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Impact of sanctions on bilateral trade of agricultural products between Iran and MENA region and the EU countries[1]

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Abstract

This paper uses Generalized Method of Moments (GMM) estimation, gravity model, and dynamic panel data to evaluate the effect of the imposed sanctions against Iran on the value of the bilateral trade of agricultural products between Iran and its trading partners among the MENA and the EU countries during 2000 to 2014. The results show that the sanctions have had no effects on the trade flows between Iran and the MENA countries. However, they have meaningful impact on the Iran's agricultural export to the EU countries, albeit they have caused a decrease in Iran's agricultural import from this area. The annual precipitation in Iran, as a control variable, using in this paper has positive effects on the Iran's agricultural export to the EU countries, nonetheless has negative effects on the Iran's import from the mentioned countries. The overall country size of two trading partners' variable has meaningful and direct effects on the mutual trade between Iran and the EU countries. According to the above outcomes, the imposed sanctions should be considered as an opportunity to the Iranian agricultural development and diversification of exports from the agriculture sector to the EU region as a wide range of non-oil products to compensate some of the costs on the Iranian economy caused by sanctions.

JEL codes: F14, F15

Keywords: Bilateral Trade of Agricultural Products, Gravity Model, Generalized Method of Moments, Dynamic Panel Data, Index of Economic Freedom

[1] This article has been extracted from the dissertation of Farzaneh Jariani

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Introduction

After occurring the Islamic Revolution and emergence and expansion of political disputes between Iran and the United States and its allies and, as a result, imposing different sanctions on Iran since 1979, this country has experienced the outcomes resulted from imposing these sanctions for more than four decades and it has paid a severe compensation including in the commercial field, therefore, sanction variable, more than three decades, has been of inseparable variables of macroeconomics in Iran.

One can divide the causes of imposed sanctions on Iran into four general groups: unilateral sanction of the United States such as occupation of American Embassy by Muslim student followers of Imam's line (1979-1981), Iran-Iraq War and reconstruction period (1981-1995), sanction of Energy Sector and Oil Industry of Iran (Iran Sanction Act (ISA)), purchase of weapons with a massive destruction power and support of international threats (1995-2006) and multilateral sanctions of the United States (Comprehensive Iran Sanctions, Accountability and divestment Act of 2010 (CISADA)), Security Council and the EU: Iran's nuclear activities (2006-2010 and 2010 onwards) (Devarajan, 2015).

Nature of imposed sanctions on Iran is involved in different features. Sanctions before 2006 have been the unilateral sanctions by the United States which haven't had a significant negative impact on the economy of Iran, but, after 2006, to impose the multilateral and stronger sanctions by the United States, Europe and the UN has had an inhibitory and crippling impact on the economy of Iran (Dizaji, 2018).

Due to the purpose of this study which examines to influence the process of the bilateral trade value of agricultural sector's products between Iran and its trading partners in years of imposing unilateral sanctions (2000-2005) and in years of

multilateral and sever sanctions (2006-2014) as well the change of trading partners of Iran in two situations, statistics of the World Bank and Central Bank of Iran in the relevant period show that the process of export value growth of agricultural products has involved the considerable fluctuations from 2000 to 2014; so that its growth rate during the unilateral sanctions in 2004 has been -10% and, in 2008, 2012 and 2013, this growth rate has been -5.1%, -5.7% and -1.3% respectively. Also, statistics of Customs of Iran show that the average of bilateral trade growth value, export and import of agricultural products between Iran and MENA countries during imposing multilateral sanctions (2006-2014) compared to the period of imposing the unilateral ones have been reduced 37%, 85% and 6% respectively, while the average of bilateral trade growth value, export and import between Iran and EU countries have been reduced 9%, 17% and 10% respectively.

Due to the results of reviews about the effective factors in Iran's agricultural sector, one can divide the negative growth in the export value of agricultural products into two main groups: internal factors (insufficient attention of governments in the different periods to the agriculture sector and weakness in management of this sector) and external factors (climatic changes and sanctions).

Since this research focuses on the impact of sanctions on the trade value of agricultural products, therefore, it should reply to questions in this research which they are: 1- What impact do sanctions have on the amount of import and export of agricultural products between Iran and its trading partners? 2- Have sanctions expanded trade of agricultural products with the MENA region countries? 3- Will elimination of the sanctions expand the trade of agricultural products with the EU countries?

Information of the relevant variables in this study has been derived from the websites of World Bank, International Monetary Fund, Iran Customs Administration, Trade

Promotion Organization of Iran and Central Bank of Iran from 2000 to 2014 and conducted by STATA15 software of the relevant calculations.

Theoretical Foundations and Experimental Studies

Date of using the gravity model to examine flow of trade refers to the introduction of the Newton Gravity Law in the field of economics in 1687 that this model has been further used by addition of effective variables to it after 1960s. Virtual variables in 1970s, and other macroeconomics variables in 1980s have been added to the gravity model and used in the studies (Soori and Tashkini, 2012). In 1990s, using the Regional Trading Arrangement (RTAs) in the studies conducted it was specified the importance of common virtual variables between the countries with the Trading Arrangement and theoretical foundations of this model were developed to the international trade. Similarly, it was examined the impact of intra-industry trade on the trading flows. Generalization historical process of the gravity model with being added an effective variable on the process of trading is: Tinbergen (1962) and Poyhonen (1963) introduced gravity model in the economy using the Newton Gravity Law in which trading has a direct relationship with the economic size of countries and it has an inverse relationship with the distance. Adding the common boundary, language and culture factors as Dummy variables, Pagoulatos & Sorensen (1975), Anderson (1979), Caves (1981) and Toh (1982) examined the significance of distance as an important factor in trading. Helpman & Krugman (1985), Romer (1986) and Lucas (1988) investigated to influence variables of economic growth, economic freedom, productivity, human capital, economic scale, technology and per capita income on trading. Krugman (1993) examined relationship of north and south in trading. Examining trade arrangement, Frankel et al. (1995) indicated the significance of common culture, language and boundary and distance in the bilateral trade between the countries with the trade arrangement. Deardorff (1995) developed

theoretical framework of the international trade model in order to demonstrate gravity model and to derive its simple forms. Stone & Lee (1995) indicated that increasing the trade has an inverse relationship with decreasing costs of transportation. Eichengree & Irwin (1998) and Rauch (1999) indicated significance of common boundary and language variables in trading. Accordingly, it has been conducted many experimental studies that, in following, results obtained from some serious internal and external researches are presented by separating the trade of agricultural products, sanction and trade as well the impact of sanctions on the agricultural products trade of Iran:

1- Agricultural Products Trade

In order to determine causes losing contribution of agricultural products and foodstuffs in the international trading, Pinilla & Serrano (2012) examined the impact of different factors on the bilateral trade of agricultural products in the production and, generally, trade for 40 countries using the gravity model in 1963-2000. Results showed that low gravitation of demand for agricultural products and foodstuffs and high-level support of productions and its trivial contribution in intra-industry trade are of the main causes of slow growth for agricultural products and foodstuffs.

In their research, Khiyavi et al. (2013) investigated effective factors on trading the products of agricultural sector between developing countries such as Iran, India, Malaysia, Pakistan, Thailand, Turkey, Brazil, Indonesia, Kenya, Venezuela, Tunisia, Romania, Chile and Mexico using gravity model and panel data in 1991-2009. Findings of this research show that trading of agricultural products between these countries is influenced by the growth of market size of trading partners. In these countries, per capita income of importing country has a positive and considerable impact on the volume of agricultural products trade and per capita income of exporting country has a negative and significant one.

Examining effective factors on the agricultural products trade of Iran with the member countries of Organization of Islamic Conference (OIC) and impact of independent variables of Gross Domestic Product (GDP), geographical distance, religious similarities and virtual variable of common boundary on each of Iran's agricultural products using the export and import statistics of Iran's agricultural products during 2006-2011 and gravity model and panel data, Shamekhi Siahmazgi et al. (2014) showed that GDP of trading partners and being coterminous have a positive impact and geography distance variable has a negative one on the export and import of Iran's agricultural products and religious similarity variable is statistically insignificant.

2- Sanction and Trade

Bigdeli et al. (2013) have examined the impact of economic sanctions on bilateral trade of Iran with its 30 trading partners during 1973-2007 using generalized gravity model and panel data in two situations (with sanctions and without them) and showed that the sanction has a negative, but little, impact on trading of Iran and its trading partners.

In a research, Kazerooni et al. (2015) examined the impact of economic sanction on the volume of Iran's trade with the 73 main trading partners using generalized gravity model and dynamic integrated data approach during 1992-2013and concluded that unilateral sanctions of US haven't a significant impact on the foreign trade of Iran but multilateral sanctions have a negative and significant impact on the foreign trade of Iran.

In his paper, Caruso (2003) investigated the impact of international economic sanctions on the bilateral trade of US and 49 target countries using gravity model during 1960-2000 and concluded that the broad and comprehensive sanctions

have a negative impact on the bilateral trade while limited and middle sanctions don't follow these results. In the next estimate, he has examined impact of unilateral sanction of US on the volume of bilateral trade between target and G-7 countries and concluded that multilateral sanctions have a more negative impact on the trading flow.

Yang, Askari and Teegen (2004) have investigated the impact of economic sanctions of US on trading of this country with the target countries as well third countries during 1979-2001 using gravity model. The sanctions have considerably decreased an amount of multilateral trade between United Stated and target countries and it has increased the trading between target countries and EU and Japan. In other words, these sanctions have a considerable impact on decreasing trading transactions between US and target countries that the decreasing process with a life more than a decade has finished after the end of Cold War.

In a research, Hadinezhad et al. (2010) have examined direct impact of economic sanctions on the non-oil trade of Iran during 1977-2007 and trading of Iran with 42 trading partners including United States, China, Russia, France, Italia, Germany, Afghanistan, Pakistan and Middle-East countries using generalized gravity model and they have found that sanctions have had a considerable impact on the non-oil trade of Iran.

Kahrazeh & Nikpour (2014) have estimated impact of economic sanctions on the export volume of Iran to the ECO, OPEC and ASEAN member countries during 1992-2013 using the gravity model, panel data and estimate of OLS and concluded that sanctions have had a negative impact on the volume of Iran's export to the OPEC members but they haven't had any impact on the export to the ECO and ASEAN member countries.

In their research, Gustavsson & Ghaderi (2015) have examined impact of economic sanctions on the Iran's trading relationships using the gravity model during 1975-2006. Results of this research show that the geographical proximity and cultural relationships have had a positive impact on the volume of this trade and sanctions have had a negative impact on this trading flow. In this study it has been used the other methods of estimate such as Tobit two-stage estimate model and PPML for zero trade and results of these estimates showed that sanctions have disarranged trading of Iran and they have also prevented economic growth of this country.

Dizaji (2018) shows that this country has shifted its trading partners from side of the EU member and OECD countries to the MENA countries and East Asia during 2000-2014 and in the different flows of sanction against Iran. In addition, results imply that although limited sanctions of US have been led to increase trading of Iran with the other countries, but, however, imposing the wide sanctions has been led to considerably decrease the flow of export, import and trading. Results show that the change in political behavior of Iran's government and negotiation with the world powers could modify the negative impact of sanctions on trading.

3- Impact of Sanctions on Agricultural Products Trade of Iran

Using Time series data, Hodrick-Prescott filter and case study of Eviews as well calculating process of added value variables and investment of agriculture sector in the years of pre- and post-sanction during 2000-2014, Faryadras (2015) has considered impact of sanction on the agriculture sector as increasing the costs of goods transportation, becoming hard and costly of monetary interactions, decreasing foreign exchange reserves and multi-currency exchange prevalence, decreasing government revenues and dropping construction budgets, increasing

government concerns in the field of food security and tendency to governmental trading, becoming hard possibility to the import of agriculture institutions and uncertainty in the environment of production and trading.

Generally, results obtained show that sanctions have had a negative and significant impact on the export and import (trading) of target country (Iran).

Since agriculture sector plays a decisive role in the economy of society in the field of supply of population's food as well national security, in the one hand, and process of growth and development of communities in terms of occupation, supply of income, meeting the consumed basic needs as well providing a part of required currency exchange of the country through importing the agricultural products and it is considered as a vital economic activity, it is very important to review how to influence the sanctions on this sector of economy. Previous studies, in general, have focused on the impact of sanctions on the total volume of trading in Iran without proceeding to separately review the impact of sanctions on the different sectors of economy. Accordingly, this study evaluates the sanctions imposed on the bilateral trade of Iran's agricultural product sector with its trading partners (MENA and EU countries).

Agricultural Products Trade between Iran, MENA[5] and EU[6] Countries from 2000 to 2014

To examine the process of trading transactions of agricultural products between Iran and its trading partners in MENA region and the EU from 2000 to 2014 as

[5] According to the world bank classification: Algeria, Bahrain, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Qatar, Saudi Arabia, Syrian, Tunisia, United Arab Emirates, Yemen. Over the considering period, Iran did not have any bilateral trading the agricultural products with Israel and West Bank and Gaza.

[6] According to the world bank classification: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech, Denmark, Estonia, France, Germany, Greece, Hungry, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovak, Slovenia, Spain, Sweden, United Kingdom.

well to compare these transactions in two situations of imposing economic sanctions and without them, in this research it has been divided the relevant period into two periods of unilateral sanctions from 2000 to 2005 and multilateral ones from 2006 to 2014. During 2000-2005, due to characteristic and low severity of unilateral economic sanctions imposed by US, economy and Iran's trading transactions with its trading partners haven't led to the considerably negative impacts and outcomes. Because, in this period, the imposed sanction has only influenced on the trading transactions between Iran and United States and Iran had still enabled to make and maintain its trading relationships with the other trading partners. During 2006-2014, with more rigorous action of the EU and Security Council to support the sanctions against Iran and to decide to impose the policy of multilateral sanctions on Iran and to execute the comprehensive sanction by US, the considerable shifts occurred in macro-economic policy-makings and trading transactions of Iran. In the meantime, because of supplying people's food and observance of the Human Rights by sanction-makers, agricultural sector was never placed on the list of sanctions imposed on Iran. However, this sector hasn't been immune of outcomes of economic sanctions including the difficulties in transportation of goods and money, currency exchange evolutions and currency rate, absence of possibility to the competition of domestic productions by the import and investment.

Results obtained by the process of total value of export, import and bilateral agricultural products trade between Iran and MENA countries from 2000 to 2014 show that their total value is equal to $ 25437, 23074 and 48511 million, respectively. Total value of agricultural products export from 2000 to 2014 has been equal to 52% of total value of bilateral agricultural products trade and total value of these products in the same period of time has been equal to 48% of total

value of bilateral agricultural products trade. This share of bilateral trade value in the periods of unilateral sanctions from 2000 to 2005 has been equal to 62% and 38% for export and import, respectively, and the share of bilateral trade value in the periods of multilateral sanctions from 2006 to 2014 has been equal to 51% and 49% for export and import, respectively. To compare average of growth value for bilateral trade and export between two periods of imposing unilateral sanctions (2000-2005) and of imposing multilateral ones (2006-2014) shows that the average of growth value for bilateral trade, export and import of agricultural products between Iran and MENA countries has been decreased 37%, 85% and 6%, respectively.

Results obtained by the process of total value of export, import and bilateral agricultural products trade between Iran and MENA countries from 2000 to 2014 show that their total value is equal to $ 5746, 30230 and 35976 million, respectively. Total value of agricultural products export from 2000 to 2014 has been equal to 16% of total value of bilateral agricultural products trade and total value of these products in the same period of time has been equal to 84% of total value of bilateral agricultural products trade. This share of bilateral trade value in the periods of unilateral sanctions from 2000 to 2005 has been equal to 26% and 74% for export and import, respectively, and the share of bilateral trade value in the periods of multilateral sanctions from 2006 to 2014 has been equal to 14% and 86% for export and import, respectively. To compare average of growth value for bilateral trade and export between two periods of imposing unilateral sanctions (2000-2005) and of imposing multilateral ones (2006-2014) show that the average of growth value for bilateral trade, export and import of agricultural products between Iran and EU countries has been decreased 9%, 17% and 10%, respectively.

To evaluate the agricultural products trade between Iran and its trading partners in MENA region and the EU, the following results have obtained: 1- in the period of imposing the unilateral sanctions (2000-2005), the main considerable share from the target export markets of agricultural products has belonged to the MENA region and the main share of importing bases of the agricultural products has belonged to the EU countries. 2- In the period of imposing the multilateral sanctions (2006-2014), the amount of exporting the products to the MENA region and the EU countries has severely decreased, but still, the main share of importing bases of agricultural products has belonged to the EU countries. 3- The main trading partners of Iran in the MENA region in the period of imposing the unilateral sanctions (2000-2005) have been United Arab Emirates and Iraq in the side of export and United Arab Emirates and Lebanon in the side of import, respectively. The main trading partners of Iran in the EU countries in the given period have been Germany, Spain and Italia in side of export, and Germany, Netherlands and France in side of import, respectively. 4- The main trading partners of MENA region in the period of imposing the multilateral sanctions (2006-2014) have been Iraq and United Arab Emirates (UAE) in side of export and UAE and Lebanon in side of import, respectively. The main trading partners of Iran in the EU countries in the given period have been Germany, Spain and Italia in side of export and Netherlands, Germany and England in side of import, respectively. 5- One could consider the cause of decreasing process in the bilateral trade value between Iran and MENA region countries as political contradiction between Iran and some countries of this region like Saudi Arabia, UAE and Kuwait and reduction of import from origin of UAE in order to bypass the sanctions. 6- One could consider the cause of decreasing bilateral trade value of the EU countries with Iran as commitment of these countries to execute the sanctions imposed. Meanwhile, in spite of this commitment and tightening of

sanctions from 2006 onwards, especially sanctions of years of 2010 and 2012, the EU countries have continued their trading relationship because of tendency to the development of economic and trading relationship with Iran.

Experimental Model of Research

To analyze and evaluate impact of effective variables on Iran's agriculture products trade with its trading partners in the MENA region and the EU, one has been used the gravity model and dynamic panel data during 2000-2014. Helpman & Ktugman (1985), Krugman (1993) and Egger (2002) showed that economic growth, productivity and economic freedom are including the effective factors on trading. Also, they showed that the trading is influenced by the factors such as conditions of origin country, economic scale, population and per capita income.

The gravity models of this study for evaluating the process of export, import and bilateral trade of agricultural products are as follows, respectively:

$$LEX_{ijt} = \alpha + \beta_1 EX_{ijt-1} + \beta_2 LGDT_{ijt} + \beta_3 LSIM_{ijt} + \beta_4 LRFA_{ijt} + \beta_5 LEFI_{it} + \beta_6 LEFI_{jt} + \beta_7 SANC_{it} + \beta_8 LRER_{ijt} + \beta_8 LARF_{it} + \varepsilon_{ijt}$$

$$LIM_{ijt} = \alpha + \beta_1 IM_{ijt-1} + \beta_2 LGDT_{ijt} + \beta_3 LSIM_{ijt} + \beta_4 LRFA_{ijt} + \beta_5 LEFI_{it} + \beta_6 LEFI_{jt} + \beta_7 SANC_{it} + \beta_8 LRER_{ijt} + \beta_8 LARF_{it} + \varepsilon_{ijt}$$

$$LTRA_{ijt} = \alpha + \beta_1 LTRA_{ijt-1} + \beta_2 LGDT_{ijt} + \beta_3 LSIM_{ijt} + \beta_4 LRFA_{ijt} + \beta_5 LEFI_{it} + \beta_6 LEFI_{jt} + \beta_7 SANC_{it} + \beta_8 LRER_{ijt} + \beta_8 LARF_{it} + \varepsilon_{ijt}$$

According to the model of Helpman & Krugman (1987), three indicators are used as the explanatory variable in this model:

GDT_{ijt}: The sum of real GDP of Iran (i) and its trading partners (j) at the time of t is an index for the overall economic size of two trading partners:

$$LGDT_{ijt} = log(GDP_{it} + GDP_{jt})$$

SIM_{ijt}: It is similarity of GDP of Iran (i) and its trading partners (j) at the time of t. SIM_{ijt} is a GDP similarity index is used as an index for relative economic size of two trading partners to explain an amount of trading between two countries. The zero value of this index indicates the full economic similarity between two trading partners and any value other than zero indicates a difference in economy between both countries:

$$LSIM_{ijt} = log\left[1 - \left(\frac{GDP_{it}}{GDP_{it}+GDP_{jt}}\right)^2 - \left(\frac{GDP_{jt}}{GDP_{it}+GDP_{jt}}\right)^2\right] \quad (1)$$

RFA_{ijt}: is absolute value of difference in the per capita income of Iran (i) and trading partners (j) at the time of t. Zero value of this index indicates the same per capita income between two countries and any value other than zero indicates difference of per capita income between both countries:

$$LRFA_{ijt} = \left|log\left(\frac{GDP_{it}}{capita_{it}}\right) - log\left(\frac{GDP_{jt}}{capita_{jt}}\right)\right| \quad (2)$$

It should be explained that Egger (2000), Baltji et al. (2003) and Kabir & Salim (2012) have used the above three indicators in their studies.

Other variables used in the above model are:

EX_{ijt}: Dollar value of exporting agricultural products from Iran (i) to the trading partners (j) at the time of t,

IM_{ijt}: Dollar value of importing agricultural products from the trading partners (j) to Iran (i) at the time of t,

TRA_{ijt}: Dollar value of bilateral trade (total export and import) of the agricultural products between Iran (i) and trading partners (j) at the time of t,

EFI_{it}: Economic freedom index of Iran at the time of t and

EFI_{jt}: Economic freedom index of Iran's partners at the time of t,

$SANC_{it}$: Dummy variable of sanctions imposed on Iran at the time of t that it is equal to zero for the years imposed the unilateral sanctions (from 2000 to 2005) and it is equal to 1 for years imposed the multilateral and sever sanctions (from 2006 to 2014).

RER_{ijt}: is real exchange rate in Iran (i) and trading partners (j) at the time of t and real exchange rate obtained by dividing the US dollar denomination in Iran on the US dollar denomination in the studied countries at the time of t that it is calculated as follows:

$$RER_{ijt} = \frac{EXRUS_{it}}{EXRUS_{jt}} \quad (3)$$

ARF_{it}: An amount of annual rainfall in Iran at the time of t as the control variable and

ε_{ijt}: Error component (has a normal and same distribution). Due to an amount of exporting agricultural products to the foreign as well an amount of need to importing the agricultural products is subject to the conditions of production inside the country and since an amount of producing the agricultural products is subject to the atmospheric conditions and an amount of rainfalls, hence, we have considered rainfall variable as control variable in this model.

To conduct the Unit Root test and because of being balance the panel data, one has used LLC test and its results are represented in Tables of (1) and (2):

Table (1)

Results of Unit Root Test of LLC (MENA – side of export, import and bilateral)

Variable	Value of test statistics of LLC in level		Result	
	Probability value (PV)	Amount of statistics (t)		
LEX	0.0000	-5.4995	Stationary	I(0)
LIM	0.0000	-14.1133	Stationary	I(0)
LTRA	0.0000	-4.4906	Stationary	I(0)
LGDT	0.0000	-9.3849	Stationary	I(0)
LSIM	0.0448	-1.6972	Stationary	I(0)
LRFA	0.0000	-4.1019	Stationary	I(0)
LEFIi	0.0000	-5.0156	Stationary	I(0)
LEFIj	0.0000	-4.9168	Stationary	I(0)
SANC	0.0008	-3.1703	Stationary	I(0)
LRER	0.0000	-13.7387	Stationary	I(0)
LARF	0.0000	-6.0767	Stationary	I(0)

Resource: Findings of research

Table (2)

Results of Unit Root Test of LLC (EU – side of export, import and bilateral trade)

Variable	Value of test statistics of LLC in level		Result	
	Probability value (PV)	Amount of statistics (t)		
LEX	0.0000	-4.0643	Stationary	I(0)
LIM	0.0000	-8.7726	Stationary	I(0)
LTRA	0.0000	-4.5632	Stationary	I(0)
LGDT	0.0000	-10.6519	Stationary	I(0)
LSIM	0.0000	-9.0874	Stationary	I(0)
LRFA	0.0000	-3.9267	Stationary	I(0)
LEFIi	0.0000	-6.5760	Stationary	I(0)
LEFIj	0.0000	-3.9098	Stationary	I(0)
SANC	0.0001	-3.8828	Stationary	I(0)
LRER	0.0000	-21.4886	Stationary	I(0)
LARF	0.0000	-7.4424	Stationary	I(0)

Resource: Findings of research

Results of Unit Root test for models of MENA region and the EU countries show that all variables are Stationary in level.

After determining the reliability of linear compound for the variables of models and confidence of absence of false regression, it was conducted F Limer test. According to the results of this test, it was accepted to use the methods of panel data.

After specifying results of the above test, dynamic panel data models were used by the two-stage method of Arllano & Band (GMM) that its overall form is as follows (results are represented in table (3)):

$$(Y_{it} - Y_{it-1}) = \propto (Y_{it-1} - Y_{it-2}) + \beta(X_{it} - X_{it-1}) + (\varepsilon_{it} - \varepsilon_{it-1}) \quad (4)$$

Table (3): Results of Estimating the Models EU and MENA

Variable	MENA			EU		
	LEX	**LIM**	**LTRA**	**LEX**	**LIM**	**LTRA**
C	-45.006 (0.002)	79.890 (0.348)	-14.862 (0.357)	-20.734 (0.178)	-126.917 (0.000)	-27.546 (0.005)
LEX(-1)	-0.112 (0.344)	-	-	**0.180 (0.000)	-	-
LIM(-1)	-	0.074 (0.729)	-	-	**0.128 (0.044)	-
LTRA(-1)	-	-	-0.069 (0.524)	-	-	0.047 (0.126)
LGDT	**4.490 (0.000)	-5.860 (0.396)	1.902 (0.168)	*1.707 (0.081)	**11.584 (0.000)	**2.910 (0.000)
LSIM	-0.808 (0.533)	-3.539 (0.638)	-0.914 (0.498)	-4.762 (0.325)	4.619 (0.554)	-1.325 (0.232)
LRFA	-1.075 (0.661)	-5.266 (0.526)	-2.266 (0.369)	-1.532 (0.172)	-1.921 (0.335)	-0.233 (0.186)
LEFIi	-0.692 (0.552)	1.807 (0.781)	0.768 (0.548)	*1.465 (0.012)	-2.529 (0.233)	-1.181 (0.481)
LEFIj	-0.986 (0.506)	-1.916 (0.888)	-1.867 (0.360)	-11.404 (0.111)	-0.648 (0.946)	3.084 (0.386)
SANC	-0.163 (0.191)	0.534 (0.221)	0.066 (0.587)	**0.130[7] (0.035)	**-0.682 (0.008)	*-0.115 (0.064)
LRER	0.080 (0.660)	-1.734 (0.391)	0.092 (0.609)	0.038 (0.697)	0.327 (0.323)	0.112 (0.924)
LARF	**-0.602 (0.002)	-1.255 (0.246)	*-0.296 (0.085)	**0.330 (0.000)	**-0.758 (0.002)	0.155 (0.212)
Number of observations	234	234	234	351	351	351
Number of variables IV[8]	100	100	100	100	100	100
Prob>chi2	0.000	0.000	0.000	0.000	0.000	0.000
Wald chi2	1078.50	20415.11	283.04	2641.89	688.04	662.84

Resource: Findings of research (* and ** are significances in level of 10% and 5% respectively)

[7] Faryadras: In the nuclear sanctions period, the price of exported products increased more than the agricultural exports. The currency changes during the sanctions were for the benefit of the agricultural exports and caused the sharp increase in exchange rates and competitive ability of products in all sectors, including the agriculture sector in global markets.

[8] Instrumental Variables

To examine compatibility of estimator GMM, it was used Sargan and serial correlation tests. Result of the Sargan test has been calculated due to the value of statistics and probability levels, confirmed zero hypothesis according to be valid the instrumental variables defined in the model and this model doesn't need to define more instrumental variables. Similarly, result of the serial correlation test showed that none of models of MENA and EU have correlation of AR (2) and instruments are valid. Consequently, there is no second-order serial correlation in the error statements of the first order differential equation in none of the models.

Due to the results of table (3), amount of annual rainfall has an inverse and significant (in level of 10%) impact on the bilateral trade value of agricultural products between Iran and MENA region countries and sanctions haven't a significant impact on the bilateral trade of agricultural products between Iran and the relevant countries. Then, it may be justifiable the negative impact of the amount of rainfall on exporting the agricultural products to MENA region countries so that one can said because these countries have located in the similar geographical and climatic regions with Iran, they have atmospheric proper rainfalls as Iran in the high-raining periods and, thus, there is a low need to import the agricultural products from Iran to these countries due to increase production of their products. Economic size of two trading partners (GDP) has a positive and significant impact (in level of 5%) on the volume of bilateral trade of the agricultural products between Iran and the EU countries (according to the results of researches of Khiyavi (2013) and Shamekhi (2014) about the impact of economic size on the volume of trading) and comprehensive and broad sanctions (SANC) have a negative and significant impact (in level of 10%) on the volume of the relevant trade with the EU countries (including reviews of Carsu (2003), Yang (2004) and Faryadras (2015)), while

severe sanctions have a positive impact on increasing export of agricultural products to the EU. It indicates that tightening the economic sanctions on Iran it decreases probability to import the agricultural products from the EU countries and it can face the food security and welfare and health of Iranian with the challenges. On the other hand, positive impact of economic sanctions on the export of agricultural products implies that Iran can design the new fields to meet its exchange needs through the regular planning and development of production and export of sections as agriculture in the conditions of heavy sanctions and in situations where export of some of Iran's basic products and particularly oil and gas and mineral resources are faced with the varied challenges. While other economic sections like banking, oil and military sections and so on are faced with the essential damages during imposing the sanctions according to the findings of some reviews (refer to Dizeji 2013, Dizeji & Bergeijk 2013, Dizaji 2014 and Dizaji 2018). Increasing in amount of rainfall has also a positive impact on export of agricultural products to the EU and, on the other hand, it is led to decrease need of Iran to import the agricultural products from the EU.

Conclusion & Proposition

In this study, with the purpose of evaluating the impact of imposed sanctions on Iran's bilateral trade of agricultural products with its trading partners in MENA region as well the EU, we analyzed statistical data and evaluated the experimental model. Analysis of statistical data implies that one of effective variables on the bilateral trade of Iran with MENA region countries is mainly an amount of annual rainfall and increasing an amount of rainfall and agricultural products in the countries of this region, it decreases their need to the trading of intra-regional agriculture. Economic sanctions haven't a significant impact on the agricultural products trade of Iran with its regional partners. While the most important effective

factors on the bilateral agricultural trade of Iran with the EU countries are general economy dimensions of trading partners and sanctions. Tightening economic sanctions against Iran is a very deterrent factor in import of agricultural products from the EU and it can face the access to relevant agricultural productions and foodstuffs with many challenges. Therefore, it is emphasized that policy-makers consider a special planning for the self-sufficiency in producing the agricultural products in the conditions of foreign threats. On the other hand, due to positive impact of sanctions on the export of agricultural products of Iran to the EU, policy-makers can consider agriculture sector as a probable canal for supplying at least a part of required exchange of the country. Significant impact of economic size of the EU countries on the agricultural trade with Iran shows that European larger economies have had more transactions in the field of agricultural products with Iran.

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