

Giving On Optimum Method for Choosing and Evaluating the Investors in the Upstream Oil and Gas Industries in Iran

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Abstract. Due to the huge sources in the Iran oil industry, increasing oil production is one major problem of oil minister's authorities in Iran. As increasing oil production required investment through investing enterprises, so it is important to choose and evaluate the proper investor for Iran oil industry especially upstream oil and gas industries. Depending on problem, we seek to give a method for choosing proper investor; so firstly we cover to identify important and influential criteria through observation and interview with oil industry officials and weigh to identified criteria by using triangle fuzzy numbers at the follow by getting necessity information from 30 investing enterprises and preparing such information, we create a method for scoring to investors; finally those investors who get the tappets score are called as top investors and have the ability of doing project by Iran oil industry(capital firms).

Keywords: Evaluating/appraising investors, fuzzy method, upstream oil and gas industries, scoring.

1. Introduction

Having confirmed supply of oil valuing about 90 billion barrel or 9% global substantiated supply and gas approximately 22 trillion square meter or 16%sum of global supply, Iran is the richest country for having source and it is an important player in the oil international market; among global countries, only Arabic Iraq, UAE and Kuwait, confirmed oil supply in Russia have more gas supply. Iran oil level is restricted by number of factors. Oil industry faces with low marketing rate of oil. It's believed that a millions of barrel have been missed for damaging to barrels and oil reduction each year. The expert and engineers find 2 factor of failing promotion of oil industry in Iran, as follow: substructure following traditional technologies, fail to invest for prohibition. [7] Employing the investors in the upstream oil and gas sector as one way of ensuring finance, promoting technologies, increasing export and employment, extending exchange in the international era would be of specific important}

2. Literature Review

Mohn and et al evaluated an economic model of investing on large companies in the period of market choose and restructuring in the oil and gas international industry based on 115 experimental data in the period of 1992-2005 that it was a debate between uncertainty in the oil industry market with taking investors that we can refer to uncertainty items in the oil industry such as political, social logical, economic, natural factors and oil price fluctuation; finally get to the result that there is a reverse relationship between uncertainty in the oil industry market with taking investor[13]. Doloi using 102 criteria to choose contractor by using observed grade of 128 questioning answer, the most important criteria was the contractor's experience in the same project. And reported it as an important factor in choosing the success of projects[5]. Fan and et al who covered a research on china oil investing companies. One of the motivation of outside investing companies for investing in the country rather the country itself, is supplying its own energy

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resource. The risks of investing for outside investors include requiring to top investment budget, the longtime building, risk taking environment of country currency rate, uncertainty in the oil price, technology discovery and improvement. In this study, the investors were evaluated based on 3 factors and divided investors work stage into 3 levels: before undertaking investor to growth, during investment growth, during production. These 3 factors are oil price, investment environment, currency rate. The research model of this study based on statistical method effect on each 3 mentioned factor on investor employing in the oil project negatively or positively[8][12].Germany commercial committee so called “DIHT”, by interviewing credit investment companies, ranked a list of investors motivating factors that ranked each of motivation factors that include the items such as extending activities outside of country on new market, supporting current market, controlling the host country, political stabilization of host country, distributing company outside country[11].Asif hameed and et al that did it as a conceptual questionnaire in terms of risk importance that is present for contractors and employers, they believe that the risk in project lead to delaying projects and increasing of such risk was evaluated for contractors through questionnaire and weight them. Finally they get the result that projects with much risk are less likely to identified cost and deadline[2].Aje and et al covered the effect of management ability of contractors in doing project successfully, the date were collected from 77 projects during 2004-2007 and were analysed by using variance and multi-variable regression, the result show that the management ability of contractors has a significant effect on the cost and interval of project. The main idea is that when required information received by employers, getting information about management ability could evaluate the contractor’s function and finally it was predicted the management effect for economizing in the cost and reducing the time 96.2%, 90.01% respectively [1][9].Xiao and et al considered the contractor’s qualitative function in 3 countries of japan, Britain and United States. They get to result that Japanese contractors accomplished their project with little deficiency and long time presentation regarding Britain and its own counterpoint American, but American and Britain contractors seek more regulative feedback form their Japanese contractors function is using of secondary contractors qualitatively and other reason than America and Britain[19].Yuhaua and et al considered to evaluate oil investors in china by using genetic algorithm between oil confirmed supply, employing investors and predicted model for employing investors regarding oil confirmed supply rate[20].Wong and et al (2003) considered grouping methods of contractors and choosing them through their performance. In this study, identification and tender employing contractors is entitled, by 68 case study that logistic regression and multi variable analysis have been done, it indicated that both methods complete a desired prediction in the field of choosing contractors but using multi variable analysis technique has more development capability rather than logistic regression [18]. Pilarerise and et al considered to evaluate the contractor’s performance by using date covering analysis and method along with a set of financial criteria, the main reason of reducing productivity on contractors are 1- reducing current rate, 2- increasing received account and the time to pay, 3- increasing debt to stakeholder’s salary 5- increasing gross interest to sale, 6- increasing office costs to pure wealth, 7- reducing pure income to sale, 8- reducing pure interest to stakeholder salary[14].Zhang and et al identified 2 indictors by using hierarchical fuzzy analysis contain rate of investment return for investing and risk investing, it considers such factors annually and finally it covered to find pattern by using genetic and survey algorithm to effect 2 indictors for evaluating the investors on the project[21].Sidhartha and et al analysed the methods of choosing contractors in the different countries and they argued the most important features for evaluating contractors such as the time completing project, bond and guarantee and the post-performance of contractors. To measure post-performance of contractors he used fuzzy methods, identified qualitative and quantitative indicators by interviewing actioners and professions, and finally confirmed its credit by experimenting model [16].Tan and et al who covered a reason in which evaluated the contractors in order to help employer, they used the key competitiveness indicators KCI and fuzzy competitiveness rating to measure Hong Kong competitiveness of contractors. In this study, a set of language terms were used for simplifying in evaluation trend; such language terms were scored; established as contractor’s evaluation and finally the result shoed that the management and official language terms would be a measure criteria of contractor’s performance by using FCR [17]. Table 1 indicates the above evaluation methods and investors employing by using some variables:

Table 1 Methods of evaluating contractors and using variables

Evaluation methods	Used variable	Reference
statistical	Political, social, economic, natural, reason and oil price fluctuation	[13]
	Planning, experience and contractor's performance quality	[5]
	Fund, time, currency rate, company motivation	[8]
	Behavioral variable of contractors	[11]
	Hygienic, security and environment variables	[12]
	Technical ability and contractor's fame	[2][19][18]
	Financial, technical, human, management ability	[1]
Business intelligence	Behavioral variables of contractors	[20]
	Financial and technical ability	[14]
	Based on 2 indicators return on invest for investing and risk of investing	[21]
fuzzy	Technical project ability and using project completing standards	[9]
	Project completion time, guarantee and warranty of the project, past performance of contractors	[16]
	Technical ability and contractor's fame	[17]

3. Research Methodology

In this stage, we show some research steps in figure 1. The main steps include 2 following stages:

First step: weighing to criteria including: considering study literature and interweaving with officials, identifying the important variables and criteria in measuring the investors performance containing 23 criteria are shown in Table 3 and weighing to such criteria is by using triangle fuzzy numbers. Briefly, the important criteria would be identified in this stage and given them necessity weight by using fuzzy numbers and heptagon triangle, so, first the questionnaire should be designed and distributed among oil industry expert; this questionnaire has a question rather than each indicator, to avoid complexity of questioner, each question considered a seven option spectrum including a) extremely important, b) much important, c) important, d) normal, e)less important, f) much less important, g) unimportant the reason for using triangle fuzzy number for deciders is its ease[4]. After collecting the questionnaire, the answers stipulated as 7 item qualitative numbers ranging extremely important to unimportant; to convert such numbers to certain quantitative numbers, each option is given a fuzzy triangle number as figure 1.

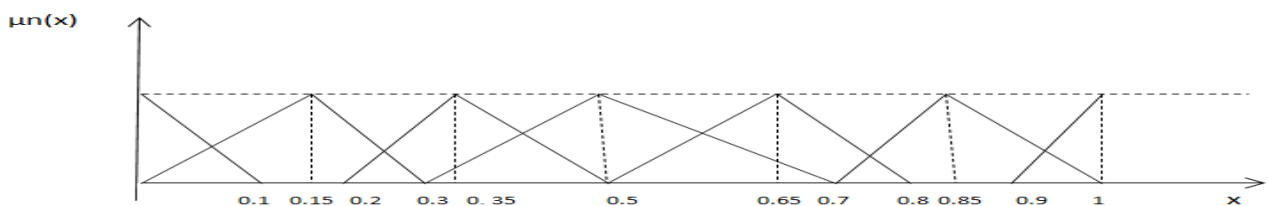


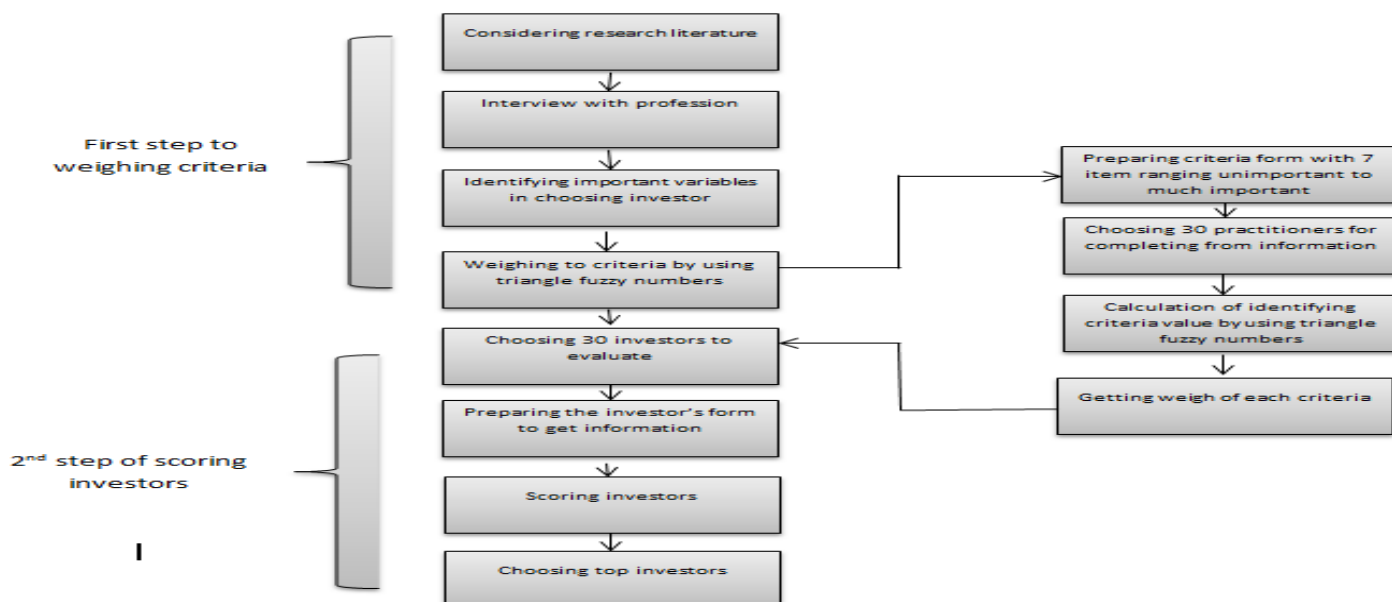
Fig. 1: An example of fuzzy triangle method

At the follow, by using fuzzy rationale concepts and the formulate of converting fuzzy number to certain number (Minkowski formulae) $x = m + (\beta - \alpha) / 4$, the mentioned fuzzy number are being equivalent to certain number that you observed in the table 2[4][6].

Table 2 Weighing criteria to fuzzy triangle method.

Linguistic value	certain number	Fuzzy numbers
unimportant	(0,0,0.1)	0.025
much less important	(0.15,0.15,0.15)	0.15
less important	(0.35,0.15,0.15)	0.35
normal	(0.5,0.2,0.2)	0.5
important	(0.65,0.15,0.15)	0.65
important	(0.85,0.15,0.15)	0.85
extremely important	(1,0.1,0)	0.975

After completing the stages, it accounts the abundance of received answers in each indicator and multiplies in the certain number of each indicator; the result would be divided into total number of replier. It gets each indicators weight and prepare for next stages. 2nd step: we collect information from investors through identified criteria and extracted value in the previous step and next, we score the investors to choose top investors. This step include 4 stages of choosing 30 investors to evaluate, prepare questionnaire due to



extracted criteria from before steps to get information from investors, investor's scoring and at the last choosing top investors for doing projects in Iran oil industry.

Fig 2 Study method

4. Model Components

In this stage of study, we cover scoring the criteria by using fuzzy method and triangle fuzzy number. The criteria are received based on studying on before researches and interview with professions of oil and gas field. And it is filled with 30 expert people, each criteria is identified by 7 items of a) extremely important, b) much important, c) important, d) normal, e)less important, f) much less important, g) unimportant that in the table 3, the received weight for each importance grade by using triangle fuzzy number and minkowosky formulae has been shown. Table 3 indicates each criteria with the importance grade rate and the number of repetition times for each indicator in 30 questionnaire and the importance of rate as well as normalized weight.

Table3 Ranking criteria

Criterion	0.025	0.15	0.35	0.5	0.65	0.85	0.975	Degree of importance	Normalized weight	Approximate percent
	unimportant	less	less important	normal	important	important	extremely important			
the investors confirmed investment	19	9	1	1	0	0	0	2.675	0.0086	0.86
kind of investing company	17	12	0	1	0	0	0	2.725	0.0088	0.88
kind of investors activity	19	10	1	0	0	0	0	2.325	0.0075	0.75
actual invest of investor	0	0	0	0	1	12	17	27.425	0.0886	8.86
the management record of company investor	0	1	14	12	3	0	0	12,6	0.0407	4.07
company date and experience	16	12	2	0	0	0	0	2.9	0.0093	0.93
the number of investing company personal	0	1	14	12	3	0	0	13	0.0420	4.20
management educational rate of investing company	15	14	1	0	0	0	0	2.825	0.0091	0.91
the number of completed projects by investors	1	0	8	16	5	0	0	14.075	0.0455	4.55
location	19	11	0	0	0	0	0	2.125	0.0068	0.68
invest rate	0	0	0	0	1	12	17	27.425	0.0886	8.86
the time completing project	0	0	14	12	4	0	0	13.5	0.0436	4.36
kind of contract	15	15	0	0	0	0	0	2.625	0.0084	0.84
correct financial evaluating of project	19	19	1	1	0	0	0	2.675	0.0086	0.86
accomplishing homogeneous project with such project	0	0	0	1	1	9	19	27.325	0.0883	8.83
the effect of employer on the process	18	10	2	0	0	0	0	2.65	0.0085	0.85
engineering	0	0	12	14	3	1	0	14	0.0452	4.52
preparation	0	0	12	16	2	0	0	13.5	0.0436	4.36
composition	0	1	10	16	3	0	0	13.6	0.0439	4.39
finance	0	0	0	1	0	10	19	27.525	0.0889	8.89
all aspects (EPC + F)	0	0	0	0	2	12	16	27.1	0.0876	8.76
direct investment	0	0	0	0	1	12	17	27.425	0.0886	8.86
having confirmation based on investor financial ability to do project	0	0	0	0	1	13	16	27.3	0.0882	8.82
total								309.325		99.89

As you see. In the table 3, the importance grade of criteria has been shown based on displaying percentage. The error rate is 0.11%; such error is because of randomizing decimal number. Based on table 3, the degree of importance of the criteria above, has been shown to have lower average. After getting criteria weight, we cover to evaluate and choose top investors. So, the data due to 30 investors in the dispensed questionnaire was received. We waive the names of investors for preserving credit and privacy of investors information, rather using Ai and label the investors from A1 to A30, following we show 30 investor's information along with their criteria of course, it should be noted that just a number of criteria has been shown in the table 4 as example but it covered total sum and investor's scoring as well as all 23 criteria in table 3.

Table4 List of investors and scoring

investors	A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	A 9	A 10	A 11	A 12	A 13	A 14	A 15	A 16	A 17	A 18	A 19	A 20	A 21	A 22	A 23	A 24	A 25	A 26	A 27	A 28	A 29	A 30	A M A X
the investors confirmed investment	0.16	0.24	0.24	0.4	0.16	0.24	0.16	0.16	0.32	0.16	0.32	0.16	0.32	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.32	0.16	0.32	0.32	0.24	0.24	0.32	0.24	0.24	0.24	0.4
kind of investing company	0.08	0.16	0.24	0.32	0.24	0.24	0.24	0.24	0.08	0.24	0.32	0.24	0.4	0.16	0.24	0.16	0.16	0.16	0.16	0.32	0.4	0.32	0.32	0.4	0.24	0.32	0.24	0.24	0.24	0.24	0.4
kind of investors activity	0.21	0.07	0.14	0.21	0.14	0.14	0.07	0.07	0.14	0.14	0.21	0.14	0.14	0.14	0.28	0.14	0.14	0.14	0.14	0.21	0.28	0.21	0.21	0.21	0.28	0.28	0.14	0.28	0.28	0.21	0.35
...
having confirmation based on investor financial ability to do project	1.76	1.76	1.76	2.64	0.88	0.88	0.88	2.64	1.76	2.64	2.64	2.64	3.52	2.64	2.64	2.64	0.88	1.76	0.88	0.88	0.88	0.88	0.88	0.88	1.76	0.88	2.64	0.88	1.76	0.88	4.4
total	22.	22	21	42	19	18	18	20	22.	22	21	20	44	23	25	21	25	21	21	23	24	22.	22.	24	23	18	16	21	16	18	49.
score	0.46	0.46	0.43	0.86	0.3	0.37	0.41	0.45	0.45	0.46	0.49	0.40	0.90	0.46	0.51	0.42	0.52	0.42	0.48	0.48	0.46	0.46	0.48	0.48	0.37	0.34	0.43	0.34	0.37	1	

As you see in the table 4, it shows 30 investors, then the information each investors have received after preparing data is multiplied in the weight of each criteria from table 3.it considered as a score for investor, then sum score of each investor would be accounted and parallel to this, the peak score an investor could get, was accounted. Total score of top investor is equal to 49.3. to normalize scores, the score of each investor is divide on the score of top investor (49.3) finally, those investors who get maximum score or close to 1, are entitled as those investors who have the ability of completing project from investor, so they would be identified and then employed. As table 4, Amax score is 1, investors, A24, A14, A30, A4, get scores 0.925, 0.909, 0.877, 0.862 respectively they are identified as those investors who have the ability of doing projects

from Iran oil company; also, the investors were identified as weak investors, A25, A7, A6, A29 get scores 0.375, 0.372, 0.375, 0.389 respectively and the rest of investors put in the averaged field.

5. Summaries

We identified 23 important criteria for evaluating the investors by observing and surveying literature as well as interview with professions in the gas and oil scope, then weight them by using heptagon triangle fuzzy number and their significance. We deduced that the criteria such as right investment criteria of investor (sig 8.86%), invest rating (8.86%) accomplishing homogenous project with said project (sig 8.83%) finance and credit possibilities (8.89%), EPC +F (8.76%), direct invest (8.86%), having a confirmation from bank based on the ability of 30 investors and due to identified criteria and their weight, all were accounted separately and considered as a hypothesis a top investor called Amax to calculate the maximum score an investor could get; finally the score of each investor was normalized due to Amax investor scoring so we concluded that the investing company A24 by getting 0.925, A14 get 0.909, A30 get 0.877 and A4 get 0.862. They are introduced as the companies which have the ability of doing defined project from Iran oil industry (capital firms) because of either the maximum score or closeness to top investor they get. It should be noted that the presented method in this study could be a proper and economized strategy to evaluate and choose investor in Iran oil industry especially in the section upstream oil and gas

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