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An Application of the Portfolio Investment Choices with Multi-Purpose Decision Making Methods in Emerging Countries

Gelişmekte Olan Ülkelerde Çok Amaçlı Karar Verme Yöntemiyle Portföy Yatırım Tercihi Üzerine Bir Uygulama

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Abstract

In this study, it is aimed to guide in foreign investors' decisions on portfolio investment decisions by using multi-purpose decision making techniques. To this end, G7 countries were identified as investors. As countries to be invested, selected countries in the Balkans were included in the analysis. Criteria used during the analysis are economic and locally defined as two main factors and their sub-factors. AHP method was used as multi-purpose decision making techniques to determine the weight of the criteria and MOORA was used to determine the Balkan country to be invested. As a result, findings show that for making investment decision to a country, country's GNP amounts, commercial climate and investment freedom about the country are the most effective factors but geographic distance and information cost factors are the least effective factors.

Keywords: MOORA, AHP, portfolio investment decision, asset allocation

Paper Type: Research

Öz

Bu çalışmada, yabancı yatırımcıların portföy yatırım kararlarında çok amaçlı karar verme tekniklerini kullanarak yatırımcılara yol gösterilmesi amaçlanıştır. Bunu gerçekleştirmek için G7 ülkeleri yatırımcılar olarak belirlenmiştir. Çalışmada yatırım yapılacak ülke olarak Balkan ülkeleri seçilmiştir. Analizde kullanılan kriterler, ekonomik ve yerel olmak üzere iki ana faktör ve bunların alt faktörleri şeklinde belirlenmiştir. AHP yöntemi, çok amaçlı karar verme tekniklerinde kriterlerin ağırlıklarının belirlenmesinde, MOORA yatırım yapılacak Balkan ülkesinin belirlenmesinde kullanılmıştır. Analiz sonuçlarına göre bir ülkeye yatırım kararı verirken en etkin faktörler o ülkenin gayrisafi milli hasılası, ticari iklimi ve yatırım serbestliği olarak belirlenirken coğrafi mesafe ve iletişim maliyetleri en az etkili faktörler olarak belirlenmiştir.

Anahtar Kelimeler: MOORA, AHP, portföy yatırım kararı, varlık dağıtımı

Makale Türü: Araştırma

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Introduction

At the beginnings of 1960s asset allocation was unexplored and Markowitz (1952, s.77-91) indicated asset allocation as diversification affect in portfolio investments. In 1970s, process of removing controls and limitations was started in domestic markets especially in USA and UK and then a lot of emerging countries accelerate adaptation with stability and structural adjustment programs (Başoğlu, 2000, s. 89). In 1980s "financial globalization" process started to take place. In this process, controls over national financial markets have gradually been lifted, allowing the capital to freely circulate among countries, and foreign exchange rates are left to fluctuate.

From the 1990s, international capital has shifted to developing countries and brought changes in the economies and financial markets of countries. Thus, international capital and portfolio investments have been increased rapidly in these countries. Instead of commercial bank credits which had the largest share at international capital markets in 1970s portfolio investments composed which include bonds and stocks.

Businesses or individuals have a lot of choices in decision making process. So, in this situation there are some problems about to decide which choice creates more effective outputs. To make decision more easily and to terminate uncertainty Multi-Objective Decision Making methods (MODM) are created. The main purpose of MODM is evaluation of choices under the same conditions at the same time and also being guide for users.

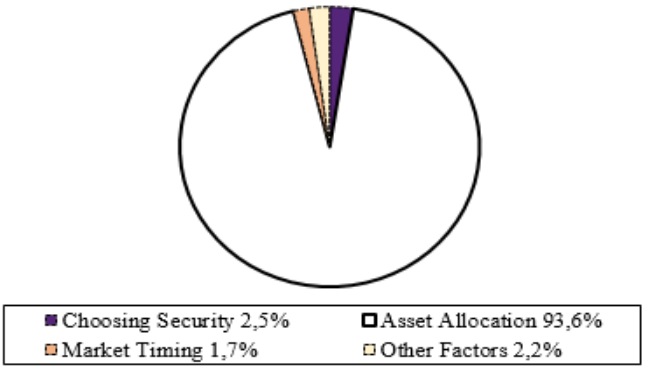
Investors have made investments in a variety of developing countries, taking advantage of globalization effect. Thus, they have lifted both the risks arising from portfolio investments and raised the expected return rates. However, the most important factor in making an international portfolio investment decision is the country in which the portfolio investment should be made. Because this factor directly influences the risks that investors will assume and the benefits they will achieve.

1. Asset Allocation in Portfolios

Portfolio is defined as an asset which has measurable, distinctive and related themselves qualifications that investors want to reach some aims (Demirtaş & Güngör, 2004, s.103). Because of financial liberalization, political-economic developments, rapid improvement in technology and easy access to knowledge occurred international financial markets investment approach was changed. Portfolio management is defined as changing portfolios or buy and sell portfolio' assets under changing economic conditions. As a result of Markowitz's diversification affect (1952, s.77-91) and Brinson et al (1986, s.39-48) study about strategic asset allocation, institutional investors implemented the asset allocation on their portfolio management.

Asset allocation is defined as a process which is distributed investment tools like stock, bond, liquids and real estates to investments according to aims (Fettahoğlu, 2016, s.144). This process which the basic of investment policy is a part of portfolio management and there is no importance about investors' type, individual or institutional.

Figure 1. Asset allocation effects on portfolio return



Source: Kılıçarslan, (2008, s.7)

Figure 1 shows the model about asset allocation's effect on traditional portfolio return. In Figure 1, it can be seen that portfolio return was affected by asset allocation which had the biggest share (%93,6) in all the other factors. Asset allocation includes in orderly %2,5 ratio financial instrument prefers, %2,2 ratio other factors and %1,7 ratio market timing.

The basic aim of the asset allocation is increasing total return of portfolio at the same risk level or decreasing total portfolio risk for reaching the target return level (Kılıçarslan, 2008, s.13). Successful asset allocation necessitates combining of the suitable asset classes and suitable real estates with good timing and favourable ratio. The biggest advantage of asset allocation is improving portfolio's return/risk exchange. So, it gives an idea to investors about which risk level creates which return level.

Portfolio investments generally include that government bonds or corporate bonds and stocks. Investors want to obtain profits and capital gains from bonds and stocks due to undertake some risks such as political risk, exchange risk, country risk and information risk. Investors make diversification through domestic and international securities for hedging from risks (Elbir, 2010, s.18).

Some indicators about making decision which country is suitable for portfolio investment are considered by international investors like as emerging countries' growing potentials and low correlation coefficients. These features provide better return/risk equilibrium for international investors in enlarge portfolio because of diversification (Korkmaz et al., 2013, s.119). Investors undertake risk less than domestic portfolios with diversification on international portfolios.

Globalization on financial markets created institutional and individual investors who want to make investments in international markets as international portfolios. According to Global Financial Stability Report prepared by IMF traditionally a lot of investors firstly distributed their wealth to stocks and bonds at the same time allocated them geographically but generally they prefer domestic investments (Kılıçarslan, 2008, s.77).

2. Aim of the Study

The aim of the study is to determine which Balkan Countries (Croatia, Slovakia, Romania, Greece, Bulgaria and Turkey) are suitable to choose about portfolio investment for foreign investors from G7 countries (US, Japan, Germany, UK, France, Italy and Canada). For this purpose, two main factors were determined which called economic and local factors to make decision about portfolio investments. Economic factors consist of Gross National Product (GNP), cost of information, amount of import and amount of export. Local factors include geographic distance, commercial climate and investment freedom (Abid & Bahloul, 2011, s.2198). Firstly, Analytic Hierarchy Process (AHP) which is one of the MODM was

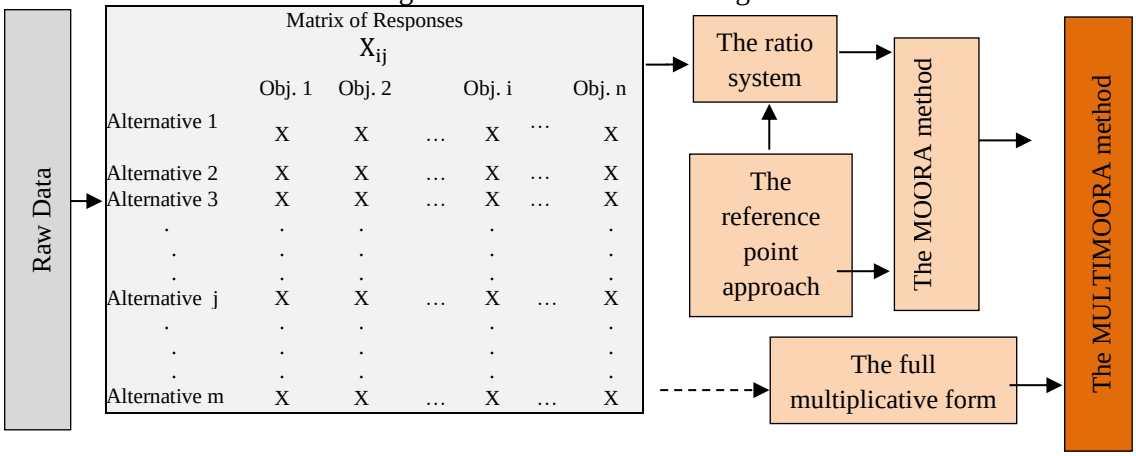
implemented to determine criteria' weights. Later, MOORA algorithm which is other MODM was used to sort Balkan countries according to criteria' weights. Thus, Balkan country which is in the first line in sorting was determined as the best country to invested portfolio in the view of G7 countries.

3. Methodology

3.1. MOORA

The MOORA (the Multi-Objective Optimization on the basis of Ratio Analysis) method was developed by Willem Karel M. Brauers & Edmundas Kazimieras Zavadskas who pioneered methods with studies in 2003. As a whole for the first time, it was introduced to the world of science with the studies 'Control and Cybernetics' in 2006 (Brauers & Zavadskas, 2006, s.446). This method is the process of optimizing concurrently two or more opposed attributes/purposes under certain constraints. It is used to improve different applications in order to assist decision making problems. The relation between the MOORA methods in the literature is shown in Figure 2.

Figure 2. MOORA method diagram



Source: Brauers, & Zavadskas (2012, s.8)

MOORA - Ratio System: This method begins with preparation of initial matrix (X). Initial matrix is as shown in Equation (1).

$$X=\begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ x_{31} & x_{32} & \cdots & x_{3n} \\ \vdots & \vdots & \ddots & \vdots \\ x_{m1} & x_{m2} & & x_{mn} \end{bmatrix}_{mxn} \quad (1)$$

Matrix normalization is applied to perform how of the each goal value corresponding to each alternative is dividing by the square root of the sum of the squares of these values. The equation which is used for matrix normalization is shown as follows:

$$x_{ij}^{*}= x_{ij} \Big/ \sqrt{\sum_{i=1}^{m} x_{ij}^{2}} \quad i = 1,2, \dots ,m \quad \text{and} \quad j =1,2,\dots ,n \quad (2)$$

Normalized goal values in the table are determined as maximum or minimum and aggregated among themselves. The collected minimum goal values are subtracted from the collected maximum goal values. The equation can be seen in the following:

$$y_{i}^{*}= \sum_{j=1}^{g} x_{ij}^{*} - \sum_{j=g+1}^{n} x_{ij}^{*} \qquad j=1, 2, 3,..., g$$

$$j=g+1, g+2, g+3,..., n \quad (3)$$

In the other step, the values of y_i^* are ranked in descending order. According to this ranking process, first-ranked alternative is considered to be the most suitable option.

MOORA - Reference Point Approach: In addition to MOORA Ratio system, the maximal purpose reference points (r_j) are determined for each purpose between alternatives according to the best value in the case of maximization (maximum point) with the lowest value in the case of minimization (minimum point). The equation is given as follow:

$$d_{ij}=\left|r_j-x_{ij}^*\right| \qquad i = 1, 2,...,m \quad \text{and} \quad j = 1, 2,...,n \tag{4}$$

This new matrix is as shown "Tchebycheff Min-Max Metric" in Equation

$$\min_i\{\max_j(\left|r_j-x_{ij}^*\right|)\} \tag{5}$$

Equation (5) is discovered the best value for each alternative and then the alternatives are arranged in ascending order. First-ranked alternative from the obtained rankings is considered to be the best option.

MOORA - Importance Coefficient Approach: If a goal has more or less emphasis than another, normalized value of the alternative is multiplied by the importance coefficient (Brauers et al., 2010, s.618) as shown in Equation (6).

$$y_i^*= \sum_{j=1}^{g} w_j x_{ij}^* - \sum_{j=g+1}^{n} w_j x_{ij}^* \tag{6}$$

The calculated y_i^* value is ranked as descending order. According to this ranking, first-ranked alternative is evaluated to be the most convenient option. Furthermore, Equation (7) can be written as Equation (4) with only difference is adding importance coefficient into the formula as shown in following equation:

$$d_{ij}=w_j\left|r_i-x_{ij}^*\right| \tag{7}$$

MOORA - Full-Multiplication Form Approach: Brauers & Zavadskas (2010,s.613-640) have developed a full multiplication version of the MOORA method. In this approach, each alternative is multiplied by the maximization purpose data and divided by the multiplication of data for minimization purposes. x_{ij} values according to the full-multiplication form approach are normalized by using the Equation (8).

$$U_i= {}^{A_i}\!/_{B_i} \tag{8}$$

$$A_i= \prod_{j=1}^{g} x_{ij} \ , \quad i=1, 2, \ldots, m. \tag{8.1}$$

$$B_i= \prod_{j=g+1}^{n} x_{ij} \ , \ i=1, 2, \ldots, m. \tag{8.2}$$

The calculated U_i values are ranked as descending order and first-ranked alternative is evaluated as the most convenient option.

Multi - MOORA Approach: Multi-MOORA approach was introduced first by Brauers & Zavadskas in early 2010 and it is successfully implemented in the solution of many problems. This method is a summary of MOORA with full-multiplication form of other approaches. It provides a solid performance ranking with time series analysis. Multi-MOORA is not a stand-alone method. It gives summaries about ranking with other MOORA methods.

3.2. AHP

The AHP (Analytic Hierarchy Process) method is a Multi-Purpose Decision Making Technique which was developed by Thomas L. Saaty in the 1970s. AHP is often used in different cases; such as complex decision problems, calculating relative importance values of alternatives and the criteria weights of the alternatives as a result of binary comparison of

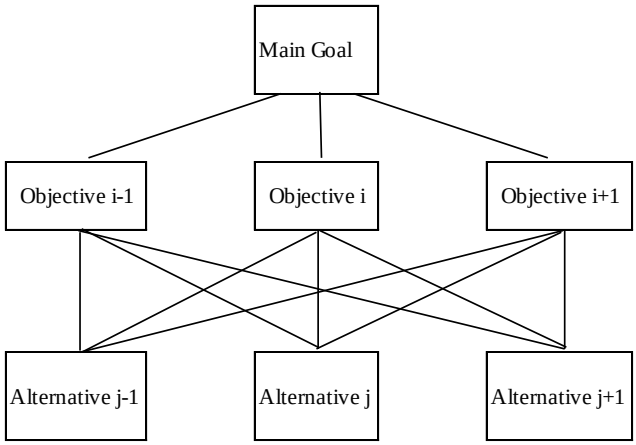
alternatives and criteria, sorting according to the relative importance values of alternatives and selecting the best alternative.

The AHP is a mathematical method that evaluates both qualitative and quantitative variables and also considers the priorities of the group or individual with the views of the experts on the decision criteria (Dağdeviren et al., 2004, s.132).

The following steps are used in the implementation of the AHP method:

Step 1: Creating the Hierarchical Structure: First, the goal of the study and criteria which suitable with the goals are determined and then the sub-criteria are identified. The main goal is located at the top of the hierarchical structure, middle level includes objectives and the lowest level consists of the alternatives (Saaty, 2008, s.85). The general structure of the Analytic Hierarchy Process is shown in Figure 3.

Figure 3. The general structure of the AHP



Source: Dalalah et al. (2010, s.568)

Step 2: Determining Binary Comparison Matrices and Superiority: The (nxn) dimensional binary comparison matrixes are formed in order to comparison alternatives and criteria among themselves and determining importance levels (Saaty, 1990, s.12). Binary comparison matrix about AHP is shown in Equation (9).

$$A=\begin{bmatrix} 1 & a_{21} & \cdots & a_{n1} \\ 1/a_{21} & 1 & \cdots & a_{n2} \\ 1/a_{31} & 1/a_{32} & \cdots & a_{n3} \\ \vdots & \vdots & \ddots & \vdots \\ 1/a_{n1} & 1/a_{n2} & \cdots & 1 \end{bmatrix}_{nxn} \quad (9)$$

1-9 importance scales which proposed by Saaty (2008, s.86) are used to prepare the matrix. It can be seen in Table 1.

Table 1. 1-9 Importance scale comparison measure

Importance Grade	Description	Explanation
1	Equal importance	Activities contribute equally to objective.
3	Moderate importance	Experience and judgment slightly favor one activity over another.
5	Strong importance	Experience and judgment strongly favor one activity over another.
7	Very strong importance	An activity is strongly favored. Its dominance demonstrated in practice.
9	Absolute importance	Evidence favoring one activity over another is the highest possible order of affirmation.
2, 4, 6, 8	Intermediate values	It is the value between two consecutive judgments to be used when specialization is needed.

Source: Saaty (2008, s.86)

Step 3: Determination of Relative Importance Vector: The binary comparison matrix is normalized. The priority values of the criteria are obtained (Kuruüzüm & Atsan, 2001, s.87). Equation (10) and Equation (11) which is used for this process are given as the following:

$$b_{ij} = {a_{ij}}/{\sum_{i=1}^{n} a_{ij}} \qquad i=1, 2, 3, .., n \qquad (10)$$

$$w_i = {(\sum_{j=1}^{n} b_{ij})}/{n} \qquad j = 1, 2, 3, ..., n \qquad (11)$$

Step 4: Calculation of Matrix Consistency: The Consistency Ratio (CR) formula introduced by Saaty is used in measuring the consistency and it is expected to be smaller than 0.10 (Supçiller & Çapraz, 2011, s.8). The equation used in the calculation of the consistency ratio is given in Equation (12).

$$CR = {CI}/{RI} \qquad (12)$$

For the calculation of the matrix consistency, previously Consistency Index (CI) must be calculated. Calculation of CI is given in Equation (13).

$$CI = {(\lambda_{max} - n)}/{(n-1)} \qquad (13)$$

The other variable used to calculate the consistency rate is the Random Index (RI) value which is dependent on the number of "n" decision alternatives. The large number of alternatives makes it difficult for the matrix to produce consistent results (Kwiesielewicz & Uden, 2004, s.713-719). Therefore, RI values can be calculated for up to 15 dimensional matrixes. Random index values are shown in Table 2.

Table 2. Random index

n	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
RI	0	0	0,58	0,90	1,12	1,24	1,32	1,41	1,45	1,49	1,51	1,48	1,56	1,57	1,59

Source: Sarıçalı & Kundakcı (2016, s. 50)

If CR> 0.10, it is accepted that the comparison matrix is inconsistent. In this situation, the comparison matrix is revisited, and the necessary arrangements are made for its consistent (Şalvarcı & Manap, 2016, s. 255).

Step 5: Finding Priority Value: A priority value is obtained for each alternative multiplying the importance weights of the criteria and alternatives. Sum of these values is equal to 1. The alternative with the highest value is chosen as the best for the decision problem (Dağdeviren & Eren, 2001, s. 44).

3.3. Data and Sampling

Portfolio investments which effected from globalization increase rapidly. Developed countries in international markets invest frequently on developing countries. New participants like investors in the global markets also prefer to invest in the developing countries. The

number of investors in the developed countries have increased and also equilibrium between risk-expected rates of return in developing countries affected by this situation. Consequently, correlation rates in the developing countries show differences according to previous years and the yields rates of investors begins to decrease at the same time. Therefore, developed countries which have strength economies started international investment for searching the new investment zones. There are two important questions that investors ask themselves when looking for new investment zones. These are;

- Which region should be invested?
- Which countries in the selected region are to be invested?

We selected Balkan region for portfolio investment in the study. Advantages of the Balkans as investment region are in the following (Çolak, 2012, s.2-3):

- Central Europe become increasingly saturated in terms of foreign investments;
- Geographical location;
- Transition to market economy does not take long time like political transition;
- Balkans were the most reforming region in terms of attracting foreign capital in the mid-2000s;
- Some legislation and the realization of reforms in the framework of alignment with the EU;
- Countries which have the lowest rate of corporate tax in Europe are located in this geography,
- The presence of incentives provided by the state such as tax exemptions, subsidies and reduction of bureaucracy (Şaban, 2015, s.42);
- There are some bilateral and multilateral free trade agreements and privatizations with Balkan region.

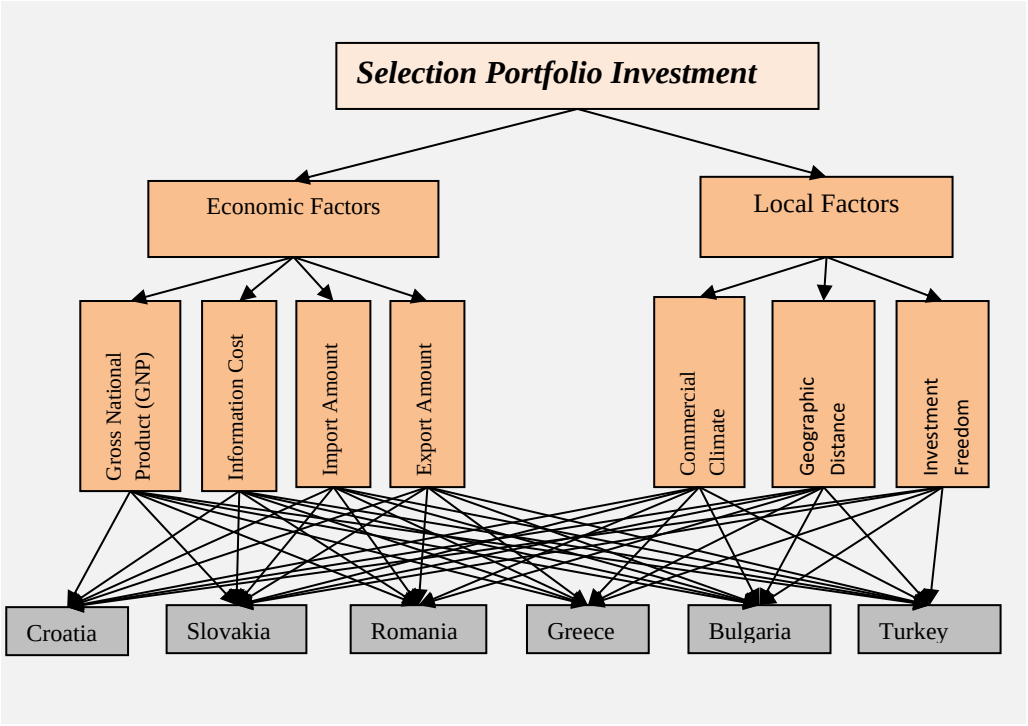
Disadvantages of the Balkans as investment region are in the following (Çolak, 2012, s.4):

- The weakness of the Balkan countries in creating a "scale economy";
- The stability in the countries which are located in Balkan region is weaker than other transitional countries;
- Market size is small,
- Potential company merger and takeovers are in low level;
- Investors' concern about political and economic instability.

The aim of the study in the framework of all this information can be defined as determination of investors from G7 Countries (USA, Japan, Germany, England, France, Italy, Canada) will invest on portfolio investment to developing Balkan countries (Croatia, Slovakia, Romania, Greece, Bulgaria, Turkey).

Figure 4 indicates AHP’s main and sub factors for the analysis. In the analysis, economic and local factors were determined as main factors and the others were determined as sub factors. Numerical data about the evaluation of the Balkan countries are real values that for each criterion from 2012 to 2017. We achieved variables from IMF, Heritace, Beri Index Score Table and World Bank. We evaluated alternative countries according to the following criteria:

Figure 4. Model of selection portfolio investment



Criterion 1: Gross National Product

Distribution of the GNP amounts of the countries by years, are added into analysis in billion US dollars.

Criterion 2: Investment Freedom

Investment freedom means open investment environment that providing high entrepreneurial opportunity and more efficiency, economic activity and job creation opportunity. Effective investment environment established with transparency is an environment encourages with innovation and competition. Individual and institutional investors are free to invest, but they should also take care of the investment climate provided to them while taking investment decisions. The rating points for the countries' investment freedom are in Table 3:

Table 3. Investment freedom

Balkan Countries	2012	2013	2014	2015	2016	2017
Croatia	70	75	80	80	75	75
Slovakia	75	75	80	80	75	75
Romania	80	80	80	80	75	75
Greece	60	65	60	60	60	60
Bulgaria	55	55	55	65	65	70
Turkey	70	65	70	75	75	75

Source: Heritage. (http://www.heritage.org/index/explore.aspx?nomobile&view=by-region-country-year. Accessed 1 May 2018)

Criterion 3: Geographic Distance

Geographic distance data calculated as kilometer (km) between Balkan and G7 countries' capitals are given in the Table 4:

Table 4. Geographical distance between Balkan and G7 countries' capitals (Km)

Balkan Countries	G7 Countries						
	The USA	Japan	Germany	England	France	Italy	Canada
Croatia	6.885,1	9.401,8	777,9	1.319,9	1.067,1	511,6	6.687,9
Slovakia	6.837,7	9.113,9	543,9	1.280	1.099,1	818,8	6.612,3
Romania	7.653,8	8.900,7	1.307,4	2.093,9	1.885,8	1.157,1	7.423,2
Greece	7.887,8	9.526,1	1.776,1	2.356,4	2.066,8	1.022	7.716,1
Bulgaria	7.581,5	9.208,9	1.329,2	2.012,9	1.764,3	900,3	7.377,2
Turkey	8.360,6	8.781,7	2.009,5	2.796,4	2.572,8	1.702,7	8.130,3

Source: GeoDataSource, 2018

Criterion 4: Commercial Climate

Commercial climate factors like countries' business investment environments, infrastructures, bureaucracies, etc. were digitized by utilizing Beri Index Table and these values are in the Table 5:

Table 5. Commercial climate points

Balkan Countries	2012	2013	2014	2015	2016	2017
Croatia	5,86	5,86	6,33	6,33	6,33	6,33
Slovakia	6,94	6,94	7,20	7,20	7,2	7,2
Romania	5,80	5,80	6,47	6,47	6,47	6,47
Greece	5,86	5,86	5,69	5,69	5,69	5,69
Bulgaria	6,05	6,05	6,48	6,48	6,48	6,48
Turkey	6,05	6,05	6,55	6,55	6,55	6,55

Source: The Scribd. (https://tr.scribd.com/document/268550703/BER-2014. Accessed 1 May 2018)

Criterion 5: Information Cost

Information cost which was calculated in US dollars as international phone call minute fee can be seen in Table 6:

Table 6. Balkan countries' information cost

Balkan Countries	Croatia	Slovakia	Romania	Greece	Bulgaria	Turkey
Phone Charge	8 cent	3 cent	2 cent	2 cent	6 cent	4 cent

Source: The Google (https://www.google.com/voice/b/0/rates?hl=en&p=hangout. Accessed 1 May 2018)

Criterion 6: Import Amount

The mean of import amount which is made from G7 countries to Balkan region for the period of 2012-2017are added into analysis in million US dollars.

Criterion 7: Export Amount

The mean of export amount which is made from G7 countries to Balkan region for the period of 2012-2017 are added into analysis in million US dollars.

4. Results

AHP matrix values were determined before starting to analysis. While determining the matrix values which were used in this study, 1 -9 importance scale comparison measure in the

Table 1 were utilized and they were determined decision-makers who are researcher this study. Thus, binary comparison matrix was created. The binary comparison matrix was normalized and then criteria' importance weights with the normalized values were created as in Table 7:

Table 7. Criteria' importance weights

Criteria	Importance Weights (%)
GNP	0,28
Cost of information	0,03
Import amount	0,06
Export amount	0,07
Geographic distance	0,03
Commercial climate	0,43
Investment freedom	0,11

CR was found 0,07 and because of this value was less than 0,1, binary comparisons of criteria were accepted as consistent. If Table 7 analyzed, it can be seen that commercial climate founded as 0,43 was the most important criteria in the all criteria for decision making process about portfolio investment in a country. Importance of the other criteria ordered as GNP, investment freedom, export and import amounts. For MOORA algorithm, If criteria' importance weights are under or above 0,06, these criteria indicated as min or max, respectively.

For analyzing investor decision better, we used all MOORA techniques in the literature. Initial matrix for MOORA algorithm which included G7 countries, Balkan Countries, criteria and their min max values are in the tables. In the study, we made analyses in G7 countries for the USA were showed detailed as an example.

After determining initial matrix, normalization process was implemented for each country. Normalization process for the USA is in Table 8:

Table 8. Normalized matrix values (The USA example)

The USA	K1	K2	K3	K4	K5	K6	K7
	Max	Max	Min	Max	Min	Min	Max
Croatia	0,06	0,44	0,37	0,40	0,69	0,06	0,03
Slovakia	0,11	0,44	0,37	0,46	0,26	0,27	0,03
Romania	0,22	0,45	0,41	0,40	0,17	0,24	0,08
Greece	0,22	0,35	0,43	0,37	0,17	0,14	0,07
Bulgaria	0,06	0,35	0,41	0,41	0,52	0,07	0,03
Turkey	0,94	0,41	0,45	0,41	0,35	0,92	0,99

After normalization, maximum values were subtracted from minimum values and results were sorted as descending order. Ranking results which were achieved from ratio system can be seen in Appendix Table 14. The USA example is showed in Table 9:

Table 9. Ratio system's ranking results (The USA example)

The USA	K1	K2	K3	K4	K5	K6	K7	Score	Rank
	max	max	min	max	min	min	max		
Croatia	0,06	0,44	0,37	0,40	0,69	0,06	0,03	-0,20	6
Slovakia	0,11	0,44	0,37	0,46	0,26	0,27	0,03	0,14	4
Romania	0,22	0,45	0,41	0,40	0,17	0,24	0,08	0,33	2
Greece	0,22	0,35	0,43	0,37	0,17	0,14	0,07	0,28	3
Bulgaria	0,06	0,35	0,41	0,41	0,52	0,07	0,03	-0,15	5
Turkey	0,94	0,41	0,45	0,41	0,35	0,92	0,99	1,04	1

According to Table 9, Turkey is the most favorable investment country for the USA. Turkey is in the first rank for all G7 countries. If Appendix Table 14 examined, Romania for the USA, Germany, England and Canada; Greece for Japan; Slovakia for Italy; Romania and Greece for France are in the second rank after Turkey as investment countries.

Reference Point Approach is the second technique about MOORA. In this technique, for each criteria reference points are determined. Reference values can be seen in Table 10 in the following:

Table 10. Reference values

The USA	K1	K2	K3	K4	K5	K6	K7
	max	max	min	max	min	min	max
Croatia	0,06	0,44	0,37	0,40	0,69	0,06	0,03
Slovakia	0,11	0,44	0,37	0,46	0,26	0,27	0,03
Romania	0,22	0,45	0,41	0,40	0,17	0,24	0,08
Greece	0,22	0,35	0,43	0,37	0,17	0,14	0,07
Bulgaria	0,06	0,35	0,41	0,41	0,52	0,07	0,03
Turkey	0,94	0,41	0,45	0,41	0,35	0,92	0,99
	0,94	0,45	0,37	0,46	0,17	0,06	0,99

After determining reference values, normalized values' deviation from reference values are calculated. Then each alternatives' maximize values are calculated and these values are ranked as ascending order. Reference point approach's results for the USA can be seen in Table 11. All G7 countries' reference point approach rank results are in Appendix Table 14.

Table 11. Reference point approach's ranking results (The USA example)

The USA	K1	K2	K3	K4	K5	K6	K7	Max.	Rank
	max	max	min	max	min	min	max		
Croatia	0,88	0,01	0,00	0,06	0,52	0,00	0,96	0,96	4 or 5 or 6
Slovakia	0,83	0,01	0,00	0,00	0,09	0,21	0,96	0,96	4 or 5 or 6
Romania	0,72	0,00	0,04	0,06	0,00	0,18	0,92	0,92	2 or 3
Greece	0,72	0,10	0,06	0,09	0,00	0,08	0,92	0,96	2 or 3
Bulgaria	0,88	0,10	0,04	0,05	0,35	0,01	0,96	0,96	4 or 5 or 6
Turkey	0,00	0,04	0,08	0,05	0,17	0,86	0,00	0,86	1

If examined Table 11, it can be seen that Turkey is the most favorable investment country according to the USA. According to reference point approach's results which can be seen in Appendix Table 14, Turkey is in the first rank for the USA, Japan, Germany and Italy. Romania is in the first rank for Canada and England. Greece and Romania are in the first rank for France. So, in this approach investor countries prefer different investment countries. To make solution to this problem, importance weights(w_i) are created for criteria.

To calculate importance weights' values, criteria weights which determined by AHP method were used. Importance coefficient approach's ranking results can be seen in Table 12 and analysis results about G7 countries can be examined in Appendix Table 14.

Table 12. Importance coefficient approach's ranking results (The USA example)

The USA	K1	K2	K3	K4	K5	K6	K7	Max.	Rank
	max	max	min	max	min	min	max		
Weights	0,28	0,11	0,03	0,43	0,03	0,06	0,07		
Croatia	0,24	0,00	0,00	0,03	0,02	0,00	0,06	0,24	5 or 6
Slovakia	0,23	0,00	0,00	0,00	0,00	0,01	0,06	0,23	4
Romania	0,20	0,00	0,00	0,02	0,00	0,01	0,06	0,20	2 or 3
Greece	0,20	0,01	0,00	0,04	0,00	0,00	0,06	0,20	2 or 3
Bulgaria	0,24	0,01	0,00	0,02	0,01	0,00	0,06	0,24	5 or 6
Turkey	0,00	0,00	0,00	0,02	0,01	0,05	0,00	0,05	1

If Table 12 examined, ranking results for the USA is the same as reference point approach's results show that Slovakia is in the fourth rank. Importance weights approach's ranking results show that Turkey is in the first rank and Croatia and Bulgaria are the last rank for G7 countries to make investment. Results can be seen in Appendix Table 14.

Full-Multiplication Form Approach is the fourth technique about MOORA. According to Full-Multiplication Form Approach's results, Turkey is in the first rank for the USA, Japan, Germany, England, Italy and Canada. But Greece is in the first preference for France as an investment country.

The last technique is Multi-MOORA which includes all other MOORA techniques as ratio system, reference point approach, importance coefficient approach and full-multiplication form approach. Multi-MOORA makes new ranking according to alternative ranking results' dominance. Turkey is in the first rank for the USA. At the same time Turkey is in the first rank for Japan, Germany, England, France, Italy and Canada as investment country. Ranking results for the USA can be seen in Table 13:

Table 13. Multi-MOORA method's ranking results (The USA example)

The USA	The Ratio System	Reference Point Approach	Importance Coefficient Approach	Full Multiplication Form Approach	Multi-MOORA Method
Croatia	6	4 or 5 or 6	5 or 6	5	5 or 6
Slovakia	4	4 or 5 or 6	4	4	4
Romania	2	2 or 3	2 or 3	3	2 or 3
Greece	3	2 or 3	2 or 3	2	2 or 3
Bulgaria	5	4 or 5 or 6	5 or 6	6	5 or 6
Turkey	1	1	1	1	1

Conclusion

Nowadays, because of global asset allocation preferred by a lot of institutional investors, developed countries search new investment zones. If foreign capital increases in to a country, risk and expected return will change, exchange-rates will be volatile and investors' earning will decrease in the country.

In this study, the USA, Japan, Germany, England, France, Italy and Canada which identified as developed countries chosen as investor countries to make decisions about asset allocation and finding new investment zones. Balkan region was determined as investment zone. Literature review about the study was analyzed and determined criteria. These criteria considered in the process of choosing countries in Balkan region. At the end total we chose six countries; Croatia, Slovakia, Romania, Greece, Bulgaria and Turkey; from Balkan region.

Because of more than one alternative and country existence, to make transaction simplicity and to evaluate all alternative at the same time into analyses MODM technique was decided. AHP and MOORA techniques which preferred mostly in literature were chosen as MODM technique in the study.

In the study, AHP was used for determining criteria's weights and MOORA was used for making investment decision. According to ratio system Turkey is in the first rank for all G7 countries but Croatia and Bulgaria are in the last rank. Reference point approach showed that Turkey is in the first rank for the USA, Japan, Germany and Italy; Romania is in the first rank for England and Canada. Romania and Greece are in the first rank for France. Croatia and Bulgaria are in the last rank for the USA, Japan, Germany, France and Italy. Turkey and Croatia are in the last ranks for England; Croatia and Slovakia are in the last ranks for Canada in this method. Croatia is in the last ranks for all G7 countries as shown in Appendix Table 14. According to full multiplication form approach Greece is in the first rank for France; Turkey is in the first rank for all other G7 countries. We used Multi-MOORA for obtaining general results and to make relations between methods. Multi-MOORA makes new ranking according to alternative ranking results' dominance. According to Multi-MOORA, Turkey is in the first rank as an investment country. After Turkey, classification is Greece, Romania, Slovakia, Croatia and Bulgaria. The ranking obtained as a result of analysis for all G7 countries is shown in Appendix Table 14. In Appendix Table 14, the ranking found with all MOORA methods can be seen separately.

For making investment decision to a country, country's GNP amounts, commercial climate and investment freedom about the country are the most effective factors but geographic distance and information cost factors are the least effective factors.

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Appendix

Appendix 1. Multi-MOORA method's ranking results for all G7 countries

G7 Countries	Balkan Countries	The Ratio System	Reference Point Approach	Importance Coefficient Approach	Full Multiplication Form Approach	Multi-MOORA Method
The USA	Croatia	6	4 or 5 or 6	5 or 6	5	5 or 6
	Slovakia	4	4 or 5 or 6	4	4	4
	Romania	2	2 or 3	2 or 3	3	2 or 3
	Greece	3	2 or 3	2 or 3	2	2 or 3
	Bulgaria	5	4 or 5 or 6	5 or 6	6	5 or 6
	Turkey	1	1	1	1	1
JAPAN	Croatia	6	6	5 or 6	6	6
	Slovakia	3	3	4	4	4
	Romania	4	2	2 or 3	3	3
	Greece	2	4	2 or 3	2	2
	Bulgaria	5	5	5 or 6	5	5
	Turkey	1	1	1	1	1
GERMANY	Croatia	5	5 or 6	5 or 6	5	5
	Slovakia	3	4	4	4	4
	Romania	2	2 or 3	2 or 3	3	3
	Greece	4	2 or 3	2 or 3	2	2
	Bulgaria	6	5 or 6	5 or 6	6	6
	Turkey	1	1	1	1	1
ENGLAND	Croatia	5	5 or 6	5 or 6	4	5
	Slovakia	4	3	4	5	4
	Romania	2	1	2 or 3	3	3
	Greece	3	2	2 or 3	2	2
	Bulgaria	6	4	5 or 6	6	6
	Turkey	1	5 or 6	1	1	1
FRANCE	Croatia	5	5 or 6	5 or 6	5	5
	Slovakia	4	4	4	4	4
	Romania	2 or 3	1 or 2	2 or 3	3	3
	Greece	2 or 3	1 or 2	2 or 3	1	2
	Bulgaria	6	5 or 6	5 or 6	6	6
	Turkey	1	3	1	2	1
ITALY	Croatia	5	5 or 6	5 or 6	5	5
	Slovakia	2	4	4	4	4
	Romania	4	2 or 3	2 or 3	3	3
	Greece	3	2 or 3	2 or 3	2	2
	Bulgaria	6	5 or 6	5 or 6	6	6
	Turkey	1	1	1	1	1
CANADA	Croatia	6	6	5 or 6	6	6
	Slovakia	4	5	4	5	4
	Romania	2	1	2 or 3	3	2

	Greece	3	2 or 3	2 or 3	2	3
	Bulgaria	5	2 or 3	5 or 6	4	5
	Turkey	1	4	1	1	1