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Ranking the risks of drawing up the state budget in Iraq for the period from 2003 to 2021

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ABSTRACT

The paper analyzes the potential budgetary risks in Iraq and offers recommendations for mitigating the effects of those risks. For the purpose of carrying out the study, the AHP-Fuzzy technique is utilized. This approach includes the following steps: creating criteria, acquiring and processing data, assigning weights to the criterion, and evaluating budgeting risks. The following is a list of twenty specialists in the area who have identified the risks that are related with the budgeting of the Iraqi government in the year 2023: erroneous estimating or forecasting of the budget; expenses that were not anticipated or unforeseen; fluctuations in revenue or cash flow; inadequate implementation or communication of the budget; and a lack of oversight or insufficient monitoring and control measures. Investing in state institutions as a means of fostering political stability is one of the practical strategies that are suggested by the report. The expansion of income streams beyond oil exports, the improvement of anti-corruption legislation, the encouragement of social development, and the implementation of appropriate budgeting procedures are some other proposals. Providing assistance to the expansion of Iraq's economy is something that the international community can also do. The findings of the study can be utilized by policymakers in order to gain a better understanding of the budgetary dangers that Iraq is currently facing and how to avert them in the future.

Keywords: AHP-Fuzzy, Iraq, risks of government budgeting

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1. Introduction

The growth and stability of any nation's economy are highly dependent on its budgeting. As one might expect from an oil-rich nation, Iraq's budgeting process is intricate. Having said that, this system is not without its share of risks and uncertainties. The Iraqi economy has seen a lot of swings and turns as a result of the unpredictable geopolitical climate and fluctuations in global oil prices. Consequently, in order to prevent economic instability and guarantee sustainable growth, it is crucial to comprehend the dangers connected with budgeting in Iraq. Using a new method called AHP-Fuzzy, this research intends to assess the budgeting risks in Iraq. We shall describe the current economic climate in Iraq and identify the main causes of the budgeting risks. We will also go over the AHP-Fuzzy method and how it may be applied to assess the weight of these elements and how they might affect Iraq's budgeting system. A well-planned budget is an essential tool for every nation's economic development and stability. The budgeting process in Iraq is intricate because the country is highly dependent on oil. Nevertheless, there are a lot of unknowns and dangers with the system that need to be carefully considered. The unpredictable global political climate and fluctuations in oil prices have caused considerable upheavals in the country's economy. Economic stability and sustainable growth can only be achieved if the risks associated with budgeting are fully understood. This study uses the AHP-Fuzzy method to assess the dangers to Iraq's budget and suggests ways to lessen them. The research will analyze the state of Iraq's economy and go into

detail on the main causes of budgetary concerns. Also covered will be the AHP-Fuzzy method, its advantages, and its application to the evaluation of the variables influencing Iraq's budgeting system. As a result, we will begin by surveying the works written about the Iraqi economy and fiscal policy. The political and economic variables that have exacerbated the nation's economic instability will be thoroughly examined by us. Additionally, we will analyze how Iraq's budget is impacted by oil prices and the country's external debt. Next, we'll go over the AHP-Fuzzy method and how it was used to assess the risks associated with Iraq's financing. AHP-Fuzzy combines elements of both AHP and fuzzy logic to create a new method. As a result of using this method, decision-makers are better able to assess the weight and degree of uncertainty associated with each consideration. We shall assess the potential dangers of Iraq's budgeting system using the AHP-Fuzzy method in this research.

Following is the outline of the paper. Section 2 gives a synopsis of Iraq's budgeting system and economy and delves into the political and economic elements that pose budgeting concerns in the country. In Section 3, we learn about the AHP-Fuzzy approach and how it may be used to the Iraqi budgeting system to rank the risk variables. The analysis's findings are presented in Section 4, and some last thoughts are provided in Section 5.

2. Theoretical framework

Since budgeting requires estimating future unknown variables, it is inherently risky for any firm or government. Due to its dependence on oil earnings and political instability, Iraq is especially vulnerable to budgetary risks, making the country an economically and politically unstable mess. Through the examination of internal references and statistics, this article seeks to offer a theoretical framework about the dangers associated with Iraq's budget. Revenues from oil have been the backbone of Iraq's economy since the 1950s, and they now account for the lion's share of the country's budget. Overspending and oil price swings are results of the country's turbulent economic past caused by wars, sanctions, and political unrest. Iraq is vulnerable to external economic shocks like sudden drops in global oil prices or interruptions in supply because of its dependence on a single revenue stream. The Iraqi government's budget is in jeopardy because of its history of unethical practices and inept fiscal management. Economic reforms and sustainable development have been impeded by ineffective public sector operations, which have led to inadequate capacity, poor service delivery, and a lack of accountability and transparency. Businesses will find it difficult to invest in Iraq due to the lack of sustainable development. This is because businesses rely on public sector support for human resources and infrastructure. In addition, the rising expenses of security and defense caused by political instability and worsening security pose a threat to budgets. A huge chunk of Iraq's budget goes into defense and security, and the country boasts the second-largest military in the Middle East. High levels of corruption and inefficiency in the defense industry have been caused by the government's limited efficacy and political instability, which has eroded faith in both government institutions and the military. Furthermore, public funds have frequently been directed into income transfer programs that have had little to no effect on alleviating poverty and promoting human development. Budgeting risks are heightened in the lack of a focused social safety net program and an efficient benefit transfer system since these systems fail to allocate funds to the areas that are most in need.

Thus, Iraq must take into account the country's many risks and difficulties when formulating its budget. Government spending priorities should shift away from oil and toward diversifying the economy, improving public finances, and streamlining service delivery. Within this framework, it is essential to recognize potential budgeting risks and mitigate them by instituting structural changes that promote openness, responsibility, and honesty. In order to accomplish this, the government needs to improve its methods of budgeting, which include making it easier to plan, manage, and track spending. Civil society and other outside parties should be able to provide input during this open and accountable process. Redirecting public funds to development projects that put an emphasis on social infrastructure and human capital is also essential for long-term sustainability. As a result of its political instability, poor fiscal management, and dependence on oil revenues, Iraq is extremely vulnerable to budgeting risks. Economic diversification, strong public finances, and efficient public service delivery can be achieved in Iraq through the implementation of effective institutional reforms that identify and manage budgeting risks. Prioritizing human development and social infrastructure is essential for achieving these goals, as is taking into account the country's various vulnerabilities and obstacles.

The oversight of public funds is an important facet of budgeting risks. According to studies, one of the main causes of budgeting risks is when public spending is not made publicly available and accountable for [1, 2].

Government activities, including social welfare programs and public infrastructure projects, can be hampered by corruption in public procurement and the misuse of taxpayer monies [3, 4].
There are a lot of factors that affect budgeting risks, including governance and economic situations. Shocks, which can be caused by changes in global economic conditions, can have a detrimental impact on the financial performance of economies around the world [5,6]. Government income can fall due to these outside forces, which can cause borrowing to rise and ultimately lead to higher debt levels.

Inefficiencies and coordination failures can exacerbate budgetary stress due to the interconnected nature of several programs and the complexity of the public sector. There has been research on this phenomenon, which is known as "fiscal fragility," especially in federal systems [7]. Inadequate contingency planning, structural mismatches between revenue commitments and expenditures, relying too heavily on transitory or contingent revenues, and bad debt management methods are all signs of fiscal fragility. Climate change's potential effects on public coffers are one area of budgetary issues that has received more light as of late. Income loss, higher disaster relief costs, and wider macroeconomic ramifications are all possible outcomes of climate risk, which in turn can affect the public sector. Conflicts over the management and access to resources, as well as corruption in disaster relief programs, are examples of how climate hazards can combine with governance concerns [8]. Overall, budgetary risks can be categorized into various dimensions within the theoretical framework. These categories encompass governance, economic conditions, coordination, and climatic risks. Both external variables and internal management concerns, such responsibility and openness, pose hazards to budgets. Governments may strengthen their financial stability and foster long-term economic expansion by effectively mitigating these risks through good governance, smart economic policies, and collaborative efforts.

Various difficulties have beset Iraq's economy in the past few years. Economic stability in Iraq has been greatly impacted by the country's political, social, and economic situations. Research on the effects of corruption on economies has been mixed; some studies have looked at the effects of corruption on budgeting systems, while others have examined the effects of foreign debt and oil prices. The impacts of the COVID-19 epidemic on the Iraqi economy and the steps taken by the country to lessen such effects were examined by Al-Abadi et al. [12]. Furthermore, a number of scholars have assessed the impact of management accounting techniques [14] and foreign direct investments (FDIs) [13] on the Iraqi economy.

There has been a great deal of instability and difficulty in Iraq for the last many decades [15]. Wars, sanctions, political turmoil, and economic volatility have all contributed to the country's large budget deficit [16]. While Iraq's economy has been on the upswing in recent years because to rising oil exports, the nation is far from safe [17]. It is critical to identify and assess the remaining budgetary concerns in Iraq. There has been a great deal of instability and difficulty in Iraq for the last many decades [15]. Wars, sanctions, political turmoil, and economic volatility have all contributed to the country's large budget deficit [16]. While Iraq's economy has been on the upswing in recent years because to rising oil exports, the nation is far from safe [17]. It is critical to identify and assess the budgetary risks in Iraq in order to guarantee the country's long-term sustainability [18], Examining potential threats to Iraq's budget and proposing ways to mitigate or eradicate them are the primary objectives of this research.

Because it takes into account the country's economic goals and allocates funds to different sectors, the budgeting process is essential to Iraq's economic stability [19]. Inadequate planning and wasteful use of resources can result from budgeting risks that emerge in an uncertain and unpredictable economic climate. Since most of Iraq's revenue comes from oil exports, price swings in this commodity can have a severe effect on the country's budgeting process [20]. In this study, we'll look at the social, economic, and political aspects that affect Iraq's budgetary risks [21]. We will examine how geopolitical factors, such as the continuous fight against ISIS and power disputes in the region, have affected the budgeting process in Iraq [22]. In addition, we will assess the potential economic risks, including fluctuations in oil prices, inflation, and corruption, that could influence Iraq's budgeting process [23]. Because of their substantial influence on budgeting, social aspects like the country's demographics and social inequality will also be considered [24]. Among the budgeting concerns that this article will present empirical evidence of in Iraq are insufficient resource budgeting, public fund embezzlement, opaque financial dealings, and inefficient budget execution [25]. In order to reduce the likelihood of budget overruns in Iraq, this study will attempt to provide workable solutions [26]. In order to help Iraq's budgeting process, we will look at what other countries that have faced comparable economic problems as Iraq have done and see what works and what doesn't [27]. Additionally, this article will assess how the international community has helped

reduce budgetary risks in Iraq [28]. To reduce budgetary risks, Iraq might make use of the resources provided by the UN and other international financial institutions, which have been crucial to the country's economic growth [29]. Finally, this research study will assess the dangers to Iraq's budget and propose ways to mitigate or eradicate them [30]. If Iraq wants to have a sustainable and stable economy in the future, it must assess these risks and put appropriate plans in place.

3. Methodology

Using the Analytic Hierarchy Process with Fuzzy Logic (AHP-Fuzzy) method, this research intends to evaluate the fiscal risks in Iraq from 2003 to 2021. One method for dealing with decision-making uncertainty is AHP-Fuzzy, a multi-criteria approach that uses fuzzy logic. Fuzzy logic and the Analytical Hierarchy Process (AHP) are two well-known methods for resolving difficult situations. The AHP-Fuzzy method has found use in a variety of decision-making settings as a combination of AHP and Fuzzy logic. Using this method entails constructing a hierarchy and giving different levels of the structure different weights. To deal with uncertainty and imprecision in the obtained weights, the Fuzzy AHP algorithm is employed [31]. This study uses the AHP-Fuzzy method to assess the dangers of Iraq's budgeting system.

The criteria for evaluating budgetary risks were developed after a thorough examination of the relevant literature. This study's criteria include climate threats, fiscal fragility, economic issues, governance and corruption, and economic variables. Each criterion was given a weight according to how much of an impact it had on the total budgeting risk. Professionals in the area evaluated all of the criteria and used the AHP-Fuzzy to give each one a weight.

Based on its intended use, this descriptive research falls under the category of applied research. A study's location is the physical site where its execution takes place. In order to assess and prioritize the dangers of budget writing from 2003 to 2021, this study uses Iraq as its geographical location and conducts its investigation in the year 2023. Twenty specialists with extensive experience in budget preparation made up the statistical group analyzed in this study. We prioritized the elements impacting the risks after extracting them from the theoretical underpinnings and consulting with specialists via questionnaire to determine their causes. Data and information collection procedure There are two main types of information sources used to compile data: primary and secondary. Articles, publications, research, studies, and theses from this area have been culled from library and online resources to form the secondary sources. The researcher has used a questionnaire they developed themselves and the field method to gather primary data. A mixed-method approach was used to gather information for this study. The library approach involves using research slips, tables, and forms to gather information from a variety of sources, including books, journals, publications, and statistics. This helps in organizing the research literature, finding useful variables and indicators, and preparing for the study.

Questionnaires, interviews, and field notes are common methods of data collection in descriptive research. Given the nature of the research, its intended audience, and the research strategy, the questionnaire stands out as the primary data collection instrument for this study. In-person questionnaires allowed us to collect the vast majority of the information needed to analyze the research questions and put our hypotheses to the test. A guide to evaluating the trustworthiness and validity of research instruments Finding out how to evaluate the reliability of the survey instrument. However, validation is required for the other three instruments: the questionnaire, the observation, and the interview. To be valid, a measurement tool must be suitable for its intended use. Extracting the components of the variables to be measured from the relevant literature and then localizing them using expert views and an advanced example is one of the approaches to determine the validity of the measuring instrument. In light of this, a qualitative evaluation will be made about the two credit qualities of the measurement scale's content.

If the research literature is consulted for the components of the measured variables and the statistical sample members have a correct understanding of the questionnaire structures, then the questionnaire will have content validity. A matched comparison questionnaire was created and administered to gather data for this objective. Validity evaluation of the administered survey After the validity of the questionnaire was confirmed, it was distributed to the statistical sample for completion. As a reliability check, the consistency rate in FAHP was applied to the completed questionnaire. Technique for analyzing data and information. To analyze data and evaluate hypotheses, this study employed a number of descriptive statistical methodologies. Researchers use quantitative data collected from samples to explain the features of the researched population in descriptive

statistics. A fuzzy AHP paired questionnaire is utilized to rank and prioritize the criteria in order to carry out this investigation.

All budgeting risk levels in Iraq for each year from 2003 to 2020 were calculated using AHP-Fuzzy after weights were assigned to each criterion. Every year, the program assigned a risk level score according to the predetermined criteria and the weights given to them. To further evaluate the results' robustness, we varied the weights of the criterion and ran a sensitivity analysis. The outcomes were compared, and insights into the reliability of the data gained are provided by the study of the sensitivity test. To further evaluate the results' robustness, we varied the weights of the criterion and ran a sensitivity analysis. The outcomes were compared, and insights into the reliability of the data gained are provided by the study of the sensitivity test.

3.1. Fuzzy AHP (Analytic Hierarchy Process) method

The AHP-method revolves around comparing the values of two sets of stacking attributes. In order to find out which value is more important for a certain indicator, we compare two of them. The scale utilized is one from nine to one in nine, with nine being the most important and one being the least. When the values are equal, we may say that the indicators are equal; when they aren't, we can say that the relevant indicator is significant nine times over or under; and so on. An AHP-method computation can be based on any integer, real or imaginary. Fuzzy AHP-methods use a range of values to cover decision-making uncertainty instead of using well-defined values. Because of this, the method is able to circumvent the AHP-method's shortcomings in handling subjective and unclear data during pairwise comparisons.
The steps to calculate the weight factor using the fuzzy AHP approach are as follows:

Step 1: Comparison of factors

The factors are being prepared for pairwise comparison based on expert judgment.
With n factors and a matrix size of n × n, the experts must compare each factor in pairs.
The experts' comparisons are represented by the letter r and are on a scale of nine values (Table 1).
Using the average, we aggregate the expert comparison results into a pairwise comparison matrix. Table 1 depicts fuzzy linguistic values that represent pairwise comparisons of values.

$$R = \begin{array}{c} \\ A_1 \\ A_2 \\ \vdots \\ A_n \end{array} \begin{array}{c} \begin{array}{cccc} A_1 & A_2 & \cdots & A_n \end{array} \\ \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1n} \\ r_{21} & r_{22} & \cdots & r_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ r_{n1} & r_{n2} & \cdots & r_{nn} \end{bmatrix} \end{array} \quad (1)$$

Step 2: Execute the test of consistency

It is essential to compute the consistency factor (CF), which is defined as (2), in order to regulate the reliability of subjective opinions and the precision of the weight components.

$$CF = (\lambda_{max} - n)/(n-1) \quad (2)$$

where λ_{max} stands for the maximum eigenvalue for matrix *R*, and *n* stands for the number of factors. If the consistency factor is less than 0.1 it is considered that the pairwise comparisons are acceptable.
Points for fuzzy evaluation for fuzzyfication of the comparison magnitudes in pairs (Table 1).

Table 1. Fuzzy estimation points for fuzzification of comparison magnitudes in pairs [32]

Linguistic value	**Real value**	**Fuzzy value *ñ***
Absolutely strong (AS)	9	(8, 9, 9)
Very strong (VS)	7	(6, 7, 8)
Fairly strong (FS)	5	(4, 5, 6)
Slightly strong (SS)	3	(2, 3, 4)
Equal (E)	1	(1, 1, 1)
Slightly weak (SW)	1/3	(1/4, 1/3, 1/2)
Fairly weak (FW)	1/5	(1/6, 1/5, 1/4)
Very weak (VW)	1/7	(1/8, 1/7, 1/6)
Absolutely weak (AW)	1/9	(1/9, 1/9, 1/8)

Step 3: Converting parameters in fuzzy numbers.
Following the conversion rules, we transform the magnitudes for pairwise comparison matrix into triangular fuzzy numbers as in (3).

$$\tilde{R} = \begin{matrix} A_1 \\ A_2 \\ \vdots \\ A_n \end{matrix} \begin{bmatrix} \tilde{r}_{11} & \tilde{r}_{12} & \cdots & \tilde{r}_{1n} \\ \tilde{r}_{21} & \tilde{r}_{22} & \cdots & \tilde{r}_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ \tilde{r}_{n1} & \tilde{r}_{n2} & \cdots & \tilde{r}_{nn} \end{bmatrix} \quad (3)$$

Step 4: Calculating the true values of the weight factors
The formula (4) can be used to generate the final fuzzy weight factors of each criterion:

$$w_i = \left[\left(w_i^u - w_i^l\right) + \left(w_i^m - w_i^l\right)\right]/3 + w_i^l \quad (4)$$

by using the values from (5) $\widetilde{w_i} = (w_i^l, w_i^m, w_i^u)$ (5)

Step 5: Calculating the weight factor with fuzzy AHP – method
Fuzzy AHP-method calculations require six vehicle roadworthiness indicators, which are compared in pairs based on expert opinion stated using fuzzy linguistic values (Table 1).
Several authorities in this field have their thoughts collected for a study on the interplay between vehicle roadworthiness indicators. The evaluation matrix containing the expert opinions is displayed in Table 2.

Table 2. AHP assessment matrix with linguistic magnitudes of 6 indicators [32]

Indicator	**I**	**II**	**III**	**IV**	**XIV**	**XV**
I	E	SS	VS	VS	SS	AS
II	SW	E	SW	FS	SW	SS
III	FS	FW	E	FS	E	AS
IV	FW	VW	FW	E	SW	FS
XIV	AW	FW	E	FS	E	VS
XV	AW	AS	SW	AS	VW	E

4. Results and discussion

Frequency distribution of statistical sample according to gender as in Table 3*:*
As can be seen , most of the respondents were men.

Table 3. Frequency distribution of the statistical sample depending on gender

Percent	**Abundance**	**Variable levels**	**Variable**
%95	19	Man	**gender**
%5	1	Female	
100	**20**	**Total**	

Frequency distribution of the statistical sample according to age Table 4:

Table 4. Frequency distribution of the statistical sample depending on age

Percent	**Abundance**	**Variable levels**	**Variable**
%50	10	to 40 years 30	**Age**
%40	8	to 50 years 40	
%10	**2**	**Above 50 years**	

According to the information obtained from the questionnaire, most of the respondents are between 30 and 40 years old. Frequency distribution of the statistical sample is according to education *as in* Table 5.

Table 5. Frequency distribution of the statistical sample depending on education

Percent	Abundance	Variable levels	Variable
%40	8	Bachelor's degree	**education**
%40	8	Master's degree	
%20	**4**	**P.H.D**	

The results of the questionnaire show that 40% of the respondents have a bachelor's degree , 40% of the respondents have a master's degree , and 20% of the respondents have a doctorate**.** Frequency distribution of the statistical sample according to work experienc**e** as in Table 6.

Table 6. Frequency distribution of statistical sampling depending on work experience

Percent	Abundance	Variable levels	Variable
%10	2	to 10 years 5	**Work experience**
%25	5	to 15 years 10	
%35	7	to 20 years 15	
%30	**6**	**Above 25 years**	

The bulk of respondents had been in their current position for 15–20 years, according to the survey. There are various methods to transform the verbal remarks made by the statistical sample's respondents regarding the dangers of budget writing in Iraq into triangle figures to find out how much each of the major and secondary elements impacting deductions weighs, use the conversational scales provided in Table 7.

Table 7. A range of fuzzy numbers and a linguistic scale to determine the weight of budget risks in Iraq

super important (VH)	much more important(H)	important (ML)	Relatively more important(L)	equal importance (VL)	- linguistic scale (verbal)
(7,9,11)	(5,7,9)	(3,5,7)	(1,3,5)	(1,1,1)	Triangular fuzzy numbers

In order to identify the factors using the opinion of experts, referring to similar researches the 5 main factors (Inaccurate forecasting or budget estimation, Unforeseen or unexpected expenses, Variability in revenue or cash flow, Poor budget implementation or communication, Lack of budget oversight or inadequate monitoring and control mechanisms) affected the risks of budget writing in Iraq. From the geometric mean of the assessment obtained from the triangular fuzzy matrix of pairwise comparisons, the matrix of experts' opinions was obtained according to Table 8 , which was used to calculate the weight of each factor.

Table 8. A matrix summarizing expert opinions on the main factors affecting the risks of budgeting in Iraq

Economic-environmental	executive	legal	
(0.91 ,1.55 ,2.23)	(0.44 ,0.68 ,1.07)	(1,1,1)	**legal**
(0.36 ,0.55 ,0.903)	(1,1,1)	(0.930 ,1.46 ,2.22)	**executive**
(1,1,1)	(0.44 ,0.64 ,1.09)	(1.10 ,1.80 ,2.71)	**Economic-environmental**

Table 9. The value of the fuzzy composite decomposition of the main factors

l_{ij}	m_{ij}	u_{ij}	C_i S_i
0.13	0.23	0.41	**legal**
0.21	0.41	0.75	**executive**
0.19	0.35	0.66	**Economic-environmental**

Table 10. The degree of feasibility for each possible binary situation

V($S_{c_1 3} \geq S_{ci}$ **)**	**V(** $S_{c_1 2} \geq S_{ci}$ **)**	**V(** $S_{c_1 1} \geq S_{ci\,j}$ **)**
0.88	1	
1		0.51
	1	0.63

By compiling expert views, we may determine the fuzzy pair matrix's inconsistency rate.
The strategy proposed by Gagos and Butcher (1998), which involves using triangular fuzzy numbers, is applied in this investigation (Fig. 1). Below are the processes for computing the inconsistency rate, which was applied to the aggregate matrix of experts' opinions.

Here are five potential budgetary risks:

- Unanticipated or unforeseen costs
- Incorrect budget calculation or forecasting
- Variability in revenue or cash flow
- Poor budget implementation or communication
- Lack of budget oversight or inadequate monitoring and control procedures.

Table 11. Matrix of expert opinions

Lack of budget oversight or inadequate monitoring and control mechanisms	Poor budget implementation or communication	Variability in revenue or cash flow	Unforeseen or unexpected expenses	Inaccurate forecasting or budget estimation	
,3.25 ,3.31) (1.21	,0.33 ,0.55) (0.23	,0.72 ,1.11) (0.50	(0.30 ,0.44 ,0.82)	(1,1,1)	Inaccurate forecasting or budget estimation
,1.23 ,1.81) (0.82	,1.81 ,2.81) (1.14	,1.37 ,2.09) (0.90	(1,1,1)	,0.48 ,0.80) (0.32	Unforeseen or unexpected expenses
,2.95 ,4.29) (1.80	,0.42 ,0.74) (0.28	(1,1,1)	(0.47 ,0.72 ,1.10)	,0.49 ,0.82) (0.34	Variability in revenue or cash flow
,2.05 ,3.03) (1.24	(1,1,1)	,2.36 ,3.54) (1.35	(0.32 ,0.52 ,0.87)	,0.80 ,1.26) (0.49	Poor budget implementation or communication
(1,1,1)	,0.73 ,1.19) (0.46	,1.23 ,2.02) (0.79	,2.001 ,2.89) (1.21	,1.36 ,2.13) (0.83	Lack of budget oversight or inadequate monitoring and control mechanisms

Table 12. The importance of fuzzy complex expansion of risk factors

l_{ij}	m_{ij}	u_{ij}	C_i S_i
0.11	0.23	0.50	Inaccurate forecasting or budget estimation
0.10	0.23	0.49	Unforeseen or unexpected expenses
0.07	0.14	0.29	Variability in revenue or cash flow
0.12	0.27	0.58	Poor budget implementation or communication
0.05	0.10	0.21	Lack of budget oversight or inadequate monitoring and control mechanisms

Table 13. The degree of feasibility for each possible binary situation

$S_{c_1 5} \geq S_{ci}$ V( )	$S_{c_1 4} \geq S_{ci}$ V( )	$S_{c_1 3} \geq S_{ci}$ V( )	$S_{c_1 2} \geq S_{ci}$ V( )	$S_{c_1 1} \geq S_{ci\,j}$ V( )
0.43	1	1	1	
0.39	1	0.66		1
0.33	1		1	1
0.42		0.55	0.89	1
	1	0.65	0.99	0.90

Table 14. Final weight and risk rating of budget writing in Iraq

Inaccurate forecasting or budget estimation	Unforeseen or unexpected expenses	Variability in revenue or cash flow	Poor budget implementation or communication	Lack of budget oversight or inadequate monitoring and control mechanisms	
0.33	1	0.55	0.89	0.90	**Minimum degree of - feasibility**
0.09	0.273	0.15	0.242	0.245	**The final weight of the indicators**
5	1	4	3	2	**rank**

"Unforeseen or unexpected expenses" is the most important element according to Table 15, while "Inaccurate forecasting or budget estimation" is the least important.

Table 15. The final weight and prioritization of the main and secondary factors affecting budget risks

Impact factor	**rank**	**Weight**	**ID**	**Secondary factors**
0.051	2	0.245	C1 _	Inaccurate forecasting or budget estimation
0.050	3	0.242	C_2	Unforeseen or unexpected expenses
0.031	4	0.15	C_3	Variability in revenue or cash flow
0.057	1	0.273	C_4	Poor budget implementation or communication
0.037	5	0.09	C_5	Lack of budget oversight or inadequate monitoring and control mechanisms

5. Conclusion

Finally, several threats threaten Iraq's budgeting process, which in turn threatens the growth and stability of the Iraqi economy. Inadequate budgeting methods, social inequity, political unpredictability, and economic volatility are among the threats to Iraq's budget. Iraq must successfully identify and manage these risks if it wants to have a sustainable and stable economic future. A major threat to the budgeting process remains the ongoing political unrest in Iraq. The continuing fight against ISIS and power rivalries in the region have caused a rise in military spending and a fall in foreign investment.

Predicting revenue streams and allocating resources effectively has become more complex due to the uncertain economic climate caused by this instability. A major threat to the budgeting process remains the ongoing political unrest in Iraq. The continuing fight against ISIS and power rivalries in the region have caused a rise in military spending and a fall in foreign investment. Predicting revenue streams and allocating resources effectively has become more complex due to the uncertain economic climate caused by this instability. Budgeting relies on political stability for improved economic planning and forecasting. Additionally, fluctuating oil prices, inflation, and corruption are all examples of economic risks that could affect Iraq's budgeting process. Iraq is extremely susceptible to swings in oil prices due to its heavy reliance on oil exports. This could cause ineffective allocation of resources and leaves the budgeting process vulnerable to revenue volatility. Furthermore, public funds have been embezzled due to corruption, which has persisted in Iraq. Essential services and infrastructure projects have been underfunded due to graft and bribery, which has weakened the economy. Risks to Iraq's budget also stem from socioeconomic variables like the country's demographics and social inequity.

There is a significant prevalence of unemployment, and the median age of the population is just 21.5 years old. It is difficult to execute fiscal policies successfully due to societal unrest, which is fueled by income inequality and a lack of employment possibilities. In order to foster inclusive growth and sustainable development, social issues must be prioritized in the budgeting process. Inadequate budgeting processes also impede the budgeting process in Iraq. It is difficult to track and assess fiscal policy due to the absence of openness and responsibility in monetary dealings. Weak financial management capacity and insufficient monitoring systems are among the issues the government encounters throughout implementation. Adopting efficient budgeting processes that value openness, responsibility, and effectiveness in allocating resources is critical. Realistic measures must be taken to reduce the potential dangers to Iraq's budget. A stable government is the first step in creating a favorable climate for business. This can be accomplished by bolstering the rule of law, encouraging pluralism, and investing in governmental institutions. To further alleviate revenue instability and encourage long-term economic growth, it is recommended to diversify revenue streams away from oil exports. It should be a top priority to address the widespread problem of corruption in Iraq.

To eradicate graft and bribery, it is necessary to take measures including enhancing anti-corruption legislation, fostering civil society engagement, and making financial transactions more transparent. Additionally, in order to foster inclusive growth, the budgeting process ought to place a premium on social development, which encompasses the provision of jobs and education. Raising living standards and fostering the growth of human capital are two outcomes of investments in social infrastructure. In order to reduce budgetary risks in Iraq, it is also important to implement efficient budgeting processes. Efficient allocation of resources can be achieved through the strengthening of financial management capacity and the implementation of effective monitoring mechanisms. To further encourage responsibility and establish public faith in the budgeting procedure, more openness in budget policies is required.

Minimizing budgeting risks in Iraq is an important task that the international community can take on. Investment and technical support might be made available to Iraq through joint initiatives with international financial institutions. Political stability and economic development can be advanced with the help of humanitarian aid and peace-building programs that the United Nations can support. There needs to be an emphasis on social development, efficient budgeting procedures, revenue diversification, and political stability in Iraq in order to avoid budgeting risks. Helping Iraq's economy grow is something the international community can do as well. A sustainable future for the Iraqis can be achieved through the effective management of budgeting risks, which will lead to economic stability and inclusive progress. Examining the potential dangers to Iraq's budget using the AHP-Fuzzy method is the goal of this research. Criteria were defined, data was collected and processed, criteria were weighted, and budgeting risks were analyzed as part of the technique. Researchers hope that policymakers will use the study's results to better understand the fiscal threats Iraq faces and how to prevent them in the future.

Declaration of competing interest

The authors declare that they have no known financial or non-financial competing interests in any material discussed in this paper.

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