

Development of oil Approaches Influenced by Effective Factors for Success of Economy-Based Entrepreneurship: A Case Study of the Oil Industry

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ABSTRACT

The oil industry is rapidly changing with the development of the international economy and the increased competitiveness of the markets. New technologies in this environment have eliminated legal, geographical, or industrial barriers and have led to new products and services in this field. The development of information technology and its expansion based on economy-based entrepreneurship in the field of oil have resulted in dramatic changes in the oil industry, even e-commerce, and have facilitated customer service. This study aimed to develop oil approaches affected by the factors influencing economy-based entrepreneurship in the oil industry. In other words, efforts were made to identify and prioritize the factors affecting the development of oil approaches under the impact of effective factors for the success of economy-based entrepreneurship in the oil industry. A review of the previous studies in this field revealed that the factors impacting the development of oil approaches affected by factors involved in the success of economy-based entrepreneurship in the oil industry were institutional, organizational, environmental, economic, technological, and opportunity recognition criteria. The present research was applied in terms of goal and survey and was cross-sectional regarding data collection method and timeframe. The statistical population consisted of experts in the country's oil industry system. In total, 16 individuals were selected from the central bank managers by purposive sampling. Data were collected using an expert questionnaire, and the fuzzy Delphi method was applied to ensure the validity of the identified indicators. In addition, the

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reliability of paired comparisons was assessed by calculating the incompatibility rates via the Gogus and Butcher method. In this regard, reliability was acceptable in all cases of less than 0.1. The ranking of critical criteria showed that economic factors had the highest importance, followed by institutional, environmental, organizational, opportunity recognition process, and technological factors.

1. Introduction

Today, economic growth and development affect axial development functions in the context of competitions, global evolutions, recession and boom cycles, political and security phenomena, threats and sanctions, access to natural resources, geographical location, and many other external factors (Mohammadzadeh et al., 2016). On the other hand, economic development requires the developmental tendencies of entrepreneurship in order to have sustainable development (Leonidou et al., 2018). In this context, economies that rely on their internal forces and can adapt to rapid changes can survive in the world (Royo et al., 2019). From another perspective, we can build internal and external criteria for sustainable economic development based on the characteristics of economy-based entrepreneurship and propose them as endogenous factors for economic development and growth. In other words, entrepreneurship can be considered one of the axes of endogenous development, broad and sustainable employment creation, and the formation of a robust and dynamic economy (Toma et al., 2014).

According to novel economic theories, change of ideas and emergence of innovations are the principle for economic development, and entrepreneurship is the most apparent means of achieving this goal (Szirmai et al., 2011). In fact, the increase of entrepreneurship in society requires the establishment of its foundations, and having favorable conditions for developing entrepreneurship is of paramount importance. Favorable conditions and factors for entrepreneurs can be examined from three dimensions of available resources, strategies, and goals of entrepreneurs; threats; and opportunities in the economic environment, which play a significant role in the sustainable development of entrepreneurship. Sustainable economic development has broad dimensions, including developing the oil industry system based on monetary and economic policies. In fact, the issue of entrepreneurial orientation in the oil industry system is the focus of attention when it comes to the issue of entrepreneurship in the macroeconomic domain. The oil industry system is the

primary source of financial support for entrepreneurial activities, especially in the economy of developing countries (Ogunkoya, 2018).

Nowadays, most economists and experts believe that the entrance of information and communication technology (ICT) to the economy and oil industry led to a revolution called “electronic commerce”. Falling behind the evolution will lead to isolation in the economy world since electronic commerce has made considerable changes in the competitive business space by creating benefits such as improved productivity, reduced prices, cost savings, and changed sizes and structures of the market, as well as the elimination of intermediaries and allowing manufacturers’ access to end-users. The first and most crucial step toward success in oil in the oil industry is recognizing and exploiting entrepreneurship opportunities (Alvani and Azar, 2019).

In fact, lack of diversity, quality, and speed in providing oil services in the oil industry as a part of the economic problems of developing countries and lack of IT infrastructure and security of servers in the electronic oil industry have led to the increased level of need for the development of economics-based entrepreneurial orientations at the level of these countries, including Iran (Asadollah et al., 2019). Information technology has considerably affected the oil industry in the past decade. There is a greater need to use the benefits of oil concerning the undeniable role of advanced technologies in changing the perceptual patterns of customers. Today, a bank’s mere provision of e-commerce services does not necessarily create a competitive advantage or attract new customers, and the need to develop innovative information technologies can help improve oil (Elia et al., 2020). Given the growing scope of e-commerce in the country, there is a need to provide a coherent framework based on economy-based entrepreneurial approaches to such services (Falah Haghighi et al., 2017).

In other words, creating the appropriate contexts and foundations for increasing entrepreneurship can be an effective model for achieving goals such as innovation, taking initiatives and presenting new functional



processes and products, and improving the quality of e-commerce services (Metvae et al., 2019). In Iran, intense competition has been created in the oil industry due to the increased number of financial institutions and banks and the privatization of some government banks. Several state banks have joined the private banks club of the country following the implementation of Article 44 of the Constitution and have put economy-based entrepreneurship on their agenda to maintain and improve their share of resources and customers. In this regard, some of the services provided by the mentioned banks have emerged from innovation and pioneering, while others have come from risk-taking, independence, and dominance capabilities.

Despite these entrepreneurial activities in Iran's oil industry, there have been a few entrepreneurial cases in the oil fields in the oil industry to develop technological services. In addition, while most banks have established e-commerce since the early 1990s based on the guidelines approved by the central bank, insufficient attention has been paid to development by entrepreneurial approaches and innovation in the field in the past few years. With this background in mind, the present study aimed to present a range of propositions of economy-based entrepreneurship success from the most influential to the least effective, focusing on the oil approach in the oil industry by fuzzy analysis with regard to the growing pace of IT development in the e-commerce section and lack of using capacities and opportunities proportional to economy-based entrepreneurship in this field while emphasizing the factors affecting the success of economy-based entrepreneurship based on cross-mix analysis.

2. Theoretical foundations

2.1. Economy-based entrepreneurship

Although an entrepreneur is an essential factor in the modern economy due to the characterization of market forces in many ways, the true importance of entrepreneurship in economic theory is not well stated (Lazear, 2004). In the economics literature, scholars such as Begley et al. (1987) and Lumpkin and Dess (1996) considered entrepreneurship to be in line with creativity, assertiveness, and imagination. Economy-based entrepreneurship moves the economy from its original equilibrium to a new direction by creating new compounds (Wong et al., 2005). The concept of economic entrepreneurship represents a kind of freedom of entrepreneurial practice in the open economic environment that requires people's freedom

in interpolation, exchange, interchange, and transfer of their personal assets legally (Boudreaux et al., 2019).

People realize their potential in the free macroeconomic environment. Free economic space encourages individuals to invest in increased entrepreneurial skills (Mason, 2018). Countries with higher free economic levels experience a higher level of test error. People are allowed to test their unique and frenzied ideas for producing their new products. While a higher rate of business failure occurs in such environments, big companies such as Microsoft and Apple are born from millions of investment efforts. Economic freedom and limited government intermediation through different channels affect the development of entrepreneurship. According to classical liberal economists, the government's intervention in the economy through application and distribution by transfer payment plans, public investment, and final taxation is a barrier to economic growth and entrepreneurship activities (Bjørnskov and Foss, 2008).

On the other hand, the protection of intellectual property rights is another dimension affecting economy-based entrepreneurship. People may never achieve innovative activities if they fail to own their creations properly. Economic freedom is closely related to the regulatory structure of societies and the administrative bureaucracy. The existence of multiple laws and over-regulation exerts pressure on firms, especially newly established ones, which leads to their discounted work.

Another critical point is the improper money, especially the inflation rate and fluctuation. Anticipating future relative prices is very important for entrepreneurs, and as instability in the economy, inflation disables the effects of relative prices. Inflation causes funds to move toward unproductive sectors such as land, housing, currency, and precious metals while limiting other sectors. Therefore, inflation causes recession (Barro, 2013). Another impact of the government's intervention in entrepreneurship development is the limitation of economic freedoms and severe monitoring, encouraging individuals to turn to rent-seeking activities instead of entrepreneurship. Corruption and rent gain a true meaning in the government and public sector (Themudo, 2014). When approaching rent and corruption resources leads to economic success, they are encouraged to move away from the tensions of production and entrepreneurship and turn to these activities.

2.2. Research background

Putnins and Sauka (2019) conducted research entitled “Why does entrepreneurial orientation affect company performance?” to evaluate the entrepreneurial orientation based on three criteria of innovation, risk-taking, and pioneering impact on corporate performance. According to their results, all three entrepreneurial orientations had a significant, positive impact on the performance of companies. In another research, Sánchez-Torres et al. (2018) evaluated the effect of social purchase and intention to buy on e-commerce, concluding that e-commerce could be affected by various factors such as customers’ trust, satisfaction, and loyalty at the level of markets, especially in competitive markets. In 2017, Crnogaj and Bradač Hojnik used the data of 24 high-income

countries during 2006–2010, concluding that economic freedom in the union field had a positive effect on the development of productive entrepreneurship. In addition, these scholars realized that individual decision-making for entrepreneurship was closely related to cultural and social norms.

3. Research method

This work was applied research in terms of purpose and descriptive survey regarding nature and method. In order to achieve the goals of the present study, we identified and extracted effective indices of economic entrepreneurship success with the oil approach in the oil industry by conducting comprehensive library surveys and evaluating past studies. These indices are presented in Table 1.

Table 1. Factors of economic entrepreneurship success with the oil approach in the oil industry.

| Main factors | Resources |
|--|---|
| Institutional factors | Simandan (2015), Szirmai et al. (2011), Sobel et al. (2017), Casero et al. (2013), Asadi (2019), Bahrinejad et al. (2018) |
| Economic factors | Wiseman and Young (2011), Wong et al. (2005), Urbano and Aparicio (2016), Nyström (2008), Sameti and Shahnazi (2006) |
| Environmental factors | Meoli et al. (2019), Morgan and Anokhin (2019), Wong (2014), Casero et al. (2013), Darvish et al. (2012) |
| Organizational factors | Meoli et al. (2019), Lee et al. (2011), Gumusay and Bohne (2018), Chavez et al. (2017), Alvani et al. (2013) |
| Technological factors (technology) | Han and Kim (2019), Elia et al. (2020), Ramezanpour Nargesi et al. (2015), Bahrinejad et al. (2018) |
| Factors of the opportunity identification process | Szirmai et al. (2011), Sobel et al. (2017), Casero et al. (2013), Darvish et al. (2012) |

In the next stage, the sub-indices or secondary factors affecting the economic entrepreneurship process among the entrepreneurship experts in the oil industry were identified using the fuzzy Delphi method (FDM). After that, the mentioned components, multi-criteria decision-making techniques (e.g., fuzzy AHP), and the selected experts’ opinions were applied in the next stage to rank the actors affecting the success of economy-based entrepreneurship with the oil approach in the oil industry. Given the use of a questionnaire and fuzzy AHP method, and concerning the need for opinions of experts ($N=10-12$) (Asgharpour, 2008), 16 experts who were highly familiar with economic entrepreneurship issues with an oil approach in the oil industry were selected by purposive (judgment) method. As mentioned above, the Delphi and the pairwise comparison questionnaires were developed

and distributed among the participants. Afterward, the fuzzy AHP method was applied to prioritize the components.

The data analysis was carried out based on the paired comparison questionnaire and AHP technique using the Expert Choice software. The reliability of this questionnaire was estimated, rendering a Cronbach’s alpha coefficient of 0.80. On the other hand, the content and structural validities of this instrument were confirmed by the approval of the respective professors and the use of the confirmatory factor analysis, showing a factor load of less than 0.5 for each item.

3.1. Fuzzy Delphi method

The Delphi technique can be applied to recognize and screen the most critical decision-making indices.



The Delphi technique is a group knowledge acquisition method, which is also used for qualitative issue decision-makings. The Delphi method is carried out based on responders' views and uses verbal phrases to assess participants' viewpoints. Verbal expressions have limitations in fully reflecting the respondent's mental secrets; for instance, the alternative "high" is different for person A, a strict person, compared to person B. If a definite number is used to quantify the views of both individuals, the results will be skewed. Therefore, this problem can be eliminated by developing a suitable fuzzy range. The traditional Delphi method has always suffered from expert convergence, high running costs, and the possibility of exclusion of some people. Murray et al. introduced the concept of integrating the traditional Delphi method with fuzzy theory in 1985 to improve the traditional Delphi method (Clibbens et al., 2012). The fuzzy

Delphi implementation algorithm can be used to determine the importance of screen indices. The implementation algorithm consists of four steps, as follows:

1. Determining the appropriate spectrum for fuzzy verbal expressions;
2. Fuzzy integration of fuzzy values;
3. Defuzzification value;
4. Selecting the threshold and screening the criteria.

This study used the Likert five-point scale and fuzzy triangular numbers to implement the fuzzy Delphi method. Fuzzy degrees and separations are considered normal. Table 2 presents the verbal expressions and the corresponding fuzzy numbers.

Table 2. Fuzzy five-degree spectrum for evaluating the indices.

| Verbal valuable | | Fuzzy value | Triangular fuzzy number |
|-----------------|----|-------------|-------------------------|
| Very low | VL | $\tilde{1}$ | (0, 0, 0.25) |
| Low | L | $\tilde{2}$ | (0, 0.25, 0.5) |
| Moderate | M | $\tilde{3}$ | (0.25, 0.5, 0.75) |
| High | H | $\tilde{4}$ | (0.5, 0.75, 1) |
| Very high | VH | $\tilde{5}$ | (0.75, 1, 1) |

The threshold should be specified after selecting the best fuzzification method, fuzzy integration (fuzzy mean method was used in this study), and defuzzification (the surface center method was used in this research). The threshold is generally considered at 0.7, which can vary in different studies depending on the researchers. If the definite value of defuzzification of the fuzzy integration of experts was larger than the mentioned amount, the index would be accepted. Otherwise, the index would be rejected.

3.2. Fuzzy hierarchical analysis process

While the goal of applying the hierarchical analysis approach is to obtain the opinion of experts, the conventional hierarchical analysis method does not correctly reflect human thinking since precise numbers are used in the pairwise comparisons in the method. A fuzzy hierarchical analysis method is proposed to overcome this problem. In the fuzzy hierarchical

analysis method, the decision-makers were asked to compare the elements of each level with others and express the relative importance of the elements by using fuzzy numbers after preparing the hierarchical chart. An example of a fuzzy triangular number along with the verbal phrase and fuzzy triangular comparisons are tabulated in Table 3, which can be applied in the fuzzy hierarchical analysis method.

The main factors of economic entrepreneurship opportunities with the oil approach were prioritized in six steps using fuzzy hierarchical analysis.

- **First step:** there are n elements in a cluster. In total, $\frac{n(n-1)}{2}$ comparisons were estimated using the below equation. Given the presence of six criteria in the research, a total of 15 pairwise comparisons were made.

$$\frac{n(n-1)}{2} = \frac{6(6-1)}{2} = 15 \quad (1)$$

Table 3. Triangular fuzzy spectra of pairwise comparisons.

| Theological expression of the comparative status of i to j | The fuzzy equivalent | Inverse fuzzy equivalent |
|--|----------------------|---|
| Equally Preferred | (1,1,1) | (1,1,1) |
| Intermediate Level | (1,2,3) | $(\frac{1}{3}, \frac{1}{2}, 1)$ |
| Moderately Preferred | (2,3,4) | $(\frac{1}{4}, \frac{1}{3}, \frac{1}{2})$ |
| Intermediate Level | (3,4,5) | $(\frac{1}{5}, \frac{1}{4}, \frac{1}{3})$ |
| Strongly Preferred | (4,5,6) | $(\frac{1}{6}, \frac{1}{5}, \frac{1}{4})$ |
| Intermediate Level | (5,6,7) | $(\frac{1}{7}, \frac{1}{6}, \frac{1}{5})$ |
| Very Strongly Preferred | (6,7,8) | $(\frac{1}{8}, \frac{1}{7}, \frac{1}{6})$ |
| Intermediate Level | (7,8,9) | $(\frac{1}{9}, \frac{1}{8}, \frac{1}{7})$ |
| Extremely Preferred | (9,9,9) | $(\frac{1}{9}, \frac{1}{9}, \frac{1}{9})$ |

- **Second step:** after that, the views of experts were made fuzzy, and the geometric mean method was applied to integrate experts' opinions in the AHP method.

$$F_{AVE} = (\prod(l), \prod(m), \prod(u)) \quad (2)$$

- **Third step:** the fuzzy expansion of each row is calculated by:

$$\tilde{S}_i = \sum_{j=1}^n x_{ij} \quad (3)$$

- **Fourth step:** afterward, the fuzzy sum of the elements of the preference column is calculated by:

$$\sum \tilde{S}_i = \sum_{i=1}^n \sum_{j=1}^n x_{ij} \quad (4)$$

- **Fifth step:** at this stage, the inverse triangle fuzzy number is calculated by:

$$\text{if } \tilde{F} = (l, m, u) \text{ then } \tilde{F}^{-1} = (\frac{1}{u}, \frac{1}{m}, \frac{1}{l}) \quad (5)$$

- **Sixth step:** defuzzification was carried out using the surface center method, which is calculated by:

$$DF_{ij} = \frac{[(u_{ij}-l_{ij})+(m_{ij}-l_{ij})]}{3} + l_{ij} \quad (6)$$

eliminated secondary factors obtained based on the results of the first round are listed in Table 4.

At the end of the first round, eight indices were eliminated, and two indices (freedom of banks to innovate in the oil field and access of banks to fin-techs based on oil) were added. Therefore, the fuzzy Delphi analysis continued in the second round for 31 remaining indices. At this stage, the remaining indices were assessed based on the opinions of experts. The eliminated secondary factors obtained based on the results of the second round are presented in Table 5.

Fuzzy Delphi analysis continued in the third round for the remaining 23 indices based on the second round results. At this stage, the remaining indices were evaluated based on the opinions of 26 experts. However, no index was added or eliminated in the third round, which can signify the end of the Delphi method. In general, one approach for the end of the Delphi process is to compare the mean scores of the two rounds of questions. The survey process is stopped when the difference between the two stages is hugely lower than the threshold (0.2).

The results presented in Table 6 showed that all differences were lower than 0.2, which confirmed the end of the Delphi rounds. The experts considered 23 out of 37 as necessary. Therefore, the main factors were ranked using the fuzzy hierarchical method. In addition, the fuzzy analytic hierarchy process (FAHP) was employed to rank the entrepreneurship opportunities. The primary and secondary factors are listed in Table 7.

3.3. Result analysis

After a literature review, a list of factors affecting the success of economy-based entrepreneurship with the oil approach in the oil industry was prepared based on the results. After assessing and eliminating overlapped and repetitive indices, a list containing 37 factors was provided to the experts. The list of factors was distributed among 26 entrepreneurship experts in the baking industry in the form of a questionnaire. The



In addition, the hierarchical pattern of model criteria and sub-criteria is illustrated in Figure 1 using the AHP technique.

Table 4. Eliminated indices based on screening.

| Main factors | Eliminated secondary factors | Definite value |
|---|--|----------------|
| Institutional factors | Level of government involvement | 0.526 |
| Economic factors | Ability to reduce shipping costs | 0.587 |
| | Research and development costs in oil | 0.622 |
| | Ability to reduce information costs in the field of oil | 0.667 |
| Environmental factors | Possibility to enter the industry | 0.667 |
| Technological factors (technology) | Startup capability of doing business in the field of oil | 0.647 |
| Factors of the opportunity identification process | Communication and network management capabilities for exploiting ideas based on oil opportunities in the oil industry system | 0.660 |
| | Ability to finance and invest venture capital in exploiting ideas based on oil opportunities in the oil industry system | 0.657 |

Table 5. Indicators removed based on screening.

| Main factors | Eliminated secondary factors | Definite value |
|---|--|----------------|
| Economic factors | Value added or expected profit | 0.58 |
| Environmental factors | Size of market status based on oil | 0.55 |
| | Industry profit margin | 0.53 |
| | Social networking opportunities and threats in the oil area | 0.58 |
| Organizational factors | The existence of oil marketing and customers' needs | 0.59 |
| Factors of the opportunity identification process | Risk management ability to exploit ideas based on oil opportunities in the oil industry system | 0.59 |

Table 6. Distance between the second and third rounds.

| Main factors | Secondary factors | The second round | The third round | Difference | Result |
|--|---|------------------|-----------------|------------|-----------|
| Institutional factors | Adopting supportive laws and regulations in the field of oil | 0.702 | 0.747 | 0.045 | Confirmed |
| | Banks freedom to innovate in the field of oil | 0.715 | 0.716 | 0.001 | Confirmed |
| | Government financial support for entrepreneurship development in the field of oil | 0.708 | 0.713 | 0.005 | Confirmed |
| | Policymaking and implementation of tax incentives in the field of oil | 0.708 | 0.707 | 0.002 | Confirmed |
| | Explaining intellectual properties policy and terms | 0.74 | 0.728 | 0.012 | Confirmed |
| Economic factors | Possibility of developing a new product or service | 0.715 | 0.731 | 0.017 | Confirmed |
| | Market growth ability | 0.798 | 0.71 | 0.088 | Confirmed |
| | Possibility to increase potential earnings | 0.737 | 0.784 | 0.047 | Confirmed |
| Environmental factors | Level of competitiveness | 0.728 | 0.707 | 0.021 | Confirmed |
| | Ease of access to domestic and foreign markets | 0.712 | 0.741 | 0.029 | Confirmed |
| | Possibility of business sustainability | 0.756 | 0.728 | 0.028 | Confirmed |
| Organizational factors | The existence of human resources specialized in oil | 0.715 | 0.719 | 0.004 | Confirmed |
| | Managers' risk-taking | 0.747 | 0.713 | 0.034 | Confirmed |
| | Existence of expert and financial advisory teams in the field of oil | 0.603 | 0.71 | 0.107 | Confirmed |
| | Managers' market knowledge of oil | 0.718 | 0.778 | 0.06 | Confirmed |
| | The benefits of accepting e-commerce in the oil area | 0.724 | 0.722 | 0.002 | Confirmed |
| Technological factors (technology) | Creation and development of robust IT infrastructure | 0.776 | 0.759 | 0.016 | Confirmed |
| | Banks' access to fin-tech based on oil | 0.76 | 0.71 | 0.05 | Confirmed |
| | Access to new technologies in the field of oil | 0.731 | 0.722 | 0.009 | Confirmed |
| Factors of the opportunity identification process | Ability to identify and evaluate technological opportunities | 0.724 | 0.722 | 0.002 | Confirmed |
| | Market development capability for innovative products and services | 0.702 | 0.744 | 0.042 | Confirmed |
| | Idea manufacturing and idea engineering abilities | 0.724 | 0.728 | 0.004 | Confirmed |
| | Ability to redesign the business model | 0.728 | 0.731 | 0.004 | Confirmed |

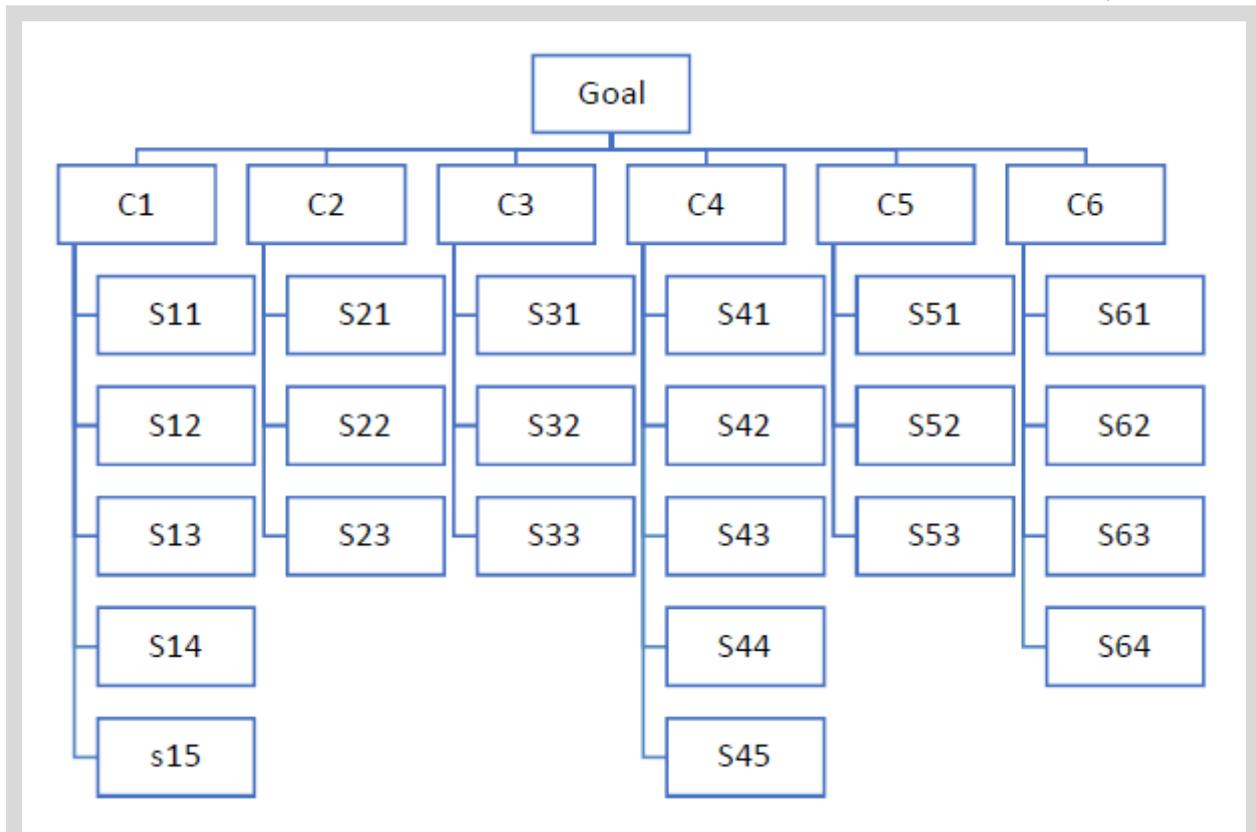


Figure 5: The scatter plot of position.

The primary and secondary factors affecting the success of economy-based entrepreneurship with the oil

approach in the oil industry were evaluated by fuzzy hierarchical analysis, and the results are presented in Table 7.

Table 7. Results for ranking the main factors.

| Main factors | Defuzzification level | Weight | Rank |
|------------------------------------|-----------------------|--------|------|
| Economic | 0.253 | 0.244 | 1 |
| Institutional | 0.217 | 0.208 | 2 |
| Environmental | 0.197 | 0.189 | 3 |
| Organizational | 0.153 | 0.147 | 4 |
| Technological | 0.107 | 0.103 | 5 |
| Opportunity identification process | 0.113 | 0.109 | 6 |

The ranking of key criteria has shown that economic factors are most important, followed by the union, environmental, organizational, process of opportunity identification, and technological factors. The incompatibility rate of 0.062 was obtained for this stage, which was lower than 0.1, and the comparisons

made could be trusted. After that, the sub-criteria related to each criterion were compared in pairs using the fuzzy hierarchical analysis. The last stage involved the final prioritization of all secondary factors, and the summary of the results of the hierarchical analysis is tabulated in Table 8.

Table 8. The ultimate priority of entrepreneurial opportunities.

| Main factor | Weight | Secondary factors | Primary weight | Final weight | Rank |
|---|--------|---|----------------|--------------|------|
| Economic factors | 0.244 | Possibility of developing a new product or service | 0.357 | 0.0870 | 3 |
| | | Market growth ability | 0.422 | 0.1028 | 1 |
| | | Possibility to increase potential earnings | 0.221 | 0.0538 | 6 |
| Institutional factors | 0.208 | Adopting supportive laws and regulations in the field of oil | 0.243 | 0.0505 | 7 |
| | | Banks freedom to innovate in the field of oil | 0.159 | 0.0332 | 14 |
| | | Government financial support for entrepreneurship development in the field of oil | 0.263 | 0.0549 | 5 |
| | | Policymaking and implementation of tax incentives in the field of oil | 0.195 | 0.0405 | 13 |
| | | Explaining intellectual properties policy and terms | 0.140 | 0.0292 | 16 |
| Environmental factors | 0.189 | Level of competitiveness | 0.291 | 0.0550 | 4 |
| | | Ease of access to domestic and foreign markets | 0.467 | 0.0884 | 2 |
| | | Possibility of business sustainability | 0.242 | 0.0457 | 9 |
| Organizational factors | 0.147 | Existence of human resources specialized in oil | 0.279 | 0.0411 | 11 |
| | | Managers' risk-taking | 0.277 | 0.0409 | 12 |
| | | Existence of expert and financial advisory teams in the field of oil | 0.181 | 0.0267 | 19 |
| | | Managers' market knowledge of oil | 0.141 | 0.0208 | 20 |
| | | The benefits of accepting e-commerce in the oil area | 0.121 | 0.0179 | 21 |
| Factors of the opportunity identification process | 0.109 | Ability to identify and evaluate technological opportunities | 0.428 | 0.0467 | 8 |
| | | Market development capability for innovative products and services | 0.259 | 0.0282 | 17 |
| | | Idea manufacturing and idea engineering abilities | 0.163 | 0.0178 | 22 |
| | | Ability to redesign the business model | 0.150 | 0.0164 | 23 |
| Technological factors (technology) | 0.103 | Creation and development of robust IT infrastructure | 0.415 | 0.0426 | 10 |
| | | Banks' access to fin-tech based on oil | 0.271 | 0.0278 | 18 |
| | | Access to new technologies in the field of oil | 0.314 | 0.0322 | 15 |



4. Conclusions

This study aimed to identify and rank the factors affecting the success of economy-based entrepreneurship in the oil industry. After the evaluation of the research background, some indices were extracted as the main factors. A method ought to be presented to assess and confirm the accuracy of the indices by using experts' opinions. After evaluating relevant articles, the fuzzy Delphi method was selected to obtain the experts' opinions. The fuzzy Delphi method is one of the best techniques in surveys, where there are high uncertainty and a low number of experts due to the integration of experts' opinions and allocation of suitable fuzzy numbers. Therefore, three rounds of surveys were carried out, which led to the extraction of 6 main and 23 secondary factors.

Afterward, the weight of each of the primary and secondary factors was determined to take more critical indices into account in the following decision-making processes. Based on the literature review, the main factors were classified into six dimensions of the union, economic, environmental, organizational, technological, and process of opportunity identification factors, and they were weighted. The economic factor with the weight of 0.24 was recognized as the most important factor, followed by the union (0.20), environmental (0.18), organizational (0.14), and process of opportunity identification (0.109) factors respectively. However, the lowest weight was allocated to the dimension of technological factors (0.103). The results of this study primarily indicated the importance of entrepreneurial orientation in the country's oil industry system. Therefore, it is suggested that an entrepreneurial charter be developed and issued to banks by the central bank to expand entrepreneurship and the tendency toward this issue. The central bank must provide the necessary infrastructures to implement the charter and carry out the necessary monitoring.

In addition, concerning the importance of innovation in using opportunities and overcoming the challenges of competitors, banks' managers' risk-taking must increase to respond to the diverse needs of customers and properly exploit the environmental opportunities. Conflict is a deterrent to the development of entrepreneurship in the country's oil industry system, and the elimination of conflict requires encouraging employees' involvement in work issues to exchange opinions properly, developing the goals and benefits of working units in line with the general goals of the

organization, and opening a space for dialogue. This issue can facilitate the tendency of entrepreneurship in banks. Moreover, applying official and unofficial mechanisms for conflict resolution and improving communication, trust, cooperation, and collaborations are essential in increasing entrepreneurship. Banks must establish their reward system based on market factors such as new accounts, number of customers, and the level of customers' satisfaction.

Moreover, attempts must be made to replace traditional structures with unofficial and decentralized structures to increase the tendency to entrepreneurship, thereby quickly and adequately responding to customers' needs. In this respect, our findings are in line with the results obtained by Szirmai et al. (2011), Sobel et al. (2017), Erbano and Aparico (2016), Ramezanpour Nargesi et al. (2015), and Bahrinejad et al. (2018). Therefore, it is suggested that regulations and laws be modified and communication and information exchange barriers be minimized to increase the tendency to entrepreneurship in oil. Thus, experts will have more freedom to act by applying organic and dynamic structures.

One of the significant drawbacks of the present study was a lack of a domestic study in line with the goal. In addition, library studies were primarily focused on identifying factors. Therefore, it is recommended that qualitative studies be carried out in the future. The topic can be developed by offering research proposals. The barriers and problems of entrepreneurship and their effect on the tendency to entrepreneurship in Iran's oil industry can also be evaluated. In addition, it is suggested that the compatibility of the human resources management system with the oil industry entrepreneurship or compatibility of the organizational structure proportional with the oil industry entrepreneurship be assessed.

References

- Alvani, M., Azar, A. (2019), Strategic model of entrepreneurship tendency in the oil industry system of Iran, *Journal of Strategic Management Studies*, 6(7): 99–116.
- Alvani, M., Kohan Hoosh Nejad, R., Safari, S., and Khodamoradi, S. (2013), Identify and prioritize organizational factors affecting implementation of corporate entrepreneurship dimensions with explain role of institutionalizing

- entrepreneurship, *Management Studies in Development and Evolution*, 22(70): 1–24.
- Asadi, B. (2019), The role of banks in specific business models in the field of modern oil, *Quarterly Journal of Advanced oil industry Studies*, 2(1): 313–328
- Asadollah, M., Sanavifard, R., and Ozadeh, A. (2019), introducing a new e-commerce model based on the rise of fin-techs and startups, *Journal of Technology Development Management*, 7(2): 195–248 (doi: 10.22104/jtdm.2019.3508.2214)
- Bahrinejad, R., Khanlari, A., Hasangholipour Yasouri, T., Hosseini, M. (2018), identifying the most important marketing processes in the Iranian oil industry to develop an oil industry maturity model, *Journal of Business Management*, 10(4): 795–814.
- Barro, R. J. (2013). “Health and economic growth”, *Annals of Economics and Finance*, 14(2): 329–366.
- Begley, T. M. and Boyd, D. P. (1987). Psychological characteristics associated with performance in entrepreneurial firms and smaller businesses, *Journal of Business Venturing*, 2(1): 79–93.
- Bjornskov, C. and Foss, N. (2008). Economic freedom and entrepreneurial activity: Some cross-country evidence, *Public Choice*, 134 (3): 307–328.
- Boudreaux, Ch, J., Nikolaev, B, N., Klein, P. (2019). Socio-cognitive traits and entrepreneurship: the moderating role of economic institutions, *Journal of Business Venturing*, 34(1): 178–196 <https://doi.org/10.1016/j.jbusvent.2018.08.003>
- Burke, M., Marlow, C., and Lento, T. (2010). Social network activity and social wellbeing, In *Proceedings of the 2010 ACM conference on human factors in computing systems* (pp. 1909–1912). New York, NY: ACM.
- Casero, J., Almodóvar González, M., de la Cruz Sánchez Escobedo, M., Coduras Martínez, A. and Hernández Mogollón, R. (2013). Institutional variables, entrepreneurial activity and economic development, *Management Decision*, 51(2): 281–305. <https://doi.org/10.1108/00251741311301821>
- Chavez, R., Yu, W., Jacobs, M, A., Feng, M. (2017). Manufacturing capability and organizational performance: the role of entrepreneurial orientation, *International Journal of Production Economics*, 184(3): 33–46. <https://doi.org/10.1016/j.ijpe.2016.10.028>
- Crnogaj, K., Bradač Hojnik, B. (2017). Institutional determinants and entrepreneurial action Management, *Journal of Contemporary Management*, 21(2): 131–150.
- Darvish, H., Alvani, M., Salehi Sadagiani, J., Abbaszadeh, H. (2012), The study of effective factors on entrepreneurial orientation in private banks, *Management Studies in Development and Evolution*, 18(66): 79–99.
- Dehdashti Shahrokh, Z., Bashirpour, M. (2018), Investigating the impact of implementing electronic business strategies on creating competitive advantage among corporate gaming companies, *Science and Technology Policy Letters*, 8(4): 69–82.
- Delafrouz, N., Taghavi, A. A., Ghasemi, A., Jafari, S. (2019), Identifying factors influencing oil development with emphasis on the role of social networks, *Journal of Business Management*, 43(3): 7–87.
- Elia, G., Margherita, A., Psaiante, G. (2020). Digital entrepreneurship ecosystem: how digital technologies and collective intelligence are reshaping the entrepreneurial process, *Technological Forecasting, and Social Change*, 150(2): 119–148. <https://doi.org/10.1016/j.techfore.2019.119791>
- Eshqi, M., Sarlak, MA., Darvish, H., Mousavi, M. (2019), Design and explanation of e-entrepreneurial organization model in Iranian oil industry (case study: Refah Bank), *IQBQ*, 23(2):28–53.
- Faber, E, Ballon P, Bouwman H, Haaker T, Rietkerk O, and Steen M. (2003). Designing business models for mobile ICT services. 16th Bled electronic commerce conference, 18(12): 10–16.
- Fallah Haghghi, N., Hajihosseini, H., Ramezanzpour Nargesi, G., Davari, A. (2017), Identifying and analyzing factors affecting the development of entrepreneurship in the field of information and communication technology, *Journal of Technology Development Management*, 5(1): 65–92.



- Farokhizadeh, F., Tolouei Ashlaghi, A., Radfar, R., Shoja, N. (2019), Dynamic model of electronic readiness of small and medium enterprises for entering the oil area, *Modern Researches in Decision Making*, 4(2): 97–122.
- Gumusay, A. A., Bohne, Th. (2018). Individual and organizational inhibitors to the development of entrepreneurial competencies in universities, *Research Policy*, 47(2): 363–378.
- Han, J. H., Kim, H. M. (2019). The role of information technology use for increasing consumer informedness in cross-border electronic commerce: an empirical study, *Electronic Commerce Research, and Applications*, 100(2): 100–126.
<https://doi.org/10.1016/j.elerap.2019.100826>
- Khodadad Hosseini, H., Alsabri, B., Moshabaki Esfahani, A., Ahmadi, P. (2019), Designing a bank marketing performance model: explaining the role of e-commerce service quality and customer relationship management strategies with a moderating role, *Biannual Peer Review Journal of Business Strategies*, 16(3): 19–38.
- Kurnia, Sh., Kanali, R. Y., Rahim, M. M. (2015). A qualitative study of business-to-business electronic commerce adoption within the Indonesian grocery industry: a multi-theory perspective, *Information and Management*, 52(4): 518–536.
<https://doi.org/10.1016/j.im.2015.03.003>
- Lazear, E. P. (2004). Balanced skills and entrepreneurship. *The American Economic Review*, 94(2), 208–211.
- Lee, L., Wong, P. K., Der Foo, M., Leung, A. (2011). Entrepreneurial intentions: the influence of organizational and individual factors, *Journal of Business Venturing*, 26(1): 124–136.
<https://doi.org/10.1016/j.jbusvent.2009.04.003>.
- Leonidou, E., Christofi, M., Vrontis, D., Thrassou, A. (2018). An integrative framework of stakeholder engagement for innovation management and entrepreneurship development, *Journal of Business Research*,
<https://doi.org/10.1016/j.jbusres.2018.11.054>
- Lumpkin, G. T. and Dess, G. G. (1996). “Clarifying the entrepreneurial orientation construct and linking it to performance”, *Academy of Management Review*, 21(1): 135–172.
- Mason, J. (2018). Entrepreneurship in knowledge-based services: opportunity and challenges for new venture, economic, and workforce development, *Journal of Business Venturing Insights*, 10(4): 121–163.
<https://doi.org/10.1016/j.jbvi.2018.e00092>
- Meoli, A., Fini, R., Sobrero, M., Wiklund, J. (2019). How entrepreneurial intentions influence entrepreneurial career choices: the moderating influence of social context, *Journal of Business Venturing*,
<https://doi.org/10.1016/j.jbusvent.2019.105982>
- Meoli, A., Fini, R., Sobrero, M., Wiklund, J. (2019). How entrepreneurial intentions influence entrepreneurial career choices: the moderating influence of social context, *Journal of Business Venturing*,
<https://doi.org/10.1016/j.jbusvent.2019.105982>
- Metvae, F. (2019). Prioritization of the entrepreneurship factors in the oil industry using FAHP and fuzzy TOPSIS, *International Journal of Business Excellence*, 17(4), 487–515.
- Mishra, V. and Singh, V. (2015). Selection of appropriate electronic oil industry channel alternative: critical analysis using analytical hierarchy process, *International Journal of Bank Marketing*, 33(3): 223–242.
<https://doi.org/10.1108/IJBM-09-2013-0099>
- Moeinzadeh, H., (2012), Quality of E-commerce services and customer satisfaction, *Monthly Journal of Telecommunication World*, 9(101): 46–50.
- Mohammadzadeh, Y., Hekmati Farid, S., Miralishrafi, K. (2016), The effect of economic freedom on entrepreneurship development in selected countries, *Journal of Entrepreneurship Development*, 9(2): 357–376 (doi: 10.22059/jed.2016.60059).
- Morgan, T., Anokhin, S. A. (2019). The joint impact of entrepreneurial orientation and market orientation in new product development: studying firm and environmental contingencies, *Journal of Business Research*,
<https://doi.org/10.1016/j.jbusres.2019.06.019>
- Murari, K. and Tater, B. (2014). Employee’s attitude towards adoption of IT-based oil industry services: a case of Indian private sector banks, *Competitiveness Review*, 24(2): 107–118.
<https://doi.org/10.1108/CR-01-2013-0005>

- Nyström, K. (2008). The institutions of economic freedom and entrepreneurship: evidence from panel data”, *Public Choice*, 136(3–4): 269–282.
- Ogunkoya, O. (2018). Strategic entrepreneurship and competitive advantage in Nigeria oil industry. *Management and Marketing Journal*, 16(1), 107–121.
- Putnins, T. J., Sauka, A. (2019). Why does entrepreneurial orientation affect company performance? *Strategic Entrepreneurship Journal*, <https://doi.org/10.1002/sej.1325>
- Ramezanpour Nargesi, Q., Ramezanpour Nargesi, S., Ghafari, A. (2015), Key elements affecting the development of technology entrepreneurship in knowledge-based companies based in science and technology parks in Iran, *Journal of Entrepreneurship Development*, 8(4): 749–766.
- Royo, R. C., Moya-Clemente, I., Perello-marin, M. R., Ribes-Giner, G. (2019). Sustainable development, economic and financial factors that influence the opportunity-driven entrepreneurship. An fsQCA approach, *Journal of Business Research*, <https://doi.org/10.1016/j.jbusres.2019.10.031>
- Sadi, M. R., Mohammadi Moghadam, Y., Abbaspour, J., Abbaspour, H. (2019), Investigating the barriers of electronic oil industry in Iran by meta-analytical approach, *Quarterly Journal of BI Management Studies*, 7(26): 137–160.
- Sameti, M., Shahnazi, R. (2006), the impact of economic freedom on financial corruption, *Iranian Journal of Economic Research*, 8(28): 87–105.
- Sánchez-Torres, J., Arroyo Canada, F. J., Sandoval, A. V., Sánchez Alzate, J. A., (2018) “E-commerce in Colombia: factors favoring its acceptance, online trust and government support”, *International Journal of Bank Marketing*, Vol. 36 Issue: 1, pp.170–183.
- Shankar, A. and Jebarajakirthy, C. (2019). The influence of e-commerce service quality on customer loyalty: a moderated mediation approach, *International Journal of Bank Marketing*, Vol. 37 No. 5, pp. 1119–1142. <https://doi.org/10.1108/IJBM-03-2018-0063>
- Şimandan, R. I. (2015). Free to enterprise: economic freedom and entrepreneurship in Romania, *Romanian Economic Journal*, 18(56): 87–100.
- Sobel, R. S., Clark, J. R. and Lee, D. R. (2017). “Freedom, barriers to entry, entrepreneurship, and economic progress”, *The Review of Austrian Economics*, 20(4): 221–236.
- Szirmai, A., Naudé, W., and Goedhuys, M. (2011). *Entrepreneurship, innovation, and economic development*. Oxford University Press 10–11.
- Themudo, N. S. (2014). “Government size, nonprofit sector strength, and corruption: A cross-national examination”, *The American Review of Public Administration*, 44(3): 309–323.
- Toma, S. G., Grigore, A. M., Marinescu, P. (2014). Economic development and entrepreneurship, *Procedia Economics and Finance*, 8(2): 436–443 [https://doi.org/10.1016/S2212-5671\(14\)00111-7](https://doi.org/10.1016/S2212-5671(14)00111-7).
- Urbano, D. and Aparicio, S. (2016). “Entrepreneurship capital types and economic growth: international evidence”, *Technological Forecasting and Social Change*, 102 (1): 34–44.
- Wiseman, T. and Young, A. T. (2011). “Economic freedom, entrepreneurship, and income levels: Some US state-level empirics”, *American Journal of Entrepreneurship*, Forthcoming.
- Wong, P. K., Ho, Y. P. and Autio, E. (2005). “Entrepreneurship, innovation and economic growth: evidence from GEM data”, *Small Business Economics*, 24(3): 335–350.
- Wong, P. K., Ho, Y. P. and Autio, E. (2005). Entrepreneurship, innovation and economic growth: evidence from GEM data”, *Small Business Economics*, 24(3): 335–350.
- Wong, S. (2014). Impacts of environmental turbulence on entrepreneurial orientation and new product success, *European Journal of Innovation Management*, 17(2): 229–249. <https://doi.org/10.1108/EJIM-04-2013-0032>
- Yiu CS, Grant K, and Edgar D. (2007). Factors affecting the adoption of the internet oil industry in Hong Kong: implications for the oil industry sector. *International Journal of Information Management*, 22(1): 336–351.