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Identifying and ranking factors affecting new oil contracts in Iran

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Abstract

One of the most important parts of oil contracts is the financial regime. The new generation of upstream contracts, which is referred to as Iranian oil contracts, has recently been designed and placed on the agenda of the Ministry of Oil. Currently, the nature and structure of the financial system has been introduced in Iran's new oil contracts, then by reviewing the texts related to the financial system and interviewing experts, the selection of financing evaluation criteria has been made. The research method was fuzzy AHP and the statistical population of the research is 20 experts and managers of the country's oil industry. The tool of the current research is an expert-oriented questionnaire, which was identified based on the opinions of experts, and 32 components were finally finalized by ranking and determining the weight of 5 criteria. According to the results of the research, the criteria of providing and attracting foreign investment, balance between risk and reward, expected return, flexibility and safety withdrawal from the reservoir have been given higher priority in the financial system of the new oil contract.

Keywords: New oil contract, financial system, Fuzzy AHP method.

INTRODUCTION

1. Introduction

Considering the single-product nature of Iran's economy and the reliance of a large amount of the country's annual budget on oil and the profound and significant impact of this vital commodity on the economic, political and social developments of this border and region, and also considering the significant and sensitive role of oil contracts in The distribution, preservation and proper exploitation of this national wealth, the necessity of reviewing oil contracts in order to preserve the sovereignty and national security of the Islamic Republic of Iran and conducting research in this field is an undeniable fact. The use of oil contracts to protect national sovereignty is an established mechanism in Iran, and the current laws and regulations allow the National Iranian Oil Company to use oil contracts to create security and advance economic, social and political goals. The design of these contracts goes back to Iran's oil law approved in 1353, which stipulates in its article 3: (Iran's oil resources and oil industry are national, and the Iranian nation's ownership rights apply to Iran's oil resources in the field of exploration) (Ebrahimi, 2013). . In various other laws protecting national sovereignty, its importance and position are clearly revealed. Among them: Article 14 of the Law of the Fourth Five-Year Plan of Economic, Social and Cultural Development of the Islamic Republic of Iran and the country's 20-year vision document and the undeniable necessity of economic development and maintaining the country's national interests and security and sovereignty on the world stage in parallel with the conclusion of oil contracts as well as the principles 125, 152 and 153 of the Constitution and the law of the fifth five-year plan, which is mentioned in note 1 of article 125 about the necessity of protecting sovereignty and national security in oil contracts, and also in article 17 of the revised oil law approved on 2013/4/23 which (exercising the right It has emphasized the sovereignty and public ownership of the Islamic Republic of Iran over oil resources and policy making (Hatami, 2014).

Some characteristics of the oil industry, such as dependence on the ups and downs of demand and consumption outside national borders, dependence of the oil industry on complex technologies of industrialized countries and multinational companies, dependence on large investors for exploration and extraction, control of oil prices by international forces, scope And it has increased the depth of influence of this article on the national destiny. Thus, it can be said that our country's need for oil income in the field of international economy is one side of the problem. On the other side of the problem is the interaction of security and national sovereignty of the country from oil revenues through the conclusion of profitable oil contracts in the domestic arena on social and economic life. Unfortunately, if we remove oil from the national economy, all the pillars of economic, social and even political life will be severely overshadowed. The injection of capital into the industrial sector, the import of basic goods, the supply and acquisition of new industrial and military technology, and the supply of domestic energy are dependent on oil revenues (Khajavi, 2019).

It may be necessary to explain that after years of not investing in the upstream sector of the oil industry after the Islamic revolution and the 8-year war, in the late 1970s, Iran took the first serious step in concluding contracts for the development of oil fields. Therefore, in the current research, we intend to examine the new oil contracts that have been used over the years and are in accordance with the standards of the country, and to assign governance mechanisms and observe national interests in them and discuss their effects.

Since its inception, oil rights have faced a fundamental change that has severely affected oil contracts. These changes started with concession contracts and continued with the invention of new methods of concluding oil contracts. Today, these contracts are divided into franchise, service and partnership contracts. The nature of oil contracts in Iran, both when they were concluded in the form of simple letters of concession with minimal government intervention, and when they were formed in the form of partnership contracts with a stronger presence in the course of their evolution, and whether now when they are complex contracts for the purchase of services or with maximum Government intervention has always been disputed. In general, there are different opinions about the nature of oil contracts. According to the fundamental concepts of administrative law such as public service, public interest and public power, some jurists believe that oil contracts are administrative. In other words, due to the national sovereignty of countries over their natural resources, the exploitation of national wealth such as oil is considered as an example of sovereignty and the nations are the real beneficiaries of these contracts (Sahib Honar, 2015).

The other group, considering the foreign nationality of the investing companies in oil contracts, believe that such contracts are international and believe that the foreign element of the investing companies causes the internationalization of such contracts, and without the intervention of the governments of the investing and receiving countries, it is not possible to implement these contracts. And finally, another group believes that these contracts are transnational or quasi-international and they believe that oil contracts are outside the rule of national laws and international law is unable to meet the needs of these contracts. Finally, in a general summary and according to the consensus of jurists, the process of development and of course the security and protection of the national sovereignty of oil exporting countries at the global level depends on the conclusion of oil contracts and how to apply their sovereignty to these types of contracts. In this study, we investigate the new oil contracts of Iran using the fuzzy AHP method.

2- Theoretical foundations

In this part, we evaluate the structure of Iran's oil contracts from different legal, financial and economic angles and examine its merits and demerits (Emami Meibdi and Hadi, 2011):

- Legal

The most important issue regarding the legal evaluation of oil contracts is the examination of the ownership rights of the parties on oil reserves. Although in Iran's new oil contracts, as in other service contracts, the ownership of reserves and produced oil at the wellhead is not transferred to the contractor, but from several

angles, ownership and national sovereignty over oil resources are impaired in these contracts, and there are many points to consider in this regard. (Kazemi, 2015):

Although, according to the opinion of some oil and gas law experts, it seems that the possibility of registering oil reserves in the property of the contractor companies is legally provided in the IPC contracts, but the Iranian authorities claim that in this contract, the payment of wages is in cash, but it is the same as sales. This reciprocal payment can be made in the form of an oil "purchase and sale" contract, which is one of the annexes of the contract, which is a commercial transaction and has a delivery point. Therefore, even ownership of production is not interpreted in this contract, and it is not possible to own reserves through the first method. What is considered as a legal necessity in the world's stock exchanges for oil companies today is the disclosure of contracts and estimates along with the annual financial balance, which they must do, and this does not mean the registration of reserves. Since the foreign company receives a certain amount of wages for each barrel of oil produced, reducing or stopping production from the field under the contract for any reason except technical reasons, although it is possible from the government, but it should not affect the repayment of the contractor's claims. This issue has been explicitly mentioned in the resolution of the government board under clause "10-3" and it has been stated that if the Ministry of Oil decides to reduce the level of production or stop it, the priority will be to reduce the fields outside the subject of the contract, and if the decision to reduce production is taken from the subject of the contract, this production reduction should not affect the reimbursement of costs and wages belonging to the contractor. One of the most important reasonable expectations created for the contractor in this contract is to receive a certain salary per barrel of oil or condensate produced. Therefore, if the government decides to reduce or stop the flow of production from the field for any reason other than technical reasons, the contractor can demand all the oil wages that he could have received during the production stop period. Indirectly, this issue means the religious right to the oil produced from the tank, proportional to the storage inside the tank and the recovery rate from it (Moghadam, 2010). However, the following points can be considered:

1- The government has the right to stop or reduce production for any reason, and the issue of how to financially compensate the contractor is a secondary issue, and this issue does not violate the government's right to sovereignty and ownership of oil resources.

2- The probability of occurrence of force majeure cases, as a result of which the government is forced to reduce or stop production, is very small, and in case of occurrence, it has its own decision, which is mentioned in the contract, and during force majeure, the obligations of the parties are suspended, and even in the case of prolonged After this period, there is a possibility of contract termination.

3- The decrease in production due to the decrease in the OPEC quota and the like has a small contribution for each field and its duration is also short, so it can be easily managed and even if possible, the decrease in production can be done from other fields that do not have a foreign contractor. The aforementioned legal problems do not arise.

4- Imposing the risk of stopping or reducing production due to non-technical reasons on the contractor (without compensating the financial expenses incurred by him and the related salary) will cause a significant increase in the risk of the contract and will show itself in the costs of the projects, which will incur unnecessary costs.

The government and the National Oil Company will put The structure of new oil contracts has provided the basis for the long-term presence of foreign oil companies in the country, and the mentioned companies can create a long-term and secure access to the country's oil reserves.

Although the IPC contract is defined as a subset of service contracts, since the contractor's salary changes based on production and oil price in a staggered manner, this contract can be considered similar to production participation contracts, and on the other hand, this issue should also be considered. It should be noted that in the IPC contract, in contrast to participation in production, where the right of ownership over part of the production is given to the other party from the very beginning, this issue has been explicitly rejected (Momini, 2019).

- Financial and economic

In this part, some economic indicators of these contracts have been examined (Nikbakht Fini et al., 2017):

A) How to divide and the amount received by the parties

In Iran's new oil contracts, the second party of the contract, in addition to receiving direct and indirect capital costs and operational costs during the exploitation period, was also present and received a certain wage from each barrel of oil/thousand cubic feet of gas produced/additional in new/under production fields. receives One of the main differences between the financial regime of this contract and cross-sale contracts is that the wages in cross-sale contracts are specified at the time of signing the contract and are paid to the contractor along with the contractor's capital and bank expenses in 5-7 year installments. While in IPC contracts, the contractor's salary is a function of various factors, including the level of production. The accurate calculation of the parties' receipts and the effect of contractual parameters and variables on its amount requires accurate financial simulation of the contract, which will take place in the next phase (Manzoor, 2015).

B) Factors influencing the receipt of the parties

- Oil prices

With the increase in the price of oil due to the increase in field income and the consequent increase in the repayment ceiling of the contractor's claims, the repayment of the claims is made faster. However, this issue of expediting the contractor's reimbursement when the price increases is relevant only in low oil prices, and the reimbursement ceiling will not be limiting when the price increases from a certain level. Also, since the wage rate is related to the oil price in a staggered manner, the wage rate will increase at higher prices, and as a result, the contractor's income and internal rate of return will also increase. Of course, the contractor's income may not change much (Tahri Fard, 2014).

- Production level

The increase in the production level affects the productivity and income of the parties in different ways. On the one hand, the reimbursement ceiling increases due to the increase in field income, which can accelerate reimbursement at low levels of price and/or production, and also due to the direct relationship between the contractor and the production level, it causes an increase in wages. Of course, due to the increase in the R factor and the decrease in the wage rate, which in addition to the R factor in this contract is directly related to the production level, the amount of wage increase will be adjusted. Also, the increase in production implies an increase in the operating costs of the project, which must be taken into account. Finally, although an increase in production, like an increase in price, can increase the efficiency of the operator, but due to the increase in operating costs and the decrease in the wage rate, the amount of this increase will be lower compared to the previous situation. The way of changing the receipt of the foreign company will be similar to the previous case (Saheb Honar, 2016).

- Cost

If the increase in expenses is not to the extent that the foreign company's claims exceed the reimbursement ceiling, in this case only the government's receipt and rate of return will decrease and the share received by the foreign company will increase. Also, considering that the R factor has an inverse relationship with the cost, with the increase in project costs, the R factor will decrease and as a result, the wage rate will increase. Therefore, it is even possible that the increase in project costs will increase the operator's internal rate of return. Therefore, it is necessary to calculate how the cost increase affects the user's internal rate of return. Otherwise, the issue of gold plating will arise. However, if the increase in costs exceeds a certain limit and postpones the repayment of the foreign company's claims, then the internal rate of return of the government and the foreign company will decrease. But determining how the parties' receipts change requires sensitivity analysis using the project's financial simulation model. In general, it can be said that the contract parameters should be in such a way that the increase in the cost of the efficiency of both parties is reduced (Nikbakht & Arian, 2014).

C) The possibility of extending the contract in case of overdraft.

- Risk distribution

Another important point about oil contracts is the fair distribution of risk and compliance between risk and reward. It was not necessary to pay attention to this point in cross-sale contracts, and on the one hand, the contractor faces significant risks, such as the risk of cost increases exceeding the contract amount, the risk of delay in completing the project, the risk of not achieving contracted production, operational risk, and the risk of price reduction. Oil was facing, and on the other hand, the government was facing the risk of non-maintenance production by that company, the risk of production reduction after project delivery, and the risk of cost overestimation, and there was no proper incentive mechanism to manage these risks (Ameri, 2014).

In general, the things that have made these contracts more flexible than previous contracts are as follows:

• Flexible development program.

• Work plan and annual budget instead of setting a fixed cost ceiling.

• The possibility of full cost recovery.

• Wage flexibility to oil price fluctuations.

• Salary according to risks and different operational areas.

• Improving the decision-making process.

• The possibility of granting permission for exploratory activities in the adjacent blocks if the commercial field is not discovered (Council of Ministers, 2015).

3- Research method

The purpose of this research is in the field of applied research. In this research, taking into account all the mechanisms embedded in the financial regime and the flow of funds of the parties to the contract, the financial simulation of the development and production periods of the 4th and 5th phases of the South Pars field is carried out. In other words, if we assume that the government now wants to develop phases 4 and 5 of the South Pars gas field, then how will the benefits of the development in the form of new oil contracts be for the parties to the contract? The tool for collecting information is an expert-oriented questionnaire. 20 professors and expert experts in the oil and gas field were selected to interview the experts in order to determine the effective criteria on the financial system in the contract and send an expert-oriented questionnaire in order to verify the components and score. In this research, the prioritization technique based on similarity to the ideal solution of multi-criteria decision-making methods, which was first introduced by Wong and Yun in 1981, has been used. One of the multi-criteria decision making methods is HP. This technique can be used to rank and compare different options and choose the best option and determine the distances between options and group them.

4- Research findings

Evaluation of indicators

In order to determine the factors affecting new oil contracts, we first distributed a questionnaire containing all the indicators taken from reliable scientific books and sources among the experts.

The following table shows the type and importance of criteria identified in new oil contracts according to experts:

Table 1: Status of answers

Questions	number of answers	mean	median	standard deviation	skewness	kurtosis	minimum	maximum
1	92	21 .8	11 .8	9854 .0	-8554 .0	-154 .0	25.1	9
2	92	39 .7	09 .7	9654 .0	-587 .0	-2547 .0	25.1	9
3	92	32 .8	47 .8	9457 .0	-8587 .0	-5848 .0	25.1	9

4	92	214 .3	30 .3	8540 .0	-8658 .0	-5415 .0	25.1	9
5	92	14 .7	74 .7	8945 .0	-8745 .0	.0 -51458	25.1	9
6	92	21 .8	64 .8	4815 .0	-3580 .0	-547 .0	25.1	9
7	92	47 .8	01 .8	8784 .0	-8745 .0	-2154 .0	25.1	9
8	92	21 .7	29 .7	8895 .0	-2547 .0	-875 .0	25.1	9
9	92	54 .6	74 .6	5647 .0	-6587 .0	-3265 .0	25.1	9
10	92	23 .8	94 .8	8795 .0	-5478 .0	-5478 .0	25.1	9
11	92	74 .7	64 .7	5468 .0	-5478 .0	-6587 .0	25.1	9
12	92	38 .6	11 .6	8745 .0	-4587 .0	.0 -22145	25.1	9
13	92	10 .7	19 .7	8401 .0	-6985 .0	-3698 .0	25.1	9
14	92	47 .2	41 .2	6748 .0	-4587 .0	-2159 .0	25.1	9
15	92	41 .7	69 .7	564 .0	-3254 .0	-3658 .0	25.1	9
16	92	20 .7	30 .7	6478 .0	-7854 .0	-1547 .0	25.1	9
17	92	14 .7	74 .7	87 .0	-4587 .0	-369 .0	25.1	9
18	92	25 .7	11 .7	6587 .0	-2549 .0	-6598 .0	25.1	9
19	92	87 .4	98 .4	687 .0	-5478 .0	-4587 .0	25.1	9
20	92	74 .7	47 .7	5678 .0	-6587 .0	-6589 .0	25.1	9
21	92	32 .8	66 .8	567 .0	-8554 .0	-2154 .0	25.1	9
22	92	28 .8	41 .8	5648 .0	-8547 .0	-6985 .0	25.1	9
23	92	98 .6	02 .6	5674 .0	-5698 .0	-3659 .0	25.1	9
24	92	38 .6	47 .6	564 .0	-7854 .0	-2547 .0	25.1	9
25	92	55 .3	03 .3	897 .0	-5587 .0	-6985 .0	25.1	9
26	92	21 .7	67 .7	6587 .0	-8754 .0	-6985 .0	25.1	9
27	92	31 .8	24 .8	564 .0	-5874 .0	-3658 .0	25.1	9
28	92	64 .8	60 .8	674 .0	-906 .0	.0 -96985	25.1	9
29	92	12 .7	07 .7	564 .0	-965 .0	-6985 .0	25.1	9
30	92	99 .7	54 .7	587 .0	-879 .0	-2545 .0	25.1	9
31	92	95 .7	64 .7	6785 .0	-7854 .0	-5874 .0	25.1	9
32	92	31 .8	42 .8	5102 .0	-879 .0	.0 -65987	25.1	9

As can be seen, according to the respondents, the criteria whose average importance is less than 5 according to the experts, are removed from the list of factors affecting new oil contracts, and other selected factors are re-weighted to determine the weight (using the fuzzy AHP questionnaire). The same experts are distributed, in the following we will describe the obtained results.

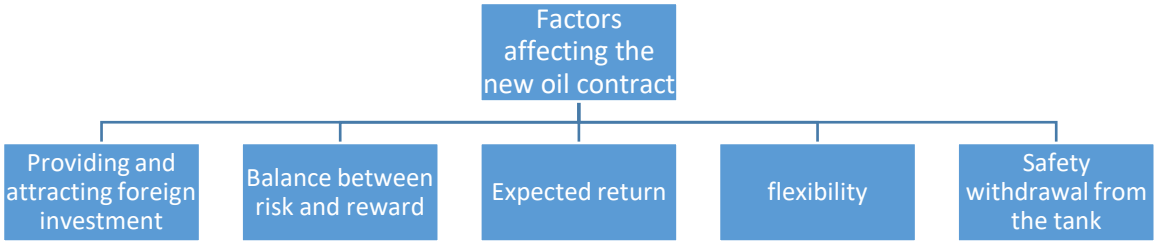
Criteria prioritization using hierarchical structure of fuzzy AHP

As mentioned, after collecting the information and performing the required calculations, it is necessary to form a hierarchical structure. Hierarchical structure is a graphic representation of a real complex problem, at the top of which is the overall goal of the problem, and at the next levels are criteria and sub-criteria or options. Although there is no fixed and definitive rule for drawing a hierarchical structure, some people have tried to state a series of general rules in this field (Qodoosipour, 2011).

Analysis Hierarchy Process (AHP) requires breaking down a decision problem with multiple indicators into a hierarchy of levels. The first level expresses the main goals of the decision-making process. The second level shows major and fundamental indicators. The third level provides more detailed sub-indexes.

With these explanations, the hierarchical structure of the current research was set as follows:

Chart 1: Important identified factors affecting new oil contracts



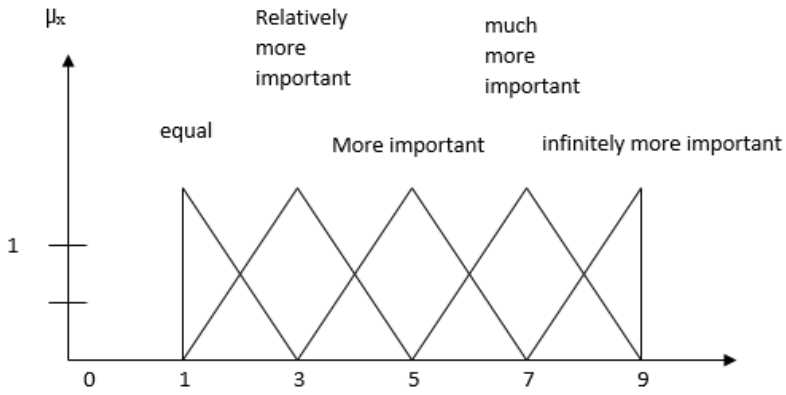
Obtaining the weight of effective criteria on new oil contracts using the FAHP model

The most important influencing factors and criteria in the new oil contracts were identified, now it is time to determine the weight of the main criteria through the FAHP model. The steps to solve the problem are as follows:

First step: pairwise comparisons

In the EA method, triangular fuzzy numbers are used for pairwise comparisons. By using the Likert scale from 1/9 to 9, the matrix of paired comparisons can be formed in the form of triangular numbers. In this stage, decision makers express their preferences by comparing pairs of elements of each level compared to elements of higher levels in a fuzzy manner.

Diagram 2: The range of fuzzy numbers used



nikTo collect the opinions of the team members regarding the pairwise comparison of the criteria, the membership function of linguistic variables as described in Table 2 has been used.

Table 2: The membership function of linguistic variables for determining the weight of criteria

Row to column preferred				Row to column preferred			
Equivalent fuzzy number			Expression variable	Equivalent fuzzy number			Expression variable
1	1	1	exactly equal	1	1	1	exactly equal
0.33	1	1	Equal importance	1	1	3	Equal importance
0.2	0.33	1	Relatively more important	1	3	5	Relatively more important
0.14	0.2	0.33	more important	3	5	7	more important
0.11	0.14	0.2	much more important	5	7	9	much more important
0.11	0.11	0.14	infinitely more important	7	9	9	infinitely more important

In the following, the geometric mean of triangular fuzzy numbers related to the opinion of each member has been calculated through the following formula.

i=1, 2, 3… m j=1, 2, 3…. m

$$\mu_G = \left(\prod_{i=1}^{n} x_i\right)^{1/n}$$ Relationship (1)

It should be noted that, since the opinion of all the members of the decision maker is given the same weight, the formula of the geometric mean is given as mentioned. Table 3 shows the matrix of fuzzy AHP pairwise comparisons, resulting from the geometric mean of decision makers' opinions. In the mentioned table, regarding the lower values of the main diameter, the inverse of the values obtained for the upper diameter of the reservoirs has been used.

Table 3: Geometric mean of experts' opinions

Indicators	Providing and attracting foreign investment	Balance between risk and reward	Expected return	flexibility	Safety withdrawal from the tank
Providing and attracting foreign investment	(1,1,1)	(5.916, 1.732, 3.872)	(3,5,7)	(5,7,9)	(5,7,9)
Balance between risk and reward	(0.256, 0.57, 0.167)	(1,1,1)	(5.916, 1.732, 3.872)	(3,5,7)	(5,7,9)
Expected return	(0.14, 0.2, 0.33)	(0.256, 0.57, 0.167)	(1,1,1)	(0.44, 1, 2.23)	(3,5,7)
flexibility	(0.11, 0.14, 0.2)	(0.14, 0.2, 0.33)	(0.44, 1, 2.23)	(1,1,1)	(3,5,7)
Safety withdrawal from the tank	(0.11, 0.14, 0.2)	(0.11, 0.14, 0.2)	(0.14, 0.2, 0.33)	(0.14, 0.2, 0.33)	(1,1,1)

The second step is to perform calculations in FAHP

Then, according to the EA method, for each of the rows of the above pairwise comparison matrix, the value of Sk, which is a triangular fuzzy number, has been calculated through the following formula.

$$S_k = \left(\sum_{j=1}^{m} M_{kj}\right) \otimes \left(\sum_{j=1}^{m}\sum_{i=1}^{n} M_{ij}\right)^{-1}$$

Relationship (2)

Where k represents the line number and i and j represent the options and indicators respectively.

After calculating the Sks, their magnitude should be calculated relative to each other. Magnitude degree for two fuzzy numbers like $M_1 = (l_1, m_1, u_1)$ $M_2 = (l_2, m_2, u_2)$ which is calculated using equation (3):

$$V(M_1 \geq M_2) = \begin{cases} 1, & if \quad m_2 \geq m_1, \\ 0, & if \quad l_1 \geq u_2, \\ \dfrac{l_1 - u_2}{(m_2 - u_2) - (m_1 - l_1)}, & otherwise, \end{cases}$$

Relationship (3)

The magnitude of a triangular fuzzy number from k other triangular fuzzy numbers is obtained from equation (4):

$$V(M_1 \geq M_2, \text{K}, M_k) = V(M_1 \geq M_2) \; and \; \text{K} \; and \; V(M_1 \geq M_k)$$

Relationship (4)

Also, to calculate the weight of the indicators in the matrix of pairwise comparisons, we use equation (5):

$$W'(x_i) = \min\{V(S_i \geq S_k)\} \quad k = 1,2,\text{K}, n \;, \quad k \neq i$$

Relationship (5)

The obtained vector specifies the non-normalized weights of the indicators. To get the normalized weights, we divide each of the non-normalized weights by the sum of the weights. The obtained vector is a normalized weight vector whose numbers are non-fuzzy and shows

the priority weights of each of the indicators or options.

= (55/886 ،86/254 ،119/399) $^{-1}$ = (0. 00835 ،0. 01159 ،0. 017893) s_k

S_1= (20. 732 ،30. 872 ،40. 916)* (0. 00835 ،0. 01159 ،0. 017893) = (0/173 ،0/357 ،0/732)

S_2= (15/899 ،24. 078 ،32. 486)* (0. 00835 ،0. 01159 ،0. 017893) = (0. 132 ،0. 279 ،0. 581)

S_3= (8. 621 ،13. 377 ،19. 069)* (0. 00835 ،0. 01159 ،0. 017893) = (0. 0719 ،0. 155 ،0. 341)

S_4= (6. 43 ،11. 212 ،16. 636)* (0. 00835 ،0. 01159 ،0. 017893) = (0. 0538 ،0. 1299 ،0. 297)

S_5= (1/7 ،2. 01 ،3. 06)* (0. 00835 ،0. 01159 ،0. 017893) = (0. 014 ،0. 0232 ،0. 054)

Then, the degree of magnitude of each of the obtained sk values is calculated in relation to the rest of them. In the following, the values of the degree of magnitude (si ≥ sk)) v obtained for each of the sks are given.

$S_1 \geq S_2) = \frac{(u1-l2)}{(u1-l2)+(m2-m1)} = \frac{(0.732-0.1327)}{(0.732-0.1327)+(0.279-0.357)} = 1$ (v

V ($S_1 \geq S_3$) =1

V ($S_1 \geq S_4$) =1

V ($S_1 \geq S_5$) =1

V ($S_2 \geq S_1$) =0. 839

V ($S_2 \geq S_3$) =1

V ($S_2 \geq S_4$) =1

V ($S_2 \geq S_5$) =1

V ($S_3 \geq S_1$) =0. 594

V ($S_3 \geq S_2$) =0. 62

V ($S_3 \geq S_4$) =1

V ($S_3 \geq S_5$) =1

V ($S_4 \geq S_1$) =0. 494

V ($S_4 \geq S_2$) =0. 524

V ($S_4 \geq S_3$) =0. 899

V ($S_4 \geq S_5$) =1

V ($S_5 \geq S_1$) =0. 46

V ($S_5 \geq S_2$) =0. 5

V ($S_5 \geq S_3$) =0. 48

V ($S_5 \geq S_4$) =0. 43

Also, to calculate the degree of magnitude of a Si, we have other Si:

V ($S_1 \geq S_2$ ،S_3 S_4 ،S_5 ،S_6) =min (1 ،1 ،1 ،1 ،1) =1

V ($S_2 \geq S_1$ ،S_3 S_4 ،S_5 ،S_6) =min (0. 839 ،1 ،1 ،1 ، 1) =0. 839

V ($S_3 \geq S_1$ ،S_2 ،S_4 ،S_5 ،S_6) =min (0. 594 ،0. 62 ،1 ، 1 ،1) =0. 594

V ($S_4 \geq S_1$ ،S_2 ،S_3 ،S_5 ،S_6) =min (0. 494 ،0. 524 ، 0. 899 ،1 ،1) =0. 494

V ($S_5 \geq S_1$ ،S_2 ،S_3 ،S_4 ،S_6) =min (0. 46 ،0. 5 ،0. 48 ،043 ،0. 517) =0. 43

These numbers represent the non-normal weight of the indicators. c1, c2, c3 are tables.

w´ = (1 ،0. 839 ،0. 594 ،0. 494 ،0. 43)

Now, based on the relationship wi= (w´ i)/(∑w´ i), the value of the normalized weights of the indices... c1, c2, c3 is obtained:

W= (0. 293 ،0. 251 ،0. 177 ،0. 147 ،0. 128)

Determining the weight of criteria and sub-criteria using the FAHP method

Table 4: The final ranking of the main criteria in new oil contracts

criteria	Weight criteria
Providing and attracting foreign investment	0.293
Balance between risk and reward	0.251

Expected return	0.177
flexibility	0.147
Safety withdrawal from the tank	0.128
Total	1

5- Conclusion and summary

The results of the evaluation of 32 criteria in the financial system in the new oil contract using the fuzzy AHP method showed that 3 criteria of providing and attracting foreign investment, the balance between risk and reward, and the expected return were more important.

In a brief summary, according to the results mentioned, one of the main goals of oil contracts is to encourage and support the attraction and direction of domestic and foreign capital for the development of hydrocarbon fields, especially the high-risk and common fields of the country. In the implementation of the new oil contract, the cost-effectiveness of the investment is one of the attractions of the investment because in the new contract, using new methods, it is possible to increase the recovery rate from the reservoirs and prevent the drop in production.

The principle of conservation production is the maximum use of products from oil fields. Since the new oil contracts are long-term contracts and the reward amount is determined according to the production of each barrel of oil, therefore the contractor has a long-term view of the tank and seeks to achieve maintenance production in order to achieve maximum profit and maximum recovery. In paragraph C of Article 3 of the model of new contracts, the issue of maintenance is addressed[1]. In this paragraph, two goals are pursued: providing the maximum recovery rate from the fields (technical approach) and secondly providing the maximum economic return and net present value (economic approach).

The flexibility of the contract means the fair sharing of the receipts of the parties to the contract (employer and contractor) in the changing conditions of the oil and gas market. In Iran's new oil contract, according to what is stated in clause "C" of Article 8 of the contract, there is no cap on capital costs, so to speak, they are open-ended, and capital costs are determined annually based on operational financial plans. In the new oil contract, from the time the field reaches initial production, all costs and bonuses will be paid according to the period specified in the contract (Article 10 of the contract) and the end of the contract period does not prevent the payment of the remaining costs under the conditions specified in the contract (Article 6, paragraph 1). In the new oil contract, the salary is determined based on the daily production amount and its rate is based on the oil price, the type and level of field development risk, the R factor and the floating production level.

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[1] Clause C, Article: 3, the commitment of the second party to the contract to maintain the oil and gas reservoirs during the contract period by using new and advanced technologies and necessary investments, including the implementation of improvement projects by increasing the recovery rate in accordance with the complexities of the field or reservoir.

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