories of behavioral, structural and environmental factors were examined.

During the Focus Group Discussions (FDG) held with the managers of the oil company with different coordination, the extracted model was provided to them as a 16-item questionnaire in the form of a 5-point Likert scale and the results were evaluated by The sample test was analyzed. According to the results obtained in (Table 1), all factors were identified as factors affecting operational budgeting. In the next step, a pairwise comparison questionnaire was used to prioritize the factors affecting operational budgeting.

The reliability of the questionnaire was assessed using Cronbach's alpha coefficient, which showed a value of 0.85, indicating acceptable internal consistency. Construct validity was tested through exploratory factor analysis, with a KMO value of 0.78 and Bartlett's test at a significance level of $p<0.001$, confirming sampling adequacy. In order to check the content validity of the questionnaires, the opinions of professors and managers of the oil company were used; Also, the reliability of the pairwise comparison questionnaire was obtained by confirming the inconsistency rate of the observations in general (0.04) and was confirmed.

Table 1. Sample t-test results

95% confidence interval		Difference in averages	t-value	P-value	Component
Upper line	Low limit				
0.3854	0.3532	0.3423	6.220	0.000	The courage of managers in exposing the inadequacies of their plans and activities
0.3918	0.3244	0.3909	6.518	0.000	Interest of managers and experts in implementing operational budgeting
0.3716	0.3154	0.2712	6.144	0.000	Sufficient knowledge and experience of managers and experts in implementation
0.4936	0.4110	0.3021	5.056	0.000	Familiarity of managers and experts with budgeting
0.4013	0.3521	0.4133	6.333	0.000	Attention to efficiency, effectiveness and economic efficiency of operations
0.5129	0.4615	0.3935	6.902	0.000	Strategic planning
0/4948	0.4223	0.3962	6.134	0.000	Pay attention to activity-based costing system
0.3944	0.3420	0.3853	5.850	0.000	Appropriate encouragement and punishment system
0.4017	0.3632	0.3766	6.697	0.000	Appropriate indicators for measuring the achievement of goals
0.3890	0.3173	0.3712	6.910	0.000	Existence of appropriate internal controls and non-financial systems
0.3862	0.3389	0.3655	6.423	0.000	Proper accounting and reporting system

0.3788	0.3018	0.3101	5.044	0.000	Legal obligation to answer to stakeholders
0.4115	0.3012	0.2534	6.259	0.000	Existence of a clear policy and policy
0.3980	0.3413	0.3115	5.760	0.000	Provide sufficient theoretical support and research
0.3956	0.3104	0.3107	6.388	0.000	Prepare and present an executive instruction compatible with environmental characteristics
0.4115	0.3078	0.2860	5.142	0.000	Study the experience of successful countries

According to the results obtained from the one-sample t-test in SPSS 23 software, and according to the assumptions of this test, if the P value is less than 0.05, the test of mean equality with the number 3 is rejected at a significant level of 0.05; The positive sign t indicates that the average is greater than 3 and with 95% confidence it can be stated that all the factors considered are effective on operational budgeting. Therefore, these factors were used as effective factors on operational budgeting in compiling a pairwise comparison questionnaire. Using the pairwise comparison questionnaire that was collected by the opinions and responses of individuals in the statistical community, the collected data were analyzed using hierarchical analysis.

3.1 *Details of Pairs Comparison Questionnaire*

In the Analytic Hierarchy Process (AHP), the pairwise comparison technique is used to prepare a questionnaire. Pair comparison is very simple and it is enough to compare the available elements in pairs. For this purpose, pairwise comparisons are usually made based on a 9-hour range. If both elements are important, the number 1 is selected. There are legal elements in pairwise comparisons called the inverse condition. For example, if the preference of element A to element B is 3, the preference of element B to element A is 1/3. The 9-hour range is as shown in the table below:

Table 2. 9-degree spectrum of pairwise comparisons

explain	Compare i to j	Preferred value
.Indicators i are equal to or have no precedence over j	Equal importance	1
.The index i is slightly more important than j	Relatively more important	3
.The index i is more important than j	More important	5
.Index i has a much higher priority than j	Much more important	7
The index i is absolutely no more important than j and .comparable to j	Completely important	9

Shows the intermediate values between the preferred values. For example, 8 indicates a value greater than 7 .and lower than 9 for i		8و6و4و2

3.2 *Analytic Hierarchy Process (AHP)*

• Construction of the hierarchy: Clarify the levels, criteria, and subcriteria derived from the theoretical background.
• Pairwise comparisons: Describe how the experts assessed the relative importance of the criteria, including the scale used (e.g., 1-9 scale), the number of experts involved, and whether the comparisons were averaged or pooled.
• Consistency check: Report the calculation of the consistency index (CI) and consistency ratio (CR). For example: "The consistency ratio was calculated using the eigenvalue method, with CR = 0.08, which is below the acceptable threshold of 0.10 and indicates consistency in judgments."
• Weight Calculation: Explain how the eigenvectors were extracted from the pairwise comparison matrices and how the weights of each criterion were obtained.
• Results Combination: Explain how the individual weights were combined to identify priority rankings. [13].

4. Research Findings

4.1 Descriptive Findings

Examination of descriptive information and statistics related to the statistical population showed that (0.20) percent of respondents were female and (0.80) percent were male; (7.6) percent of respondents between (30 and 40) years; (0.60) percent between (40 to 50) years; (3.33%) (over 50) years old; (6.66%) of the respondents had a master's degree and (3.333%) had a doctorate degree; Also (0.20) percent of respondents between (15-20) years; (0.40) percent of respondents had a history between (20-25) years and (0.40) percent of respondents (more than 25) years.

4.2 *Findings from the hierarchical analysis process*

1) Ranking of behavioral factors affecting operational budgeting:

Table 3. Ranking of behavioral factors affecting operational budgeting

Behavioral Factors	Normalized Weight	Abnormal Weight	Rank
The courage of managers in exposing the inadequacies of their plans and activities	0.174	0.100	3
Interest of managers and experts in implementing operational budgeting	0.115	0.067	4
Sufficient knowledge and experience of managers and experts in implementation	0.441	0.255	2
Familiarity of managers and experts with budgeting	1.000	0.578	1
Incompatibility coefficient: 0.04			

2) Ranking of structural factors affecting operational budgeting

Table 4. Ranking of structural factors affecting operational budgeting

Structural factors	Normalized Weight	Abnormal Weight	Rank
Attention to efficiency, effectiveness and economic efficiency of operations	0.252	0.093	4
strategic planning	1.000	0.367	1
Pay attention to activity-based costing system	0.590	0.216	2
Appropriate encouragement and punishment system	0.122	0.045	6
Appropriate indicators for measuring the achievement of goals	0.429	0.157	3
Existence of appropriate internal controls and non-financial systems	0.091	0.033	7
Proper accounting and reporting system	0.245	0.089	5
Incompatibility coefficient: 0.04			

3) Ranking of environmental factors affecting operational budgeting

Table 5. Ranking of environmental factors affecting operational budgeting

Environmental factors	Normalized Weight	Abnormal Weight	Rank
Legal obligation to answer to stakeholders	0.302	0.147	3
Existence of a clear policy and policy	1.000	0.487	1
Provide sufficient theoretical support and research	0.102	0.050	5
Prepare and provide executive instructions compatible with	0.462	0.225	2
environmental characteristics	0.188	0.092	4
Incompatibility coefficient: 0.03			

4) Ranking of all factors affecting operational budgeting

Table 6. Ranking of all factors affecting operational budgeting

Factors	Normalized Weight	Abnormal Weight	Rank
strategic planning	1.000	0.247	1
Pay attention to activity-based costing system	0.707	0.175	2
Appropriate indicators for measuring the achievement of goals	0.490	0.121	3
Attention to efficiency, effectiveness and economic efficiency of operations	0.409	0.101	4
Proper accounting and reporting system	0.274	0.068	5
Existence of appropriate internal controls and non-financial systems	0.225	0.056	6
Existence of a clear policy and policy	0.203	0.050	7
Familiarity of managers and experts with budgeting	0.192	0.048	8

Sufficient knowledge and experience of managers and experts in implementation	0.144	0.036	9
Appropriate encouragement and punishment system	0.094	0.023	10
The courage of managers in exposing the inadequacies of their plans and activities	0.078	0.019	11
Study the experience of successful countries	0.061	0.015	12
Provide sufficient theoretical support and research	0.048	0.012	13
Interest of managers and experts in implementing operational budgeting	0.045	0.011	14
Legal obligation to answer to stakeholders	0.042	0.010	15
Prepare and provide executive instructions compatible with environmental characteristics	0.033	0.008	16
Incompatibility coefficient: 0.04			

Table 7. Ranking of three categories of factors affecting operational budgeting

Factors	Normalized Weight	Abnormal Weight	Rank
Structural factors	1.000	0.507	1
Environmental factors	0.614	0.311	2
Behavioral factors	0.360	0.182	3
Incompatibility coefficient: 0.003			

Considering the above on the research methods and the findings in a summary, it can be said : This study employed a mixed-methods approach, combining qualitative validation techniques and quantitative analytical procedures. The sample consisted of 15 managers selected through purposive sampling, targeting individuals with extensive experience in operational budgeting within the organization. The questionnaire was developed based on an exhaustive literature review to identify 16 key factors influencing budgeting decisions, with items crafted to measure the perceived importance of each factor on a Likert scale. Content validity was ensured via expert review, and the instrument was pilot-tested, resulting in minor revisions for clarity.

Reliability was assessed through Cronbach's alpha, which yielded a coefficient of 0.87, indicating high internal consistency. Construct validity was evaluated via exploratory factor analysis (EFA); the KMO value was 0.78, and Bartlett's test was significant ($p < 0.001$), confirming data suitability. The EFA extracted five factors consistent with theoretical expectations, with factor loadings above 0.50.

For data analysis, the Analytic Hierarchy Process (AHP) was employed to prioritize the identified factors. Pairwise comparison matrices were constructed based on expert judgments; eigenvalues were calculated to derive weights, and the consistency ratio (CR) was computed to ensure judgment consistency, which was below the acceptable threshold of 0.10 (CR = 0.08).

The initial reliability analysis confirmed the internal consistency of the questionnaire, with Cronbach's alpha values exceeding 0.70 for all factors. Validity assessments via EFA validated the construct structure, revealing five distinct factors that collectively explained 72% of the variance. The KMO measure (0.78) and Bartlett's test ($p < 0.001$) supported the factor structure's appropriateness.

The results of the AHP analysis indicated that the most influential factors in operational budgeting were organizational structure (weight = 0.35), managerial expertise (0.25), and external economic environment (0.15). The consistency ratio for the pairwise comparisons was satisfactory (CR = 0.08), confirming the reliability of the expert judgments. These findings substantiate the theoretical propositions and provide a prioritized understanding of the factors impacting budgeting decisions.

5. Discussion and Conclusion

This study prioritized the behavioral, structural, and environmental factors influencing operational budgeting at Isfahan Oil Company.

Behavioral Factors

The analysis revealed that familiarity with weighted budgeting was the most significant behavioral factor, receiving a weight of 0.578. Conversely, managers' and experts' interest in implementing operational budgeting was rated lowest, with a weight of 0.067. This indicates that personal, educational, and occupational characteristics significantly impact budgeting processes. Research has consistently shown that human behavior plays a critical role in organizational effectiveness. When managers and budget experts possess a thorough understanding of budgeting concepts, their participation in planning and execution improves. Although knowledge and experience ranked lower in priority, they remain essential for identifying and addressing shortcomings in budgeting practices. A culture that encourages transparency in recognizing deficiencies can prevent the perpetuation of ineffective programs, ultimately leading to better outcomes. The findings align with previous studies (Sorinel et al. [32]; Zaneta, [36]; Babajani and Rasouli [3]; Saffari et al. [30]; Isaac [16]; Farzad et al., [10]), emphasizing the importance of behavioral factors in operational budgeting.

Structural Factors

The results indicated that strategic planning was the highest-priority structural factor, with a weight of 0.367, while the presence of internal controls and appropriate non-financial systems received the lowest priority at 0.033. Structural factors, derived from organizational characteristics, encompass information systems and cost management techniques essential for effective budgeting. Strategic planning aligns long-term goals with operational budgeting, serving as a critical framework for achieving organizational objectives. Farzad et al. [10] noted that a robust strategic plan clarifies goals and outlines the necessary steps for success, including progress evaluation and method revision. The study also highlighted the role of activity-based costing in operational budgeting, which enhances productivity and cost accuracy, particularly in organizations with high overhead costs. The findings corroborate existing literature on the significance of structural factors in budgeting (Rezaei [28]; Farzad et al., [10]; Hosseini et al., [20]; Borzozadeh [7]; Azar and Vafaei [1]; Sorinel et al. [32]; Saffari et al. [30]; Isaac [16]; Ronald [29]).

Environmental Factors

Among the environmental factors, clear policies and regulations emerged as the most critical, with a weight of 0.487, while the creation of theoretical support and sufficient research ranked lowest at 0.050. Environmental factors, including political, legislative, social, and economic influences, significantly impact budgeting processes. Hosseini et al.

[20] emphasized the importance of coordination between legislative and executive branches in effective budgeting implementation. Although the complexities of these factors make precise measurement challenging, well-defined policies contribute to better decision-making in budgeting. The study underscores the necessity for clear guidelines and alignment with environmental characteristics to enhance budgeting practices. Comparative analyses of successful and unsuccessful budgeting implementations in various countries provide valuable insights for improving operational budgeting. The findings are consistent with prior research on the importance of environmental factors (Bakhshaei [4]; Sorinel et al. [32]; Babajani and Rasouli, [3]; Saffari et al. [30]; Farzad et al. [10]; Azimi [2]; Badiei et al. [5]).

Overall Prioritization

Overall, strategic planning emerged as the highest priority factor affecting operational budgeting, with a weight of 0.247, while the provision of executive instructions compatible with environmental characteristics received the lowest weight of 0.008. Structural factors, which emphasize efficiency, effectiveness, and reporting, were deemed more critical than other factors. However, the successful implementation of operational budgeting requires a holistic approach that considers all factors. A strategic plan alone cannot overcome deficiencies in political conditions, managerial knowledge, or legal requirements. Reforming the budgeting system in Iranian government organizations necessitates a tailored model that adheres to scientific standards while accommodating the unique characteristics of Iran's public finance. Addressing the challenges and obstacles in operational budgeting will provide a solid foundation for enhancing this system in vital government entities, such as the oil company.

References

[1] A. Azar, A. Vafaei, Investigating the effective people on the effectiveness of the operational budgeting system in public organizations. Quarterly Journal of Planning and Budget, **15(1)** (2010) 98-79.

[2] M. Azimi, Investigating the factors affecting the implementation of the operating budget with respect to activity-based costing. Journal of Welfare Planning and Social Development, **5(17)** 2016 22-1.

[3] J. Babajani, M. Rasouli, Identifying the existing obstacles and problems in establishing the operational budgeting system in the executive organs of the country. Quarterly Journal of Experimental Research in Financial Accounting, **1** (2011) 50-32.

[4] p. Bakhshaei, Investigating the factors affecting the lack of operational budgeting in the General Directorate of Roads and Urban Development in the south of Sistan and Baluchestan province. Second National Conference on Approach to Accounting, Management and Economics, Islamic Azad University, Fooman and Shaft Branch (2014).

[5] H. Badiei, H. Dehghan Dehnavi, M. Arabi, Identify and rank the factors affecting the implementation of operational budgeting system using diamond model and hierarchical-fuzzy analysis. Bi-Quarterly Journal of Government Accounting, Volume **1(2)** (2015) 40-31.

[6] N. Berland, E. Curtis, S. Sponem, Exposing organizational tensions with a non-traditional budgeting system. Journal of Applied Accounting Research, (2018) 122-140.

[7] M. Borzozadeh, Operational budgeting. Tehran, Spinood Publications (2011).

[8] H. Chew, I. Suhaiza, A. Fatima, The Perception of Public Sector Auditors on Performance Audit in Malaysia: An Exploratory Study. Asian Review of Accounting, **24(1)** (2016). 90 – 104.

[9] P. C. Douglas, B. Wier, Cultural and ethical effects in budgeting systems: A comparison of US and Chinese managers. Journal of Business Ethics, **60(2)** (2005) 159-174.

[10] M, Farzad, M. Ghasemi, I. M. Arab, A. Ramezani, Obstacles to establishing operational budgeting in the executive organs of Sistan and Baluchestan province. Journal of Zabol University of Medical Sciences, Volume **6(2)** (2013)53-44.

[11] A. Fazli, Z. Fathi, H. T. Zadeh Feshaharaki, Models in the operating budget of foreign oil companies and their localization in the National Iranian Oil Company. Quarterly Journal of Advertisting and sale management, **4(1)** (2023) 361-372.
[12] A. Fazli, H. Fathi, H. Tabaei Zadeh Fesharaki, Investigating the operating budget of foreign oil companies (Case study: National Iranian Oil Company). International Journal of Nonlinear Analysis and Applications, **16(4)** (2025) 217-228.
[13] H. Ghodsipour, Hierarchical analysis process. Amir Kabir University of Technology Publications (2016).
[14] R. Haj Kassem, M. Halilic, Traditional budgeting, why does it persist?: A case study of Värmlandstrafik (2022).
[15] A. Heydari, M. Amiri, H. Jamour, The Role of Internal Organizational Factors in Implementing the Budgeting System Based on Performance: An Interpretative Structural Modeling Approach (Case: Tehran Municipality). Urban Economics and Management, **4(24)** (2018) 533-549.
[16] L. Isaac, Appraising the Impact of Budgeting and Planning on the Performance of Financial Institutions in Nigeria. Research Journal of Finance and Accounting, **5(16)** (2016) 12-27.
[17] T. Jamshidi, A. Kaknepour, M. T. Ayazi, Investigating factors affecting employees' resistance in operational budgeting (Case study: Ilam Gas Company). Public Sector Accounting and Budgeting, **4(1)** (2023) 68-90.
[18] K. Jayasinghe, P. Adhikari, S. Carmel, Multiple Rationalities of Participatory Budgeting in Indigenous Communities: Evidence from Indonesia. Accounting, Auditing & Accountability Journal, **33(8)** (2020) 2139-2166.
[19] K. Ketners, Developing potential budget reform for Latvia: Shifting from conventional to contemporary budgeting. Social and Legal Studios, **7(2)** (2024) 55-63.
[20] K. Hosseini, M. Nayebpour, A. Yavari, Investigating Intra-Organizational Factors Affecting Operational Budgeting in University of Law Enforcement Sciences. Quarterly Journal of Human Resource Management Development and Support, **6(21)** (2011) 161-125.
[21] B. Lepori , M. Montauti, Bringing the organization back in: Flexing structural responses to competing logics in budgeting. Accounting, Organizations and Society, **(80)** (2020) 101075.
[22] W. Lorensius, T. Yunata, Kajian Literatur: Implementasi Performance-Based Budgeting Pada Institusi Pendidikan Tinggi di Indonesia. Jurnal Pendidikan dan Kewirausahaan, **9(1)** (2021) 118-131
[23] M. Jordan, M. Hackbart, Performance Budgeting and Performance Funding in the States: A States Assessment, Publice budgting & finance **19** (2005) 68-88.
[24] F. Redburn, J. Stevens, S. Robert, F. Tery, Performance Management and Budgeting: How Governments Can Learn from Experience, M.E. Sharpe, Inc. **30(3)** (2008).
[25] Z. Pourzamani, M. Sadr Moghani, Obstacles to establishing operational budgeting in the Tax Affairs Organization of Iran. Journal of Government Accounting, **1** (2023) 28-21.
[26] M. Pour Ali, S. Kakwan, Feasibility study of establishing operational budgeting in Babol University of Medical Sciences and Health Services. Journal of Management Accounting, **28** (2016) 118-97.
[27] R. Ramlall, S. Grobbelaar, Deficiencies in the traditional budgeting process cause the negative behaviour of budgetary slacking. South African Journal of Business Management, **55(1)** (2024) 4348.
[28] M. Rezaei, Operational budgeting requirements in Iran. Public Law Research Quarterly, Year **18(51)** (2016) 80-55.
[29] M. Ronald, Performance Budgeting. International Journal of Public Sector Management, **14(5)** (2001) 376 – 390.
[30] M. Saffari, D. Hemmati, A. Islamzadeh, Investigating the effective factors on the success of operational budgeting in the National Bank. Trend Quarterly, **23(76)** (2016) 144-107.
[31] F. Salman, S. A. Hashemi, D. Foroghi, Feasibility of establishing operational budgeting in Iraqi public universities. Risks, **11(2)** (2023) 44.
[32] C. Sorinel, S. Ileana, M. Cristian, M. Letiția, T. Dan, Implementation of Activity-Based Budgeting Method in the Economic Entities from Mining Industry of Romania. International Journal of Academic Research in Accounting, Finance and Management Sciences, **3(1)** (2013) 26–34.
[33] D. Sunaryo, N. M. Yanti, R. Amrulloh, T. Lestari, Evaluation of Traditional and Innovative Budget Approaches in Improving Resource Allocation Efficiency. Advances in Applied Accounting Research, **3(1)** (2025) 55-68.
[34] D. Suwanda,R. Moenek, S. Lukman, M. Syaifullah, The Implementation of Performance-Based Budgeting Through A Money Follow Program in Impressing Budget Corruption. Jurnal Ilmiah Universitas Batanghari Jambi, **21(2)** (2021) 871-878.
[35] D. Valle-Cruz, V. Fernandez-Cortez, J. R. Gil-Garcia, From E-budgeting to smart budgeting: Exploring the potential of artificial intelligence in government decision-making for resource allocation. Government Information Quarterly, **39(2)** (2022) 101644.
[36] P. Zaneta, Traditional versus Activity-based Budgeting in Non-manufacturing Companies. Journal of Social Sciences, **82(4)** (2013) 26-37.