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The Impact of the Real Exchange Rate Volatility on Non-oil Exports: The Case of Iran

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Abstract:
Up to now, the impact of real exchange rate on the non-oil exports of Iran has been mainly on focus. However, the more important aspect of the fluctuations in exchange rate is its degree of volatility which can have profound effect on the non-oil exports. Hence, the main objective of this paper is to investigate the linkage between non-oil exports and the real exchange rate volatility for Iran over the period of 1971-2007. For this purpose, a proxy for the real exchange rate volatility has been estimated by using GARCH model. Then, a conventional exports function has been estimated by Johansen's multivariate co-integration approach. The empirical findings reveal that among the explanatory variables, the real exchange rate and its volatility have positive and negative impact on the non-oil exports of Iran respectively.

Keywords: GARCH Model, Iran, Johansen's Co-integration Technique, Non-oil Export, Real Exchange Rate,

JEL Classification: C22, F14, F33

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1. Introduction

Like the other oil exporting counties, the major challenge facing Iranian economy is its overwhelming dependence on the petrodollars (around 67 percent of government revenue) which are often exposed to exogenous oil price shocks. This can destabilize domestic economy. To achieve a more stable economy, Iran needs to expand its non-oil exports. In this regard, it is essential to identify the key determinants of the exports. One of its main determinants is the real exchange rate and its volatility which are considered in this paper.

Since the collapse of the Bretton-Wood's agreement (fixed exchange rate system) in the early of 1970s and emergence of the floating exchange rate system, the world has witnessed significant fluctuations in both real and nominal exchange rates which mean widespread volatility[1] for most currencies. This has led economists to investigate extensively the nature and extent of effects of the exchange rate volatility on the level of international trade, especially exports.

In the case of Iran, since1979 the gap between parallel exchange rate[2] and official rate has widened. This widening gap can be attributed to several factors. First of all, uncertainties surrounding the private property rights, confiscations and nationalization of the private properties in the early years of the revolution has led to the huge flight of capital out of Iran (outflow of capital during 1979 and 1980 has been 6884 and 843 million rial respectively)[3]. In addition, Iran and Iraq war and reduction in oil exports and its price caused a shortfall in the oil earnings. All of these factors plus unstable economic policies have intensified the exchange rate volatility in the post-revolutionary period and put a heavy pressure on the parallel foreign exchange market and consequently, the premium of parallel rate over official rate during time has increased.

Up to now, the impact of change in the real exchange rate on the non-oil exports of Iran has been mainly on focus. However, the more important aspect of the fluctuations in exchange rate is its degree of volatility which can have profound effect on the non-oil exports. In this context, the fundamental question has been the impact of the exchange rate volatility on the exports, especially non-oil exports.

The only research that has addressed the adverse impact of black-market exchange rate volatility on Iranian foreign trade is that of Oskooee (2002). Using a co-integration technique, his model consisted of three demand functions of total exports, non-oil exports, and imports; all depends on black-market exchange rate. These functions also include the volatility of the exchange rate as a measure of uncertainty and one of the key determinants in which the moving standard deviation of the real exchange rate over five years is used as a proxy for the black market exchange rate volatility. However, Oskooee's technique of the order of moving-average standard deviation is subjective and thus can result in different outcomes depending on the order of moving average selected by the investigator. Our study attempts to overcome this weakness, by using a more advanced GARCH method to measure the volatility in which the order of moving standard deviation is measured endogenously by the model, thus is not subjective, and is more accurate and reliable.

As a case study, the main focus of this paper is to examine the effect of real exchange rate and its volatility, as a representative for real exchange rate variability, along with other relevant variables such as GDP and terms of trade on the non-oil exports of Iran from the supply-side perspective.

The rest of paper is organized as follows: the next section consists of an overview of the linkage between the real exchange rate volatility and the exports from the theoretical aspects as well as empirical evidence. In section III, an econometric model is specified for the non-oil exports of Iran which embodies the exchange rate volatility as one of the main explanatory variables. Then, the sources of data set are presented in the following section. Section V presents the estimation techniques and the empirical results. The last section includes the concluding remarks and policy implications.

2. Theoretical Framework

Generally, it can be argued that higher exchange rate volatility imposes more risk and cost for risk-averse traders and consequently generates more uncertainty surrounding their long run

[1] Volatility is defined as risk associated with the unexpected movements of exchange rate.

[2] In segmented foreign exchange market of Iran, the black foreign exchange market sometime is called parallel foreign exchange market because the market operations are parallel to the official foreign exchange market operations.

[3] Central Bank of Iran.

profitability and lowers incentive for economic agents to undertake more exports.

From a theoretical point of view, in context of a simple model of firm's behavior under uncertainty, an exporting firm is considered whose profitability (Clark, 1973) is subject to the variability of exchange rate and it is the only source of risk for the firm. Here, it is assumed that the firm decides on the level of exports by taking into account the uncertainty related to exchange rate through maximizing the expected value of utility which is a quadratic function of profit in terms of the home currency: $U(\pi) = a\pi+b\pi^2$, where $b<0$ indicates the firm is risk averter. Then, this hypothesis that higher exchange rate volatility has a negative impact on the level of exports depends on the three following essential assumptions:

2.1. Risk Aversion

The assumption of risk aversion on the part of traders not necessarily leads to a conclusion that the higher risk of exchange rate volatility will depress exports; it depends on the degree of risk aversion of trader which is implicit in properties of trader's expected utility of profit. Generally, a risk-averse exporter responds to an increase in uncertainty by shifting its activities from foreign markets to domestic markets (substitution effect). In addition, it also lowers the expected total utility of the activity; to sustain the same level of utility, more resources must be allocated to that activity (income effect). However, this approach has been criticized by De Grauwe (1988) who believes that for sufficiently risk-averse individuals, an increase in uncertainty raises the expected marginal utility of export revenues and pushes them to increase their export activities. When substitution effect dominates over income effect, an increase in the volatility of exchange rate leads to export reduction.

2.2. Hedging Opportunities

Accessibility to the forward contracts in the foreign exchange market may lower the impacts of exchange rate volatility. However, there are several reasons why hedging against the exchange risk can not be complete. First of all, forward exchange market does not exist for developing countries. Even in industrial countries, the risk associated with the short term exchange rate volatility can be hedged by participation in the forward exchange market, but hedging the risk through the forward market permanently would be very costly and difficult, and may not be possible.

2. 3. Profit Opportunities

The exchange rate fluctuations do not just pose uncertainty; they lead to opportunities for making profit. It is generally believed that the average profit for a firm rises when it is exposed to the uncertain price environment caused by exchange rate volatility. When cost of production gets high, the firm increases prices to gain profits and reduces production if the price lowers, in order to sustain its profit. In this respect, exchange rate volatility has a positive effect on the utility of firm, which should be compared with its negative effect, which results from the uncertainty for the risk-averse firm.

The presence all three postulations might create an environment which obscures the linkage between exchange rate volatility and exports.

On the other hand, there have been numerous empirical studies concerning the impacts of exchange rate volatility on the volume of exports. As a general, the evidence on the effect of exchange rate volatility is inconclusive and the results are mixed and sensitive to model specification, data, country selection, proxies for exchange rate volatility, and estimation techniques (McKenzie, 1999). Hooper and Kohlhagin (1978) were Pioneer economists who investigated the effects of exchange rate uncertainty on the trade among developed countries over 1967-75. They applied the standard error of nominal exchange rate as index for the volatility. Their conclusion indicates that there is no significant impact of exchange rate volatility on the volume of trade.

In addition, Mustafa and Nishat (2004) by using the standard error of real exchange rate function and the co-integration method determined that in the long run, the exchange rate uncertainty has an ambiguous impact on exports growth between Pakistan and other major trade partners during 1991-2004. Cote (1994) differentiate between the long run volatility that depicts divergence of exchange rate from the trend or equilibrium value and the short run deviation as measured by moving standard error of exchange rate and shows the exchange rate variations from one period to the next period .The standard error of exchange rate has several shortcomings, such as skewness of exchange rate distribution and volatility clustering which means that successive exchange rate movements are not independent.

Over time, the economists have developed more sophisticated time series models in measuring uncertainty such as ARCH and GARCH[1](see Lee and Saucier, 2005) and more advanced estimation techniques including co-integrating and panel data regression approaches (see Arize et al., 2005) for determination the long run relationships between trade and exchange rate volatility. For example, Boug and fagereng (2007) examined the causal link between export performance and exchange rate volatility across different monetary policy regimes in Norway. Using a co-integrated VAR model and conditional variance as a measure of exchange rate volatility, they concluded that there is no evidence to indicate that exports has been affected by exchange rate uncertainty.

The result of a panel based study on all twelve major industrial countries over 1977-2003 shows that the coefficient of the volatility is statistically insignificant (Hondroyiannis, et al., 2005) which is consistent with early results based on the seven-largest industrial country panel (Baily et al., 1986). On contrary, another study by Chit et al. (2008) examines the impact of bilateral real exchange rate on exports of five East Asian countries among themselves and to industrial countries in the context of a general gravity model. More specifically, they used a panel data regression for estimation. The empirical results indicate that exchange rate volatility has a negative impact on the exports of these East Asian countries. Akhatar and Hilton (1984) provide the standard deviation of exchange rate as measure for exchange rate risk. However, in a survey of previous studies by Ozturk (2006), most of studies indicate that increased exchange rate volatility depresses the growth of exports flow. As far as LDCs are concerned, especially in a case of 10 developing countries over 1973-98, by using quarterly data and applying the co-integration approach, Arize et al. (2003) reveal that exchange rate volatility exerts a significant negative effect upon the export flows in most of the countries and can enforce the exporting country to reallocate resources. Mckenzi (1999) similarly found that most recent papers confirm such a negative relationship.

Finally, in case of Iran, Bahmani-Oskooee (2002) by using the black market exchange rate volatility and co-integration technique over 1959-1989 finds out that uncertainty associated with the black market exchange rate has adverse effects on the trade flows of Iran.

3. Econometric Model Specification:

It is essential to specify the non-oil exports function for Iran in terms of the demand or the supply –side determinants. Here, the emphasis is focused on supply-side determinants of the non-oil exports. According to review of economic literatures, specifically empirical studies by Boug and Fagereng (2007), Chit et al. (2008), and Ozturk and Acravci (2006), one of alternative models for the non-oil exports (*NX*) function of Iran has been defined as follows:

$$NX=f\,(RER, VOL, GDP, TOT, Z) \qquad (1)$$

In a conventional export function, the exports of a country depend on exchange rate as well as the relative price level of home country with respect to that of foreign country. A combination of these two variables can be

[1] The main advantage of GARCH model over standard error approach in estimating volatility is that GARCH model is a dynamic and order of GARCH model is determined endogenously, but the order of moving standard error of exchange rate exogenously IS determined.

shown that by real exchange rate (*RER*) which indicates the competitiveness of the home country. It means that in a higher real exchange rate, the exports of a home country more competitive in comparison with the foreign country and lead to more exports. The impact of real exchange rate volatility (*VOL*) could be negative or positive as we discussed in theoretical framework of the paper. From theoretical point of view, a higher productive capacity of a country means more potential for the export by that country. In other words, the effect of GDP on the non-oil exports of Iran should be positive. In addition, the effect of the terms of trade (*TOT*) on the non-oil exports should be positive. Terms of trade can be regarded as an index of the gains from trade. So it can be argued that the higher terms of trade (the relative export price to import price) stimulates more exports from supply side channel. Other factors, as a group of control variables, may affect the dependent variable, which is denoted by *Z*.

This function can be transformed into the econometric equation in terms of logarithm linear form:

$$LNX_t = \beta_1 + \beta_2 LRER_t + \beta_3 LVOL_t + \beta_4 LGDP_t + \beta_5 LTOT_t + \beta_6 Z_t + U_t \quad (2)$$

As discussed above, the expected sign of coefficients are: $\beta_2 > 0$, $\beta_3 < 0$, $\beta_4 > 0$ and $\beta_5 > 0$. Here, all of the variables are transformed in to natural logarithm. *NX* denotes real non-oil exports from Iran to other countries in terms of constant price of 1997 and is measured in million dollars. RER represents real exchange rate, where the RER is calculated as $RER = NER \times \frac{PPI_{US}}{CPI_{IRI}}$. In this formula, *NER*, PPI_{US} and CPI_{IRI} represent nominal exchange rate of the US dollar in terms of the Iranian currency, Rial, US producer price index and Iran consumer price index respectively. *VOL* represents a proxy for real exchange rate volatility and estimated by using of GARCH model. *GDP* represents gross domestic product of Iran in terms of constant price of 1997 and is measured in billion rials. *TOT* denotes Iranian terms of trade and calculated as $TOT = \frac{PEX}{PIM}$ [1] where *PEX* and *PIM* indicate export price index and import price index for Iran respectively on the assumption that 1997 is the base year. As previously explained, Z indicates the control variables such as a dummy variable which influences the Iranian non-oil exports, and U_t is stochastic error term.

4. Data

The scope of this study is limited to the period immediately after the breakdown of the Bretton Woods's monetary system in 1971 and domination floating exchange rate regime. Hence, the data use is annually covered from 1971 to 2007. The annual data on the parallel exchange rate, the consumer price index (*CPI*), gross domestic product (*GDP*), export price index (*PEX*), import price index (*PIM*) and the non-oil exports in real terms (*NX*) on Iran have been taken from the Central Bank of Iran various reports (time series data bank).The producer price index of the US (*PPI*) has been extracted from the International Financial Statistics (*IFS*).

5. Empirical Results

Before the non-oil export function is estimated, the real exchange rate volatility should be measured by appropriate time series methods. In order to estimate the real exchange rate volatility; the GARCH[2] approach can be applied. In this approach, at first an ARIMA[3] model should be identified and estimated for the real exchange rate time series. One alternative way to predict the behavior of the real exchange rate is to estimate an ARIMA (p, d, q) model as forecasting method for the real exchange rate. In this step, we have to test the structural break in the time series of real exchange rate. The Figure

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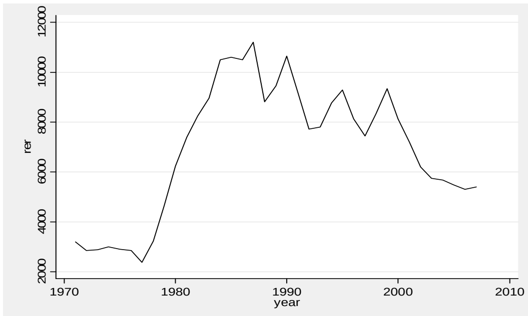
[1] The lack of information on volume of export index as well as import volume index for Iran have enforced us to use the pure barter terms of trade.

[2] Generalized Auto Regressive Conditional Heteroskedasticity

[3] Auto Regressive Integrated Moving Average

1 shows the break point of the time series of real exchange rate, which occurred in 1978.



Source: **Authors**

Figure 1: The fluctuations of real exchange rate in Iran (1971-2007)

In this case for the stationary test of real exchange rate in logarithmic terms, we use Perron test. Table 1 indicates that real exchange rate variable is stationary if we include a dummy variable fore break year (1979)[1] and trend variable in the unit root test. According to Table 1, the *LRER* is integrated of order zero, I(0). In next step, by using the *ACF*[2] and *PACF*[3] correlogram the right order of p=1 and q=0 has been identified, because the residual of this ARMA is stationary[4].

Table 1: The results of Perron test for the *LRER* variable

Variable	Coefficient	*t*- Student Value
C	15.55	5.76*
DU_{1979}	-0.19	-1.67
DT^{**}	0.522	6.64*
DTB^{***}	0.007	1.57
Trend	-0.009	-5.10*
$LRER_{t-1}$	0.71	12.40*
$R^2 = 0.92$, $\bar{R}^2 = 0.91$, F=74.59		

* **Significant at 1% level**

** ***DT*** **is a dummy variable that takes value zero, when t<1978 otherwise DT=1.**

*** ***DTB*** **is a dummy variable that take value zero, when t<1978, otherwise *DTB = t-TB*, where *TB* represents the year of structural break.**

Source**: Authors**

The results of ARIMA model estimation for real exchange rate are presented in Table 2.

Table 2: The estimation results of ARMA (1, 0) model for the *LRER*

Variable	Coefficient	*t*- Student Value
C	9.059	64.22
DU_{57}	0.54	2.73
$LRER_{t-1}$	0.98	25.74

Source**: Authors**

Then we can provide the conditional standard error of the residual of this ARMA model by estimating GARCH (p,q) model, where p and q denotes order of auto regressive and moving average of GARCH model and can be determined by Akaike and Schwarz criteria. In last step, we can apply the predicted value of conditional standard error of residuals as a proxy for exchange rate volatility in the non-oil export regression function. Table 3 indicates estimation of ARCH model, $h_t = \alpha_1 + \alpha_2 \varepsilon_{t-1}^2 + \nu_t$.

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1 In Perron test, the year of break plus one is considered as starting point of time for dummy variable.

2 Auto Correlation Function

3 Partial Auto Correlation Function

4 With respect to the *LRER* corregragm, the order of ARMA seems to be p=1, q=1. However, inclusion of q=1 for order of moving average makes the effect of AR (1) insignificant in ARMA model.

Table 3: The estimation results of ARCH (1) model.

Variable	Coefficient	*t*- Student Value
C	0.004	2.032
ε_{t-1}^{2} *	0.776	3.49
$R^2 = 0.87$, $\bar{R}^2 = 0.85$, F=41.64, SC= -0.81		

*** h_{t-1} I is first lag of conditional variance of the residuals.**
***Source*: Authors**

According to this table, the results of estimation satisfy the necessary as well as sufficient conditions for convergence of conditional variance of the residuals. In order to test the non-symmetrical behavior of conditional variance, the Wald test can be applied[1]. The results are summarized in Table 4.

Table 4: The estimation results of TARCH[2] (1) model.

Variable	Coefficient	*t*- Student Value
C	0.065	1.18
$D\varepsilon_{t-1}^{2}$	0.583	0.64
ε_{t-1}^{2}	0.85	1.59

***Source*: Authors**

Table 5: The results of Wald test

Coefficient	*F* Test	χ^2 Test	P.V
$\alpha_2 = 0$	0.0085	.0085	0.92

***Source*: Authors**

The result of Wald test indicates that the coefficient of α_2 insignificant and consequently the existence of *TGARCH*[3] are not confirmed. From this model, predicted value of the standard error of ε_t as a data can be used for real exchange rate volatility in estimation the non-oil export regression function.

5.1. The Co-integration Test

To investigate whether the variables in the non-oil exports function are co- integrated or not, the standard maximum likelihood method of Johansen (1988) and Johansen- Juselius (1990) has been applied. In this test the following unrestricted vector auto regressive model (VAR) is used:

$$Y_t = A_0 + \sum_{i=1}^{p} A_i Y_{t-i} + \varepsilon_t \qquad (3)$$

where Y = (*LNX*, *LRER*, *LVOL*, *LGDP*, *LTOT*) is an 5×1 vector of 5 variables (except for *LRER* which is stationary, the rest of variables are non-stationary). The results of the unit root test for the first difference of these variables have been shown in Table 6. A_0 is 5×1 vector of constant, P is number of the lags, A_i is a 5×5 matrix of parameters, and ε_t is 5×1 vector of independent and identically distributed innovations. If Y_t is co-integrated, Equation1 can be generated by a vector error correction model (*VECM*):

$$\Delta Y_t = A_0 + \sum_{i=1}^{p-1} \Gamma_i \Delta Y_{t-i} + \Pi Y_{t-1} + \varepsilon_t \qquad (4)$$

Where $\Gamma_i = -\sum_{i=j+1}^{p} A_i$ and $\Pi = \sum_{i=1}^{p} A_i - I$. Δ is difference operator, Γ and Π represents coefficient matrices, and I is an $n \times n$ identity matrix. The coefficient matrix Π contains information about the long-run relationships. Johansen's methodology is based on estimation

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1 From empirical point of view a Threshold GARCH is justified for the real exchange rate because in the period of 1979-1990 the foreign exchange market has been destabilized by war and revolution in Iran and after that the stability has returned to foreign exchange market which led to non-symmetrical behaviour of real exchange rate volatility.

2 Threshold Generalized Auto Regressive Conditional Heteroscedastcity

3 In a threshold *GARCH* (*TGARCH* (1,1)) Process $h_t = \alpha_0 + \alpha_1 \varepsilon_{t-1}{}^2 + \lambda D_{t-1} \varepsilon_{t-1}{}^2 + \beta h_{t-1} + v_t$ which allows for the non-symmetric effects of shocks (ε_t) on volatility. In this model D_{t-1} is dummy variable that is zero, if $\varepsilon_{t-1} > 0$ and takes one, if $\varepsilon_{t-1} < 0$.

of the VAR Equation (3) and then, the residuals are used to calculate two LR test statistics that can be used in order to determine the number of co-integrating vectors Y_t . Base on these two test statistics (trace test and maximum Eigen values test), the co-integrating rank can be tested and identified.

Table6. Stationary Tests of each variable using ADF and PP.

Variables	ADF	PP
	Constant and Trend	Constant and Trend
DLNX	-4.26	-4.18
*LRER**	----	----
DLVOL	-4.67	-5.02
DLTOT	-4.37	-4.38
DLGDP	-3.91	-3.80

*** Perron test for structural break confirms that at the level, LRER is stationary subject to trend.**
MacKinon critical value at 5%level (-3.52).
***Source*: Authors**

The procedure of estimation of co-integrating vectors of coefficient is as follows:
At first order of VAR model (p=2) is determined by using Schwarz criteria and size of sample.

In next step, by using information from the estimation of the VAR model, we can used the Trace statistic (*λ-trace*) and maximum Eigen value (*λ-max*) statistic to test the null hypothesis that implies there can be r co-integrating vectors among by variables system. The results of the Johansen co-integration test are shown in Table 7.

Table7: Johansen co-integration Tests for non-oil exports.

Null Hypotheses	*λ-max*	95%CV	Null Hypotheses	*λ-trace*	95%CV
$H_0: r = 0$ $H_1: r = 1$	49.71	33.46	$H_0: r = 0$ $H_1: r \geq 1$	82.28	68.52
$H_0: r \leq 1$ $H_1: r = 2$	20.62	27.07	$H_0: r \leq 1$ $H_1: r \geq 2$	32.56	47.21
$H_0: r \leq 2$ $H_1: r = 3$	8.56	20.97	$H_0: r \leq 2$ $H_1: r \geq 3$	11.95	29.68

***Source*: Authors**

With respect to Table 7, the null hypotheses of no co-integration are rejected on the basis of *λ-max* and *λ-trace* tests. The co-integration results indicate that there is one co-integrating vector based on these tests. We normalized the co-integrating vectors with respect to non-oil exports coefficient, as dependent variable. Then we choose a co-integrating vector, whose estimated coefficients signs are consistent with the relevant economic theory as discussed before. The final co-integrating vector of estimated coefficients is shown in the following equation:

$$\underset{}{LNX_t} = 1.52 + \underset{(8.45)}{4.05 LGDP_t} + \underset{(3.12)}{1.55 LRER_t} \underset{(-4.17)}{- 2.074 LVOL_t} + \underset{(2.41)}{1.79 LTOT} \qquad (5)$$

This function reveals that there is a long-run relationship between non-oil exports (*LNX*) and explanatory variables, such as *LGDP*, *LRER*, *LVOL* and *LTOT* where the estimated coefficient of explanatory variables is interpreted as elasticity of non-oil exports with respect to those variables. All of the coefficients are highly significant statistically. The effect of real exchange rate volatility is negative and more than one and implies the uncertainty associated with real exchange rate depresses the exports. In addition, the elasticity of real exchange rate is positive and more than one. This means that a real depreciation of domestic currency, rial improves performance of the non-oil exports of Iran.

The *GDP* elasticity is sufficiently high which suggests the responsiveness of non-oil exports to domestic product is high. Finally, terms of trade elasticity is positive and more than one reveals that as the terms of trade increases, the incentive to export more will increase, so the impact of the terms of trade on non-oil exports should be positive.

Finally, the vector of error correction mechanism (*VECM*) for the co-integrating vector of coefficients has been estimated and the results reported in Table 8. According to the results obtained, the error correction coefficient Π_{t-1} is negative and statistically significant, which implies only 18 percent of adjustment happens in one year. It implies that there is a long-run relationship between non-oil exports and other relevant variables.

Table 8: The results of VECM model (dependent variable ΔLNX_t)

Variable	Coefficient	t- Student Value
C	0.04	0.81
ΔLNX_{t-1}	0.052	0.72
$\Delta LnGDP_{t-1}$	0.004	2.71
$\Delta LnTOT_{t-1}$	0.007	1.58
$\Delta LVOL_{t-1}$	-0.12	-2.03
$\Delta LRER_{t-1}$	0.038	3.10
DU_{59}	-0.077	-2.29
ecm_{t-1}	-0.18	-2.54

***Source*: Authors**

6. Conclusion

This paper analyzes empirically the relationship between non-oil exports and exchange rate volatility in Iran over the period of 1971-2007. For this purpose the real exchange rate volatility has been estimated by using GARCH model, then the non-oil exports function has been specified in a model for Iran from supply perspective and in a linear logarithmic form. Since the variables in this model are non-stationary at level and stationary at the first difference; therefore Johansen's co-integration technique has been applied to estimate the model. According to the results provided by the estimation, there exists a unique co-integrating vector that is consistent with the economic theories. More importantly, the results reveal a negative impact of the real exchange rate uncertainty on the non-oil exports of Iran which confirms previous evidence on LDCs. From policy stand point implication, it can be argued that the lower real exchange rate volatility stimulates non-oil exports; consequently, it is recommended measures undertaken by the government that would promote greater exchange rate stability in Iran. Since the main source of the exchange rate instability in Iran inherent from the world oil price shocks, one alternative policy is persuasion of relaxing heavy reliance on petrodollars by expanding and diversifying non-oil exports.

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