Quarterly Journal of Quantitative Economics, Spring 2015, 12(1): 19-37

Economic and Social Duality in Iran (Using Fuzzy Topsis Decision-making)

Jalil Khodaparast Shirazi (PhD)*

Received: 2015/7/6 Accepted: 2016/2/20

Abstract:
One of the planners and policy-makers' aims on the one hand is optimum allocation and distribution of credits and facilities among regions and on the other hand is to provide and compile a suitable model aiming at achieving economic and social equity as well as creating reasonable and real economic growth. Paying attention to the balanced regional development, decreasing regional and district duality and inequities, regional policy-making and planning for achieving objectives, which change according to structural characteristics, facilities and limitations of each region require studying and recognition of each region based on its position in the whole province. In this study, economic and social duality means differences among provinces of Iran that are determined with four indices of income per capita, export's relation to production, unemployment rate and Gini coefficient. Fuzzy method for the year 2013 has been used owing to the existing complexities in the development indices. The results show that the provinces are socially and economically different and these differences will be intensified and greater costs and time would be needed for reducing them. Moreover, a comprehensive plan won't work for these provinces with significantly different deviation coefficients and the decision-makers are advised to make a regional policy for each province.

JEL classification**:** O50, O11, C10

Keywords: *Economic and Social Duality, Development Indices, Iran's Provinces, Fuzzy Topsis Decision- Making*

* Department of Economics, Shiraz Branch, Islamic Azad University, Shiraz, Iran. (jkshirazi@iaushiraz.ac.ir)

1. Introduction

The objectives of the third millennium development are only achieved when they are meaningful, new and clear for billions of people at whom such objectives are aimed. These objectives should be converted to national realities and be tangible and clear-cut for the interested groups namely people and governments. Achieving these objectives requires the existence of powerful and efficient governments in the countries that are able to put their developmental commitments into practice and have a just performance. Today, expanding justice is among the main indices of good performance of governments and sustainable development, which used to be explained with the concept of environment's stability, has expanded to the concept of equitable and balanced development. In this view, if countries' socio-economic development results in the expansion of caste split and creation of economic poles, and if the poor remain poor and the rich benefit from economic gifts exclusively, this problem will be worrying; because it results in serious retardation of these provinces compared with other provinces regarding insufficiency of social income owing to the less access to the government-sector provided goods and service. As a result, these provinces' retardations have a permanent effect on the poverty of social income. Iran is not an exemption in this regard. Regional inequities in Iran have resulted in problems such as emigration and its relevant problems from undeveloped to wealthier provinces. In spite of considerable attempts aiming at decreasing regional imbalances at the country level as well as different conducted studies in this regard, economic dimensions of inequities and their causes are still unknown. No doubt that determination of national development level and awareness of the causes of these inadequacies or power points are mainly bonded with the classification of each region and province.

The main purpose of this study is to measure the economic and social duality in Iran. We estimate deviation coefficients of provinces using the Fuzzy Topsis Decision-making methodology. This is based on an analogue measurement system with a wide

range of values to cover a spectrum of opinions rather than a digital measurement system with only two values (0 and 1). This is an innovative aspect of this study. The data is derived from the Central Bank of Iran and Iran Statistics Centre, analyzed by three experts to express their opinions. It helps the governors either to prepare a comprehensive plan for all over the country or to make several regional policies for each province. There is no doubt that a comprehensive plan won't work for the provinces with significantly different deviation coefficients and the decision-makers are advised to make a regional policy for specific provinces. Thus, the economic and social measurement in Iran paves the way for managers in high levels of hierarchy to determine their planning style.

2. Review of the Related Literature

Equalities and inequalities in the different regions of countries have been of great importance for socio-economic planners and researchers in recent decades. This subjectivity, which has been formed from the early 1960s owing to a kind of decentralization in the administrative and developmental affairs, has laid the ground for widespread administrative measures in different provinces of Iran. Studies concerning identifying deprived provinces and studies regarding comprehensive development of different provinces have been conducted in recent years and have resulted in some wide administrative measures in certain areas. In this regard, a study regarding grading provinces was conducted, applying factor analysis method by Tala Minai titled "an Analysis of Regional Characteristics in Iran". The overall result of this study indicates that if investments are made irrespective of active sectors in each region, not only do not they solve the region's problems, but also they may overshadow several industries in the region. Regional planning office of Management and Planning Organization of Tehran conducted a study from 1982 to 1988 titled "a Preliminary Plan for Identifying deprived regions of Iran" using taxonomical method. This study, considering three main indices of education, health care and rural development that are converted into 11 sub-indices indicated that

15% of provinces in Iran do not have an acceptable situation and the other provinces are in deprivation. International organizations such as the World Bank, have graded the world's countries according to the national production per capita. According to this gradation, it has classified the world countries based on their income from low-income countries to high-income countries. Tofigh[4] in 1993 conducted a study titled "Factor Analysis or Integration of Regional Indices" using factor analysis. In this study, Iran provinces were divided into six groups, Tehran in the first group and Kohgiluyeh and Boyer-Ahmad in the sixth group. Geographical studying of these phenomena and characteristics only in regional level is impossible alone due to the variety of local phenomena and various characteristics, because financial and temporal limitations as well as human force make such a work impossible and will not bring about desired results. Thus, the first step to study local phenomena with various characteristics is classifying them in similar groups. Therefore, classification is a tool to organize different information for easier understanding of subjects. Moshrefi (1996) conducted a study titled "Measuring Development of Iran's provinces in the Three Periods of time including 1976, 1988 and 1993 using Factor Analysis. The results show that in these three periods, provincial groups were divided into five groups in 1976, seven groups in 1988 and 8 groups in 1993. In all the three cross sections (1976, 1988, and 1993), Tehran takes the first place although the second and third places were taken by various provinces. In 1976, the differences among the provinces were smaller and they were more homogeneous while in the subsequent years the differences became bigger and bigger and they got more and more heterogeneous. However, after Keynes, when government's interference in the market mechanism was accepted, regional imbalance was not considered by the economists so that gaining growth rate higher than 6 and 7 % was among the major goals of governments in developing countries to achieve economic development. This goal was encouraged and recommended by the UN, but the performance of a considerable number of such

countries indicated that achieving the aforementioned goal not only has not resulted in providing welfare and reducing poverty and caste differences in these societies, but also it has led to reverse effects in some cases. Therefore, since 1950s, balanced growth has been discussed by economists and has gained an important position in the economic development texts. Salimifar (1997) conducted a study titled "Regional Economic Heterogeneousness in Iran" using dispersion coefficient in two years of 1971 and 1991. In this study, six indices of economic and social development were used. The results showed that the inequalities in 1991 were greater than those in 1976.

The particular situation of Iran regarding its vastness, climatic variety and particular topographical position necessitates further attention to the role of different regions in the economic dimensions. Hosseini and Eskandari (2000) conducted a study titled "The Gradation of Iran's provinces from the Standpoint of Socio-economic Indices" using taxonomical method. This study using two major developmental, fundamental and social variables - each of which were divided into 22 and 31 sub-indices respectively- shows that regarding the variable of development, Tehran, Esfahan, Kerman and Markazi were placed in the first to the fifth positions and Kurdistan, Elam, Bushehr, Kohgiluyeh and Boyer-Ahmad were placed in the last rows of table in order, but from the standpoint of fundamental facilities, Tehran, Esfahan, Semnan, Yazd and Gilan occupied the first to the fifth rows and Lorestan, Hormozgan, West Azerbaijan, Ardabil, Kurdistan and Sistan and Baluchestan went in the last rows. In recent decades, economic development level of countries refers to the desirable and optimum usage of existing resources and facilities in order to achieve their economic goals. This issue indicates the particular importance of productivity in economic development of a country at micro and macro levels. Khodaparast Shirazi et al (2001) conducted a study titled "A Comparative Analysis of the Productivity of Total Production Factors in the Industry" using production function of Cobb and Douglass and Divisia Index that graded Iran provinces regarding the utilization of resources. The

results show that work force elasticity in Mazandaran was the lowest and in Kerman is the highest and elasticity in Gilan was the lowest and in Markazi was the highest. In order to reach an appropriate model of regional development for better allocation of credits and facilities as well as achieving a steady regional growth and development, it is necessary for planners to have complete knowledge of the quality and rate of being developed or undeveloped. Kiani and Khosravi (2003) conducted a study titled "The Gradation of Development in the Cities of Kurdistan during the First and Second Development Program". The method of this study was the analysis of the main factors and numerical taxonomy. The results show that during the First Program (1989-1994), inequities between cities of Kurdistan increased while it decreased during the Second Program (1994-1999). Measuring development rate is at issue more than a half century. Many years ago, in 1954, a UN report concerning social policy-making and planning presented particular recommendations against using economic indices as the only development standards. Following this report, particularly in the 1970s, an extraordinary series of different writings were presented in search of substituting standards for human welfare and development; writings that attempted to provide socio-economic indices for comparing development levels in different countries. Noorbakhsh (2003) conducted a study titled "Human Development and Regional Inequities in Iran: A Model for Policy-making" with 16 indices for 26 provinces. In this study, analyzed Human Development Index (HDI) called "RMHDI" was used. The results show that the difference between Tehran and other provinces was huge and the provinces in the first to the forth place (Qom, Esfahan, and Yazd) have a relatively high difference with the other provinces. Determining a number as gradation indicating being undeveloped or imbalanced for a region in order to make balanced developmental policies is extremely important. To determine this grade, there are many socio-economic and cultural variables. In economic issues, the inputs of the model can be reduced. Unnecessary calculations can also be reduced by using combined

indices or determining correlation rate among some of the variables. Moosavi Mohseni and Moatari (2004) conducted a study titled “the Determination of Development and Balance in Iran’s provinces Using Fuzzy Logic” using four indices. The results indicated great difference among Iran provinces; Tehran was the best with 84% and Sistan and Baluchestan had the lowest balance among provinces with 2%. The necessity of paying attention to the people’s role and different regions of a country in balanced development and developing their capacities for satisfying basic needs, make us design a particular plan for each region. This issue will be impossible without people’s participation and irrespective of the predispositions of that region. Thus, employing a participatory solution in the regional development makes development process internalized and brings about justice-seeking and environmental compatibility. The region-wide development is institutionalized with the continuance of regionally developmental measures in higher level of the society and communities collaborations. In an integrated system, the regional development is common to the bottom-up movements of local people and top-down movements of governmental-national institutions. This leads to contributory interaction. This is not for superiority, but it is in search of finding a common way for achieving steady and widespread development. Pardazi Moghadam and Safai (2006) conducted a study titled “Multivariate Analysis Methods and Their Application in Grading Iran’s provinces”. In this study, the sustainable development level of Iran provinces are introduced by integrating the definition of steady human development and regional development of suitable indices as well as an optimum method for measuring the difference. Indices were totally divided into 47 groups. Cluster analysis method is then employed to grade the difference and similarity of provinces. The results show that Tehran in all indices had the first grade except for air pollution and Sistan and Baluchestan as well as Kohkiloye and Boyerahamd obtained the last grade except for air pollution. Regional planning process is constituted from two consecutive

and distinctive phases in the national level. The first phase includes the analysis of the past socio-economic system, status, problems, existing dilemmas and future development perspective. The second phase includes diagnosis, evaluation and section of plans of economic and social development made to solve present problems and the future of region. One of the most common methods for evaluating the development level of each region is using a suitable method for the selected indices. This method includes selecting appropriate indices from different parts of society and economy of the region and comparing indices with regional or state indices as well as with objectives and standards determined for some sectors. Although, there are some regions that are superior due to benefitting from particular natural resources, economic savings and external factors or even historical reasons that should be taken into consideration in making plans, they are not effective in many indices of regional capacities and social justice should be implemented which is the same optimum distribution of public resources and facilities for promoting provinces and regions that are lower than the state mean. Furthermore, some compatible decisions should be made to remove deprivation and regional imbalance. An inclusive study titled "The Gradation of Iran's provinces Based on the Quantitative Indices of the Fourth Program conducted by Mahdavi (2006) graded provinces using selected indices method that includes 57 indices. The results indicate that the status of provinces during the fourth program will not lead to a balance among them and inequity regarding many indices will exist among provinces and in some cases, even it will also be intensified. Mehrjerdi et al. in 2011 ranked the provinces of Iran according to the health care indexes. They used two techniques: a) Taxonomy and b) TOPSIS. They suggested that, in Iran, there are 12 developed, 9 semi-developed, and 9 undeveloped provinces. The most developed province is Semnan (deviation coefficient=4.238) and the least developed one is Sistan and Baluchistan with a more than three times greater coefficient (deviation coefficient=13.290). They concluded that the

provinces of Iran show a big health care gap which should be narrowed. Zarabi et al. in 2012 used multi-criteria Fuzzy techniques for evaluating the development indexes in five cities in Ardabil province of Iran. Based on 45 cultural, economic and infrastructural indexes in 2006, they found out that these cities were in different levels of development notwithstanding their close geographic and cultural distance. Zangiabadi et al. in 2014 analyzed the development of the socio-economic, cultural and educational, health-therapeutic, and industrial proxies in the cities of a province in Iran (Kurdistan) using TOPSIS methodology. They found that the development of the Kurdistan cities was highly imbalanced. Dadashiansarai et al. in 2015 measured the agricultural sustainability in the three cities of Eastern Azarbaijan province in Iran including Tabriz, Ahar, and Maraghe. They employed TOPSIS technique to analyze the economic, social, and environmental data which was gathered on the basis of the experts' view points and the yearbook of 2012. The results show that environmental proxies have the most significant effect while social proxies have the least profound effect on agricultural sustainability. Moreover they argue that from the agricultural sustainability perspective, there is a huge gap among the cities.

3. Statistical Foundations

In this study, four indices of income per capita, the export to production ratio, unemployment rate and urban Gini coefficient of 31 provinces are used. Furthermore, to obtain Gini coefficient, urban family costs of provinces are used.

4. TOPSIS as an approach for decision making in group fuzzy

In this research, group decision making theory in a fuzzy environment is used. It is supposed that there is an n possible switch $F = \{f_1, f_2, ..., f_n\}$ from decision making k, $p_k (k = 1,2,...,K)$ which are selected based on criterion m $X = \{x_1, x_2, ..., x_m\}$, actively and functionally. Here, experts determine criterion priorities and switch values based on

language variables. Language variables are explained through trapezoidal fuzzy numbers.

Switches include 31 country provinces (n=31). Criteria are divided into 4 groups of income, urban Gini coefficient, exports to gross production ratio and unemployment rate. In this research, ranking country provinces is for group decision makings. Suppose that switch value of $F=\{f_1, f_2,..., f_n\}$ in criterion of $X=\{x_1, x_2,..., x_m\}$ is equal to $p_k(k=1,2,...,K)$ by $p_k(k=1,2,...,K)$ decision maker. Hence, a group fuzzy decision making in a matrix could be explained:

$$\tilde{Y}^k=(\tilde{f}^k{}_{ij})_{m\times n}=\begin{bmatrix}\tilde{f}^k{}_{11} & \tilde{f}^k{}_{12} & ... & \tilde{f}^k{}_{1n}\\ \tilde{f}^k{}_{21} & \tilde{f}^k{}_{22} & ... & \tilde{f}^k{}_{2n}\\ . & . & . & .\\ \tilde{f}^k{}_{n1} & \tilde{f}^k{}_{n2} & ... & \tilde{f}^k{}_{nm}\end{bmatrix}\quad k=1,2,...,K \tag{1}$$

Three experts' ideas are used in this research. (k=3) Their ideas can be witnessed in Table 2. Similarly, we assume that criterion value of $X=\{x_1, x_2,..., x_m\}$ is shown as $\tilde{w}_i^k=(\sim_i^k,\ {}_i^k, ¥_i^k, ¢_i^k)$ by $p_k(k=1,2,...,K)$ decision makers.

Criterion and switch values are calculated as:

$$\tilde{w}_i=\frac{\tilde{w}_i^1+\tilde{w}_i^2\oplus...\oplus\tilde{w}_i^K}{K}=\left(\frac{\sum_{k=1}^{K}\sim_i^k}{K},\frac{\sum_{k=1}^{K}{}_i^k}{K},\frac{\sum_{k=1}^{K}¥_i^k}{K},\frac{\sum_{k=1}^{K}¢_i^k}{K}\right) \tag{2}$$

and,

$$\tilde{f}_{ij}=\frac{\tilde{f}_{ij}^1+\tilde{f}_{ij}^2\oplus...\oplus\tilde{f}_{ij}^K}{K}=\left(\frac{\sum_{k=1}^{K}a_{ij}^k}{K},\frac{\sum_{k=1}^{K}b_{ij}^k}{K},\frac{\sum_{k=1}^{K}c_{ij}^k}{K},\frac{\sum_{k=1}^{K}d_{ij}^k}{K}\right) \tag{3}$$

Based on the foregone discussions, FMAGDM problem as the following decision making matrix:

$$\tilde{Y} = (\tilde{f}_{ij})_{m\times n} = \begin{bmatrix} \tilde{f}_{11} & \tilde{f}_{12} & \cdots & \tilde{f}_{1n} \\ \tilde{f}_{21} & \tilde{f}_{22} & \cdots & \tilde{f}_{2n} \\ . & . & . & . \\ \tilde{f}_{n1} & \tilde{f}_{n2} & \cdots & \tilde{f}_{nm} \end{bmatrix} \quad (4)$$

Since criterion may be measured by various methods, decision making matrix of $\tilde{Y}$ needs to be normalized. Linear scale changing is used for the normalization.

$$\tilde{r}_{ij} = (\frac{a_{ij}}{d_i^{\max}}, \frac{b_{ij}}{d_i^{\max}}, \frac{c_{ij}}{d_i^{\max}}, \frac{d_{ij}}{d_i^{\max}}) \ (f_i \in F^1) \quad (5)$$

and

$$\tilde{r}_{ij} = \begin{cases} \left(\frac{a_i^{\min}}{d_{ij}}, \frac{a_i^{\min}}{c_{ij}}, \frac{a_i^{\min}}{b_{ij}}, \frac{a_i^{\min}}{a_{ij}} \right) & (a_i^{\min} \neq 0) \\ \left(1 - \frac{d_{ij}}{d_i^{\max}}, 1 - \frac{c_{ij}}{d_i^{\max}}, 1 - \frac{b_{ij}}{d_i^{\max}}, 1 - \frac{a_{ij}}{d_i^{\max}} \right) & (a_i^{\min} = 0) \\ & (f_i \in F^2) \end{cases} \quad (6)$$

That, $d_i^{\max} = \max_{1\le j\le n} \{d_{ij} \mid \tilde{f}_{ij} = (a_{ij}, b_{ij}, c_{ij}, d_{ij})\}$ and

$$a_i^{\min} = \min_{1\le j\le n} \{a_{ij} \mid \tilde{f}_{ij} = (a_{ij}, b_{ij}, c_{ij}, d_{ij})\}$$

In brief, $\tilde{r}_{ij}$ is shown as $\tilde{r}_{ij} = (\alpha_{ij}, \beta_{ij}, \gamma_{ij}, \delta_{ij})$. Fuzzy decision making matrix of $\tilde{Y} = (\tilde{f}_{ij})_{m\times n}$ is normalized to

$$\tilde{R} = (\tilde{r}_{ij})_{m\times n} = \begin{bmatrix} \tilde{r}_{11} & \tilde{r}_{12} & \cdots & \tilde{r}_{1n} \\ \tilde{r}_{21} & \tilde{r}_{22} & \cdots & \tilde{r}_{2n} \\ . & . & . & . \\ \tilde{r}_{n1} & \tilde{r}_{n2} & \cdots & \tilde{r}_{nm} \end{bmatrix} \quad (7)$$

Considering the importance of each criterion, the normalized could be transformed into weighted normal fuzzy decision making of $\tilde{V}$:

$$\tilde{v}_{ij} = \tilde{w}_i \otimes \tilde{r}_{ij} = (\sim_i \ll_{ij}, \ \ _i \mathbin{!} _{ij}, ¥_i \circ_{ij}, ¢_i {}^{a}_{ij}) \tag{8}$$

$$\tilde{V} = (\tilde{v}_{ij})_{m\times n} = \begin{bmatrix} \tilde{v}_{11} & \tilde{v}_{12} & \dots & \tilde{v}_{1n} \\ \tilde{v}_{21} & \tilde{v}_{22} & \dots & \tilde{v}_{2n} \\ . & . & . & . \\ \tilde{v}_{n1} & \tilde{v}_{n2} & \dots & \tilde{v}_{nm} \end{bmatrix} \tag{9}$$

Where $\tilde{v}_{ij}$ will be represented as trapezoidal fuzzy number of $\tilde{v}_{ij} = (\pm_{ij}, ¶_{ij}, {}^{3}_{ij}, {}^{2}_{ij})$.

f^+ as fuzzy positive ideal answer and f^- as fuzzy negative ideal answer are defined as $\tilde{a}^+ = (\tilde{a}_1^+, \tilde{a}_2^+, ..., \tilde{a}_m^+)$ and $\tilde{a}^- = (\tilde{a}_1^-, \tilde{a}_2^-, ..., \tilde{a}_m^-)$, respectively, in which $\tilde{a}_i^+ = (1,1,...,1) = 1$ and $\tilde{a}_i^- = (0,0,...,0) = 0$.

f_i distance from f^+ and f^- are retrieved from:

$$D(f_i, f^+) = \sum_{i=1}^{m} d_2(\tilde{v}_{ij}, \tilde{a}_i^+) = \sum_{i=1}^{m} \sqrt{\frac{(1-\pm_{ij})^2 + 2(1-¶)^2 + 2(1-{}^{3})^2 + (1-{}^{2}_{ij})^2}{6}} \tag{10}$$

and

$$D(f_i, f^-) = \sum_{i=1}^{m} d_2(\tilde{v}_{ij}, \tilde{a}_i^-) = \sum_{i=1}^{m} \sqrt{\frac{(\pm_{ij})^2 + 2(¶)^2 + 2({}^{3})^2 + ({}^{2}_{ij})^2}{6}} \tag{11}$$

Hence, the deviation coefficient for each f_i could be calculated through:

$$C^*(f_i) = \frac{D^*(f_i, f^-)}{D^*(f_i, f^+) + D^*(f_i, f^-)} \tag{12}$$

In this study, the decision makers (experts) determine the importance of each criterion and value of each option on the basis

of the language variables which are shown in table 1. The language variables are described by the positive trapezoidal fuzzy numbers closely resembling the words in the table whose membership functions are clear. The options include 31 provinces (n=31). The criterion is classified into four social-economic groups including income per capita, civil GINI coefficient, export to gross production ratio of province, and unemployment rate. Regarding the above-mentioned criteria and the group decision-making theory, we rank the provinces.

5. Data

All the data comes from the Central Bank of Iran and Iran Statistics Centre which is analyzed by three experts. Income per capita, the export to production ratio, unemployment rate and urban Gini coefficient, and urban households' costs are five proxies which play important roles in the economic and social advancement of a society. These proxies have been obtained from the above-mentioned databases for 31 provinces in Iran in 2013 regarding which three experts rank the provinces economically and socially. The measurement of this ranking system is performed with deviation coefficient. According to the economic and social proxies, each expert grades each province with which a deviation coefficient is evolved from. This coefficient shows the economic and social gap among the provinces. The more different the deviation coefficients are, the more diverse the provinces are economically and socially.

6. Results

We employed Fuzzy TOPSIS Decision-making method to estimate the deviation coefficients of Iran provinces, paving the way to analyze the economic and social duality in Iran.

In this study, we employed three experts' views which are represented in table 1.

Table 1: Experts view based on data and indexes

	Expert 1	Expert 2	Expert 3	Views conclusion
Per Income	VH	VH	EH	0.73, 0.83, 0.87, 0.93
Provinces Urban Gini Coefficient	G	M	M	0.43, 0.53, 0.57, 0.67
Exports to Gross Production Ratio	L	L	M	0.27, 0.37, 0.43, 0.53
Unemployment Rate	G	G	G	0.5, 0.6, 0.7, 0.8

Based on the experts' views in table 1 and equation 4, the deviation coefficients are resulted and presented in table 2.

Table 2: Country's provinces ranking

Rank	Provinces	Deviation coefficient $C^*(f_i)$	Rank	Provinces	Deviation coefficient $C^*(f_i)$
1	Markazi	0.50	17	Alborz	0.29
2	Qazvin	0.44	18	Ardabil	0.29
3	Kohgiluyeva Boyer Ahmad	0.43	19	Ilam	0.29
4	Khuzestan	0.42	20	KhorasanRazavi	0.28
5	Tehran	0.38	21	Gilan	0.28
6	Zanjan	0.38	22	ChaharMahalvaBakhtiyari	0.26
7	Kerman	0.37	23	Semnan	0.25
8	Bushehr	0.36	24	Kurdistan	0.24
9	Hormozgan	0.36	25	Golestan	0.22
10	Isfahan	0.35	26	Lorestan	0.22
11	Yazd	0.34	27	Kermanshah	0.17
12	Mazandaran	0.32	28	Hamedan	0.17
13	East Azarbaijan	0.32	29	North khorasan	0.16
14	West Azarbaijan	0.31	30	South khorasan	0.15
15	Fars	0.31	31	Sistan and Baluchistan	0.15
16	Qom	0.29			

Table 2 shows the deviation coefficients of 31 provinces of Iran. The minimum coefficient goes to South Khorasan, and Sistan and Baluchistan (0.15) which is consistent with Mehrjerdi et al., 2011; Hosseini and Eskandari, 2000; PardaziMoghhadam and Safai, 2006 and the maximum one goes to Markazi (0.5), presenting a great economic and social gap (more than three times which is consistent with Mehrjerdi et al., 2011) among provinces in Iran which is consistent with the previous studies (Mehrjerdi et al., 2011; Hosseini and Eskandari, 2000; Tofigh, 1993; Moshrefi, 1995; PardaziMoghhadam and Safai, 2006). Although Kohgiluyeva Boyer Ahmad ranges among the least developed countries in the previous studies (Tofigh, 1993; Hosseini and Eskandari, 2000; Mehrjerdi et al., 2011; PardaziMoghhadam and Safai, 2006), it is, unexpectedly, in the third place close to Tehran which is in the fifth place. Based on the resulted deviation coefficients, the 31 provinces can be categorized into four groups. The first second, third, and fourth groups range between 0.4-0.5, 0.3-0.4, 0.2-0.3, and 0.1-0.2, respectively. The least crowded group is the first one with only four provinces, followed by the fourth group with five provinces. A vast majority of the provinces (22) fit in the second and third groups; 11 provinces in each group. Thus, the predominant middle groups (the second and third) place more than two-third of the provinces while the extreme groups (the first and fourth) contain one-third of the provinces, four provinces for the first group and five for the fourth. It implicitly implies a great social and economic gap among the provinces.

7. **Conclusion**

In this study, Iran provinces are compared and graded based on some economic and social development indices in 2013 using fuzzy system Topsis Decision-making method. The results show that great differences exist among Iran provinces. According to the results, Iran provinces can be divided into four groups. The first group involves Markazi, Ghazvin, Kohgiluyeh and Boyer-Ahmad and Khozestan that Kohgiluyeh and Boyer-Ahmad and Khozestan are placed in this group according to their oil export.

The second group includes Tehran, Zanjan, Kerman, Bushehr, Hormogan, Esfahan, Yazd, Mazandaran, East Azerbaijan, West Azerbaijan and Fars. The third group includes Qom, Alborz, Ardebil, Elam, Razavi Khorasan, Gilan, Choharmahal and Bakhtiari, Semnan, Kurdistan, Golestan and Lorestan. The fourth group is Kermanshah, Hamadan and Sistan and Baluchistan. It can be mentioned that homogeneity has become greater, but the difference between the first and fourth group is great. This difference is considerable in being developed and some of provinces are placed in the end of the table permanently. As it was expected and previous studies show, social income, resulted from low production of goods and services and provided by the government, has increased provinces' retardation. These differences among provinces have a considerable cost for people and the government, because with one program and plan, the set goals in the five-year development programs (as programs' performance shows) and goals of perspective cannot be achieved. As a result, these differences will be intensified and greater costs and time would be needed for reducing such differences. Moreover, a comprehensive plan won't work for these provinces with significantly different deviation coefficients and the decision-makers are advised to make a regional policy for each province.

Reference:

Dadashiansarai, M., G. Dashti, B. Haiati & M. Ghahremanzade. (2015). Compound Application of Hierarchical Analysis and TOPSIS Technique in Weighted Evaluating of Criteria and Measurement of Agricultural Sustainability, Agricultural Science and Sustainable Production, No. 1, pp. 145-157.

Deng-Feng, L. (2007). Compromise Ratio Method for Fuzzy Multi-Attribute Group Decision Making, Applied Soft Computing, No. 7, pp. 807-817.

Durkheim, E. (1990). Social Labourdevision, BabolKatabseraye Publications.

Hatami Nejad, H. & O. Rasti. (2009). Social Justice and Regional Justice.Political-Economic. No. 269-270, pp. 83-84.

Hosseini, Y. & A. Eskandari. (2000). Ranking Country's Provinces According to Social Economical, Programming and Budget Magazine, vol. 49-50. pp. 101-121.

Khodaparast Shirazi, J. (2001). A Comparative Analysis of the Total Factor Productivity Industrial Sector, Programming and Management Organization Fars Province..

Khodaparast Shirazi, J., A. Rahmansetesh, M.R. Ghasami & H. Forougzar. (2012). Development Measure of Iran's Province from the View Point of Having Socio-economic Indexes, African Journal of Business management, Vol. 6(5), pp. 1787-1794, AJBM.

Khodaparast Shirazi, J., M,R. Moosavi & A. Rahmansetesh. (2011). Ranking of Provinces in Iran According to Socio-Economic Indices (A Case Study of Fars Province 2001- 2006, European Journal of Economic, Finance and Administrative Sciences,Vol. 40, pp. 6-15.UK.

Khodaparast Shirazi, J., M. Ebrahimi & M. Moattari. (2011). Sustainable Development and Socio-Economic Duality Using Fuzzy System- A Case study of Iran, Modern Economy, Vol. 2, pp. 427-437. USA.

Khodaparast Shirazi. J. (2011). Sustainable Development, LAP Lambert Academic Publishing GmbH & Co. KG, USA.

Kiani, M. & K. Anvar. (2003). Determining the Development Degree of Kordestan's Cities, Programming Management and Organization Kordestan.

Kowkabi, L., A.R. Rahman Setayesh, A. Badri & Rajaee.A. (2013). The Application of Fuzzy Multi-Attribute Group Decision Making to Prioritize

the Landscapes with high Ecological Value: Khoshk River in Shiraz, Int. J. Environ. Res., No. 7(2), pp 423-434, Spring.

Mahdavi, G. (2006). Ranking Country's Provinces According to Quantity Purpose Indices of Fourth Program Development, Programming and Management Organization of Mazandaran Province, Mazandaran.

Mehrjerdi, M.H.T., H.B. Meibodi & A.M. Sharifabadi. (2011). Ranking The Provinces in Islamic Republic of Iran According to the Indexes of Health and Cure Sector, Health Information Management, NO. 3, Pp. 356-369.

Moosavi Mohseni, R. & M. Mazda. (2004). Deterring Development Amount in Countries Provinces by Using Fuzzy Logics, Puyesh Magazine Programming and Managing Organization of Fars Province Shiraz, No, 29. Pp. 18-28.

Moshrefi, M. (1995). an Attempt to Measure the Country Provinces Development During 1972- 1976- 1988, Managing and Programming Organization of West Azarbayjan.

Noorbakhsh, F. (1998). A Modified Human Development Index, World Development, Vol. 26 (3). pp. 336-343.

Noorbakhsh, F. (2003). Human Development and Disparities in Iran, Political Economy Quarterly, V1, No.2.Pp.76-108.

Oliveira, B. & M. Victorine. (2005). Democracy and Economic Development: a Fuzzy Classification Approach, FEP Working Papers, Portugal .Pp, 18-24.

Pardazi Moghadam, S. & B. Safai. (2006). the Methods of Multinariables Analysis and Their Application In Grading the Country's Provinces, Commercial surveys, No.18

Partovi, A. (2009). Identity Crisis and Development Policies in Iran. Journal of Imam Sadegh University, Vol, 3, pp.13-16.

Regional Planning Office. (1982-1988). Introductory Plan of the Country Undeveloped Regions Identification, Tehran Management and Planning Organization, Tehran.

Salimifar, M. (1997). Regional Economical an Inhomogeneous in Iran, Political- Economic Ettela'at, Tehran, No, 121-122. pp.172-181.

Sarvar, R. (2006). Applied Geography and Land Use Planning, Samt, Press, Tehran.

TalaMinai, A. (1974). Analysis of Regional Characteristics in Iran, Tehran University, Tehran.

Tofigh, F. (1993). Factor Analysis and the Combination of Regional Indices, Abadi Magazine, Vol. 3, No. 10. pp.11-15.

Wang, Lie-Xin. (1996). A Course in Fizzy Systems and Control, Prentice Hall,lnc.upper Saddle River,NJ,USA.

www. Cbi.ir

www. International living .com

Zangiabadi, A., M. Ahmadian, & M. Karami. (2014). Spatial Analysis of the Regional Development Indicators Using by Multi Criteria Decision Making Techniques, Case Study: The Province Of Kurdistan, Civil Ecological Researches, No. 1, pp. 83-96.

Zarabi, et al. (2012). Application of Multi-Criteria Fuzzy Decision-Making Techniques in Evaluating and Analysis of Development Indexes, Case Study: Ardabil Province, Applied Researches in Geographic Sciences, No. 25, pp. 97-125.

Zimmermann, H. (1991). Fuzzy Set Theory & Its Applications, Second Edition, Kluwer Academic Publishers, Dordrecht.