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The Effect of Economic Sanctions on Iran's Export

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Abstract

Since the Islamic Revolution of 1987, Iran has been affected by economic sanctions imposed by Western countries, especially the U.S. Since 2006 and with the development of the Iranian nuclear conflict, the United Nations has frequently imposed economic and financial sanctions against Iran. As a result of these international restrictions and their administration by an international organization, iran's exports has been heavily influenced. This study seeks to address the question whether the economic sanctions imposed against Iran's exports have been effective. And if yes, and if yes, to what extent this effectiveness, is. Due to the fact that the sanctions imposed on Iran have been at first less economic and they have intensified over time, the effect of the sanctions in the three years of 2012, 2013, and 2014 have been examined by the fixed-effects Gravity model extracted from the model of Anderson and van Wincoop. In addition, all the trade relations and models considered have been estimated through the PPML method to estimate the unbiased coefficients in order to use all the data and to avoid the problem of zeros. Based on our results, the sanctions imposed against Iran have had a significant and negative effect on the amount of export in Iran to all its trading partners considered in all the given years. The examination of the coefficients during the years 2012, 2013, and 2014 show that Iran's value of export has fallen annually by 33 percent in average and the total loss for these three years has been 104 billion dollars.

Keywords: Iran's Nuclear Conflict, Gravity Equation, PPML, Sanctions.

1. Introduction

In the wake of the Cold War, sanctions were imposed by the Western countries, particularly the U.S., as one of the common tools supposed to help in the promotion of democracy and human rights in other parts of the world. Moreover, the aim of some sanctions has been to prevent some countries from acquiring nuclear or chemical weapons. Since the Cold War, the number of sanctions imposed on countries has been added in such a way that

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they have increased from 1.8 new sanctions a year in the time period of 1945-1969 to 3.8 new sanctions a year in 1970-1989 and then to 6.3 new sanctions a year in the period of 1990-2000 (Hufbaur et al., 2007).

Sanctions can generally be divided into three types: military, diplomatic, and economic ones. Among them, the economic sanctions imposed against countries have been significantly practiced in recent years. Such sanctions usually target the business sectors of the countries and limit their trade and monetary flows. Iran and Russia are among the countries that have been the target for economic sanctions in recent years.

As mentioned earlier, the aim of sanctions has been the promotion of democracy and human rights. Therefore, it is expected that this tool could be used against countries that have dictatorship or coup-oriented governments or governments different from the ones elected by the people; nonetheless, the employment of this instrument by Western countries is selective. The review of the sanctions imposed on countries indicates that there are countries with autocratic systems and unfortunate situations of human rights that have escaped international sanctions, while countries with far greater democracies and better situations of human rights have been affected by the sanctions. In fact, due to the high political and economic costs placed on stable regimes as a result of sanctions, Western countries tend to put more pressure on vulnerable countries (Dizaji and van Bergeijk, 2013). Therefore, these countries consider other conditions at first, such as the political and economic costs of sanctions, and then attempt to impose them. For example, international pressure to impose sanctions on a country wherein a coup has occurred is more likely to be high. As well, these countries are likely to impose less pressure on countries with stable governments in comparison with the countries with high vulnerability (Soest and Vahman, 2015).

Despite the sanctions selectively imposed by Western countries, their effectiveness cannot be crucially assessed. Zimbabwe and North Korea are good examples of countries that have been under sanctions for a long time, but there are no specific symptoms of greater political liberty and their governments have been stable for many years. However, there are countries in which the level of political liberty after economic sanctions is improved.

Since the Islamic Revolution of 1987, Iran has been among the countries affected by economic sanctions imposed by Western countries, especially the U.S. These sanctions were intensified in 1995 following the joining of the American enterprises which had trade relations with the Iranian government. However, the effectiveness of the sanctions imposed against Iran has always been questioned due to the fact that other countries have not accompanied the U.S. in this respect. Since 2006 and with the development

of the Iranian nuclear conflict, the United Nations has frequently imposed economic and financial sanctions against Iran. As a result of these international restrictions and their administration by an international organization, Iran's economy has been heavily influenced in a way that Iran's crude oil exports have dropped from 2.5 million barrels per day in 2011 to 1.1 barrels in 2013. Accordingly, Iran's economy has declined by 5 percent in 2013 due to the limitations imposed on the private sector (Katzman, 2015).

Financial and commercial limitations imposed against a country which is the first largest country in terms of proven gas reserves and the fourth largest country in terms of oil resources could adversely affect financial markets, energy, and, beyond doubt, the economy in the Middle East and across the world. Considering the role and importance of Iran in global economy, since the beginning of the economic sanctions imposed against Iran, the effectiveness of these sanctions has always been discussed. After more than 8 years of economic sanctions against Iran and according to the available data, it is possible to examine the effect of economic sanctions on Iran's export. Thus, this study seeks to address the question whether the economic sanctions imposed against Iran's export have been effective. And if yes, what is the extent of this effectiveness?

2. Literature review

Although studies in this area compared to other areas of the economy are scant, they can be divided into two general categories. The theoretical issues and the modeling of an economy under sanctions using the general equilibrium theory and the conventional game theory are placed in the first category and the overall aim of the studies is at examining the effectiveness of sanctions in general as well as governments' reactions under sanctions. In the second category, there are more practical studies in which an attempt is made to estimate the impact of sanctions imposed on the private sector or the economy of countries via the econometric methods. Some of these studies are reviewed as follows.

Hufbaur and Schott (1985) argue that economic sanctions will not significantly help to achieve the objectives of foreign policy leading to the sanctions. They believe that the fulfillment of those objectives is likely to occur only in special cases, such as the time when the country under the sanctions or the goal of the policies is mild.

Ling Lam (1990) believes that the presence of bias in the methodology used in the study by Hufbaur and Schott has led to the above-mentioned results, so they are to be questioned. Using the Probit model, Lam concluded

that import controls can have significant effects on sanctions and their consequences can influence achievement to foreign policy goals.

Using a General Theoretical Equilibrium model, Dollery (1993) showed that trade and financial sanctions designated have a negative effect on the welfare of a small country. According to this study, the main burden of financial sanctions is on capital-intensive import sectors. In contrast, the main burden of trade sanctions is against labor-intensive export sectors.

Hufbaur et al. (1997) used a generalized gravity model and examined the effect of economic sanctions imposed by the U.S. and the OECD countries against various countries over the three years of 1985, 1990, and 1995 through ordinary least squares method. In these studies, the sanctions were divided into the three types of limited, moderate, and severe based on the extent of their severity. According to the results, sanctions imposed in limited, moderate, and severe forms had moderately reduced the trade to 27.4, 35.6, and 91 percent, respectively. As well, due to the sanctions imposed, the missing trade for the U.S was about 19.031 billion dollars.

Using a gravity model and taking 30 trading partners into account, Bigdeli, Gholami, and Boldaji (2013) estimated the effects of economic sanctions imposed on Iran in the time period from 1973 to 2007. According to the results of this study, the negative impact of sanctions was 0.08 and the sanctions imposed against Iran had a small and negligible impact on bilateral trade with partners.

Oechslin (2014) investigated the treatment of authoritarian regimes under sanctions through a model. According to this study, the country under sanctions seeks policies to worsen the detrimental effects of the sanctions. Based on the model presented in this study, autocratic regimes reduce the supply of their public goods to decrease the productivity of the private sector. This can lead to rebellion and revolutionary movements against the government and as a result the costs of rebellion and objection increase via the administration of restrictive policies by the government. This status can last as long as the sanctions are abolished and actually make the effect of the sanctions on changing the regime nonsense.

According to a study by Faraji Dizaji (2014), economic sanctions that led to the limitations of government revenue from oil exports could affect government spending as an important factor in Iran’s economic growth.

Farzanegan and Parvari (2014) employed VAR[1] and Impulse Response Function methods to examine the effects of economic sanctions on Iran’s oil prices. The time period considered in this study was from 1965 to 2012. The

1. Variance Decomposition Analysis

results of this study indicated that through the control of oil supply by other countries, the global income as the dummy variable of post-revolutionary Iran sanctions, if Iran's oil exports have a negative shock and drop; global prices in the first two years respond to this shock in a negative and significant form, but then again the prices reduce which could be justified due to oil supplies by other countries to world markets and filling the proportion of Iran.

Etkas and Zimring (2015) studied the effects of changes in welfare in the Gaza Strip during the siege of the territory by the use of household expenditure and enterprise production from mid-2007 to mid-2010. In order to compare the situation in the region as well as the economic changes with the given changes, the West Bank was considered. According to the findings of this study, welfare in the Gaza Strip has reduced by 14.27 percent. Also, households with higher spending levels before the blockade of the Gaza Strip have lost more welfare. The blockade has also led to the movement of the workforce of the industrial sector or the sectors dependent on input import to service sectors, and the productivity of the workforce in this period has declined by 20% in average.

Using the gravity model employed in the study by Hufbaur et al. (2007), Devarjan and Mottaghi (2015) investigated the effect of sanctions imposed on Iran's trade with major trading partners. In this study, 28 commercial partners of Iran in the time period of 2000-2014 were considered. According to the results, with severe economic sanctions by the European Union (EU) and the U.S. against Iran, Iran's export revenue was decreased by 17.1 billion dollars during the years 2012-2014. Also, in the case of lifting the economic sanctions against Iran, imports would be oriented to the U.S., Germany, and the Netherlands as well as Asian countries such as South Korea, China, and Singapore.

3. Theoretical Foundations and Methodology

The gravity model was used in this study. The gravity model was first introduced by Tinbergen in 1962. However, due to the more physical nature of the model than its economic essence, it has been used less in order to express the trade relations between the countries. In the meantime, Trefler, in 1995, proposed the idea of missing business and focused on obstacles such as geographical distance that were against trade. In those years, it was believed that due to advances in technology and the integration of countries' economy in the global economy, we were facing a world without borders wherein the geographical distance played no role. However, McCallum used the gravity model in 1995 and showed that borders and geographical

distance between countries are also important and have an impact on the trade between the countries. At this time, the gravity model was introduced as one of the tools to measure and explain the missing trade.

Anderson and van Wincoop (2003) were among those who provided the theoretical foundations for the gravity model. Based on the model presented by Anderson and van Wincoop, the exports from region i to region j can be demonstrated as follows:

$$x_{ij} = \frac{y_i y_j}{y^W} (\frac{t_{ij}}{\Pi_i P_j})^{1-\sigma}$$

where in

$$\Pi_i \equiv \left(\sum_i (t_{ij}/P_j)^{1-\sigma} \theta_i \right)^{1/(1-\sigma)}$$

$$P_j = \left(\sum_i (t_{ij}/\Pi_i)^{1-\sigma} \theta_i \right)^{1/(1-\sigma)}$$

In the above equation, Π_i and P_j are literally called "multilateral resistance". As well, considering the distance and having a common border, the business cost in this model is as follows:

$$t_{ij} = b_{ij} d_{ij}^{\rho}$$

Taking all the data into account, the model presented by Anderson and van Wincoop gives unbiased coefficients and can be calculated in different methods. In the study by Anderson and van Wincoop, the nonlinear ordinary least squares method was used, but Head and Mayer (2013) introduced an iterative structural estimation method in order to estimate this gravity equation.

The model by Anderson and van Wincoop can be called the structural gravity equation. This model can be changed into the reduced form with little alterations and provide a better estimation of the model by using the fixed impacts of exporting and importing. In fact, if there are unobservable factors specific to each region or country, the fixed effect due to the effect of these factors will bring about more reliable results, which is an advantage of using this method. But in the fixed effects method, the economic structure and all data are not taken into account; while this limitation is not observed in the method provided by Anderson and van Wincoop (Anderson, 2011). The abbreviated form of the model by Anderson and van Wincoop can be statistically illustrated as follows:

$$X_{ij} = x_i m_j t_{ij}^{1-\sigma} \varepsilon_{ij}$$

In this equation, x_i represents fixed effects for the country i as an exporter and m_j shows fixed effects for the country j as an importer. It should be noted that according to a study by Anderson and Yotov (2010), the results of the fixed effects ($x_i m_j$) are very close to the statement in a gravity model which is obtained through the data from the whole economic system ($Y_i E_j \Pi_i^{\sigma-1} P_j^{\sigma-1}$). In short; according to these studies, the method by Anderson and van Wincoop and the fixed effects method have similar results; however, considering the effect of other unobservable variables on trade in the fixed effects method can have more reliable results. That is why it is used in more recent studies.

The estimation of the gravity models, regardless of the business relationships with values of zero and the presence of heterogeneity of variances, leads to inconsistencies in coefficients. Using Jensen's inequality, Silva and Tenreyro (2008) showed that in the log-linear models where the coefficients are interpreted as traction, if there are variance differences and the least squares method is employed, the results obtained will be confusing. In this study, Poisson Pseudo Maximum Likelihood (PPML), with attention to providing compatible estimators, has been introduced as an appropriate method. Also, the study by Fally (2015) revealed that in both fixed effects method and Anderson's method, coefficients obtained from the fixed effects model that have been estimated using the PPML are consistent with Anderson's model which has more limitations in terms of the multilateral resistance.

3.1. The given model

According to the contents expressed in the theoretical foundations, the effect of economic sanctions on Iranian exports was examined through the fixed effects model. This model is similar to the model considered by Anderson and Yotov (2010) in their study. Moreover, due to the problem of heterogeneous variances and removal of zeros, the PPML method was used to estimate compatible coefficients. The model used in this study is illustrated as follows.

In the abbreviated version of the gravity equation (fixed effects), trade costs are included among the factors affecting the bilateral trade. The commercial costs displayed via t are the costs of geography, culture, customs, and traditions. According to the economic sanctions imposed on Iran and its role in increasing trade costs with Iran, the entry of the effect of sanctions into the cost function can be consider as its effect on international trade. In fact, the economic sanctions as a dummy variable such as the

variable of a common language or a common border enter into the function of trading costs. Considering other factors, this function is made clear as follows:

$$X_{ij} = x_i m_j t_{ij}^{1-\sigma} \varepsilon_{ij}$$

$$t_{ij}{}^{1-\sigma} = e^{\beta_1 lnDist_{ij} + \beta_2 Sanction_{iran} + \beta_3 Border_{ij} + \beta_4 Lang_{ij} + \beta_5 Colony_{ij}}$$

In this regard, log LnDist represents the geographical distance between the two countries of i and j, sanction is the dummy variable to account for the effect of sanctions on Iran's exports to countries which is 1 for the countries importing goods from Iran and zero otherwise. Border is the dummy variable to determine the effect of having common borders. If the two countries of i and j have a common border, it is equal to 1 and otherwise it is zero. Lang is also the dummy variable to consider the effect of having a common language between the two trade partners. This variable is 1 if the two countries have a common language and zero if not. Colony is a dummy variable that is 1 if the two trading sides have common colonial history and zero otherwise.

If the relationship between the above costs is incorporated into the gravity equation by Andersen and van Wincoop, it will be as follows:

$$\frac{x_{ij}}{y_i y_j} = \frac{1}{y^W}\left(\frac{1}{P_i P_j}\right)^{1-\sigma} e^{\beta_1 lnDist_{ij} + \beta_2 Sanction_{iran} + \beta_3 Border_{ij} + \beta_4 Lang_{ij} + \beta_5 Colony_{ij}} \epsilon_{ij}$$

To estimate the compatibility of this model, to avoid inconsistency of variance, and to use all the data; the PPML fixed effects model was used. Accordingly, if the dummy variable is considered for the effects of the exporting country (e) and importing country (m), the above relation is converted into the following relation that is estimated in this study:

$$\frac{x_{ij}}{y_i y_j} = c + e_i + m_j + \beta_1 lnDist_{ij} + \beta_2 Sanction_{iran} + \beta_3 Border + \beta_4 Lang + \beta_5 Colony + \varepsilon_{ij}$$

3.2. Data

In the beginning years, sanctions imposed against Iran have been largely non-economic and therefore the economic statistics show that in these years, they did not have a dramatic effect on Iran’s economy. With the passage of time and since 2012, economic sanctions intensified. The sanctions in 2012 and the ensuing years had a severe impact on the Iranian economy.

According to the Central Bank of Iran and despite high oil prices in 2012, the dollar exchange rate rose from 19000 Rls to 32000 Rls. This severely affected Iran's economy and consequently the economic growth became negative. In the process of economic sanctions imposed against Iran, Iran's trading partner countries, especially in the field of petroleum and energy have been allowed to gradually and not suddenly curtail their business relationship with Iran and so necessarily in the beginning years of sanctions they did not interrupt or limit their economic ties with Iran unpredictably. For this reason, it is expected that the sanctions have little effect on international trade in the initial years, and this effect furthers with countries joining the sanctions.

In order to evaluate the effectiveness of the sanctions during this time, according to the statistics, the three years of 2012, 2013, and 2014 were considered. In 2012, the economic sanctions intensified to some extent and in the subsequent years, with the involvement of other countries, the sanctions rose to extreme levels. Statistics on Iranian trade were not available in the time period under review and these figures and statistics are made using data from the imports by trade partners of Iran. In order to use all the data, a total of 185, 183, 163 countries are considered for the years 2012, 2013, and 2014, respectively. In order to fix the problem of zeros and to use the PPML method, all possible trade relations between the countries are taken into account. For example, in 2012, a total of 185 countries considered could eventually have 34040 bilateral relationships in which the trade relation without any number is zero (Given the method employed and in order to present answers, several observations were removed). All the data related to the cost variables were derived from CEPII. The national income statistics and trade statistics have been extracted from the World Bank and the database of the United Nations, respectively.

4. Results

According to the presented model, it is expected that the variables of sanctions and geographical distance have a negative index due to their negative effect on business costs; in contrast, language, geographical borders, and a common colonial history with their effect on the reduction of business costs have a positive index.

According to the results obtained from the estimation of the gravity model and the PPML method, sanctions imposed against Iran in all the given years have left a negative effect on exports. The examination of the coefficients during the years 2012, 2013, and 2014 show that Iranian exports have fallen annually by 33 percent in average. Likewise, in comparison with

exports in 2012, the effect of the sanctions has been more in the two subsequent years which could be due to the intensification of economic sanctions and the approval of extreme resolutions against Iran. Also, as mentioned earlier, trading partners of Iran have limited their trade relations with some interruptions and delays. Since the sanction variable is a dummy variable, the coefficients obtained need to have an exponentiation of e and reduce it from 1 to determine the effect of sanctions on the actual amount of exports. Accordingly, in 2012, the sanctions decreased Iran's exports to 28 percent. This amount has increased in 2013 and has reached to 40 percent and, with a 10-percent reduction, it has reached to 30 percent in 2014.

Given the effect of sanctions on Iran and if Iran's exports were not affected by the sanctions, it could increase its exports in 2012 to 32 billion dollars. According to the Central Bank and the National Iranian Oil Company, oil exports fell by 1 million barrels per day in 2012 and the results obtained confirm the sharp decline in Iranian exports as a result of the sanctions imposed. Iran's missing exports in 2013 was equal to 44 billion dollars and this amount in 2014 was 28 billion dollars. The results of this study are different from the results obtained from the study by Devarjan and Mottaghi in terms of the impact of sanctions imposed on Iran's exports. According to this study, the total losses of Iran in the three years of 2012, 2013, and 2014 were 17 billion dollars, while in the present study, the loss was 104 billion dollars (Table 1). A simple calculation based on Iran's oil exports reveals that the figure of 17 billion dollars cannot be accurate. If we assume the average sale of Iranian oil in 2012 equal to 100 dollars and 1 million barrels a day is reduced from Iran's exports, reducing Iran's trade in one year will be far more than 17 billion. It should be noted that in the study by Devarjan and Mottaghi, only 28 countries have been considered and in the method used in the present study, all the data is not used and only the existing commercial relations are taken into account (the problem of zeros).

Table 1. The effect of the sanctions imposed on Iranian exports

Year	2012	2013	2014
Real Exports	83.992	64.461	65.158
Percentage of Effects of Sanctions	28	40	30
Exports without Sanctions	116.713	108.535	93.955
Missed Exports	32.721	44.073	28.797

Source: Research findings

Also, as shown in Table 2, the distance log to the trade between the countries considered in all the years has been significant with a negative impact. Having a common language and a common colonial history have

also entailed an index as expected as well as a positive effect on trade between countries in the considered time period. As a rule, countries that have been independent from a common colonial country have many similarities as being identical in terms of governmental or administrative system and this fact reduces the business costs between them. Common borders have also had a positive index expected during the considered years.

Table 2. The estimated coefficients of the gravity model

	2012		2013		2014	
Variable	**Coefficient**	**Standard Error**	**Coefficient**	**Standard Error**	**Coefficient**	**Standard Error**
Intercept	-30.08*	0.153	-30.77*	0.134	-31.31*	0.146
Log of Distance	-1.19	0.011	-1.08*	0.009	-1.113*	0.01
Common Border	0.49*	0.055	0.786*	0.048	1.02*	0.051
Common Language	0.853*	0.023	0.548*	0.018	0.797*	0.021
Common Colonial History	0.664*	0.063	0.637*	0.058	0.635*	0.062
Effect of Sanctions	-0.329*	0.125	-0.521*	0.105	-0.366*	0.111
No. of Countries	185		183		163	
Sample Size	23552		33306		26406	

Significant at the level of 95 percent

Source: Research findings

Conclusion

The aim of this study was to estimate the effect of economic sanctions on Iran's exports. Due to the fact that the sanctions imposed on Iran have been at first less economic and they have intensified over time, the effect of the sanctions in the three years of 2012, 2013, and 2014 have been examined. Given the stable oil prices in these years, the fluctuations in Iran's exports have been due to the factors other than oil price fluctuations which can provide useful data to identify the effect of sanctions. In order to investigate the effect of economic sanctions on Iran in these years, a dummy variable is used. Also, according to the models presented, the fixed effects model extracted from the model of Anderson and van Wincoop is used. In addition, all the trade relations and models considered have been estimated through the PPML method to estimate the unbiased coefficients, in order to use all the data and to avoid the problem of zeros.

According to the results, the sanctions imposed against Iran have had a significant and negative effect on the amount of exports in Iran and all the countries considered in all the given years. As well, the intensity and the

extent of this effectiveness over time compared to 2012 have increased which could be due to the exacerbation of the economic sanctions over time, as well as joining of more countries to the sanctions. According to the results, the sanctions imposed in each year have decreased about 33 percent of Iran's exports annually and have imposed a loss of 104 billion dollars on Iran's trade. Given the reduction of 1 million barrels in Iranian exports, these results were not unexpected. Similarly, according to the results, the effect of the sanctions has been much more than the 17 billion dollars mentioned in the study by Devarjan and Mottaghi (2015). The positive effect of common language, geographical borders, and colonial history can also be noted as the results of this study. The results revealed that with increasing geographical distance, the amount of trade between the given countries was decreased. According to the results of this study, it was implied that if sanctions continued, the negative and severe effects of sanctions on Iran's export would last and the further decline of Iran's national currency against other currencies would go through a far more severe decline than the one in 2012.

References

Anderson, J. E. (2011). The Gravity Model. *Annual Review of Economics, 3*, 133-160.

Anderson, J. E., & Van Wincoop, E. (2003). Gravity with Gravitas: A Solution to the Border Puzzle. *American Economic Review*, *93*(1), 170-192.

Anderson, J. E., & Yotov, Y. V. (2010). The Changing Incidence of Geography. *American Economic Review, 100*, 2157-86.

Bigdeli, M. Z., Gholami, E., & Boldaji, F. T. (2013). The Effect of Sanctions on Iran's Trade: An Application of the Gravity Model. *Pajhooheshname Eghtesadi*, *13*(48), 109-119.

Devarjan, S., & Mottaghi, L. (2015). *Economic Implications of Lifting Sanctions on Iran*. Middle East and North Africa Quarterly Economic Brief, USA, Washington DC, World Bank, July.

Dizaji, S. F. (2014). The effects of Oil Shock on Government Expenditures and Government Revenues Nexus (with an Application to Iran's Sanctions). *Economic Modelling*, *40*, 299–313.

Dizaji, S. F., & Van Bergeijk, P. AG. (2013). Potential Early Phase Success and Ultimate Failure of Economic Sanctions: a VAR Approach with an Application to Iran. *Journal of Peace Research, 50*(6): 721–736 .

Dollery, B. E. (1993). A Conceptual Note on Financial and Trade Sanctions against South Africa. *Economic Analysis and Policy, 23* (2), 179-188.

Etkes, H., & Zimring, A. (2015). When Trade Stops: Lessons from the Gaza Blockade 2007–2010. *Journal of International Economics, 95*, 16–27.

Fally, T. (2015). *Structural Gravity and Fixed Effects*. National Bureau of Economic Research Working Paper Series, 21212.

Farzanegan, M. R., & Parvari, M. R. (2014). Iranian-Oil-Free Zone and International Oil Prices. *Energy Economics, 45*, 364–372.

Head, K., & Mayer, T. (2014). *Gravity Equations: Workhorse, Toolkit, and Cookbook*. 4th Ed., Handbook of International Economics, Gopinath, Helpman, and Rogoff.

Hufbauer, G. C., Elliott, K. A., Cyrus, T., & Winston, Elizabeth (1997). *US Economic Sanctions: Their Impact on Trade, Jobs, and Wages*. Working Paper Series Working Paper Special (2). Peterson, Institute for International Economics.

Hufbauer, G. C., Schott, J. J., Elliott, K. A., & Oegg, B. (2007). Economic Sanctions Reconsidered. 3rd Ed.,Washington D.C., Peterson, Institute for International Economics.

Hufbauer, G. C., & Schott, J. J. (1985). *Economic Sanctions Reconsidered: History and Current Policy*. Washington DC, Institute for International Economics.

Katzman, K. (2015). Iran Sanctions. Congressional Research Service, RS20871.

Lam, S. L. (1990). Economic Sanctions and the Success of Foreign Policy Goals. *Japan and the World Economy, 2*, 239-248.

McCallum, J. (1995). National Borders Matter: Canada-U.S. Regional Trade Patterns. *The American Economic Review, 85*, 3, 615-623.

Oechslin, M. (2014). Targeting Autocrats: Economic Sanctions and Regime Change. *European Journal of Political Economy, 36*, 24–40.

Santos Silva, J., & Tenreyro, S. (2006). The Log of Gravity. *Review of Economics and Statistics, 88*(4), 641-658.

Soest, C. V., & Wahman, M. (2015). Not all Dictators are Equal: Coups,

Fraudulent Elections, and the Selective Targeting of Democratic Sanctions, *Journal of Peace Research, 52* (1): 17-31.

Tinbergen, J. (1962). Shaping the World Economy: Suggestions for an International Economic Policy. New York, Twentieth Century Fund.

Trefler, D. (1995). The Case of the Missing Trade and other Mysteries. *The American Economic Review, 85*(5), 1029-1046.