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Using Analytic Hierarchy Process (AHP) for Selecting the Appropriate Country for Economic Integration (Case of Iran's Foreign Trade with OIC Countries)

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Abstract

This paper deals with application of Analytic Hierarchy Process (AHP) for selection of an appropriate country for economic integration with the case study of Iran's foreign trade with Organization of Islamic Countries (OIC). The main sample of this study was chosen from experts who are frequently involved in trade especially with OIC countries. Appropriate country selection process includes the identification of relevant criterions which found necessary by traders such as; Legal factors, financial factors, transportation factors, political and cultural factors and origin and destination economy factors. The described process also includes the identification and evaluation of selected OIC countries such as; Saudi Arabia, Indonesia, Pakistan, Turkey, Malaysia and Egypt with the quest for consensus among multiple decision makers. The hierarchical model was designed in such a way and the experiences in implementing and using the model are discussed. The paper discovered that, choosing Malaysia as the appropriate country for economic integration with Iran is the best alternative.

Keywords: Multiple criteria decision making, Analytic hierarchy process, economic integration, OIC countries.
JEL Classification: F15, O24

1. Introduction

During 1990s, efforts had being made of regionalization around the world. The new wave of regionalization was generally as a result of European countries success in implementing the European Common Market and then European Union (EU) (Ogawa and Tsubuku, 2017). Advocates of free trade agreement predict that a country that signed trade agreement would benefit in term of trade volume which known as a trade creation. The idea of trade creation widely used in international trade as Viners (1950) in his seminal paper reveal that the expansion of intra bloc under custom union is welfare enhancing from bloc members countries as well as the world economy. In recent phenomena, the trend of country sign free trade agreement with other country or other regional groups are common. In fact, each country in the world at least has signed one free trade agreement either at multilateral level

(WTO), regional level (such as AFTA, NAFTA, and EU) or bilateral level (such as US-Singapore) (Normaz and Rusmawati, 2009). Basically, the regional economic integration was formed because of regional or geographical factors, none of the existence of regional economic integration based on ideology, culture or religion. Recent development of propose to establish an Islamic common market among the Organization of the Islamic Conference (OIC[1]) countries has seen as a positive movement towards regional economic integration so called 'faith-based integration' (Fahimifard, 2013). The history of economic cooperation among Islamic countries is back to September 1969, when Islamic leaders gathered in Rabat to participate in first meeting of the OIC. During the meeting, foreign Ministers of Islamic countries agreed the foundation of General Secretary of OIC. At the present time, most Muslim countries (in Middle East, East Asia and North Africa) are also members actively in several cooperation blocks such as ACC[2], ECO[3], GCC[4], and CAEU[5] etc. However, countries are found, Lebanon for example, not to be a member of any cooperation organization, while Mauritania is participating in seven economic integration plans. In addition, some of them have strong economic relationships with non-Islamic countries rather Islamic ones. All these reveal the fact that there is no a unique and harmonized arrangement among these countries to follow up their own current and future integration strategies. To achieve advantages of integration programs in the favor of today globalization, collaboration of all Islamic countries in an economic theme should be thus a necessity (Tayyebi and Moallemy, 2003). Currently OIC has 57 memberships. The objective of the organization at the beginning serves as a collective of Muslim voice and ensuring to safeguard and protect of interest of the Muslim world. The OIC members are also heterogeneous group with uneven in term of development and growth pattern. Based on Income Classification from the World Bank, out of 57 OIC members, 12.5% are high income economies, 19.6% upper middle income economies, 40% are lower-middle-income economies and 32% are low-income economies. Most of the high income countries members are oil exporting countries with substantial growth potentials while others are among the least developed and highly indebted poor countries. Even though they are different in income, language, geographical location, races, cultural, however, as a Muslim they follow the same faith (Normaz and Rusmawati, 2009). In the view of this development, this study provides empirical evidence to investigate the appropriate country to economic integration using Analytical Hierarchy Process (AHP) with the case of Iran's foreign trade with OIC countries. The paper is organized as follows. Section 2 provides a survey of the literature on loan defaults. Section 3 describes the methodology, and Section 4 presents the results of selecting the appropriate OIC member for making economic integration with Iran using AHP. Section 5 concludes.

2. Literature Review

On the theory, economic integration is basically defined as a larger economic unit than a set of smaller national economies included. Hence, trade restrictions are properly given up and, on the other hand, collaboration in trade, monetary and fiscal activities are promoted among members of an integration block. The theory of economic integration expresses that common wealth countries make efforts to combine trade liberalization strategies with protective policies, to minimize trade restrictions amongst themselves accompanied by conducting discriminative policies for non-members. After integration, trade transactions followed by a decrease in costs and resources reallocation will result in an increase in products, trade and then economic welfare for members (Soete and Hove, 2017). The economic integration relies upon economic transaction promotion and unification of resources of two or several isolated systems that leads to a rise in the capability of the larger integration system. The weakest is a

[1] . Organization of Islamic Countries
[2] . Arab Cooperation Council
[3] . Economic Cooperation Organization
[4] . Gulf Cooperation Council
[5] . Council of Arab Economic Unity

Preferential Trade Agreement (PTA), which allows for reduction in tariffs, but not their total elimination, followed by a Free Trade Agreement (FTA), Custom Union (CU) and the most advanced type of economic integration is Economic and Monetary Union, which not only sets up a CM, but also gives the responsibility for fiscal policy to a supra-national authority and adopts a common currency amongst of the member countries. These types of Economic Integration are also referred to as regionalism (Orcalli, 2017).

According to the importance of economic integration several studies have been carried out such as: Caporale et al. (2001), analyzed trade specialization dynamics in two Eastern European countries (Romania and Bulgaria – EEC-2) vis-à-vis the core EU member states (EU-15) over the period 1990-2006 using the Gravity model. Specifically, they focused on whether there is a shift towards intra-industry trade leading to economic convergence and technological catch-up. They used recently developed static (FEM, REM and FEVD) and dynamic (GMM) panel data methods which take into account possible heterogeneity. Their empirical results indicated that intra-industry trade has indeed increased, but it is of the vertical rather than the horizontal type, resulting in complementary rather than competitive production patterns. Tayyebi and Moallemy (2003) afforded to explore the role of economic co-operations among about twenty selected Islamic countries. They conducted the hypothesis in which the more trade integration among the countries; the more trade flows will be realized. A Trade Gravity Model (TGM) is thus specified and can then estimate by econometric methods, illustrating how trade integration can create aforementioned impacts. As well known, the model is also reliable to consist of several qualitative variables that explain roles of a variety of scenarios such as the conduction of a possible regional economic integration, etc. overall, the estimation results lend support to a growing literature both theoretical and empirical that regional economic tightness has substantially led rises to trade flows of potential integrated Islamic nations. Most economic integration are based on geographical and economic purposes, however, Raimi, and Mobolaji (2008) proposed Muslim countries to have the economic integration based on faith namely 'faith-based integration'. Even though based on different level of income and development, they suggest that the integration may increase in term of promoting technological development, raise the level of human capital, improve product diversification and develop stable institutions and infrastructure. Warin et al. (2009), investigated the feasibility of creating a common-currency union consisting of 16 countries in Southern Africa. They estimated an augmented-gravity model that includes public deficit, public debt, public expenditure, inflation, and the foreign reserves position. They also integrated Africa-specific variables such as existing economic blocs in the region, colonial heritage, and the convergence of living standards. Their analysis showed that the prospect for further integration in Southern Africa is promising, but many challenges still persist. The existing economic blocs can provide a first stepping stone to a larger currency union, but countries continuously have to cultivate good governance and fiscal discipline. Normaz and Rusmawati (2009) examined the bilateral export between Malaysia and 52 OIC members for the period of 1990 to 2006.Using a traditional gravity-equation framework, this study investigates to what extent export creation between Malaysia and the OIC members after being long term membership since 1969. The major finding is that the market size of members is important determinant for Malaysian trade. Furthermore, there is evidence Malaysia trade with high income economies more than other members. Empirical result also support that trade increases between Malaysia and OIC member if they are not similar in term of size and factor endowments. Chung (2016), in his study developed assessment criteria of logistics cluster competitiveness based on Porter's diamond model, calculated the weight of each criterion by the AHP method, and finally evaluated and discussed logistics cluster competitiveness among Asia main countries. The results indicate that there was a large difference in logistics cluster competitiveness among six countries. The logistics cluster competitiveness scores of Singapore (7.93), Japan (7.38), and Hong Kong (7.04) are observably different from those of China (5.40), Korea (5.08), and Malaysia (3.46). Singapore, with the highest competitiveness score, revealed its absolute advantage in logistics cluster indices. These research results intend to provide logistics policy makers with some strategic

recommendations, and may serve as a baseline for further logistics cluster studies using Porter's diamond model.

Reviewing the previous researches indicated that there is a lack of literature in field of investigating the appropriate country to economic integration. Accordingly, this lack motivated the authors to carry out current issue with the case of Iran's foreign trade with selected OIC countries.

3. Method

The Analytic Hierarchy Process (AHP), introduced by Thomas Saaty (1980), is an effective tool for dealing with complex decision making, and may aid the decision maker to set priorities and make the best decision. By reducing complex decisions to a series of pairwise comparisons, and then synthesizing the results, the AHP helps to capture both subjective and objective aspects of a decision. In addition, the AHP incorporates a useful technique for checking the consistency of the decision maker's evaluations, thus reducing the bias in the decision making process. The AHP is a very flexible and powerful tool because the scores, and therefore the final ranking, are obtained on the basis of the pairwise relative evaluations of both the criteria and the options provided by the user. The computations made by the AHP are always guided by the decision maker's experience, and the AHP can thus be considered as a tool that is able to translate the evaluations (both qualitative and quantitative) made by the decision maker into a multicriteria ranking. In addition, the AHP is simple because there is no need of building a complex expert system with the decision maker's knowledge embedded in it. The AHP can be implemented in three simple consecutive steps:

1) Computing the vector of criteria weights.
2) Computing the matrix of option scores.
3) Ranking the options.

Each step will be described in detail in the following. It is assumed that m evaluation criteria are considered, and n options are to be evaluated. A useful technique for checking the reliability of the results will be also introduced.

In order to compute the weights for the different criteria, the AHP starts creating a pairwise comparison matrix A. The matrix A is a m×m real matrix, where *m* is the number of evaluation criteria considered. Each entry a_{jk} of the matrix A represents the importance of the jth criterion relative to the kth criterion. If $a_{jk} > 1$, then the jth criterion is more important than the kth criterion, while if ajk < 1, then the jth criterion is less important than the kth criterion. If two criteria have the same importance, then the entry a_{jk} is 1. The entries a_{jk} and a_{kj} satisfy the following constraint:

$$a_{jk} * a_{kj} = 1 \quad (1)$$

Obviously, $a_{jj} = 1$ for all *j*. The relative importance between two criteria is measured according to a numerical scale from 1 to 9, as shown in Table 1, where it is assumed that the *j*th criterion is equally or more important than the *k*th criterion. The phrases in the "Interpretation" column of Table 1 are only suggestive, and may be used to translate the decision maker's qualitative evaluations of the relative importance between two criteria into numbers. It is also possible to assign intermediate values which do not correspond to a precise interpretation. The values in the matrix **A** are by construction pairwise consistent, see (1). On the other hand, the ratings may in general show slight inconsistencies. However these do not cause serious difficulties for the AHP.

Table 1: Table of relative scores

Value of a_{jk}	***Interpretation***
1	*j* and *k* are equally important
3	*j* is slightly more important than *k*
5	*j* is more important than *k*
7	*j* is strongly more important than *k*
9	*j* is absolutely more important than *k*

Once the matrix **A** is built, it is possible to derive from **A** the *normalized pairwise comparison matrix* **A***norm* by making equal to 1 the sum of the entries on each column, i.e. each entry $\bar{a}_{jk}$ of the matrix **A***norm* is computed as:

$$\bar{a}_{jk} = \frac{a_{jk}}{\sum_{l=1}^{m} a_{jk}} \quad (2)$$

Finally, the criteria weight vector w (that is an m-dimensional column vector) is built by averaging the entries on each row of Anorm, i.e.

$$w_j = \frac{\sum_{l=1}^{m} \bar{a}_{jl}}{m} \quad (3)$$

The matrix of option scores is a $n \times m$ real matrix **S**. Each entry s_{ij} of **S** represents the score of the *i*th option with respect to the *j*th criterion. In order to derive such scores, a *pairwise comparison matrix* $B^{(j)}$ is first built for each of the *m* criteria, *j=1,...,m*. The matrix $B^{(j)}$ is a $n \times n$ real matrix, where *n* is the number of options evaluated. Each entry $b_{ih}^{(j)}$ of the matrix $B^{(j)}$ represents the evaluation of the *i*th option compared to the *h*th option with respect to the *j*th criterion. If $b_{ih}^{(j)} > 1$, then the *i*th option is better than the *h*th option, while if If $b_{ih}^{(j)} < 1$, then the *i*th option is worse than the *h*th option. If two options are evaluated as equivalent with respect to the *j*th criterion, then the entry $b_{ih}^{(j)}$ is 1. The entries $b_{ih}^{(j)}$ and $b_{hi}^{(j)}$ satisfy the following constraint:

$$b_{ih}^{(j)} * b_{hi}^{(j)} = 1 \quad (4)$$

and $b_{ii}^{(j)} = 1$ for all *i*. An evaluation scale similar to the one introduced in Table 1 may be used to translate the decision maker's pairwise evaluations into numbers.

Second, the AHP applies to each matrix $B^{(j)}$ the same two-step procedure described for the pairwise comparison matrix **A**, i.e. it divides each entry by the sum of the entries in the same column, and then it averages the entries on each row, thus obtaining the score vectors $s^{(j)}$, *j=1,...,m*. The vector $s^{(j)}$ contains the scores of the evaluated options with respect to the *j*th criterion. Finally, the score matrix **S** is obtained as

$$S = [s^{(1)} \dots s^{(m)}] \quad (5)$$

i.e. the *j*th column of **S** corresponds to $s^{(j)}$.

Remark. In the considered DSS structure, the pairwise option evaluations are performed by comparing the values of the performance indicators corresponding to the decision criteria. Hence, this step of the AHP can be considered as a transformation of the indicator matrix **I** into the score matrix **S**.

Once the weight vector ***w*** and the score matrix **S** have been computed, the AHP obtains a vector **v** of global scores by multiplying **S** and **w**, i.e.

$$v = S * w \quad (6)$$

The *i*th entry *vi* of **v** represents the global score assigned by the AHP to the *i*th option. As the final step, the option ranking is accomplished by ordering the global scores in decreasing order.

When many pairwise comparisons are performed, some inconsistencies may typically arise. One example is the following. Assume that 3 criteria are considered, and the decision maker evaluates that the first criterion is *slightly* more important than the second criterion, while the second criterion is *slightly* more important than the third criterion. An evident inconsistency arises if the decision maker evaluates by mistake that the third criterion is equally or more important than the first criterion. On the other hand, a slight inconsistency arises if the decision maker evaluates that the first criterion is also slightly more important than the third criterion. A consistent evaluation would be, for instance, that the first criterion is more important than the third criterion.

The AHP incorporates an effective technique for checking the consistency of the evaluations made by the decision maker when building each of the pairwise comparison matrices involved in the process, namely the matrix **A** and the matrices $B^{(j)}$. The technique relies on the computation of a suitable *consistency index*, and will be described only for the matrix **A**. It is straightforward to adapt it to the case of the matrices $B^{(j)}$ by replacing **A** with $B^{(j)}$, $\boldsymbol{w}$ with $s^{(j)}$, and m with n. The *Consistency Index* (*CI*) is obtained by first computing the scalar x as the average of the elements of the vector whose jth element is the ratio of the jth element of the vector $\mathbf{A}\cdot\boldsymbol{w}$ to the corresponding element of the vector $\boldsymbol{w}$. Then,

$$CI = \frac{x-m}{m-1} \tag{7}$$

A perfectly consistent decision maker should always obtain CI=0, but small values of inconsistency may be tolerated. In particular, if

$$\frac{CI}{RI} < 0.1 \tag{8}$$

the inconsistencies are tolerable, and a reliable result may be expected from the AHP. In (8) *RI* is the *Random Index*, i.e. the consistency index when the entries of **A** are completely random. The values of *RI* for small problems ($m \leq 10$) are shown in Table 2.

Table 2: Values of the *Random Index* (*RI*) for small problems

m	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***
RI	*0*	*0.58*	*0.90*	*1.12*	*1.26*	*1.32*	*1.41*	*1.45*	*1.51*

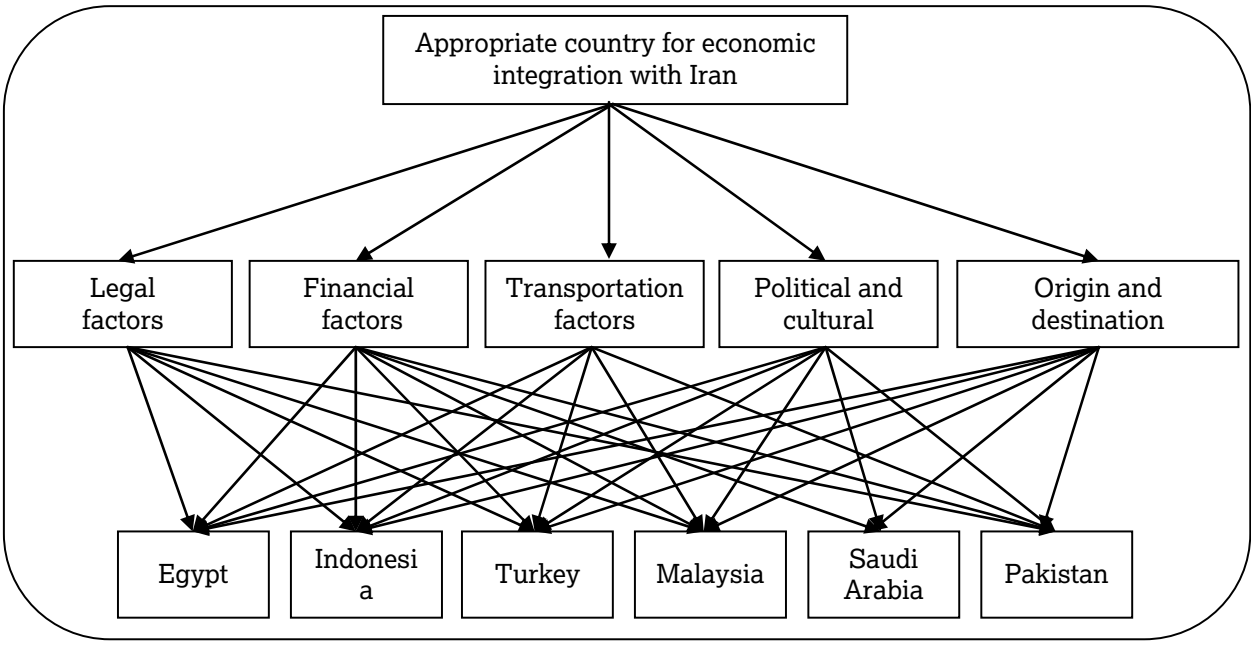
4. Data Collection

After developing the hierarchy framework of AHP, the next necessary step is to conduct the data collection. We sent questionnaires for 30 experts who are frequently involved in trade especially with OIC countries. Each one of them has more than five years of experience in this field. The nine point scale as recommended by Saaty (1995) was used to assign pair-wise comparisons of all elements in each level of the hierarchy and alternatives. The collected data that have the inconsistency ration of more than 0.1 were removed. The chosen cases are described as follows.

5. Results and Discussion

In this section of the paper, an AHP application is used in selecting the appropriate OIC member for making economic integration with Iran. In order to organize the AHP structure, Firstly, Firstly, criteria and alternative goal countries are discussed and defined by the experts. The outcome of this group discussion was formed with focusing on goal as “Appropriate country for economic integration with Iran” with the criteria; as “Legal factors”, “Financial factors”, “Transportation factors”, “Political and cultural factors” and “Origin and destination economy factors”. Due to the importance of GDP and per capita income, in economic integration establishment, this study considers 7 countries of OIC members including: Iran, Egypt, Indonesia, Turkey, Malaysia, Saudi Arabia and Pakistan. Therefore, Iranian bilateral trade partners cove 6 countries. The proposed Analytic Hierarchic Process model was drawn as seen in Figure-1.

Figure 1: AHP Flowchart of selecting for economic integration with Iran



Pairwise comparisons are performed with the guidance of Saaty's "1-9 Scale AHP preference" as given in Table-1. These comparisons are made with respect to the given criterion of the control hierarchy and importance weights of each factor are calculated. In pairwise comparison, decision makers who have the expertise knowledge on related subject compare the elements in pairs. The level of importance and their definitions are given with the detailed explanations from 1 to 9 in Table-1 with the reciprocals for inverse comparisons. The calculated values of pairwise comparisons are allocated in the columns of pairwise comparison matrix and priority vector is derived from eigenvector. As it is seen in Table-3, a group of experts' knowledge is tabulated as pairwise comparison matrix related with "Legal factors" indicating the inconsistency ratio (0.015) in the last row of the table.

Table 3: Pairwise Comparison Matrix of Legal Factors

	Saudi Arabia	**Indonesia**	**Pakistan**	**Turkey**	**Malaysia**	**Egypt**	**Relative Priorities**
Saudi Arabia	1	1/2	1/3	1/3	1/5	1/8	0.039
Indonesia	2	1	3	3	3	4	0.063
Pakistan	3	1/3	1	1/3	1/4	1/5	0.115
Turkey	3	1/3	3	1	1/2	1/4	0.245
Malaysia	5	1/3	4	2	1	1/4	0.316
Egypt	8	1/4	5	4	4	1	0.222
Inconsistency Ratio = 0.015							

Although tables for other criteria are not printed in this paper due to space constraint, their "Relative Priorities" are given in related criteria columns of Table-4 with their inconsistency ratios in the last row. As it can be concluded from Table-4, every criterion has the different priorities on the alternative countries.

Table 4: Priorities of Goal Appropriate Country for Economic Integration with Iran According to Criteria

	Legal factors	Financial factors	Transportation factors	Political and cultural factors	Origin and destination economy factors
Saudi Arabia	0.039	0.041	0.156	0.081	0.117
Indonesia	0.063	0.069	0.066	0.142	0.120
Pakistan	0.115	0.111	0.256	0.101	0.126
Turkey	0.245	0.241	0.223	0.181	0.197
Malaysia	0.316	0.299	0.101	0.284	0.283
Egypt	0.222	0.239	0.198	0.211	0.157
I.R.	0.015	0.011	0.017	0.10	0.013

As a final step, with the conclusions of the answers gathered from the expertise knowledge on related subject, the cells of a comparison matrix of criteria for appropriate country for economic integration with Iran (Table-5) are filled. While forming Table-5, priorities of Table-4 are used together with the "Relative Priorities of Criteria" which were calculated from the pairwise comparison of criteria using generalized answer of the expertise knowledge on related subject. According the results given in Table-5, relative priorities for alternative countries are found as; (0,071), (0,107), (0,115), (0,209), (0,283) and (0,216), for Saudi Arabia, Indonesia, Pakistan, Turkey, Malaysia and Egypt, respectively. It is quite easy to determine best alternative (appropriate country for economic integration with Iran) from these results. It can be clearly seen that Malaysia has the best priority score and can be said that it is the most suitable country for bilateral economic integration with Iran.

Table 5: Comparison of Criteria for Goal Appropriate Country for Economic Integration with Iran

	Legal factors	Financial factors	Transportation factors	Political and cultural factors	Origin and destination economy factors	Relative Priorities
Relative Priorities of Criteria	0.106	0.297	0.048	0.483	0.066	
Saudi Arabia	0.039	0.041	0.156	0.081	0.117	0.071
Indonesia	0.063	0.069	0.066	0.142	0.120	0.107
Pakistan	0.115	0.111	0.256	0.101	0.126	0.115
Turkey	0.245	0.241	0.223	0.181	0.197	0.209
Malaysia	0.316	0.299	0.101	0.284	0.283	0.283
Egypt	0.222	0.239	0.198	0.211	0.157	0.216

6. Summary and Conclusion

Recent development of propose to establish an Islamic common market among the Organization of the Islamic Conference countries has seen as a positive movement towards regional economic integration so called 'faith-based integration'. In this paper, we have determined the most appropriate country for economic integration among the six OIC alternatives (Saudi Arabia, Indonesia, Pakistan, Turkey, Malaysia and Egypt) using AHP methodology. In the application section of the study, the AHP model of the problem is structured with the predefined and evaluated criterions; as "Legal factors", "Financial factors", "Transportation factors", "Political and cultural factors" and "Origin and destination economy factors". The pairwise comparison matrix formed based on the knowledge of an expert group and the relative priorities of criteria derived from the experts are used to find the weights of appropriate country options. We discovered that, choosing Malaysia as the appropriate country for economic integration with Iran is the best alternative with relative priority 0.283. On the other hand, this model should be evaluated carefully due to flexible values of its criteria and criteria composition which can be changeable in the near future with the changeability of economic and politic conjunctures.

References

[1] Caporale, G. M. Rault, C. Sova, R. and Sova, A. (2001), Trade specification and economic convergence: Evidence from tow eastern European countries, Working paper, April 2001.

[2] Chung, T. W. (2016), A Study on Logistics Cluster Competitiveness among Asia Main Countries using the Porter's Diamond Model, The Asian Journal of Shipping and Logistics, 32(4): 257–264.

[3] Fahimifard, S. M. (2013), Studying Iranian economic integration with OIC members using Gravity model, Journal of Money and Economy, 8(1):169-181.

[4] Hove, J. V. Soete, S. (201), Dissecting the Trade Effects of Europe's Economic Integration Agreements, Journal of Economic Integration, 32(1):193-243.

[5] Normaz W. I. and Rusmawati S. (2009), Export Creation between Malaysia and OIC countries. Islamic Economics System Conference (iECONS 2009), 394-404.

[6] Ogawa, H. Tsubuku, M. (2017), Impact of Capital Market Integration on Skilled-Unskilled Labor Choice, Journal of Economic Integration, 32(1):90-111.

[7] Orcalli, G. (2017), Market Building through Regional Integration Agreements: The EU and the ASEAN Way, Journal of Economic Integration, 32(1):160-192.

[8] Raimi, L., Mobolaji, H. I. (2008), Imperative of economic integration among Muslim countries: Lessons from European globalisation, Humanomics, 24 (2), 130 – 144.

[9] Saaty, T.L., (1980), "The Analytic Hierarchy Process." McGraw-Hill, New York.

[10] Tayyebi, S. K. and Moallemy, M. (2003), Possibility of Trade Integration among Selected Islamic Countries, Iranian Economic Review, 8(9): 91-105.

[11] Viner, J. (1950), The Custom Union Issue. New York.

[12] Warin, T. Wunnava, P. V. Tengia, O. and Wandschneider, K. (2009), Southern African Economic Integration: Evidence from an Augmented Gravity Model, IZA Discussion Paper No. 4316, July 2009.