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Research Article

The Effect of Sanctions on Exchange Rates through GMM Method (A Cross Country Comparison)

Mohammad Sadeqh Rasolyar[1*], Javad Babaei[2], Shima Yavari[3]

[1]Isfahan University
[2]Razi University, gavad.gbp.a@gmail.com
[3]Razi University, shima.yavary@yahoo.com

ABSTRACT

The present study aims to investigate the effect of sanctions on exchange rates through GMM method and contemplating two scenarios. Data collection is done using chronological ordering of the cases in Iran, Burma, Cuba, North Korea, Sudan and Syria from 1974 to 2011. Data analysis is done using GMM method because it is not only a strong method for analyzing panel data but also increases the model's explanatory strength. In the first scenario, the effect of sanctions on exchange rates is estimated considering each country. The results of this estimation indicated that the relation between sanctions and exchange rates fluctuations is positive and a 1% sanction increase would increase exchange rates fluctuations by 0.38. In the second scenario, the effect of sanctions on exchange rates in Iran is investigated. The results of this estimation indicated that the relation between sanctions and exchange rates fluctuations is positive and a 1% sanction increase would increase exchange rates fluctuations by 0.12. Obviously, the effect of sanctions on exchange rates in Iran is more than that of the other countries.

Keywords Economic Sanctions; Exchange Rates; GMM.

INTRODUCTION

New sanctions especially Rial sanctions have had the greatest impact on financial deals outside of the country and have decreased the demand for exchange inside the country. An increase in the demand for exchange inside the country increases the exchange price itself and this has a negative effect on Iran economy since a reduction in the value of the national exchange increases inflation.

Some commercial deals were done outside of Iran especially in Turkey and Dubai so there was no need to change Rial to dollar in Iran and it was done in those countries. Foreign exchange stores could change Iran exchange to dollar upon Rial sanctions and this demand was better to be targeted towards inside markets. The pressure for such demands inside the country would lead to an increase in the demand for dollar and this would increase dollar and other foreign currencies price itself since the inside market doesn't have sufficient exchange resources.

Meanwhile exchange rates fluctuations had decreased in the last couple of months, Rial sanctions will shock the exchange price particularly dollar price. Since we are over dependent on oil incomes and there are high fluctuations in these incomes, high fluctuations of exchange rates are observed.

In prosperous times, the government inclination for using torque (nominal anchor) exchange rate to combat inflation would decrease the true exchange rate. The true exchange rate decrease was evident in the prosperous days of oil in 2001s. This would in turn reduce the competition between Iran manufacturers in national and international markets. During insufficient exchange resources (hard economic sanctions from 2012 to 2013), the floating exchange rate system will fail and the governments will turn to exchange multi-rate together with budgeting.

However the drop in national exchange value in current conditions is to the best advantage of the exporters. But due to the unpredictability of emergencies, national manufacturers can't risk to make investments for export development. The multi-rate exchange system was used during 2012-2013. Central bank can't actively intervene in the exchange market due to the exchange resources limitation & the unclear future of Iran's nuclear issues and sanctions. The government prefers the dollar price not to fall less than 26500 Rials in 2014 for budget compensation. Therefore manufacturers' competition has increased. However, foreign trades and international payments' barriers have led to the prevention of non-oil exports development. Exchange rates fluctuations have increased investment risks and trading activities.

As far as the return to the floating exchange system is concerned, it should be mentioned that the central

* Corresponding Author
Mohammad Sadeqh Rasolyar
mohamad.sadegh.rasouliar@gmail.com

bank has to return to the floating exchange system and advocate the fixed exchange rate in 2013 budget law. We should note that the implementation of this policy by the central bank would be difficult in the absence of a predictable outline of the sanctions since advocating any acceptable exchange rates in the current unclear nuclear conditions would lead to the loss of central bank resources. In particular, the central bank can't easily access its deposits in foreign banks in the current international money exchange sanctions. A move can be made towards floating single exchange rates after partial or total removal of sanctions. In this case, returning to the dollar price less than 26000 Rials can decrease manufacturers' competition and intensify payment balance reductions. During the last couple of years, Iran's access to the international financial market has significantly decreased upon the implementation of sanctions. Additionally, in some cases even the access to western financial markets was almost impossible. Rials value has dramatically dropped since financial sanctions Iran's access to oil incomes.

Sanction isn't the major cause of exchange crisis in recent years. The dollar demand for importing purposes superseded exchange supplies since financial sanctions impeded foreign exchange exchanges and this in turn intensified Rials value reduction. In order for Rial price to fix, the government shouldn't be money-oriented. This not only causes inflation but also increases inflation expectations of the government and reduces the demand for national money. In such circumstances, people change their own money to foreign exchange which results in a drop in money value. If the government has access to high oil incomes earned by selling to foreign countries in the time of its prosperity, central bank will intervene in the market in order to gain back people's trust. None of the above exists during the time sanctions are implemented.

Exchange crisis began in 2012. Even though Iran's foreign exchange resources had not finished, government encountered a dramatic drop in the value of Rial in 2012 due to financial sanctions on bank exchanges with foreign countries. This resulted in an intensive inflation. To stop this, the Iranian government implemented capital control on the one hand and limited access to foreign exchange for importing life necessities on the other. For any other type of goods, importers were dependent on free market in which exchange value is determined in a competitive way. The government has shown to be more flexible using multiple exchange rates and aligned his national policies for creating demand growth balance.

It also limited governmental expenses being equal with the growth of bank credits, excessive demands and the pressure for increasing the prices. Even a fixed exchange rate can be unpleasant if the government intervenes. Fixing the exchange rate has endless advantages. Predictability of the exchange rate attracts national deals trust and increases the number of foreign investors. Nevertheless, the major cause of the exchange crisis was extensive financial policies during intensive inflation that was followed by the transfer of governmental subsidies in the energy sector considering that the recent financial sector was a trigger.

Lack of access to high value exchange is one of the effects of sanctions on exchange rates fluctuations which was caused by oil export reduction on the one hand and Iran's disability to collect oil incomes from other countries on the other. Before implementation of JPA (mutual implementation program), around 1.5 billion dollars was kept in foreign accounts every month that is more than 3.4 billion dollars. Part of this was because of Iran's disability to determine goods in importing countries equal to our financial claims from other countries.

The above-mentioned can only justify the effect of inflation on exchange rate in Iran. Obviously, exchange rate has gone through different fluctuations but how much of this chaos is truly caused by inflation?

Countries sanctioned by the United States are: North Korea 1950, Cuba 1962, Iran 1979, Syria 1986, Burma 1997 and Sudan 2002. It is noteworthy that exchange rate fluctuations have not been as intensive as in Iran in any of the mentioned countries.

DATA ANALYSIS

Since the current study aims to investigate the effect of sanction on exchange rate in the sanctioned countries, the variables of the study are analyzed first. A virtual variable is used for analyzing the effect of sanctions. The exchange rate is taken as dependent variable. Also, Inflation, GDP per capita, government expenses and sanction as virtual variable were selected as independent variables. Regarding the nature of the data and the selected countries, the panel data method was the best method for conducting the analysis. Due to the presence of the dependent variable on the right hand of the selected model, the GMM method is used.

The advantage of the GMM method is that

All regression variables that don't correlate with the residuals. (Including……variables and differential variables) could potentially be instrumental variables. What is important about this quick estimator is that it doesn't need detailed information of the residuals distribution. It should be noted that when there are variance difference, GMM method should be used since GMM doesn't have anything to do with regression assumptions (it also includes normality).

The underlying assumption of this approach is based on the fact that disturbing variables in the equations don't correlate with the series of instrumental variables.

By choosing the right instrumental variables, this estimation method can apply a weight matrix to create a suitable estimator for dissimilar variances. Considering

the specific conditions of the proposed model, the relationship between the explanatory variables and the residuals is expected. Due to structural failure in the normal process of variables due to events such as revolution, war, and the development of different socio-economic programs, ……variance phenomenon is expected. It seems as if the most practical estimator is GMM in current situation.

The expanded form of the model is as the following:

$$lexchange_{it} = \propto_0 + \propto_1 lexchange_{it-1} + \propto_2 lgdp_{it} + \propto_3 cost_{it} + \propto_4 linf_{it} + \propto_5 sa_{it}$$

The model variables are as the following according to the definition: Exchange, GDP, INF, SA, and Cost

To solve the problem of inbreeding potentiality of the explanatory variables, the systematic estimators method based on the observation of the explanatory variables as instrumental variables is used.

These intervaling values are the most appropriate instrumental variables: 1. the error should not have serial correlation and follow a changing average of the specified order.

2. Future initiatives of dependent variables should not affect the current values of the explanatory variables but can be influenced by the current and past values of the dependent variable (i.e. inbreeding is common).

To specify the variables of the model, the variables reliability is tested by Elliot & Johnson, Richard, expanded Fuller and Shane et.al. Later, the model was estimated by GMM method and then the value of control variables namely; government costs, inflation rate and gross domestic product are measured.

If we realize during the processes that the two-step GMM would be more appropriate, AR test will be also used in addition to the above test. The population of the study includes all annual time series variables in the Iran, Burma, Cuba, North Korea, Sudan and Syria economy over the 2011-1974 (2011 - 1974) period which is obtained from the official statistics of the Central Bank of the Islamic Republic of Iran and the Central World Bank. Also, the subject matter analyzes the effect of sanctions on the exchange rate using GMM (inter-country comparison).

Model Estimate

The following table demonstrates the result of economic sanctions effects on the exchange rate when all countries are included using GMM dynamic panel data. The results of this estimation indicated that economic sanctions significantly affect exchange rate.

Table 1- Estimation results by GMM for all of the country using GMM

variable	coefficient	statistic Z	P-Value
lexchange(-1)	0.6270	9.79	0.000***
lgdp	0.2930	3.43	0.001
cost	7.78	7.74	0.000
linf	0.0449	0.56	0.574
sa	0.3882	3.72	0.0000
constant	2.8526	8.66	0.0000
Wald test	------	6897.89	0.0000
Sargan test	------	50.3069	0.2379

Source: research findings

According to the above table, the intervaling exchange rate has a significant positive effect on the exchange rate in the current year. In other words, a 1% increase in the exchange rates previously would increase exchange rates by 0.62 if other conditions are kept constant. In other words, changes of the exchange rates in a period of time is not limited to the same period and recession or prosperity in one time can affect later periods.

Also, according to the results, the relationship between economic sanctions and exchange rate is positive. A 1% increase in economic sanctions would increase the exchange rates by 0.38, which means that exchange rate increases by increasing sanctions. Also, a positive relation was found between GDP, government costs and inflation with export, which means that a one percent increase in GDP, would increase the exchange rates by 0.29.

Additionally, an increase in government costs by one percent would significantly increase the exchange rate by 7.78. Sargan test statistics of the distribution with equal degrees of freedom and unknown limitations rejects the null hypothesis stating that residues are correlated with instrumental variables. The result confirmed the validity of the interpretation.

In the Wald test, if the probability is less than 0.05 the model would be significant, i.e. even if one of the variables is questioned to be significant or not, the total regression wouldn't be questioned in terms of significance. Therefore the validity of the results in the above table is confirmed by parent & Sargan tests. The results of the above table, considering all the countries as a unit of countries, indicates that the imposition of sanctions and will increase the exchange rate in general.

This verifies the hypothesis that sanctions affect the exchange rate. but the main research question is whether this influence exists in the same way in the Islamic Republic of Iran and with the same intensity or not.

To answer this question, the impact of sanctions on the exchange rate is estimated using GMM only for the country and we will continue to evaluate the results.

The estimated results for the country are given in the following table:

variable	coefficient	statistic Z	P-Value
lexchange(-1)	0.6255	5.76	0.000***
lgdp	0.2335	1.65	0.099
cost	0.8616	7.47	0.000
linf	0.0027	0.51	0.012
sa	0.1259	2.85	0.004
constant	-0.2621	-0.60	0.548
Wald test	------	3794.12	0.000
Sargan test	------	21.6206	0.0998

Source: research findings

Based on the results of the table, the intervaling amounts of exchange rate in the country have a positive and significant impact on the exchange rate this year, i.e. a 1% increase in the exchange rate previously would increase exchange rates by 0.62 if other conditions are kept constant. In other words, changes in the exchange rate in a period of time affect it in other later time periods as well. Also, a positive relation was found between GDP, government costs and inflation rates. A 1% increase in GPD would increase exchange rates by 0.23. Additionally, a 1% increase in government costs would increase exchange rates by 0.86. Finally, a 1% increase in sanctions would increase exchange rates by 0.12.

4- CONCLUSION

Economic sanctions are drastic strategies of countries against one another. The aim of sanctors is to make the other countries change their international positions and accept prevailing international conducts. One such sanctions is economic sanctions that aim at depriving the economy to benefit from global markets, services and capital that in turn has detrimental effects on the economy. Nowadays the export embargo has become one of the main challenges for the international community Economic .thrym not only directly lead to reduced restrictions on exports and access to world markets, but also indirectly through its widespread impact on other macroeconomic variables such as exchange rates, inflation and GDP of a country's economy entry targets because of rising unemployment and the negative effects on human rights has led to concerns over the rise.

Do a lot of study of economic sanctions in recent years, represents the public interest and its importance has been the subject of studies by different researchers demonstrated that the economic sanctions and foreign trade, especially exports, there is a negative relationship Dard.asrat Sanctions in different countries, depending on the particular circumstances of its economy. In Myanmar, for example, about 80% of the manufacturing industry in the United States prior to the imposition of sanctions against it. After Kshvrsadr and economic sanctions that this was a targeted industry, export industry. In Iran, due to a sharp decline in the

economy and its dependence on oil monoculture wide control the negative effects of the oil and non-oil production and exports are. So expect the economic conditions, sanctions, have different effects on the economy.

This study investigated the effect of economic sanctions on the exchange rate.in the fourth quarter, we see that, the first hypothesis about the significance of the effect of sanctions on the exchange rate will be accepted, but in conjunction with the second hypothesis about the impact of sanctions on the exchange rate in the sanctions should be the same as that This hypothesis can be rejected, according to estimates in the fourth quarter, meaning that the effect of sanctions on exchange rate fluctuations in embargoed countries are not the same.

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