International Business Management 10 (15): 2895-2901, 2016
ISSN: 1993-5250

A Survey on Iran's Economic Integration and its Business Cycle Synchronization with MENA Group Using Spatial Econometric Approach

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Abstract: Given the widespread and intense competition in the new global economic environment, the formation of commercial blocks can help countries to increase competitiveness. In this study, bilateral trade flows of Iran with the countries of the MENA group have been investigated using two models of gravity and spatial assessment. According to the results, countries have positive convergence and spatial econometrics confirms the existence of this convergence. GDP and labor force participation rate have a determining role in determining the volume of business in Iran and have positive coefficient. Synchronization variable of business cycles has no significant effect on the process of bilateral business because of its extremely low coefficient and the lack of significance. Since one of the variables affecting economic convergence is synchronization cycles from this perspective the economic convergence of Iran in the group should not be a priority.

Key words: International trade, investigation, MENA group, synchronization of business cycles, convergence

INTRODUCTION

One of the most important features of the international system in today's world of globalization is the formation of regional convergence in the framework of international organizations and national efforts to eliminate tariff and non-tariff barriers in different parts of the world. Given the widespread and intense competition in the new global economic environment and given that developing countries cannot compete in the international arena without previous preparation; the formation of trade blocks can help countries to increase competitiveness and strengthen the comparative advantages of member countries in international trade (Derakhshideh and Jalaee, 2014).

MENA region includes the major oil-producing countries of the Middle East and North Africa. The region starts from Morocco in the Northwest of Africa and stretches to Iran, the most Eastern country in the Middle East and includes Algeria, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Bahrain, Malta, Morocco, Saudi Arabia, Oman, Palestine, Qatar, Syria, Tunisia, United Arabic Emirates and Yemen. These countries have 60% of oil resources and 45% of world gas resources and play an important role in the global economy.

Similarity and correlation of business cycles of countries that tend to be located within a block or economic cooperation can play an important role in economic integration between countries in case of periodic correlation between member states of a block, the possible costs of using counter-cyclical economic policies will become minimum. Synchronization of business cycles means that the ups and downs of cycle are the same over time. Also, the meaning of synchronization of business cycles is the correlation between changes in GDP between the two countries in a period of time.

Undoubtedly, trade liberalization and particularly WTO membership have undeniable costs for developing countries although, it is generally believed that primarily these expenses are lower than the costs of trade and economic isolation and secondly in case of informed, intelligent and effective encounter it can be reduced to a great extent in the medium-term and in the long-run it can be compensated; however, the fact that the costs of economic adjustment, liberalization and globalization approach is usually very low or there is the possibility of reduction and compensation this does not exclude the possibility that in certain cases, poor and contradictory policies by policy-makers or special conditions of some communities will increase the costs of this process. This kind of concern about the costs and consequences of this global approach and trade liberalization through the WTO accession and the considerations after the Cold War has led to the condition where in some cases, countries around the world seek regionalism approach and creation of economic-trade blocks as a prelude to the approach of globalization to preserve their business relationships and also to maintain their positions in the existing international blockades on the economy and global politics (Fathi, 2002).

Given the essential role of MENA group in the global economy and the significant impact of this group on the

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economy of developing and developed countries, the study of the status of Iran in this group and the economic convergence of Iran with member countries of the group is particularly important. To estimate the economic convergence of Iran and MENA group two generalized gravity model and spatial econometric tools are used individually. Gravity models are useful experimental tools that are widely used in the international trade in explaining trade flows to determining the bilateral business potential and examining the effect of convergence on bilateral trade. Using econometric methods, multivariate regression with panel data is calculated. Differences in spatial econometrics and general econometric are in the use of econometric techniques in sample data that has a spatial component.

LITERATURE REVIEW

In recent years models used in international studies have had a considerable progress and with a reciprocal trade approach between countries and regional blocks, the factors affecting international trade have been estimated.

Selin *et al.* (2012) studied the trade status of member countries of the MENA showed that due to the theoretical predictions, benefits of regional integration are being distributed unequally between the rich and poor countries. In this study, the effects of different patterns of integration in the Middle East and North Africa were studied and the results indicate that in free trade agreement of Arabic countries, causing trade to poor countries (in terms of resources) is provided by regional integration and there is no evidence of trade diversion. But in rich countries in the case of rich country with relative abundance of workforce and rich country with the entry of workforce, there is the evidence of trade diversion. It focuses on the idea that regional integration can help extending the benefits distributed unevenly among regional economies Deadorff, completed the theoretical basis of the gravity model by showing that the equation of gravity is perfectly consistent with the trade model of Pomfret studied the trade policy in Central Asia and showed that unilateralism through WTO in homogeneous goods with complete competition. Mohammad Mafizur Rahman using the generalized gravity model and using panel data investigated the factors affecting on the imports of Bangladesh from its major commercial partners and the results of the study indicate that the determinants of imports of this country are the inflation rate of countries, the differences in per capita income and the degree of their openness. The shared borders between the countries had also a considerable impact on a country's imports from its trading partners. Sologa and Winters used the following gravity model to study the new preferential agreements that began in the early 90s. Based on the findings, forming a block has not led to increased foreign trade volume. In European Union and Free Trade Area of EFTA, trade diversion was detected and after controlling for gravity variables, the imports of European Union and EFTA have dropped significantly. In Latin American, the tendency to increase the exports has generally been accompanied by the increasing trend toward imports which shows the strong effects of their general trade liberalization. First time Anselin (1988) presented a perfect framework of spatial econometric facts in the book called "spatial econometrics, methods and models". In the past few years enjoying this way has been taken into consideration by the scholars of the regional science. In the study by Beugelsdijk and Schaik (2005) they examined the relationship between social capital and economic growth in 54 regions of Europe using a spatial model survey and concluded that social capital has a significant positive effect on economic growth so that a standard deviation of group activities increases the economic growth to 0.03%. Barro and Sala-i-Martin (1991) studied the economic convergence of the states of America and achieved the convergence rate of the US as 1.9%. Also, Barro and Sala-i-Martin (1991) studied the convergence of 114 countries and concluded that there is not absolute convergence between countries. He considered the reason as structural differences between countries. Conditional convergence coefficient in this study was 2.5. Soleimani Movahed and Afshari in the study of testing the theory of Heckscher-Ohlin-Samuelson in Iran's intra-industry trade using dynamically estimation method, evaluated the effects of model variables of Heckscher-Ohlin-Samuelson on intra-industry trade of Iran and MENA countries during the period from 1999-2007 and showed that among the variables of Heckscher-Ohlin-Samuelson Model, the human capital had the minimal impact on Iran's intra-industry trade with MENA region countries and in most cases, the relative advantages of Iranian intra industry trade have not changed over time. Nikbakht *et al.* (2008) in an article entitled analysis of economic integration (bilateral foreign direct investment) in D-8 group of countries using the generalized gravity model investigated the convergence of Islamic countries of D-8 group and showed that GDP of capital (as mass of goods) guest and host countries and their geographical distance (as distance) are consistent with the theory of gravity. And economic structure difference indicator and economic openness indicator play a positive role in bilateral trade flows. And the

group moves towards convergence and can increase economic cooperation between members to move towards globalization. Nikbakht *et al.* (2008) studying the economic convergence of Islamic countries of D-8 group using the generalized gravity model showed that GDP in the host and guest countries, the host country population, indicator of economic structural differences and openness of the economy indicator play a positive role on bilateral trade flows. The results also show that economic integration of D-8 group has increased the volume of foreign direct investment of the member states. The convergence of Iran has no significance in this group and Iran's membership of the group has not had any effect on Iran's economic situation. Mohammad Reza Lotfali poor examined the economic convergence between Iran and Latin American countries in terms of trade block formation. In fact, the main objective of this study is investigation of success or failure of block formation and its impact on the increase of bilateral trade between Iran and these countries. The results showed that the existence of economic cooperation between Iran and Latin America will lead to a significant increase in bilateral trade flows. In other words, trade block can increase the amount of trade among the member countries up to 89%. Nematolah and Shokoofeh (2005) in a study examined the economic integration among Muslim countries with an emphasis on the role of the Persian Gulf states. For this purpose spatial econometric methods were used. The results showed that the structural transformation of the global economy in recent years made the economies more dependent and made influence on each other. And economic cooperation can increase trade, economies of scale, technology transfer and improvement of economic prosperity and growth. Nematollah and Mojgan (2005) investigated the effects of economic integration in the countries of the Persian Gulf on the international trade flows. These countries have a common border and therefore spatial dependence between them have an impact on trade flows. Also, the coefficient of dummy variable of integration indicates the fact that the volume of trade between countries in the Persian Gulf is less than the gravity model variables and to increase it the countries must remove the trade barriers of cooperation contracts and use the potential and the benefits to each other. Najafi Alamdar examined the factors influencing the export of agricultural products in member countries of ECO in 1992-2008 using a model of the spatial model survey. The results indicate the spatial correlation between the countries. On the other hand, the GDP variables, exchange rates and adjacent countries on agricultural exports have positive effects and the countries' population had a negative effect on it. Sameti and Behnud in a study entitled " the Effects of Economic Instability on Human Development in Selected Asian Countries" examined the effects of inflation, unemployment, stagnation in production, budget deficits and exchange rate fluctuations on human development through geographically weighted regression approach on spatial econometrics as a branch of study in selected countries in Asia. The results show that due to the spatial data, spatial econometric is superior to general econometric and geographically weighted regression as a sub-branch of spatial econometric method to Global. The spatial anisotropy of exchange rate parameters and budget deficits are confirmed but spatial dependence of human development has not been approved. Derakhshideh investigating economic convergence and synchronization of business cycles of Iran and Shanghai group using spatial econometrics approach indicated that countries have spatial correlation and trade status of every country is affected by that of neighboring countries. Despite lack of synchronization in economic cycles, economic convergence can be justifies.

THE CLARIFICATION OF MODEL

Gravity model: The simple form of the gravity model is defined as follows which has been adopted from the Newtonian Gravity Model. This model describes the distant gravitation between two or more substances. And asserts that the gravitational force between two materials is proportional to their weights and inversely proportional to the square of the distance between these two materials. To estimate international commercial flows in the simplest case where there is no obstacle and encouraging, using these models, bilateral trade flows can be considered as a direct function of economic size of the two countries and an inverse function of the geographic distance between the two countries:

$$T_{ij} = C\frac{GDP_i.GDP_j}{D_{ij}^2} \quad (1)$$

Although, the gravity equation initially did not have theoretical basis but relatively large R^2_s have led many researchers to use the gravity equation as a measure for bilateral trade volume. For the first time, the gravity model was proposed to measure certain bilateral trade examples and to justify commercial blocks and then it was also used to examine the effects of regional integrations on foreign reciprocal investment. In its simplest form, the gravity model was originally developed by Tinbergen (1962) in economics which is directly derived from Newton's theory of gravity.

$$T_{ij} = c_1 + c_2 Y_i + c_3 Y_j + c_4 POP_i + c_5 POP_j + c_6 D_{cu} + c_7 D_{lan} + c_8 D_d + \ldots + U_{ij} \quad (2)$$

Where:

T_{ij} = Exports (imports) of country i to (from) j
Y_i = Income of country i
Y_j = income of country j
POP_i = Population of country i
POP_j = Population of country j which appear as explanatory variables on the right side
Y_i and Y_j = Considered as mass variables in Newton's relation and demographic variables are two other scale variables

Following these variables, a set of dummy variables will be added to explain other effects on reciprocal trade flows between the two countries.

D_{cu} is the dummy variable added to explain the other effects of the two countries' mutual trade blocks. D_{lan} is the dummy variable for the common language between the two countries and D_d is the dummy variable related to the distance or proximity of the two countries. The model used in this study is generalized gravity model and is specified as follows:

$$\ln XM_{ijt} = \alpha_{ij} + \alpha 1 \ln GNP_{it} + \alpha 2 \ln GNP_{jt} + \alpha 3 \ln \text{labor force} + \alpha 4\, DIS_{ij} + \alpha 5 LIN_{ijt} + \alpha 6 SYNCH_{ij} + U_{ijt} \quad (3)$$

Where:

XM = Exports plus imports of the country at time t and shows the bilateral trade flows between exporter countries (i) and the importing countries (j)
α_{ij} = An abscissa that represents the specific effects of each of the partner countries and may vary depending on the trade orientation
GNP_{it} and GNP_{jt} = Real GDPs of country i and country j at time-t which express the country's economic size
labor force = The labor force participation rate in the country and is considered as one of the factors of production preceding a significant role to play in economic development
D_{ij} = Geographical distance between economic centers (capitals of the two exporter and importer countries) of the two countries of i and j. Since, the greater distance will impose higher transportation costs it is expected to have negative effects on trade flows
LIN_{ijt} = Linder variable

In order to express the economic similarities between each pair of trading partner countries, Linder variable as a function of per capita GDP for each pair of countries is entered into the model:

$$linder_{ijt} = LN\left(\left(\frac{GDP_{it}}{POP_{it}} - \frac{GDP_{jt}}{POP_{jt}}\right)^2\right) \quad (4)$$

According to Linder trade theory it is expected that the coefficient of this variable is negative. According to this theory, similar countries have more tendency to trade with each other than with other dissimilar countries.

$CYNCH_{ij}$ is indicator of trade cycle synchronization between countries i and j. Kalemli-Ozcan, Sebnem. Elias, Papaioannou. luis, Peydro (2009) have calculated it as follows:

$$SYNCH_{ijt} = -\left|(LnY_{i,t} - LnY_{i,t-1}) - (LnY_{j,t} - LnY_{j,t-1})\right| \quad (5)$$

Where:

$Y_{i,t}$ = The real GDP of country $Y_{i,t}$ at time t
$Y_{j,t}$ = The real GDP of country j at time t

The more the value of this index in terms of the algebra and the closer to zero is the greater would be the synchronization of trade cycles between the two countries.

According to Mandel and McKinnon, the synchronization of trade-cycles is a precondition for integration and cooperation of countries into a regional trade agreement; because the possible cost of anti-cycle economic policies are reduced with simultaneous trade cycles.

Spatial econometric model: Conventional econometric technique that is based on assumptions of Gauss-Markov is flawed for regional studies. Research done in the area of the regional science are dependent on sample data of the area that were collected due to the measurement location as a spot in space. In this case, the researcher faced with two phenomena in regional study data as: the spatial dependence between observations and spatial heterogeneity.

Spatial dependence: In a set of sample data to mean that the observations in place i depend on other observation in place j. In other words:

$$Y_i = f(Y_j), \quad i = 1, 2, \ldots, n \quad i \neq j \quad (6)$$

It is expected that the sample data observed at a point in space is related to the observed values in other locations.

Spatial heterogeneity: Refers to the deviation between the observations are related to the level of geographic locations. Lessage (1999) linear relationship is depicted as follows:

$$Y_i = f(X_i \beta_i + \varepsilon_i) \quad (7)$$

where, i represents observations obtained in i = 1, 2, 3, ..., n points in space, X_i represents vector (k×n) from explanatory variables with parameters β_i related to it Y_i is the dependent variable i the observation or place i and ε_i represents the random error. In general, the spatial anisotropy violates the linear relationship with constant variance exists between sample observations. If the equation changes with the move between the spatial sample data spatial econometric estimation models will model these changes.

Spatial lag: One of the basic concepts associated with space is spatial lag. Spatial lags are similar to the backward transfer in time series analysis and unlike the time series that lag occurs within the time in spatial econometric interruption means the transmission over the space. So that, $\beta_{yt} = y_{t-1}$ represents the first lag and $\beta_{yt}^{p} = Y_{t-p}$ represents the pth lag. The concept of spatial lag is used for the relations "neighbors than neighbors".

Diagnostic tests of spatial autocorrelation

Moran test: Is used to diagnose the spatial autocorrelation regression disturbing components. This test demonstrates the spatial correlation is disturbing in parts. Statistic Moran is achieved as follows:

$$I = \frac{e'We}{e'e} \quad (8)$$

where, e represents the regression disturbing components.

Likelihood ratio and Wald test: These tests are used to test for spatial correlation in the disturbance components according to the difference between the likelihood logarithm of spatial error model and the likelihood logarithm of least squares regression.

Lagrange multiplier test: Is conducted based on the residual least squares and calculation of the spatial weight matrix W. In this study to detect spatial autocorrelation in the disturbance components, Moran tests, likelihood ratio and Wald and Lagrange multiplier tests are used to identify the appropriate model to address spatial autocorrelation.

First order spatial regression model (FAR): The main application of this model is to detect the spatial correlation between neighbors. This model indicates the y changes as a linear combination of latitude and longitude:

$$Y_i = \rho \sum_{j=1}^{n} W_{ij} Y_j + \varepsilon_i = \rho W_y + \varepsilon_1 \quad (9)$$
$$\varepsilon_i \sim N(0, \sigma^2)$$

W contains information about latitude and longitude of the country. We introduced W_y as a spatial lag variable.

Mixed Regression-Auto Regressive Model (SAR): In this model y is a linear combination of neighboring countries such as auto regression time series and since covariance in this model is not a diagonal matrix, estimation is done as inconsistent OLS and Maximum likelihood method is used in this model to estimate the parameters. The model is as follows:

$$Y_i = \rho \sum_{j=1}^{n} W_{ij} Y_j + \sum_{k=1}^{k} \beta_k X_{ki} + \varepsilon_i = \rho W_y + \varepsilon_1 \quad (10)$$
$$\varepsilon_i \sim N(0, \sigma^2 I_n)$$

Model explicitaion: For estimating, the model can be explicated as follows:

$$XMij = \alpha 0 \left(GDP\right)^{\alpha 1} \left(\text{labor force}\right)^{\alpha 2} \left(SYN\right)^{\alpha 3} \left(\text{lin}\right)^{\alpha 4} \quad (11)$$

$$\ln XM_{ijt} = \alpha_{ij} + \alpha_1 \ln GDP + \alpha_2 \ln \text{labor force} + \alpha_3 SYN + \alpha_4 \text{lin} + U_{ijt} \quad (12)$$

The statistical population includes the MENA countries (Algeria, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Bahrain, Malta, Morocco, Saudi Arabia, Oman, Qatar, Syria, Tunisia, United Arabic Emirates and Yemen). The data are extracted from compact discs of WDI, IMF, PC-TAS and UNCTAD.

Estimating the model: In this study, the issues raised in the first section of the gravity equation will be used to estimate and then the economic integration is being estimated using the spatial econometric model.

Estimating the gravity model: Using the explicated (Eq. 2) gravity model is examined by Hausman test and estimating the values of the coefficients and then estimating the model.

Hausman test: In panel data method, both random and fixed effects estimations are discussed. Due to the fact that sometimes a huge difference exists between the estimates obtained from these two methods; Hausman test is used to choose between the two methods.

Table 1: Results of pattern selection (bounded F-test and hausman test)

Test types	Test statistic	The value of test statistic	p-values
F-bound	F	260.0700	0.0000
Hausman	H	2.4101	0.6608

Calculations of the researcher

Table 2: Results of the estimation

Variables	Coefficients	t-statistics	Possibility
LNGDPI	0.172657	6.037366	0.0000
LNGDPj	1.017465	51.673820	0.0000
LNLABOR	-0.238499	-15.547210	0.0000
DIS	4.43E-05	3.958084	0.0001
LIN	-0.215030	-2.506124	0.0128
SYN	0.202423	1.885980	0.0604

Calculations of the researcher; $R^2 = 0.95$

According to the results of (Table 1) it can be noted that with a probability of over 90% there is no reason for rejecting the hypothesis H_0 which indicates random effects against fixed effects and the method of random effects which has a high explanatory power is preferred and the results analysis is done based on it.

Estimating the model: According to Table 2, the overall estimation results with R^2 >95%, indicates that the gravity model could largely explain the bilateral trade flows of Iran and MENA group and the coefficients are statistically examined at the 95% confidence level.

GDP is used as a representative for economic size of the trading partner and according to the results, the GDP of trading countries with Iran has had a determining role in determining the volume of trade and the coefficient is positive. The estimated coefficient means that by constant variables a one percent increase in GDP of member countries explains 1.01% of Iran bilateral trades. Distance variable has insignificant positive sign. Due to proper condition of good transportation and technology advances, resulting in manufacturing smaller volume products with fewer primary materials, the share of transport costs is gradually reduced and the geographical distance loses its importance. We can say that the process of globalization downplays the problem of distance and distance cannot be a deterrent to international trade. Leander variable shows the similar effects on trade flows between member economies. Due to this variable coefficient, the economic similarity of member states has the opposite effect on foreign trade. Synchronization variable of business cycles has positive sign and is trivial. Therefore, the synchronization effect of business cycles on trade volume can be seen between the countries. Therefore, Synchronization of business cycles has a positive impact on economic integration and more are the business cycles of member countries, the less will be the economic integration of member countries.

Estimation of spatial econometric model: According to the specified model, the following steps are taken to estimate the model:

Table 3: Results of Moran, likelihood ratio and wald tests

Statistics	Coefficients
Moran I-statistic	4.4444
Probability	8.8144e-06
L ratios	19.4962
Probability	1.0080e-05
Walds	70.1445
Probability	0

Table 4: Lagrange multiplier test

Statistics	Coefficients
Lm error	18.6672
Probability	1.5564e-05
Lm lag	31.4218
Probability	2.0764e-08

Table 5: The results of estimating FAR Model

Statistics	Coefficients
ρ	0.989983
Asymptot t-stat	384.400847
Z-probability	0000/0

Calculations of the researcher

Table 6: The results of estimating of SAR Model

Variables	Coefficients	t-statistics	Possibility
Constant	4.026160	2.564600	0.010329
Ln (GDP)	0.242873	9.411866	0.000000
Ln (labor force)	0.451428	11.325773	0.000000
Lin	0.086125	8.862603	0.000000
SYN	0.480495	1.543763	0.122646
W*dep.var	0.261979	4.381933	0.000012

Calculations of the researcher; $R^2 = 0.6209$

Moran, likelihood ratio and wald tests: The null hypothesisin all three tests is the absence of spatial autocorrelation in disturbing components and since the moran statistic value is >1.96 and the likelihood ratio and Wald statistic values are >6.635, the null hypothesis is rejected. By rejecting the null hypothesis as the lack of spatial autocorrelation, spatial econometrics can be used (Table 3).

Lagrange multiplier tests: The null hypothesis of lmerror and lmlag tests is the lack of spatial correlation in disturbing components and the lack of spatial dependence in the dependent variable observations. Test results in Table 4 show that the SAR Model should be used to remove the disturbing elements of spatial autocorrelation.

Estimation of FAR Model: The results of estimating equation in Table 5 show that the spatial coefficient ρ is equal to 0.989983 which is statistically significant and indicates the positive spatial correlation among the countries:

$$\ln(ex+im)_t = \rho(W*\ln(ex+im)_t)+\varepsilon_i \qquad (13)$$
$$\varepsilon_i \sim N(0, s^2 I_n)$$

Estimation of SAR Model: Table 6 represents the results of estimating the following equation:

$$\ln (XM_t) = \beta_0 + \beta_1 \ln (GDP_t) + \beta_2 \ln (\text{labor force}_t) + \beta_3 (\text{lin})_t + \beta_4 (SYN) + u_t \quad (14)$$

$$u_t = \lambda(W_{ut}) + \varepsilon_t, \varepsilon_i \sim N(0, s^2 I_n)$$

Results of Table 6 show a positive and significant coefficient of W*dep.var which implies the trade status of a country influenced by its neighboring countries. The overall results of estimating by >62% R^2, indicate that the current model is able to explain the group's bilateral trade with Iran. Coefficients are statistically examined at the 99% confidence level. According to the results, GDP which is used as a representative of economic size of the trading partner, plays a significant role in determining the volume of Iran's trade and has a positive coefficient and this result is consistent with the survey hypothesis. The estimated coefficient means that by constant variables, a one percent increase in GDP of member countries explains an average of 0.23% of Iran bilateral trades. Labor force variable is significant and has a positive sign and represents the positive impact of increasing labor force participation rates on countries' bilateral trades. Business cycles synchronization variable is not significant and can be said not to have an effect on bilateral trade. Leander variable represents effects of economic similarity of member countries on trade flows. According to coefficient of this variable, economic similarity of member countries has an opposite effect on countries' foreign trade.

CONCLUSION

Given that unprepared developing countries cannot compete in the international arena, forming commercial blocks can help countries significantly in order to increase competitiveness power. Accordingly, in the present study using the gravity model and spatial assessment model, Iran's bilateral trade flows with MENA's member countries was surveyed. Results of the gravity model show that the model with R^2 greater than 95% could explain bilateral trade flow well. GDP of Iran's trade partners has a positive effect and economic similarity has an opposite effect on determining Iran's trade volume and synchronization variable of business cycles has a positive sign and is very trivial. The result of spatial econometric models shows that group's countries have spatial correlation and the business climate of each country is influenced by neighboring countries. Business cycles synchronization variable is not significant, therefore it has no impact on bilateral trade. Since, one of the variables affecting economic convergence is synchronization cycles from this perspective, economic convergence of Iran in this group should not be a priority. According to the coefficient of Leander variable, economic similarity of member countries has an opposite effect on countries' foreign trade.

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