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Prioritizing the Factors Affecting Performance Budgeting in the Public Sector Using the DEMATEL Technique[1]

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ABSTRACT

Performance budgeting system serves to promote the effectiveness of organizational resource consumption gained the attention of governments at local and national levels. The question as regards implementing this effective managerial instrument is "What is the prioritization of requirements to fully and appropriately implement performance budgeting on the part of government organizations?" This study had an applied goal and fell under quantitative approaches. In the meantime, this study also used the DEMATEL techniques as a ranking method. Data were gathered through library studies and deep and open interviews with 15 experienced academic professors, activists, and managers of public sector organizations via purposive sampling until the saturation point was reached. The validity of this study was examined and then confirmed by interviewees, and expert professors. The reliability was obtained to be 91% using the retest-reliability method. Results indicated that contexts (systemic, human, structural, and national), and categories (organizational ability, organizations, bodies, administrative- managerial) had the highest and lowest impacts on performance budgeting in the public sector, respectively. Practical results obtained from this research will help organizations to implement programs and activities as best as possible and add effectiveness and efficiency of costs to regular budgeting. Considering the novelty of the application and study of this issue in the public sector, it is expected that this research will have a significant impact on the views of the aforementioned managers and employees who act in a decision-making position for the success of the organization.

Keywords: performance budgeting, public sector, DEMATEL technique

[1] Taken from the treatise of ph.D

1. Introduction

The budget is the vital component and the most important document provided by a government because it foresees and fulfills all financial activities, including revenue generation and expense payment, within the framework of budget laws for program implementation. Therefore, the budget is a representation of all government programs and activities and has a major role to play in national economic development (Hansen et al. 2022). Most government bodies use cash accounting systems for their financial statements and employ common and traditional methods to develop and implement budgeting reporting (Azar et al. 2014).

The current budgeting process of most government organizations in third-world countries is based on a linear traditional budgeting model. In the traditional budgeting model, the capacity of long-term planning is limited and the possibility of conducting budgeting operations and regulation is weak; furthermore, this system does not provide any information about budget performance and the effectiveness of credit programs (Panahi et al. 2020). Traditional budgeting systems provide no information about how credits are spent, nor envisage the effectiveness of credit programs; these systems have, instead, a short-term vision and struggle with keeping expenses in long-term accounts, thereby reducing systems' management authority over budgets (Safari & Gholamrezaei, 2006). The organizations using traditional budgeting methods suffer from unintegrated budget structure, untransparent credits, revenues, and expenses, the separation of planning units from budgetary units, and thus ineffective financial regulations, the dominance of the executive role of financial and economic policymaking units over the active role of planning, the lack of an accounting system capable of providing financial performance reports, financial computations, and the computations of the finished prices of services, the structural and legal obligation of service providers, and their failure to respond to credits received, and the separation of the budget provision system from the budget control system (Burch, 2014).

In scientific assemblies, budgeting refers to the prediction of financial resources and consumption to fulfill government tasks and missions. In other words, budgetary information is a financial and credit representation of executive decisions and planning domains, consistent with a government's framework of activities. Hence, a review of substantive evaluation of budgetary decisions, and consequently budgeting spectrum, and the volume of operations in the political structures of interfering governments or so-called guiding governments represent many differences. On the other hand, the position of a government and its social expectations are affected by the governing value system and the historical background of that government. Meanwhile, the nature of public revenues, governments' access to financial resources, the collaboration of people, and the way these resources are secured are very critical. Thus, to select and define budget and budgeting in the public sector, the effects of differences caused by the above issues concerning the nature of resources and the limit of consumption in each country should be taken into account. One of the latest reforms in budgetary systems is the movement toward performance budgeting to standardize government activities, increase responsiveness, and improve performance (Pakmaram et al. 2012).

Performance budgeting aims to directly allocate resources from budget and operations to achieve goals (Dimond, 2003). On the other hand, in this budgeting method, a link between performance indicators and resource allocation is established. Although links of this kind are mostly weak, they can expedite budgetary policy-making and increase law-making regulation over public expenses and relevant outcomes (Panahi et al. 2020). Because the subject of the current study was directed at performance budgeting, the following concerns several relevant concepts, including performance budgeting.

Experiences of other countries have shown that using performance budgeting as a reformative measure that only creates a technical link between budget and performance is a mistake, and because relations between performance indicators and resources allocation are not simply technical, and are also affected by political options, this type of budgeting brings a variety of advantages as follow:

1) Increasing public responsiveness: Performance information extracted from performance budgeting can be communicated to the public in various ways such as budgetary documents, strategic plans, and performance reports.
2) Management for better performance: This approach is different from the negative use of performance information, including using it for

punishment and rewards (which risks encouraging avoiding the laws and misusing the system instead of improving performance). The indicators of effectiveness, workload, service quality and customer satisfaction are indicators that are involved in improving performance for managers. These indicators can be employed to determine performance goals and design strategies to meet these goals, track performance over time, and compare the performance with those of other organizations.

3) Improving resources allocation: Relating strategic planning to resource allocation is one of the main requirements of goal-based resource allocation. Organizations should provide their performance indicators and strategic goals within their proposed budgets. This method helps decision makers involved in resources allocation in organizations and requires budget analysts to examine the necessity of budgets requested by each organization, its relation to the priority of strategic organizational plans, its relation to government policies and goals, and the risks and uncertainty of costs estimation (Panahi et al. 2020).

The budget structure of Iran's government organizations easily incurs costs and does not distinguish real resources from unreal and inflationary resources. In common budgeting methods in Iran's government systems, only the expenses ceiling is protected, i.e., each system sets the budget of its fiscal year as a standard, and then, without evaluating its performance and what the real expenses of unit-producing goods and services are, considers the inflation rate and other possible expense variables to add a percentage of revenues and expenses to the fiscal year, and to offer it to the government as its next year's budget. Finally, in Iran's government system budgets, the system survival is key, rather than the real necessity of the society; thus, such issues as the existential philosophy and goals, and legal explanations involving performance budget provision for government systems are not investigated nor reviewed.

Considering traditional budgeting problems and the advantages of performance budgeting, a review of challenges and enumeration of problems with implementing performance budgeting in the national government bodies can encourage authorities involved in budgeting and financing to employ this modern budgeting method. Because researchers of this study found no suitable model that matched factors and components affecting performance budgeting and Iran's government organizational conditions, a model will be provided to serve as the basis for performance budgeting planning.

What led to selecting this issue was the significance of performance budgeting in the public sector. Although some studies were conducted in performance budgeting over the last years, providing a performance budgeting model in the public sector is required to do a study in this regard. For this, this study aimed to examine managerial factors affecting the performance budgeting model in the public sector. The prospective results could help organizations better implement the programs and activities and increase expense effectiveness. Considering the novelty of the subject, this study is expected to leave a significant impact on the perspectives of managers and employees to make the decision that will help their organizations succeed. The results could also help better allocate budgets. For this, the results of this study are important. As regards the factors affecting performance budgeting in the public sector, no literature was found despite the researchers' attempts; however, below are several studies that have referred to performance budgeting. The issue that led to the selection of this issue is the importance of operational budgeting in the public sector. Although there have been some studies regarding the implementation of operational budgeting in the last decade, presenting the operational budgeting model in the public sector requires conducting research, the purpose of this realization is to investigate the management factors affecting the operational budgeting model in the public sector. The results obtained from this research will help organizations to implement programs and activities as best as possible, and you will add the effectiveness and efficiency of costs to regular budgeting. Due to the novelty of the application and study of this issue in the public sector, it is expected that this research will have a significant impact on the views of the aforementioned managers and employees who act in the decision-making position for the success of the organization and make decisions in the direction of budget allocation, and also for Similar organizations and academic researchers should be

useful to cover the mentioned research gaps. Therefore, the results of this research can be of special importance and value.

In a study by Hanssen (2022), types of budgeting methods were compared in a model by the three indicators of prediction, operational planning, and performance evaluation. Results from this model indicated the desirability of rolling budgeting over other budgeting methods.

In a study, Iacuzzi et al. (2020) demonstrated that the movement towards integrated reporting and its changes at the national Italian universities required creating integrated thinking and a common value in the public sector.

Wang (2019) developed a simple model based on the resource allocation model for budget distribution between research institutes in China based on their performance. His study examined various dimensions of performance at research centers, including the number of documents published, the number of inventions, and revenue from selling knowledge.

In a study "Performance-based planning in Zimbabwe: concepts and factors of success", Zinyama and Nhema (2016) identified a legal framework of planning, strategies, capacities and abilities, expense priorities, and budgeting structure and formula, motivation transfer, combination strategies, responsiveness, reporting, monitoring and evaluation as the key success factors in deploying performance budgeting.

In a study, Pour-Ghaffar et al. (2021) found that the factors affecting the deployment of performance budgeting in Iran's public sector were environmental factors (legal requirements, political recognition, rules and regulations, transparency and responsiveness, reforming the structure and tasks of the Budget and Planning Organization based on social and communication capital; human factors (motivational and managerial policies); organizational factors (comprehensive information bank, infrastructure, and ICT, e.g., organizational architecture, integrated systems, and integrated reporting approach); ICT factors (the removal of no-value added activities value chain reforms, the optimal use of organizational resources); process factors (the deployment of a strategic planning system, accounting and auditing system, management and operational performance, and planning and performance management factors.

Khadami et al. (2021) demonstrated that there was organizational preparation in the army to face performance budgeting changes and the motivation and adequate resources to meet these challenges. However, because implementing performance budgeting includes various processes and states, it is required for practitioners to promote their knowledge in this area.

Panahi et al. (2020) found that managerial factors had a significant effect on implementing performance budgeting using the finished price accounting method. Farhadi et al. (2020) indicated that there was a significant relationship between implementing performance budgeting and managerial factors, and concluded that problems with implementing performance budgeting were 1) technical and process factors, 2) human factors, and 3) environmental and managerial factors.

The study by Taleban and Shafaei (2020) focused on deploying performance budgeting to make executive systems in the government purposeful.

Jami et al. (2019) investigated and identified the indicators of requirements and obstacles to deploying performance budgeting at the University of Sistan and Baluchistan, and found that environmental, individual, and organizational factors constituted performance budgeting requirements. The most notable of the requirements were effective manpower, expert training forces, employee empowerment, and accrual accounting, the lack of which could be a major barrier to organizations.

According to the above, the following hypotheses are raised:

1. **Hypothesis 1.** Causal factors (political-functional-organizational) have a significant effect on the categories (organizational ability-organizations and organs-management).

1.1- Causal factors have a significant impact on organizational ability

2.1- Causal factors have a significant impact on organizations and bodies

3.1- Causal factors have a significant impact on management categories

Hypothesis 2. Categories have a significant effect on (technical-social) strategies.

1.2- Categories have a significant impact on technical strategies

2.2- Categories have a significant impact on social strategies.

Hypothesis 3. Strategies have a significant effect on (national-organizational) outcomes.
3.1- Strategies have a significant impact on organizational outcomes.
3.2- Strategies have a significant impact on national outcomes.
Hypothesis 4. Background factors (systemic-human-structural-national) have a significant effect on strategies.
1.4- Systemic background factors have a significant impact on strategies
2.4- Human background factors have a significant impact on strategies
3.4- Structural background factors have a significant impact on strategies
4.4- National background factors have a significant impact on strategies
Hypothesis 5. Intervening factors (organizational-process-economic) have a significant effect on strategies.
1.5- Organizational intervening factors have a significant impact on strategies.
2.5-Intervening process factors have a significant impact on strategies.
3.5- Economic intervening factors have a significant impact on the economy.
Hypothesis 6. Causal conditions have a significant effect on strategies through categories.
Hypothesis 7. Background factors have a significant effect on strategies through strategies.
Hypothesis 8. Intervening factors have a significant effect on outcomes through strategies.
Hypothesis 9. Causal conditions have a significant effect on outcomes through categories and strategies.

Study Method

The present study was applied in terms of goal and fell under quantitative research in terms of gathering information. In the first step, by referring to experts, management indicators of performance budgeting deployment in Iran's public sector were extracted. The number 15 experienced academic experts, activists, and managers of public sector organizations with knowledge of performance budgeting were selected based on such factors as the record of professional activities in performance budgeting, the record of conducting scientific research in this area, etc. In this research, following a comprehensive review of the related literature and the conducting of in-depth interviews, finally, the factors affecting the performance budgeting of Iran's public sector were identified, and the DEMATEL technique was used to rank the factors.

Research conceptual model

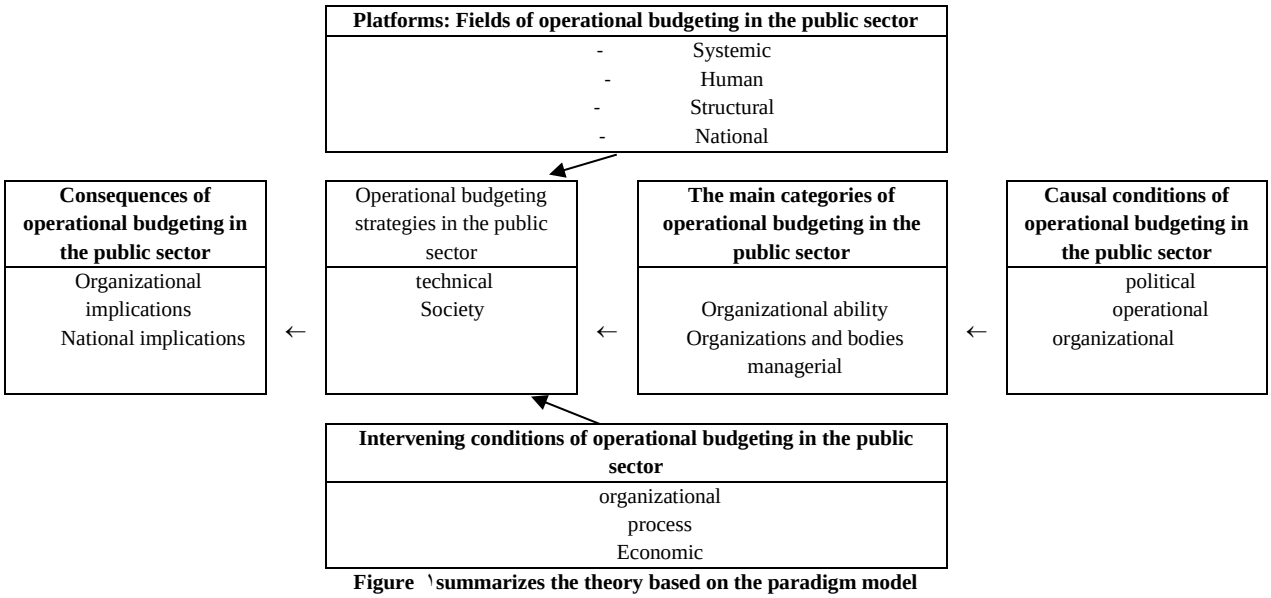

Figure 1 summarizes the theory based on the paradigm model

DEMATEL Method: It is a multi-criteria decision-making method to causally identify components of a system and to reveal the reciprocal relations between factors/criteria and effects of criteria on other criteria; the matrix resulting from the DEMATEL technique (internal relation matrix) also suggests the cause-and-effect relationship between the factors.

Study Findings

After conducting interviews and implementing them in a process, the interview texts were examined to find the main factors. In the first step of the interview texts, the propositions (dimensions and characteristics) were extracted, in the next stage, data were analyzed at the sentence and phrase levels, and sub-categories were derived. In other words, after extracting the propositions through classifications, the factors were acquired. When data were accurately analyzed, concepts were made through their common applications. Coding was directly based on the subjects' interview texts, and the interview texts were examined. Data analysis was performed ten times before reaching logical saturation. As for the main categories, their dimensions were repetitively conducted. Dimensions of each category were not determined after initiating the analysis, and these categories were analyzed throughout the entire analysis process.

Table 1: Concepts extracted from the interviews

Main classes	Model code	Inductive codes
Causal factors	Political	Policy-making conditions and political ideology Political factors governing the region Political culture deployed in the organization and public sector Political developments of budgeting in other countries Ineffective public sector governance Conservatism culture related to the political culture
	Performance	Determining transparent indicators and scales to measure functions Determining the performance indicators of managers and organizations Performance budgeting based on performance Measuring activities
	Organizational	The readiness of the public sector and executive organizations' infrastructure Organizational capacity
		People's' level of literacy in the organization Facilities and conditions of executive organizations The transparent responsiveness of executive organizations
Categories	Organizational ability	The ability to evaluate the performance Organizational technical abilities Saving ability in resources The ability to generate value in the organization
	Organizations and bodies	Budgeting and Planning Organization Budget meetings and commissions Executive systems General country's treasury Ministry of Economic Affairs and Finance General Inspection Organization as a regulatory body Supreme Audit Court as a regulatory and controlling body of resources and consumption
	Administrative-managerial	Responsiveness of public sub-sectors' managers Managers' effectiveness and goal-oriented policies that could help meet intended results Managers' expertise and labor division Making budget spending process by considering managers' activities
Intervening factors	Organizational	Islamic Consultative Assembly Executive bodies Subjects taken up by the Budget and Planning Organization Establishing a strong financial management information system Appropriate organizational structure with performance budgeting
	Process	Regulating scheduling for execution Reviewing strategic plans Determining performance indicators Providing administrative and managerial contexts Inclusive training of manpower Codified planning and scheduling for budget allocation

Main classes	Model code	Inductive codes
	Financial and economic	National macroeconomic policies Inflation Stagnation Oil and non-oil revenues
Underlying (contextual) factors	Systemic	Promoting management software systems Promoting accounting software systems Promoting financial software systems Promoting reporting software systems
	Human	Training manpower, especially in the financial, accounting, and operational sectors Technical boost to manpower Senior-level managers' support for the organization and their acceptance and commitment
	Structural	Identifying expense centers Accrual accounting Performance budgeting and emphasis on loan outputs Building the culture of deploying performance budgeting
	National	Gross Domestic Product Income from oil and taxes Infrastructure strengthening
Strategies	Technical	Creating a logical order for the budget establishment Planning Costing Performance evaluation Compiling indicators in line with national general conditions Accurate control and guidance of resource allocation Execution methods Execution time
	Society	Organization’s maximum use of resources with minimum resource wastage Avoiding misuse, and the fulfillment of financial discipline Attracting the agreement and commitment of the main players in budgeting Providing managerial backgrounds Performance budgeting support through upstream laws Meeting social justice The proper allocation of resources, and the government’s proper execution of tasks against people
Outcomes	Organizational outcomes	Granting more freedom of action to executive bodies using credits to access cash Granting more resiliency to executing bodies using credits to access cash Making changes to promote the level of responsibility and accountability at executive bodies over economic efficiency in using resources Promoting managers’ responsibility and accountability against the panned goods and services and the quality of their efficacy Increasing the confidence factor of receiving cash from credits set out in the executive bodies’ budget Changing the regular one-year budget approach towards multi-year budget approaches (long-term plans, and short-term credit supply) Promoting the responsibility and accountability of inter-generation rights through estimating the finished price of activities and their financial resource supply Increasing financial accountability to operational accountability Increasing pressure on executive bodies by focusing on program implementation results
	National outcomes	Changing concentration and emphasis from input to output and outcome Strengthening the role of independent evaluating organizations such as the Supreme Auditory Court and the General Inspection Organization Developing performance indicators and performance requirements for program evaluation Helping institutions work effectively in the global economic environment Helping adopt a rational decision about resource allocation, and the government’s resource commitment using measurable outcomes Increasing social justice

Table 2: Variable codes

Variable	Code	Dimension	Code
Causal conditions	Cause	Political	Political
		Performance	Performance
		Organizational	Organizational
Categories	Categories	Organizational ability	Organizational ability
		Bodies	Bodies
		Managerial	Managerial
Context creators	Creator	Systemic	Systemic
		Human	Human
		Structural	Structural
		National	National
Intervening	Intervening	Organizational	Organizational
		Process	Process
		Economical	Economical
Strategies	Strategy	Technical	Technical
		Society	Society
Outcomes	Consequences	Organizational outcomes	Organizational outcomes
		National outcomes	National outcomes

Research hypotheses and conclusions about them

Hypothesis 1. Causal factors (political-functional-organizational) have a significant effect on the categories (organizational ability-organizations and organs-management).

The statistical assumptions of the test are:

H0 = causal factors (political-functional-organizational) do not have a significant effect on the categories (organizational ability-organizations and bodies-management).

H1 = causal factors (political-functional-organizational) have a significant effect on the categories (organizational ability-organizations and bodies-management).

The results of structural equation model analysis: Hypothesis ۱ Table

Test result	T-value	standardized coefficient	dependent variable	Independent variable
rejection H0	36/10	63/0	categories	Causal factors

Source: made by the researcher

Considering that the value of the significant number (T-value) between the two variables of causal factors and categories is equal to ۱۰/۳۶ and greater than ۱/۹۶, then the causal factors have a significant effect on the categories. Also, because the path coefficient (standard coefficient) between two variables is equal to ۰/۶۳, it can be concluded that the causal factors have a direct, positive and significant effect on the categories and the intensity of this effect is relatively strong (۰/۶۳). . Therefore, the first hypothesis of the research is confirmed.

Hypothesis ۲. Categories have a significant effect on (technical-social) strategies.

The statistical assumptions of the test are:

H۰ = categories have no significant effect on (technical-social) strategies.

H_1 =categories have a significant effect on (technical-social) strategies.

Table ۲: The results of structural equation model analysis: Hypothesis ۲

Test result	T-value	standardized coefficient	dependent variable	Independent variable
rejection H0	۱۷/۳۷	۰/۸۷	strategies	Categories

Source: made by the researcher

Considering that the value of the significant number (T-value) between the two variables of categories and strategies is equal to ۱۷/۳۷ and greater than ۱/۹۶, then categories have a significant effect on strategies. Also, because the path coefficient (standard coefficient) between the two variables is equal to ۰/۸۷, it can be concluded that the categories have a direct, positive and significant effect on the strategies and the intensity

of this effect is relatively strong (۰/۸۷). Therefore, the second hypothesis of the research is confirmed.

Hypothesis 3. Strategies have a significant effect on (national-organizational) outcomes.
The statistical assumptions of the test are:
H۰= strategies do not have a significant effect on (national-organizational) outcomes.
H۱ = strategies have a significant effect on (organizational-national) outcomes.

The results of structural equation model analysis:
Hypothesis 3 Table

Test result	T-value	standardized coefficient	dependent variable	Independent variable
rejection H0	۱۱/٤۸	۰/٦۹	consequences	Strategies

Source: made by the researcher

Considering that the significance value (T-value) between the two variables of strategies and consequences is equal to ۱۱/۴۸ and greater than ۱/۹۶, then the strategies have a significant effect on the consequences. Also, because the path coefficient (standard coefficient) between the two variables is equal to ۰/۶۹, it can be concluded that the strategies have a direct, positive and significant effect on the results, and the intensity of this effect is relatively strong (۰/۶۹). Therefore, the third hypothesis of the research is confirmed.

Hypothesis 4. Background factors (systemic-human-structural-national) have a significant effect on strategies.
The statistical assumptions of the test are:
H۰ = contextual factors (systemic-human-structural-national) do not have a significant effect on strategies.
H۱ = contextual factors (systemic-human-structural-national) have a significant effect on strategies.

The results of structural equation model analysis:
Hypothesis 4 Table

Test result	T-value	standardized coefficient	dependent variable	Independent variable
rejection H0	۱۳/۱۹	۰/۷٤	strategies	Background factors

Source: made by the researcher

Considering that the significance value (T-value) between the two variables of background factors and strategies is equal to ۱۳/۱۹ and greater than ۱/۹۶, then background factors have a significant effect on strategies. Also, because the path coefficient (standard coefficient) between the two variables is equal to ۰/۷۴, it can be concluded that the background factors have a direct, positive and significant effect on the strategies and the intensity of this effect is relatively strong (۰/۷۴). . Therefore, the fourth hypothesis of the research is confirmed.

Hypothesis 5. Intervening factors (organizational-process-economic) have a significant effect on strategies.
The statistical assumptions of the test are:
H۰ = intervening factors (organizational-process-economic) do not have a significant effect on strategies.
H۱ = intervening factors (organizational-process-economic) have a significant effect on strategies.

The results of structural equation model analysis:
Hypothesis 5 Table

Test result	T-value	standardized coefficient	dependent variable	Independent variable
rejection H0	-۱۷/۰۳	-۰/۸۵	strategies	Intervening factors

Source: made by the researcher

Considering that the significance value (T-value) between two variables of intervening factors and strategies is equal to -۱۷/۰۳ and smaller than -۱/۹۶, then intervening factors have a significant effect on strategies. Also, because the path coefficient (standard coefficient) between the two variables is equal to -۰/۸۵, it can be concluded that the intervening factors have an inverse, negative and significant effect on the strategies and the intensity of this effect is relatively strong (۰/۸۵). Therefore, the fifth hypothesis of the research is confirmed.

Hypothesis 6. Causal conditions have a significant effect on strategies through categories.
The statistical assumptions of the test are:
H۰= causal conditions do not have a significant effect on strategies through categories.
H۱= causal conditions have a significant effect on strategies through categories.
As the results of Table ٦ show, the causal conditions have a positive, direct and significant effect on the categories equal to ۰،٦۳, and the categories also have a positive, direct and significant effect on the strategies equal to ۰،۸۷, so hypothesis number ٦ That is, the

mediation of categories in the relationship between causal conditions and strategies is also confirmed. By confirming the mediating role of categories, causal conditions have an indirect, positive and significant effect of ۰,۵٤ on strategies.

The results of structural equation model analysis: Hypothesis 6 Table

result	t	path coefficient	type of effect	Hypothesis
confirmation	۱۰/۳٦	۰/٦۳	direct	Causal conditions → categories
confirmation	۱۷/۳۷	۰/۸۷	direct	Categories → strategies
confirmation	۱۳/۸٦	۰/۵٤	Indirect	Causal conditions → Categories → strategies

Source: made by the researcher

The results of table show that the value of z (۸,۸۹) is greater than ۱,۹٦, so the hypothesis H۰ is rejected. That is, there is a significant relationship between the causal conditions and the strategies according to the mediating role of the categories.

$$VAF = \frac{.63 \times .87}{(.63 \times .87) + .54} = 0.503722084$$

The results of show that the value of z (۸,۸۹) is greater than ۱,۹٦, so the hypothesis H۰ is rejected. That is, the causal conditions have a significant effect on the strategies according to the mediating role of the categories.

The results of Table ۸ show that the VAF statistic is equal to ۰,۵۰۳۷. This means that ٪۵۰,۳۷ of the total effect of causal conditions on strategies is explained by the mediating variable of categories, which is a significant amount.

Hypothesis ۷. Background factors have a significant effect on strategies through strategies.
The statistical assumptions of the test are:
H۰= contextual factors do not have a significant effect on outcomes through strategies.
H_1= background factors have a significant effect on outcomes through strategies.

The results of structural equation model analysis: Hypothesis 7 Table

result	t	Path coefficient	Type of effect	hypothesis
confirmation	۱۳/۱۹	۰/۷٤	Direct	Background factors → strategies
confirmation	۱۱/٤۸	۰/٦۹	Direct	Strategies → Consequences
confirmation	۱۲/۳۳	۰/۵۱	indirect	Background factors → strategies → consequences

Source: made by the researcher

As the results of Table ۹ show, contextual factors have a positive, direct and significant effect on strategies equal to ۰,۷٤, and strategies also have a positive, direct and significant effect on outcomes equal to ۰,٦۹, so hypothesis number ۷ means Mediation of strategies in the relationship between contextual factors and outcomes is also confirmed. By confirming the mediating role of strategies, contextual factors have an indirect, positive and significant effect equal to ۰,۵۱ on the results.

The results of the table show that the value of z (۸,٦۵) is greater than ۱,۹٦, so the hypothesis H۰ is rejected. That is, there is a significant relationship between the background factors and the outcomes, considering the mediating role of strategies.

$$VAF = \frac{.74 \times .69}{(.74 \times .69) + .51} = 0.500293945$$

The results of the show that the value of z (۸,٦۵) is greater than ۱,۹٦, so the hypothesis H۰ is rejected. That is, contextual factors have a significant effect on the outcomes, considering the mediating role of strategies.

The results show that the VAF statistic is equal to ۰,۵۰۰۲. This means that ٪۵۰,۰۲ of the total effect of background factors on outcomes is explained by the mediatin
g variable of strategies, which is a significant amount.

Hypothesis 8. Intervening factors have a significant effect on outcomes through strategies.
The statistical assumptions of the test are:
H۰ = intervening factors do not have a significant effect on outcomes through strategies.

H١= intervening factors have a significant effect on outcomes through strategies.

Table 11: The results of structural equation model analysis: Hypothesis 8

result	t statistic	Path coefficient	Type of effect	hypothesis
Confirmation	-١٧/٠٣	-٠/٨٥	Direct	Intervening factors → strategies
Confirmation	١١/٤٨	٠/٦٩	Direct	Strategies → Consequences
Confirmation	١٤/٢٥	٠/٥٨	indirect	Intervening factors → strategies → consequences

Source: made by the researcher

As the results of the table show, the intervening factors on the strategies have a negative, inverse and significant effect equal to -٠,٨٥, and the strategies also have a positive, direct and significant effect on the results equal to ٠,٦٩, so the hypothesis no. ٨means that the mediation of strategies in the relationship between intervening factors and outcomes is also confirmed. By confirming the mediating role of strategies, intervening factors have an indirect, positive and significant effect equal to ٠,٥٨on the results.
The results of the table show that the value of z (٩,٥١) is greater than ١,٩٦, so the hypothesis H ٠is rejected. That is, there is a significant relationship between the intervening factors and the outcomes according to the mediating role of the strategies.

Hypothesis 9. Causal conditions have a significant effect on outcomes through categories and strategies.
The statistical assumptions of the test are:
H٠=causal conditions do not have a significant effect on outcomes through categories and strategies.
H ١ =causal conditions have a significant effect on outcomes through categories and strategies
As the results of the table show, the causal conditions have a positive, direct and significant effect on strategies * categories equal to ٠,٥٤ and also the categories * strategies have a positive, direct and significant effect on strategies equal to ٠,٦٠, so Hypothesis number ٩, that is, the mediation of categories * strategies in the relationship between causal conditions and consequences is also confirmed. By confirming the mediating role of categories * strategies, the causal conditions have an indirect, negative and significant effect equal to ٠,٣٢ on the results.

result	t statistic	Path coefficient	Type of effect	hypothesis
confirmation	١٣/٨٦	٠/٥٤	Direct	Causal conditions → categories * strategies
confirmation	١٤/٤٢	٠/٦٠	Direct	Categories * Strategies → Consequences
confirmation	١٤/١٤	٠/٣٢	Indirect	Causal conditions → Categories * Strategies → Consequences

Source: made by the researcher

The results of the table show that the value of z (٩,٩٩) is greater than ١,٩٦, so the hypothesis H ٠is rejected. That is, there is a significant relationship between the causal conditions and the consequences according to the mediating role of categories * strategies.

$$VAF = \frac{.54 \times .60}{(.54 \times .60) + .32} = 0.50310559$$

The results show that the value of z (٩,٩٩) is greater than ١,٩٦, so the hypothesis H٠ is rejected. That is, the causal conditions have a significant effect on the outcomes according to the mediating role of categories * strategies.
The results show that the VAF statistic is equal to ٠,٥٠٣١. This means that ٪٣١,٥٠of the total effect of causal conditions on outcomes is explained by the mediating variable of categories * strategies, which is a significant amount.

Prioritization of Factors Affecting Performance Budgeting in the Public Sector
Model of Relations between Variables Using DEMATEL Technique
To reflect reciprocal relationships between the main criteria, the DEMATEL technique was used. This technique enables experts to more dominantly express their views on the effects (direction and intensity of effects) between the factors. It is noteworthy that the matrix resulting from the DEMATEL technique (internal relationship matrix) both indicates the causal relationship and the way the variables affect and are affected.

First step: Direct correlation matrix computation (M)

Using the views of several experts, a simple computational average of views is used, and the direct relationship matrix (M) is formed.

Table 3: Direct relationship matrix

	Causal conditions	Categories	Strategies	Contexts	Intervening factors	Outcomes	Total
Causal conditions	0.000	2.053	2.000	2.421	1.947	105.2	8.421
Categories	2.368	0.000	2.158	2.000	2.842	3.000	12.368
Strategies	2.421	2.158	0.000	1.684	2.105	3.000	11.368
Contexts	1.842	1.421	1.789	0.000	1.368	1.211	7.631
Intervening factors	3.632	2.579	3.421	2.105	0.000	3.632	15.368
Outcomes	3.268	3.211	3.000	2.421	1.526	0.000	13.421
Total	13.526	11.422	12.368	10.631	9.788	10.843	

Second step: Normal direct correlation matric computation (N=K*M)

First, all columns and rows are summed up. The inverse of the largest column and row number constitutes the K. According to Table 3, the largest number is 15.368, with all table values multiplied by this number to make the matrix normal.

$$K = \frac{1}{max \sum_{j=1}^{n} a_{ij}} = \frac{1}{15.368} = 0.065$$

N = 0.065 * m

Table 4: Normal direct correlation matric (N)

N	Causal conditions	Categories	Strategies	Contexts	Intervening factors	Outcomes
Causal conditions	0.000	0.134	0.130	0.158	0.127	0.137
Categories	0.154	0.000	0.140	0.130	0.185	0.195
Strategies	0.158	0.140	0.000	0.110	0.137	0.195
Contexts	0.120	0.092	0.116	0.000	0.089	0.079
Intervening factors	0.236	0.168	0.223	0.137	0.000	0.236
Outcomes	0.212	0.144	0.195	0.158	0.099	0.000

Third step: Full correlation matrix computation

To compute the full correlation matrix, the identity matrix of (I) is first formed. Then, the identity matrix is subtracted from the normal matrix and the resulting matrix is inverted. In the end, the normal matrix is multiplied by the inverse matrix.

T = N * (1 – N)-1

Table 5: Norma direct correlation matrix (T)

N	Causal conditions	Categories	Strategies	Contexts	Intervening factors	Outcomes
Causal conditions	0.414	0.448	0.497	0.475	0.423	0.516
Categories	0.626	0.392	0.577	0.515	0.525	0.635
Strategies	0.590	0.484	0.418	0.469	0.460	0.598
Contexts	0.417	0.333	0.390	0.254	0.316	0.372
Intervening factors	0.781	0.612	0.725	0.598	0.440	0.755
Outcomes	0.648	0.503	0.599	0.523	0.448	0.451

Fourth step: Demonstrating network relations map

To determine the network Relations Map (NRM), the threshold intensity must be calculated. Using this method, partial relations can be discarded and a reliable network of relations be outlined. The only relations whose values in the matrix T are larger than the threshold value will be demonstrated in the NRM. To calculate the threshold value of the relations, the average matrix T value must be calculated. After determining the threshold intensity, all matrix T

values, being smaller than the threshold, must be zero, i.e., the relationship is not seen as a causal one. This study derived the threshold intensity of 0.506, thus the model of significant relations will be s follow:

Table 6: Model of the significant relations of the main criteria

N	Causal conditions	Categories	Strategies	Contexts	Intervening factors	Outcomes
Causal conditions	-	-	-	-	-	0.516
Categories	0.626	-	0.577	0.515	0.525	0.635
Strategies	0.590	-	-	-	-	0.598
Contexts	-	-	-	-	-	-
Intervening factors	0.781	0.612	0.725	0.598	-	0.755
Outcomes	0.648	-	0.599	0.523	-	-

According to the model of relations, a causal diagram can be illustrated based on Table 7:

Results of columns (R-J) and (R+J) in the table above indicates that the R, J, (R+J), and (R-J) contexts were 9.245305, 7.794941, 17.04025, and 1.450364, respectively, suggesting the highest impacts on performance budgeting in the public sector; also, the R, J, (R+J), and (R-J) categories were 2.884511, 4.866521, 7.751032, and -1.98201, respectively, suggesting the lowest impacts on performance budgeting in the public sector. A review of all the sub-elements was performed like that of the stages of the higher-order criteria of the model. Table 8 gives the R, J table for all criteria and sub-criteria based on the computations which indicate the ranking of all model criteria and elements.

Table 7: Causal relations model table on the main criteria of performance budgeting in the public sector

Sub-criteria	R	J	R+J	R-J	Ranking
Contexts	9.245305	7.794941	17.04025	1.450364	1
Causal conditions	8.819471	7.461863	16.28133	1.357608	2
Outcomes	4.042905	4.102651	8.145556	-0.05975	3
Strategies	2.358251	3.934135	6.292386	-1.57588	4
Intervening factors	2.976211	4.61899	7.595201	-1.64278	5
Categories	2.884511	4.866521	7.75032	-1.98201	6

Table 8: R, J table for all key criteria of performance budgeting in the public sector

Sub-criteria	R	J	R+J	R-J	Ranking
Organizational causal conditions	1.487857	1.245638	2.743495	0.252219	1
Managerial	2.895222	2.685591	5.580813	0.209631	2
Political	2.991082	2.835979	5.827061	0.155103	3
Economical	1.559768	1.410551	2.970319	0.149217	4
Process	1.632818	1.501638	3.134456	0.13118	5
Performance	2.577065	2.446995	5.02406	0.13007	6
Organizational outcomes	1.379536	1.273641	2.653177	0.105895	7
Human	1.611842	1.55386	3.165702	0.057982	8
Structural	1.538818	1.545268	3.084086	-0.00645	9
National	1.368407	1.453216	2.821623	-0.08481	10
Systemic	2.354013	2.450866	4.804879	-0.09685	11
Organizations and bodies	2.236328	2.393565	4.629893	-0.15724	12
Organizational ability	1.739291	1.908375	3.647666	-0.16908	13
Technical	1.348078	1.567493	2.915571	-0.21942	14
Society	2.398535	2.756052	5.154587	-0.35752	15
Organizational	2.381455	2.978754	5.360209	0.597302	16
National outcomes	2.441311	3.115421	5.556732	-0.67411	17

Results of columns (R-J) and (R+J) in the table above indicates that the R, J, (R+J), and (R-J) causal organizational conditions were 1.497857, 1.245638, 2.743495, and 0.252219, respectively, suggesting the highest impacts on performance budgeting in the public sector; also, the R, J, (R+J), and (R-J) national outcomes were 2.441311, 3.115421, 5.556732, and -0.67411, respectively, suggesting the lowest impacts on performance budgeting in the public sector.

Discussion and Conclusion

Performance budgeting aims to directly allocate resources from budget and operations to achieve goals (Dimond, 2003). On the other hand, in this budgeting method, a link between performance indicators and resource allocation is established. Although links of this kind are mostly weak, they can expedite budgetary policy-making and increase law-making regulation over public expenses and relevant outcomes. Because the subject of the current study was directed at performance budgeting, the following concerns several relevant concepts, including performance budgeting.

Experiences of other countries have shown that using performance budgeting as a reformative measure that only creates a technical link between budget and performance is a mistake, and because relations between performance indicators and resources allocation are not simply technical, and are also affected by political options, this type of budgeting brings a variety of advantages as follow:

1) Increasing public responsiveness: Performance information extracted from performance budgeting can be communicated to the public in various ways such as budgetary documents, strategic plans, and performance reports.
2) Management for better performance: This approach is different from the negative use of performance information, including using it for punishment and rewards (which risks encouraging avoiding the laws and misusing the system instead of improving performance). The indicators of effectiveness, workload, service quality and customer satisfaction are indicators that are involved in improving performance for managers. These indicators can be employed to determine performance goals and design strategies to meet these goals, track performance over time, and compare the performance with those of other organizations.
3) Improving resources allocation: Relating strategic planning to resource allocation is one of the main requirements of goal-based resource allocation. Organizations should provide their performance indicators and strategic goals within their proposed budgets. This method helps decision makers involved in resources allocation in organizations and requires budget analysts to examine the necessity of budgets requested by each organization, its relation to the priority of strategic organizational plans, its relation to government policies and goals, and the risks and uncertainty of costs estimation (Ibid).

All key points of the interviews were extracted and coded, and after being analyzed, similar codes were assigned to special concepts. In the end, the number 119 model codes, 89 concepts, 17 secondary classes, and 6 main classes of the inductive coding process comprised six axial categories, causal conditions, intervening conditions, contextual conditions, strategies, and outcomes. In the end, the performance budgeting model in the public sector was selected as the axial category. This category was selected as the axial category because it was a conceptual label, considered for the developed framework. Because this study investigated the performance budgeting of the public sector, the class of performance budgeting in the public sector was selected as the axial class, following data gathering and inductive coding stages.

Using the DEMATEL method, the prioritization of the main factors indicated that contexts held the highest impact on performance budgeting in the public sector, whereas the categories held the lowest impact on it. Also, sub-criteria prioritization suggested that the organizational causal conditions held the highest impact on performance budgeting in the public sector, while national outcomes held the lowest impact on performance budgeting in the public sector.

Suggestions

The budget at executive bodies is the most important tool for policy-making, decision-making, and planning to implement development strategy; the budget also serves as a reflection of all government activities and programs that has a major role to play as a financial

policy tool to stabilize economic volatilities and as a costs criterion to measure the efficacy of executive bodies. For this, the budget greatly contributes to the national economy. The present study made, however, some suggestion in this regard which are as follow:

1) Because a performance budgeting system is being implemented in our country, it appears that a performance auditing system, as the evaluating and complementary tool of this performance, should be executed in line with performance budgeting. This will enable government budgeting systems, and finally government fiscal reporting to achieve their excellent goals. Performance budgeting serves as a powerful instrument at the hand of governments to meet their responsibilities and contribute to their economic prosperity.
2) Organizing executive bodies based on incremental budgeting commensurate with inflation or other indicators, other than scientific indicators of performance measurement, could strengthen the bargaining power and the relational allocation of budget to activities. This issue leads directors of executive bodies to ignore realities and past performance, and thus to fail to use scientific accounting methods. Thus, it is recommended to use novel scientific and reality-based methods for budget allocation.
3) Transforming the process of "budgeting system" and "accounting and financial reporting system" in the first place requires an appropriate understanding of the role and significance of these two systems in the public accountability process. For this, the role and significance of the annual budget as the government's sphere of action and financial and performance accountability, and the role of financial accounting and reporting as one of the main tools to fulfill and promote these two types of systems should be clarified for the statement, policy-makers, and financial authorities.
4) For the finished price calculations, activities and programs should be taken into account as one of the most sensitive stages of performance budgeting, because the more accurate the finished process as the main input of the performance budgeting system, the more successful this system and other accounting methods will be. The incorrect calculation of the finished process could lead to incorrect outputs from the systems, and finally incorrect decision-making.
5) Considering the significant relationship between planning, cost analysis, and performance management with improved accountability, experts, auditors, financial managers, and other officials should take into account these issues in providing budgets. Public sector authorities' knowledge of meeting accountability as regards the protection and correct use of public financial and economic resources, on the one hand, and their understanding of the tools and facilities to realize and improve the level of this responsibility, on the other hand, help create a fundamental transformation within the existing accounting and financial reporting systems, thereby laying the ground for desirable accountability. Like other studies, this study has suffered from some limitations: i.e., the small number of study subjects, the short follow-up period, the lack of external and internal studies in performance budgeting, the non-cooperation of some of the study samples during the interview, the time and place constraints of the respondents during the interview were issues that should be examined in the future.

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