

An Investigation on Changes in the Situation of Iran in the Developing 8 Countries

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Abstract: This paper investigates on the situation of Iran and its changes among the Developing 8 (D-8) countries. To this end, the condition of indices such as Gross Domestic Product (GDP), economic growth, per capita income, income distribution and trade balance with their changes are investigated in Iran and compared with those of other members of this group. In addition, using the Numerical Taxonomy method, position of the country is specified among the D-8 group members. The data of the research is mainly prepared from international institutes like World Bank. The results of the research reveal that the economic growth of the country has decreased, the income distribution unchanged and finally the trade balance, the share of capital formation and exports in GDP have increased during 1990-2006 period. As a result of these changes, position of Iran falls from the third in 1990 to the fourth in 2006.

JEL Classification: E010 • O470 • P450

Key words: Macroeconomic Indices • D-8 Countries • Numerical Taxonomy • Economic Situation of Iran • Ranking of Countries

INTRODUCTION

The D-8 group which is considered as one of the lateral institutes of the Islamic Organization Conference includes eight Muslim and developing countries Bangladesh, Egypt, Indonesia, Iran, Malaysia, Nigeria, Pakistan and Turkey. The main aim of its novel establisher, Njmaddin Arbakan, the Islam-oriented first minister of Turkey in 1997, was economic and social development of the member through cooperation in terms of industry, trade, trade obstacle eliminating and benefit from the capability of members to improve their contribution in global decision.

D-8 is like other regional economic contracts among Islamic countries, such as Economic Cooperation Organization (ECO) and Persian Gulf Cooperation Council. The main difference among the associate countries returns to their outspread almost from the far east Islamic countries, i.e., Indonesia and Malaysia to the far west of them, i.e., Nigeria in Africa. In contrast to other economic contracts such as ECO and Persian Gulf Cooperation Council that due to being located in a geographic region have more differences with each other, there is a relative economic similarity among the D-8 countries. However, these countries can be categorised into three subgroups:

the oil exporter countries including Indonesia, Iran and Nigeria; the middle income group countries including Egypt, Malaysia, Pakistan and Turkey; and finally the less developed member, Bangladesh.

As it is stressed in the second manifest of this organization in Dakar, D-8 not only has no contradiction with globalization trend of economy, but also moves towards its implementation. Thus, it is expected that D-8 will do well preparing countries to join the World Trade Organization (WTO). The success of countries in such organisations relies on the similarity of condition within members, thus enabling them to have economic and social cooperation. Otherwise, it turns the country into a market for other members as well as stopping its own production activities [1].

Investigating on the economic indices in the D-8 countries, this paper will specify the rank of these countries with respect to these indices in 1990 and 2006. In addition, studying the changes in the indices of the members, the economic success of these countries is specified. One trait of this research compared with the previous ones that have been done in Iran, returns to a higher level of similarity of economic condition of other countries, with that of Iran. Using the Numerical Taxonomy method is another feature of this research compared with the previous ones.

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The paper contains six sections. Section 2 is allocated to reviewing the literature of related studies. In section 3, we introduce the economic indices and data resources. Introduction of the model of the research is what we will deal with in the fourth section. The results of implementation of the model is analysed in section 5. Finally, the conclusion section ends the paper.

The Literature Review: The comparison of economic condition of countries that generally is done through economic indices has different aims. Irrespective to the indices that are investigated, they are different in view of the models that are employed. In a general classification, these studies are categorised into two groups:

A part of the studies compared the countries with each other. To this end, the condition of the countries was compared in different aspects to each other in related years. Jafari Samimi [2] compared different countries with respect to 14 economic and social indices in 1980 and 1988. The countries have been ranked based on their average rank in different indices. The GDP growth, GDP, inflation rate indices were employed separately to specify the rank of Iran among some Middle East countries such as Egypt, Turkey, United Arab Emirates and Saudi Arabia in Pazoki [3]. The annual report of the Organisation for Economic Cooperation and Development (OECD) in 30 developed countries of this organisation as well as Brazil, China, Indonesia, Russia and South Africa compared the situation of these countries with respect to several essential indices including national accounts, industrial products, normalized unemployment rate, international trade and current balance [4, 5]. The condition of Iran in the world was investigated by Jonoubi [6] with respect to 10 economic liberalisation indices of countries including job liberalisation, trade liberalisation and investment liberalisation from 1995 to 2008.

Another branch of studies in this field concern the trend of changes of countries in different periods. In Mousalo and Tehrani [7], the condition of Iran was compared with 16 countries located in the area from Indonesia and South Korea to Egypt and from Saudi Arabia to Kazakhstan from 1990 to 2005 with respect to some indices such as annual growth of GDP, investment growth, labour productivity growth, unemployment rate, inflation, exports and imports of goods and services. The condition of Iran and 24 other countries in South West Asia and Egypt were investigated in Tabatabaei Yazdi and Aboutalebi [8] with respect to the change of 40 economic and social indices during the years from 2004 to 2007.

Change in the 5 health indices in comparison with the economic and social development of Iran and other countries located in the east of Mediterranean Sea during the last two decades was studied by Movahedi *et al.* [9].

Introduction to Indices and Data Resources: With respect to data availability for all of these countries, 9 indices were considered in this research as follows:

- | | |
|---|-----------------------------|
| a. Gross Domestic Product (GDP) | f. Exports |
| b. Economic growth, the growth of GDP | g. Trade balance |
| c. Per capita Income, per capita GDP | h. Capital formation in GDP |
| d. Pre capita income growth | i. Exports in GDP |
| e. Income distribution, through
Gini Coefficient | |

All of the required data are collected from the international resources. For the matter of similarity, it has been attempted to get them from similar resources. To this end, these data are collected from the World Bank¹. However, the deficits have been compensated by The statistical Economic and Social Research and Training Center for Islamic Countries [10].

Methodology: To study the condition of all countries, each country's condition has been specified with respect to all indices separately. Condition of Iran has been studied for the years 1990 and 2006. The changes of these indices in Iran and other D-8 members are studied as well. And finally, to have a general index to specify the condition of the countries in different years and the changes in the condition of these countries, the Numerical Taxonomy Method is employed. Thus, with respect to the indices, the countries are ranked in 1990 and 2006.

The Numerical Taxonomy that first was proposed by Adanson in 1763, was developed by Polish mathematician in the early 1950s. Hellwing offered this method to United Nations Educational, Scientific and Cultural Organisation (UNESCO) [11]. Capabilities of this method lead to its being employed in economics, social, agricultural and medical sciences to name a few.

Today the Numerical Taxonomy is employed for activities, economic sectors, towns, regions, countries ranking with respect to several different or sometimes contrasting economic and social factor indices. There are many evidences in implementation of this method in Iran like all the world. The ranking process of countries by this method is carried on through several stages, generally explained with a bit of variation in different resources:

¹World Development Indicators, World Bank, URL: <http://www.worldbank.org/>

The first stage is related to data matrix formation, matrix X , in which x_{ij} shows the elements of the matrix. In this study, i stands on the rows of the matrix, pertaining to the countries. The columns of this matrix relates to the indices. Thus, for ranking the D-8 countries with respect to 9 indices, the data matrix has 8 rows and 9 columns.

The second stage is related to standardisation of the primary data that are measured with different units. To eliminate the effect of such disparity, matrix Z , the standard matrix of X is calculated as follows:

$$\bar{x} = \frac{\sum_{i=1}^8 x_{ij}}{8} \quad (1)$$

$$s_j = \sqrt{\frac{\sum_{i=1}^8 (x_{ij} - \bar{x})^2}{8}} \quad (2)$$

$$z_{ij} = \frac{x_{ij} - \bar{x}}{s_j} \quad (3)$$

\bar{x} stands on the average of different indices, s_j the standard error, z_{ij} the elements of Z .

To test the homogeneity of the countries, the distance matrix of indices for countries from each other is calculated in the third stage. This matrix that is yielded through equation (4), is a symmetric matrix. Since the diagonal of this matrix concern to the distance of the indices of countries from itself, it is equal to zero.

$$d_{ab} = \sqrt{\sum_{j=1}^9 (z_{aj} - z_{bj})^2} \quad (4)$$

Thus, d_{ab} shows the standardised indices of country a from country b .

With respect to the results of the third stage, the limits of homogeneity of the countries are calculated. To this end, the shortest distance vector is made from the smallest elements of distance matrix rows:

$$D = \min[d_{ij}] = \begin{bmatrix} d_1 \\ d_2 \\ \vdots \\ d_8 \end{bmatrix} \quad , j = 1, 2, \dots, 9 \quad , j \neq i \quad (5)$$

$$\bar{d} = \frac{\sum_{i=1}^8 d_i}{8} \quad (6)$$

$$S_d = \sqrt{\frac{\sum_{i=1}^8 (d_i - \bar{d})^2}{8}} \quad (7)$$

$$L_1 = \bar{d} - 2s_d, \quad L_2 = \bar{d} + 2s_d \quad (8)$$

D denotes the vector that contains the shortest distance, \bar{d} and S_d the average and standard error of d_i elements of vector D , respectively and finally L_1 and L_2 the up and down limits of homogeneity domain of the countries, respectively. Countries that have shorter distance with the other ones are in this domain. Those countries which are homogenous, can be compared with each other, with respect to the concerned indices.

The fifth stage pertains ranking among the homogenous countries. To this end, a standard matrix is calculated for the homogenous countries. To rank the countries with respect to related indices, the maximum value of columns is selected as the ideal value (relationship (9)). Using the relationship (10), the distance of the countries is calculated from the ideal value of the columns.

$$z_{mj} = \text{Max}(z_{ij}, \quad i = 1, 2, \dots, n) \quad (9)$$

$$d_{im} = \sqrt{\sum_{j=1}^9 (z_{ij} - z_{mj})^2} \quad (10)$$

z_{mj} refers to the maximum value of index j and d_{im} the distance of the i^{th} country from the ideal value for indices.

A smaller value for d_{im} indicates that the country has less distance from the ideal value of indices and as a result, is located in a better rank. Thus the countries are ranked based on these distances.

RESULTS

As it is shown in table (1), Iran had the second GDP among D-8 members in the year 1990. Turkey had the highest GDP and Indonesia with a little difference with our country was located in the third place in view of GDP. And finally, the lowest level of GDP was Nigeria in this year.

Table 1: The condition of countries with respect to different Indices in 1990 and 1991

Countries	GDP ⁽¹⁾	Economic growth		Per Capita Income\$	Per capita income growth 1991 ⁽²⁾	Gini Coefficient	Exports ⁽¹⁾	Trade Balance ⁽¹⁾	$\frac{I}{GDP}$	$\frac{X}{GDP}$
		1991 ⁽²⁾	Income\$						$\frac{I}{GDP}$	$\frac{X}{GDP}$
Bangladesh	30128.8	5.9	260.7	1	33.6	1844.5	-2233.1	6	6.1	
Egypt	43130.4	5.7	1189.8	-0.9	34.4	8646.6	-5462.8	20	20.0	
Indonesia	109150	9.0	612.4	7	37.0	35828.9	5432.2	23	25	
Iran	116035	13.7	1292.2	10.8	44.5	16852.8	-9992.1	15	14.5	
Malaysia	44024.2	9.0	2511.1	6.6	49.2	32816.4	933.1	75	74.5	
Nigeria	28472.5	8.2	370.3	1.7	50.6	12365.9	4163.1	43	43.4	
Pakistan	40010.4	4.5	465.4	2.4	41.0	6216.9	-3134	16	15.5	
Turkey	150597.8	9.3	2502.8	-1.0	43.6	20127.5	-6344.4	3	13.4	

(1): US millions \$

(2): Percent $\frac{I}{GDP}$: Capital formation in GDP ratio

$\frac{X}{GDP}$: Exports to GDP ratio

Resources: World Development Indicators(WDI) and the results based on it

The second column of table (1) displays the economic growth of D-8 members in 1991 compared with 1990. Based on this data, with 13.7% annual economic growth in constant price, Iran had the highest economic growth among all of the D-8 countries. Turkey occupy the second rank, Indonesia and Malaysia occupy the third rank jointly whereas Pakistan with 4.5% economic growth had the lowest grade in view of this index.

The per capita income is the next index. As it is shown in table (1), Malaysia and Turkey had the first and the second highest per capita income respectively. Iran had the third place in view of this index and finally, Bangladesh has had the last place.

The growth of per capita income in constant price in 1991 compared with 1990 is another index of this study. With 10.8% annually growth, Iran had the highest grade with respect to this criterion. Indonesia and Malaysia were located in the second and the third place, whereas Egypt and Turkey with negative growth rate in this index occupied the seventh and the eighth place respectively.

The Gini coefficient index has been used for income distribution of the countries. Based on this criterion, Bangladesh and Egypt with 33.6% and 34.4% in 1990, had the most equal income distribution among the D-8 countries, respectively. The Gini coefficient of Iran was 44.5% in this year that was located at the sixth grade in view of this criterion. Nigeria with 50.6% Gini coefficient had the lowest grade in this case.

The two next indices concern to foreign trade. In view of exports, after Indonesia, Malaysia and Turkey, Iran stands at the fourth place; whereas Bangladesh with less exports is located at the eighth rank. However, from the view point of trade balance, Iran with the most trade deficit is located at the eighth grade. In contrast, Indonesia, Nigeria and Malaysia with the highest positive balance, occupy the first, to the third grade, respectively.

The two next indices are about final goods consumption of the country. In 1990, the capital formation and exports to GDP ratios of Malaysia were 75% and 74.5%, respectively that had the first rank in view of both of these indices. This result indicates the high amount of foreign investment inflow to this country as well as taking part in the international trade. Nigeria with allocating 43% and 43.4% of GDP to investment and exports respectively, are located at the second grade in view of these criteria. In view of these indices, Iran holds the sixth place, where Turkey and Bangladesh were at the seventh and eighth place, respectively.

Table (2) shows these indices for the year 2006. In view of GDP, Iran is located after Turkey and Indonesia, in the third place. Compared with the year 1990, Indonesia outran Iran in view of GDP and was located at the second place. Compared with 1990, there was an exchange of ranking among Nigeria and Bangladesh, which were located in the seventh and eighth place, respectively.

In view of economic growth that measures the growth of GDP in constant price 2006 compared with 2005, with 4.6% growth, Iran is located at the eighth place among the other members. With respect to Iran's holding the first place in 1991, the chief part of these changes are due to stopping a significant portion of production activity during the war years, which led to a high economic growth in the early years of reconstruction stage. Pakistan, Egypt and Bangladesh had first to the third place, respectively.

In view of per capita income in 2006, after Malaysia and Turkey, Iran located at the third place in this year. But the growth of per capita income in 2006 compared with its previous year was about 3.06%, which led the country to be located at the seventh place. Whereas due to high economic growth of Iran in 1991, the country was

Table 2: The situation of countries with respect of different Indices in 2006

Countries	GDP ⁽¹⁾	Economic growth 1991 ⁽²⁾	Per Capita Income\$	Per capita income growth 1991 ⁽²⁾	Gini Coefficient	Exports ⁽¹⁾	Trade Balance ⁽¹⁾	$\frac{I}{GDP}$ ⁽²⁾	$\frac{X}{GDP}$ ⁽²⁾
Bangladesh	61897.4	6.6	419.4	4.78	33.2	11744.2	-3881.6	25	19
Egypt	107484	6.8	1724.1	4.95	34.4	32191.3	-1740.1	19	29.9
Indonesia	219271	5.5	983.1	4.31	39.4	102651	21423.9	26	31
Iran	217897.7	4.6	1977.5	3.06	44.5	90623.8	17342.7	27	41.6
Malaysia	150672.4	5.9	4535.4	4.03	41.1	176256.8	25584.5	21	117
Nigeria	115337.8	5.2	440.2	2.75	43.7	64970.6	24892.2	22	56.3
Pakistan	126835.5	6.9	634.5	4.75	30.6	19395.8	-10173.9	20	15.3
Turkey	402709.9	6.1	3588.5	4.78	41	113624.8	-30842	21	28.2

(1): US millions \$

(2): Percent

$$\frac{I}{GDP}$$

: Capital formation in GDP ratio

$\frac{X}{GDP}$: Exports to GDP ratio

Resources: World Development Indicators(WDI) and the results based on it

Table 3: The distances of countries from the ideal value of indices and their ranks

Row	Countries	1990		2006	
		Distance from the Ideal value	Rank	Distance from the Ideal value	Rank
1	Bangladesh	7.74	8	7.82	8
2	Egypt	7.23	6	7.16	5
3	Indonesia	3.96	1	5.11	1
4	Iran	5.98	3	7.02	4
5	Malaysia	5.13	2	5.58	2
6	Nigeria	6.83	5	7.45	6
7	Pakistan	7.52	7	7.54	7
8	Turkey	6.30	4	6.57	3

Resource: the results of the paper

located at the first place in view of this criterion. Egypt, Turkey and Bangladesh held the first to the third rank in view of this criterion in 1991.

In view point of income distribution, Iran had the most unequal distribution among the D-8 countries in 2006. However, Iran took the sixth place in view of this index in 1990. Pakistan and Bangladesh with the most equal distribution of income in 2006, took the first and the second rank in 2006, respectively.

In view of exports, like the year 1990, Iran was located in the fourth place in 2006. Malaysia, Turkey and Indonesia were located in the first to the third place, respectively. In view of trade balance, Iran's exports overran its imports in 2006, so the trade balance of the country grew positive, whereas it was negative in 1990. As a result, after Malaysia, Nigeria and Indonesia, Iran was located in the fourth place in view of this criterion.

And finally, In view of capital formation and exports to GDP ratios, there is a considerable change in the position of Iran. The increase in the share of capital formation in GDP from 15% in 1990 to 27% in 2006 in Iran, the position of the country rose from sixth to the first. Indonesia and Bangladesh took the second and third

place, respectively. In view of exports to GDP ratio, Malaysia and Nigeria which were located at the first and the second place in 1990, with an increase in the value of this ratio, saved their place in view of this criterion. With an increase in the size of this ratio for Iran from 14.5% in 1990 to 41.6 in 2006, the position of Iran in view of this criterion had risen to three.

Table 3 displays the distance of the countries from ideal value of the indices in different years. Based on calculation, the total distances of the indices of Iran from the ideal values of these indices in 1990 was 5.98 that was located at the third place among all of the members. Whereas Indonesia and Malaysia were at the first and the second place, respectively. In contrast, Pakistan and Bangladesh held the seventh and the eighth place, respectively.

In 2006, the distance of the value of indices from their ideal value for Iran increased to 7.02 units that caused the position of the country decline from the third to the fourth place. Indonesia, Malaysia and Turkey took the first to the third place, respectively. In contrast, Pakistan and Nigeria were located at the seventh and eighth position, respectively.

CONCLUSIONS

The indices of the research have been chosen with respect to their characteristic and data availability. In a general classification, the indices of the paper can be categorised into four groups in terms of production (GDP, economic growth, per capita income and its growth), distribution (income distribution), trade (exports and trade balance) and final consumption (the capital formation and exports to GDP ratios). In the year 1990, Iran was located at the second place in terms of GDP, the third place in terms of per capita income and was located at the first place in view of the growth of these indices. In 2006, in terms of GDP the country took the third place, in terms of per capita income remained the third, but in terms of the growth in GDP and per capita income, it declined to the eighth and the seventh position, respectively.

In terms of income distribution, condition of the country in comparison to the other members was very deficient, as declining from the sixth place in 1990, to the eighth place in 2006. Principally, these positions are due to a relatively even income distribution in the D-8 countries. Thus, although the value of income distribution in Iran in 2006 is the same as it was in 1990, due to a higher level of equality in income distribution of other members, position of the country declined from the sixth in 1990 to the eighth in 2006.

In view of trade indices, position of Iran in 1990 did not change in 2006. However, the exports of the country exceeding its imports, led the position of Iran in terms of this criterion improved from the eighth place to the fourth one.

In view of final consumption, Iran was located at the sixth place with respect to the value of related indices. However, with respect to improvement in the share of fixed capital formation in the GDP of the country in 2006 in comparison with the year 1990, the situation of the country in view of this index improved to the first place. The share of exports in the GDP of Iran has improved from the sixth place in 1990 to the third in 2006 as well.

Totally, due to decline in the economic growth and the income distribution, the condition of Iran becomes worse in terms of production and distribution indices. In contrast, through progresses in terms of trade balance and increase in the share of capital formation and exports in the final consumption, the situation of the country in view of trade (except exports) and final consumption indices has improved. Thus, as a result of two reciprocal changes in the indices, position of Iran among D-8 countries declined from the third place in 1990 to the fourth in 2006.

REFERENCES

1. Rak Khah, F., 2005. An introduction to D-8 group of Economic and Commercial Islamic countries. Islamic Advertisement Organisation, (Persian). URL:<http://www.ido.ir/a.aspx?a=1384053001>
2. Jafari Samimi, A., 1996. Trends of main macroeconomic indicators: a new method and ranking countries around the world. Quarterly of Economic Res., 2: 24-40, (Persian).
3. Pazoki, M., 2008. A comparison of macro indices of Iran and Middle East. Religion and Economic Studies Institution, (Persian). URL:http://ires.ir/index.php?option=com_content&task=view&id=45&Itemid=52
4. Main Economic Indicators, 2009. Organisation for Economic Co-operation and Development (OECD), 9: I-244. URL: <http://www.ingentaconnect.com>
5. Main Economic Indicators, 2010. Organisation for Economic Co-operation and Development (OECD), 2: I-270. URL: <http://www.ingentaconnect.com>
6. Jonoubi, P., 2008. Efficiency of Iran's macroeconomics in view of indices, from 1995 to Aftab, 16/6/2008 (Persian). URL:www.aftab.ir/.../2008/.../c2c1220699631_economy_marketing_business_budget_economy_iran.php
7. Mousalo, U. and M. Tehrani, 2008. An investigation of macroeconomic indices in some selected countries. Barnameh Publication, No. 302, (Persian). URL: <http://www.spac.ir/barnameh/302/Barnameh%20302.pdf>
8. Tabatabaei Yazdi, R. and Z. Aboutalebi, 2007. The economic and social condition of Islamic Republic of Iran in comparison with all countries of south west Asia. Strategic Res. Centre, Report No. 04-2-87-40, (Persian).
9. Movahedi, M., A.A. Haghdoost, O. Pournik, B. Hajarizadeh and M.S. Fallah, 2008. Temporal variations of health indicators in Iran comparing with other Eastern Mediterranean Region countries in the last two decades. J. Public Health, 30(4): 499-504.
10. The statistical Economic and Social Research and Training Center for Islamic Countries (SESRIC), URL: <http://sesric.org/index.php>
11. Kelantri, K., 2001. Regional planning and development (theories and techniques), Khoshbein Publication, Tehran, (Persian).