

Приоритизация факторов, влияющих на ненефтяной экспорт Ирана с использованием группового подхода к принятию решений на основе иерархического анализа

Мохаммадбеиги Хортаби Фарзин¹, Даниали Сара², Мохаммадбеиги Яздан³

¹аспирант, ФГБОУ ВО «Государственный университет управления»,
г. Москва, Российская Федерация, ORCID: 0000-0002-0484-0440, e-mail: f_b258@yahoo.com

²канд. экон. наук, ФГБОУ ВО «Санкт-Петербургский политехнический университет Петра Великого»,
г. Санкт-Петербург, Российская Федерация, ORCID: 0000-0003-3101-3085, e-mail: daniiali.sm@edu.spbstu.ru

³генеральный директор, Pooyandegan Andishe Hirkan Company,
г. Горган, Иран, e-mail: yazdanmb@yahoo.com

Аннотация

Экономика Ирана имеет три сектора: углеводородный, сельское хозяйство и услуги. В силу исторической тенденции иранская экономика находится под влиянием государственного управления в сфере производства и услуг. Учитывая роль ненефтяного экспорта и чрезмерную зависимость иранской экономики от нефти и нефтепродуктов, необходимо провести исследование для определения факторов, влияющих на ненефтяной экспорт.

Поскольку нефтяные доходы не рассматриваются в качестве надежного источника доходов для правительства из-за их нестабильности, развитие ненефтяного экспорта является одной из важнейших целей Ирана. Если цели, поставленные в этой области, будут достигнуты, то положение страны улучшится в валютном плане, сдерживая волатильность, вызванную ценами на нефть, и приобретая экономические и конкурентные преимущества на мировой арене. Важнейшим вопросом в развитии ненефтяного экспорта является либерализация экономического потенциала за счет новых инвестиций.

В статье на основе литературного образа определены факторы, влияющие на ненефтяной экспорт. С учетом опроса 32 руководителей и экспертов нефтеперерабатывающей компании Fajre Jam, как одной из главных компаний-экспортеров конденсата в этой стране и регионе, выявлены наиболее важные факторы, а затем классифицированы с использованием подхода аффинного графа. При обработке аналитических иерархий в программном обеспечении выбора экспертов использовались парные сравнения для взвешивания основных факторов и подфакторов с участием 10 руководителей и экспертов указанной компании.

Ключевые слова: развитие ненефтяного экспорта, экономика Ирана, Фаджр Джам нефтеперерабатывающая компания, внешняя торговля, приоритизация, метод аналитической иерархии.

Цитирование: Мохаммадбеиги Х.Ф., Даниали С., Мохаммадбеиги Я. Приоритизация факторов, влияющих на ненефтяной экспорт Ирана с использованием группового подхода к принятию решений на основе иерархического анализа // Управление. 2019. № 4. С. 60–66.

Prioritizing factors affecting Iranian non-oil export using group decision making approach based on hierarchical analysis process

Mohammadbeigi Khortabi Farzin¹, Daniali Sara², Mohammadbeiki Yazdan³

¹Postgraduate student, State University of Management, Moscow, Russia,
ORCID: 0000-0002-0484-0440, e-mail: f_b258@yahoo.com

²Candidate of Economic Sciences, Peter the Great St. Petersburg Polytechnic University, Saint Petersburg, Russia,
ORCID: 0000-0003-3101-3085, e-mail: daniali.sm@edu.spbstu.ru

³CEO, Pooyaandegan Andishe Hirkan Company, Gorgan, Iran, e-mail: yazdanmb@yahoo.com

Abstract

Iran's economy has three sectors: hydrocarbons, agriculture and services. Due to the historical trend, Iranian economy is under the influence of government governance in production and services. Considering the role of non-oil exports and the over-reliance of Iranian economy on petroleum and petroleum products, it is necessary to conduct a research to determine the factors, which affect non-oil export.

Since oil revenues are not considered as a reliable source of revenue for the government due to their volatility, development of non-oil export is one of the major goals of Iranian most important goals. If the goals, set in this area will be achieved, the country's position will be improved in terms of foreign exchange, curbing the volatility, caused by oil prices and gaining economic and competitive advantages in the global arena. The most important issue in the development of non-oil exports is the liberalization of economic capacity through new investments.

In this article all factors, affecting non-oil exports have been determined, based on studying literature. Considering a survey of 32 executives and experts of Fajre Jam Refining Company as one of the most important condensate exporter companies in the country and region, the most important of them have been identified and then categorized using the affinity graph approach. Pairwise comparisons were used to weight the main and sub-factors with the participation of 10 executives and experts of the mentioned company within the framework of the analytic hierarchy process in expert choice software.

Keywords: non-oil export development, Iranian economy, Fajre Jam Refining Company, foreign trade, prioritization, analytic hierarchy process.

For citation: Mohammadbeigi K.F., Daniali S., Mohammadbeiki Y. Prioritizing Factors Affecting Iranian Non-Oil Export Using Group Decision Making Approach Based on Hierarchical Analysis Process (2019) *Upravlenie*, 7 (4), pp. 60–66. doi: 10.26425/2309-3633-2019-4-60-66

The volatility of export earnings, especially oil earnings, has always prompted various countries, including Iran, to seek non-oil export to achieve the stability needed to pursue economic development programs. Export and the policies, which are associated with it, are the engine of the country's economic growth, that can develop new technologies, increase demand, and encourage investment. Many developing countries have begun their own economic reform programs during the 1980s [2]. Under the current conditions of the Iranian economy, the role of export is more than only forex earning, in matters such as employment, production and economic growth. Therefore, the necessity of examining the factors affecting non-oil export to formulate practical plans in this regard is too important for current and future of Iranian economy. The importance of the issue is heightened when these factors have synergistic relationships and feedback effects, not only with non-oil export, but also with each other. In the present study, it is not only attempted to identify the factors affecting the development of non-oil export, but also to categorize and prioritize them as general factors.

According to Katsikeas et al. besides the behavior of businesses, the role of other factors in the development of non-oil export is also significant, and the effort to identify these factors can provide valuable guidance to managers and policymakers in formulating and implementing plans and policies [3]. He also discussed the implications of the study for both business practitioners and public policy makers.

In the current situation, favorable policy-making regarding the development of export of various non-oil commodities is one of the issues, that can lead the Iranian economy towards optimal utilization of available

capacities. Table 1. shows the performance of Iran's non-oil export by value (million dollars) in the years 2015 to 2018.

As can be seen in Table 1, the highest value of export earnings in all these years were industrial, petrochemical and condensate. Industrial items are naturally very diverse, petrochemicals are relatively diverse, and condensate items are not very diverse. Also, a look at the table shows that in any case, condensates and petrochemicals have an oil base, accounting for about 50 % of non-oil export in these years. However, given, that the export of crude has been avoided and other purposes such as foreign investment development, processing, and Job creation are considered before production and export of gas condensates and petrochemicals, the trend is favorable. Concerning agricultural and mineral commodities, considering, that the processing capacity and added value creation are not optimally utilized, higher perceived value and even higher percentage share can be achieved by better planning and policy making. Therefore, the questions, that can be considered in the study can be as follows:

- what are the factors contributing to the development of non-oil export?
- how are the factors influencing the development of non-oil export classified?
- what is the weight of the general and partial factors that influence the development of non-oil export?

Dezhphasand et al. by econometric functions concluded, that productivity, economic openness and GDP have a positive effect on non-oil export. They have recommended that economic policymakers adopt policies other than raising the exchange rate to improve the level of non-oil export [4]. Abbasi et al. have explored

Table 1

Non-oil export performance of Iran in 2015–2018 (value in million USD)

Таблица 1. Показатели ненефтяного экспорта Ирана в 2015–2018 гг. (Стоимость в млн долл. США)

Export commodities	2015		2016		2017		2018	
	Value	%	Value	%	Value	%	Value	%
Condensate	4680	11	7320	17	7063	15	4935	11
Petrochemical	15273	36	16419	37	14486	31	14150	32
Industrial	17165	40	14496	33	18800	40	19693	44
Carpets and handicrafts	333	1	374	1	465	1	308	1
Agricultural	3988	9	3922	9	3944	8	3747	8
Mineral	990	2	1399	3	2224	5	1477	3
Total non-oil export	42429	100	43930	100	46982	100	44310	11

Source: [1] / Источник: [1]

the theories behind the development of non-oil export. They have come to realize that the two approaches of micro at corporate level and macro at the country level are significant in the development of non-oil export. They have incorporated into their own consideration of major factors such as exchange rates as well as industry-related variables such as R&D expenditure, skill intensity, import penetration, and labor-to-capital ratios in exporting of business products [5].

Nouri and Navidi have concluded that exchange rate risk has a short-term positive and significant effect on non-oil export in Iran. Indeed, it is the positive nature of Iran's exchange rate fluctuations that has led to such an outcome. They also pointed to the income of Iran's trading parties, which has a significant impact on increasing export to those countries. The effect of this factor is that Iran's export to those countries will increase by about 3 %, if the revenue of Iran's trading parties is increased one percent [6].

Mohammadzadeh and Mohammadi concluded, that import of capital goods, index of trade integration or globalization, and exchange rate had a positive and significant long-term effect on non-oil export, but inflation had a negative and significant effect on Long-term relies on non-oil export. Also, the existing structure of non-oil export plays a decisive role in the fate of export. They have suggested that in order to accelerate non-oil export, the nature of its existing structure and the structural transformation of the export sector should be taken into account. Other proposals include foreign trade liberalization, joining the WTO along with deregulation and reducing tariffs [7].

According to Gharabaghian, foreign trade is of particular importance to countries around the world, with classical and neoclassical economists referring to it as economic growth. Foreign trade can provide the need for industrialization, the knowledge and experience needed for economic development and provide countries with the means to access it [8]. Guraraj et al. have considered the situation of India in their study of the development of non-oil export. Their study suggests that inflation rate, real effective exchange rate (REER) and foreign direct investment have a significant negative impact on oil export [2].

The purpose of this study is descriptive in terms of purpose and practical in terms of the type use, as it is an attempt to understand a specific situation in the real world in order to apply the results of the findings to problem solving and to provide a solution. Besides, this study is a descriptive-correlational research of the field branch and is considered a cross-sectional study in time. Also, this study is a quantitative research in terms of data type.

In the present study, on the one hand, based on a library study of experts' opinions and published reports

on the development of non-oil exports, and on the other hand, using the views of managers and experts of Fajr Jam Gas Refinery Company (FJGRC) through a brainstorming session, the primary factors has been extracted which are probably effective on the development of non-oil export. It should be noted that FJGRC is one of the most important exporter of natural gas and condensate in the country and the region.

Then, using the Likert scale questionnaire, the most important factors were selected and finally the factors were added in the general factors using the affinity diagram method and experts view. Based on the mentioned factors categorization and also using pairwise comparisons within the AHP approach, the weight of each general and partial factor was determined.

Therefore, the method of gathering data is through field studies, questionnaires and documentation related to the development of non-oil export and the statistical population consists of top managers and senior experts of FJGRC. Face validity is guaranteed using experts' view and t-test is used for content validity. To ensure reliability, Cronbach's alpha coefficient was used in Likert type questionnaires and inconsistency ratio (IR) index was used in pairwise comparison questionnaires based on Expert Choice software report.

In pairwise comparisons, decision makers used verbal judgment from 1 to 9, which 9 is "completely preferred or completely desirable" and 1 is "the same preference or desirability".

In the set of 32 respondents, 29 were male and 3 were female. In terms of age of responders, 3 were 30 or younger, 14 were 30–40, 11 were 40–50 and 4 of them were more than 50. Regarding the working experience of responders, 3 of them had 5 or less years, 3 of them had between 5–10 years, 18 of them had between 10–20 years, and 8 of them had more than 20 years of experiences. 13 of responders had bachelor degree, 17 master degree and 2 of them had PhD.

For received responses, the scales of 1 for ineffective, 2 for a little effective, 3 for relatively effective, 4 for effective, and 5 for very effective are used. To extract important items, the mean of the responses was calculated and then their significance of being greater than number 4 is investigated using t-statistics.

Table 2 shows the inferential analysis of the collected data. Cronbach's alpha statistic was used to assess the reliability of the questionnaire. The calculated statistic is 0.805 and indicates its suitability. Items that by deleting them the Cronbach's alpha statistic will increase are listed in Table 2. Items 1, 4 and 31 are of this category. By deleting these three items, the Cronbach's alpha statistic was increased to 0.825, which is quite indicative of the suitability of the remaining items.

Table 2

Inferential analysis of collected data to evaluate factors affecting Iranian non-oil export development

Таблица 2. Логический анализ собранных данных для оценки факторов, влияющих на развитие ненефтяного экспорта Ирана

Items	Mean	Stan. dev.	t-ratio	Significant	Alpha if item deleted
Low domestic production and rising domestic demand	3.88	0.13	-0.94	0.35	0.810
Lack of identification of the export potential capabilities of non-oil goods	4.31	0.08	3.75	0.00	0.806
Export of goods with low value added	4.00	0.11	0.00	1.00	0.799
Illegal export	3.34	0.15	-4.49	0.00	0.811
High final price of export items	3.56	0.16	-2.82	0.01	0.783
Improper packaging of export items	4.34	0.12	2.98	0.01	0.790
The absence of a long-term policy on non-oil exports	4.38	0.12	3.21	0.00	0.797
Improper transportation and logistics	3.72	0.11	-2.51	0.02	0.795
Problems with the supply of raw materials needed for production	4.06	0.14	0.44	0.66	0.796
Problems with the supply of manufacturing machinery and equipment	3.91	0.14	-0.68	0.50	0.797
Surplus domestic demand	3.25	0.11	-6.82	0.00	0.803
Inappropriate financial and banking transactions with other countries	4.44	0.11	4.00	0.00	0.803
Inflation	3.66	0.14	-2.47	0.02	0.801
Banking facilities for investors and manufacturers	4.13	0.13	0.94	0.35	0.797
Banking facilities for exporters	4.06	0.11	0.57	0.57	0.793
Government investment in infrastructure	4.28	0.14	1.96	0.06	0.793
The possibility of foreign direct investment	3.75	0.14	-1.76	0.09	0.795
Exchange rate stabilization	4.13	0.11	1.16	0.25	0.806
Lack of active business offices	3.66	0.13	-2.61	0.01	0.805
Lack of active Iranian business offices in the world	3.88	0.14	-0.89	0.38	0.793
Inadequate advertising and information on export items	3.84	0.10	-1.54	0.13	0.798
Competitive policies of other exporting countries	3.88	0.10	-1.28	0.21	0.801
Replacement of synthetic materials instead of natural raw materials in export items	3.53	0.13	-3.69	0.00	0.798
Imitating of rival countries from traditional Iranian export	3.31	0.13	-5.27	0.00	0.799
Poor quality of Iranian export goods	4.78	0.07	10.52	0.00	0.806
Insufficient understanding of consumer markets	4.41	0.12	3.45	0.00	0.800
Competitiveness and openness of the country's economy in terms of import	4.38	0.13	3.00	0.01	0.806
Political tensions between Iran and other countries	4.53	0.13	3.95	0.00	0.793
Recession	4.13	0.13	0.94	0.35	0.804
Recession in the world	3.38	0.15	-4.25	0.00	0.805
Ease of doing business in the private sector in the country	3.88	0.11	-1.16	0.25	0.815

Compiled by the authors of the study / Составлено авторами по материалам исследования

According to the inferential analysis, important items were identified and categorized by the expert team using the affinity diagram approach into more general factors. Following, the classification of factors affecting the development of Iranian non-oil exports are listed.

1. Having a comprehensive business plan and export product marketing:

- understand the potential export capabilities of non-oil goods;

- adequate understanding of target consumer markets;
- adopt and pursue a long-term policy on non-oil exports.

2. Technical and operational capabilities of production and supply of products:

- export of appropriate value-added goods;
- convenience and attractiveness of export items packaging;
- appropriate quality of Iranian export goods;

3. Providing the infrastructure and resources needed for production and supply:

- government investment in infrastructures;
- ease of supply of raw materials needed to manufacturing and supplying the products;
- ease of supply of equipment and machineries needed to manufacturing and supplying the products.

4. Policies and mechanisms of banking and financial system:

- appropriate financial and banking transactions with other countries;
- banking facilities required by investors, manufacturers and exporters;
- exchange rate stabilization (difference between state preferred rate and free market rate).

5. De-escalation and political and economic interaction with other countries:

- de-escalation and political and economic interaction with other countries.

6. The country's economic and commercial boom:

- competitiveness and openness of the country's economy in terms of import;
- the economic boom of the country.

The pairwise comparison questionnaire was designed and analyzed by ten experts of FJGRC including top managers and senior executives. Table 3 shows the pairwise comparisons of the main factors affecting the development of Iranian non-oil export. According to the comparisons and obtained weights, “de-escalation and political and economic interaction with other countries” is of the utmost importance. “Having a comprehensive plan of business and export product marketing” and

Table 3

Pairwise comparisons of the main factors affecting Iranian non-oil export and related weights

Таблица 3. Парное сравнение основных факторов, влияющих на иранский нефтяной экспорт, и соответствующих весовых коэффициентов

Main factors	2	3	4	5	6	Weight
Having a comprehensive plan of business and export product marketing	0.72	2.56	1.98	0.21	1.89	0.15
Technical and operational capabilities of production and supply of products		1.21	1.36	0.24	1.36	0.13
Providing the infrastructure and resources needed for production and supply			1.11	0.30	1.87	0.10
Policies and mechanisms of banking and financial system				0.27	1.36	0.10
De-escalation and political and economic interaction with other countries					4.28	0.44
The country's economic and commercial boom						0.08

Compiled by the authors of the study / Составлено авторами по материалам исследования

Table 4

Local and general weights of partial factors affecting the development of non-oil exports

Таблица 4. Локальные и общие веса частных факторов, влияющих на развитие нефтяного экспорта

Sub factors	Local weight	General weight
Understand the potential export capabilities of non-oil goods	0.43	0.06
Adequate understanding of target consumer markets	0.39	0.06
Adopt and pursue a long-term policy on non-oil exports	0.18	0.03
Export of appropriate value-added goods	0.20	0.03
Convenience and attractiveness of export items packaging	0.15	0.02
Appropriate quality of Iranian export goods	0.65	0.08
Government investment in infrastructures	0.20	0.02
Ease of supply of raw materials needed to manufacturing and supplying the products	0.31	0.03
Ease of supply of equipment and machineries needed to manufacturing and supplying the products	0.49	0.05
Appropriate financial and banking transactions with other countries	0.51	0.05
Banking facilities required by investors, manufacturers and exporters	0.17	0.02
Exchange rate stabilization (difference between state preferred rate and free market rate)	0.32	0.03
De-escalation and political and economic interaction with other countries	1.00	0.44
Competitiveness and openness of the country's economy in terms of import	0.67	0.05
The economic boom of the country	0.33	0.03

Compiled by the authors of the study / Составлено авторами по материалам исследования

“technical and operational capabilities of production and supply of products” are also of relatively high importance. The inconsistency ratio of 0.03 indicates that the comparison matrix is appropriate.

Table 4 shows the local and general weights of the partial factors affecting the development of non-oil export. In this table, the weights of each of the sub-factors within the relevant main factor are also specified. As can be seen, the highest weight is related to the factor of “De-escalation and political and economic interaction with other countries”. It should be noted that in all pairwise comparisons, the incompatibility ratio was less than 0.1.

Conclusion

According to the obtained weights, the most important axis of the solution can be based on the factor of “de-escalation and political and economic interaction with other countries”. However, the technical and managerial

aspects of the issue, such as improving the quality of export items, appropriate understanding of export items and their advantages, and adequate understanding of target markets, are also important. The economic interaction with countries around the world, on one hand, will provide an opportunity to identify the target consumer markets and Iran’s advantages on that area, and on the other hand, provide technical facilities, tools and technologies for production and supply of products. The development of interaction leads to a better understanding of the expected technical and operational needs and standards of customers on a more global scale and therefore can gradually influence customer behavior. The global market provides opportunities to take advantage of opportunities around the world, including in the production and sales process, which, in addition to reducing costs, leads to creativity and innovation in business details and thus its dynamics in a global competition.

Библиография

1. Foreign Trade Performance Report / Iran trade development organization – office of business planning. Statistics and Research. Tehran. 2019. P. 3.
2. Gururaj, B., Satishkumar, M., Aravinda Kumar, M. Analysis of factors affecting the performance of exports in India// International journal of agriculture, environment and biotechnology. 2016. V. 9. No. 4. P. 613–616.
3. Katsikeas, C. S., Piercy, N. F., Ioannidis, C. Determinants of export performance in a European context//European journal of marketing. 1996. V. 30. No. 6. P. 6–35.
4. Dezhpasand, F., Amiri, M., Saveh, B., Investigation of effective factors on non-oil Exports with emphasis on non-price variables//Journal of financial economics and development. 2011. V. 5, No. 15. P. 9–29.
5. Abbasi, G., Mirzaee-Nejad, M., Donyabin, F., The factors influencing exports in Iranian industry with the emphasis on market structure//Journal of planning and budgeting. 2012. V. 17. No. 3, P. 97–113.
6. Nouri, M., Navidi, H. The exchange rate risk and non-oil export in Iran//Quarterly journal of economic growth and development research. 2012. V. 3. No. 9. P. 59–70.
7. Mohammadzadeh Nazi, M. F. Investigating factors affecting Iranian non-oil exports with emphasis on globalization// Journal of financial economics. 2012. V. 6. No. 21. P. 7–30.
8. Gharabaghian, M. Economics of growth and development. Tehran: Nashr-e Ney. 2014. 44 P.

References

1. Foreign Trade Performance Report, Iran trade development organization - Office of Business Planning, Statistics and Research, Tehran, 2019, p. 3.
2. Gururaj B., Satishkumar M., Aravinda Kumar M. Analysis of factors affecting the performance of exports in India, International Journal of agriculture, environment and biotechnology, 2016, vol. 9, no. 4, pp. 613–616.
3. Katsikeas C. S., Piercy N. F., Ioannidis C. Determinants of export performance in a European context, European journal of marketing, 1996, vol. 30, no. 6, pp. 6–35.
4. Dezhpasand F., Amiri M., Saveh B. Investigation of effective factors on non-oil exports with emphasis on non-price variables, Journal of financial economics and development, 2011, vol. 5, no. 15, pp. 9–29.
5. Abbasi G., Mirzaee-nejad M., Donyabin F. The factors influencing exports in Iranian industry with the emphasis on market structure, Journal of planning and budgeting, 2012, vol. 17, no. 3, pp. 97–113.
6. Nouri M., Navidi H. The exchange rate risk and non-oil export in Iran, quarterly journal of economic growth and development research, 2012, vol. 3, no. 9, pp. 59–70.
7. Mohammadzadeh Nazi M.F., Investigating factors affecting Iranian non-oil exports with emphasis on globalization, Journal of financial economics, 2012, vol. 6, no. 21, pp. 7–30.
8. Gharabaghian M. Economics of growth and development, Tehran: Nashr-e Ney, 2014, 44 p.