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The Effects of Real Effective Exchange Rate on Exports of Iranian Caviar

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Abstract – **Order to increase the exchange rate may not always promote exports and the rate of export of goods, have different reactions. Hence, this study has attempted to examine the effect of real effective exchange rate on exports of Iranian caviar. Therefore, using the auto-regressive distributed lag method, supply function of Iranian caviar export was estimated. The required data and Information for the period of 1974-2011 were gathered from Foreign Trade Statistical Yearbook of Iran, Statistical Yearbook of the International Monetary Fund, the United Nations Food and Agriculture Organization and various publications of the Central Bank of Iran. The results of this study indicated that domestic production of caviar, a significant and positive effect on the export of this product, but income variables of importing countries and the real exchange rate on exports of the product were ineffective.**

Keywords – **Real Effective Exchange Rate, Exports, Caviar, Autoregressive Distributed Lag Method, Iran.**

I. INTRODUCTION

Iran's foreign trade is known with monoculture export and severe dependence on foreign exchange revenues from oil exports. Since the discovery of oil in Iran, the share of exports of this product from total exports has been rising almost always. But given the volatility and uncertainty in the realization of oil revenues and the problems and obstacles that impede the exports of this product, despite sanctions and increasingly widespread, as today, there is an undeniable need for expansion of nonoil exports. On the other hand, it is believed that the Iranian agricultural section according to the extent of the land and climate variability has a high potential on global markets field. So based on capabilities of these section, we hope to expand the non-oil exports. From Critical agricultural products such as our world-class manufacturing is a special place, is caviar. Caviar sturgeon of Caspian Sea, are supplier over 90 percent of world caviar (Seyed Naghavi & Babaei, 2010). But in recent years, the trend of production and operation shows that the large fluctuations in the production of this output. In addition, the quantity of Iranian caviar exports has declined over the years 2000-2010, more than 60 tons (Iranian Fisheries Organization, 2011). Decline in caviar sturgeon stocks, smuggling and fraud in product development and entry the Europe cultures caviars into international markets factors that decrease the caviar exports over the last decade has been (Feizabadi, 2009). Due to the significant decline in the export of this product, is increasing day by day on the value and price of caviar. Although many countries have artificial rearing its action, but it's free so still have considerable value. Therefore, factors affecting the development of export of this product are a special place (Feizabadi, 2009).

One of the fundamental problems that plague the economy and especially in recent years is inflation. In the meantime if the price of foreign currency does not rise as the prices of other goods, national currency shall be the consequences of excessive pricing. This can disrupt the mechanism of relative prices and market allocation of resources and on the other hand, the rapid depletion of foreign exchange reserves at the central bank. Moreover, in these conditions, the balance of foreign payments will be granted. Hence, over the years, have been witnessed frequent increases of exchange rates in exports and imports and Authorities have tried to upgrade the exchange rate to boost non-oil exports. But the question that could be raised is whether the increase in the exchange rate will increase non-oil exports? This study is an attempt to address these questions about the Iranian fishery products (caviar).

Numerous studies have examined the effects of exchange rate on economic performance. Torkamani & Tarazkar (2005), were studied the short run and long run effects of exchange rate on export prices of Iran pistachio. In this study, they used the export price equation is derived exclusively from the requirement to maximize profits. The results of this study showed that changes in exchange rates in the short run and long run, the most important factor affecting the Iranian pistachio export price. In addition, pistachio export price is also affected to export quantity of this product. Furthermore, the relationship between domestic production and pistachio export prices in the short run was evaluated significant and negative. Bolkesjo and Buongiorno (2006) was studied the Effects of exchange rates on international trade in forest products. The results showed that in short, the ratio of exports to exchange rate elasticity is high, while the ratio of import to exchange rate elasticity is moderate. In the long run, the elasticity of exports and imports is reduced but still significant. Yazici (2008) By examining and comparing the response of three agricultural trade, industry and mining in Turkey, to Changes in exchange rates, showed that all three of these sectors react to devaluations, the cycle of rise - fall - has been rising. However, despite a similar react these three sections to changes in exchange rate in short run, long run or overall reaction of these

sectors was different, Thus, Thus, while the industry and mining trade balance result devaluations is improved long-term, but, the agricultural trade balance was negative react. Karami and Zibaei (2008) were studies the effect of exchange rates volatility on export supply of crops productions in various countries. The results of this study showed that exchange rate volatility have different effects on different countries' exports of pistachios and dates, therefore, in relation to agricultural trade policies in different countries should volatility effect of exchange rate in relation to the objective country, and was particular attention. Hayakawa and Kimura (2009) in an empirical study, were studied the relationship between exchange rates and international trade with a focus on East Asia. Results showed that Middle East trade as more serious than the rest of the region has been affected by exchange rate fluctuations and the negative effect of exchange rate fluctuations is bigger than tariffs and smaller than the distance effect in East Asia. Ehsani et. al (2009) have examined the volatility effect of weighted real exchange rate on Iranian non-oil export. In this study, to quantify the volatility of exchange rate were used deviation index moving average and conditional standard deviation. The results showed that the effect of exchange rate on non-oil export is positive, however, volatility of this rate has a negative impact on non-oil export. Kazerooni and Feshari (2010) investigated 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. Their empirical findings revealed 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. Pedram et al. (2012) have investigated the asymmetric effects of exchange rate volatility on export prices. The results of this study suggest that the react of export prices to decrease and increase of money value is asymmetric. So that the ratio of export prices reacts to negative shocks of exchange rate (devaluation) is more from the positive shock (increase in value). In addition, when the size and direction effect be combined, asymmetric of export prices reacts to decrease and increase the money value of the high and low will be approved.

II. Materials and Methods

The real effective exchange rate is a weighted index of the real exchange rate that the index weights, volume of transactions with business partners and competitors in the country. Relationship that from, used for calculation the real effective exchange rate index is defined as follows:

$$REER_t = \frac{\sum_{i=1}^{m} W_{it} E_{it} P_{it}^{*}}{P_t} \quad (1)$$

Where, P_{it}^{*} is the price index in country i, P_t: price index in Iran, E_{it}; the exchange rate between country i and Iran (which is defined as the number of Rials per unit of foreign currency) and W_{it}; the weight i. To calculate the bilateral exchange rates (E_{it}) exchange relations ($E_{it} = E_t^{US}. E_{it}^{US}$) is used where E_t^{US}; Rials per U.S dollar and E_{it}^{US}; the dollar exchange rate has been calculated U.S.A currency i (which. For the countries of Iran and commercial prices, the consumer price index is used. Are used to calculate the weight of index i (W_{it}) of the total imports of country i in Iranian imports.

The export function of agricultural products in general, can be expressed as follows (Nouri and Yazdani, 2000, and Mohammadi and Naghshinehfard, 2006):

$$X = f(P, Y, ER, PRO) \quad (2)$$

Where, P; The average price of the objective product, Y; income importing countries, ER; The real effective exchange rate and PRO; domestic production of the product. Econometric form of export supply model of caviar products are as follows (in the marginal form of real effective exchange rate is used in the model):

$$XC = \beta_0 - \beta_1 PC + \beta_2 Y + \beta_3 RER + \beta_4 PROC \quad (3)$$

Where, XC is the export of Iranian caviar, PC is the average global price of caviar, Y is the GDP-weighted average of the five major importer of Iranian caviar (including Germany, France, Spain, Japan and the United Arabian Emirates), RER is the real effective exchange rate and PROC is caviar domestic product.

To select the best function form from four forms of linear forms, linear-logarithmic, logarithmic-linear and logarithmic, after estimation of this patterns and investigation the coefficients significant, used from the BOX-COX Index and the R^2 statistic and the dynamic model of export supply function using appropriate forms of assessment are as follows:

$$XC_t = \beta_0 + \sum_{i=1}^{n_1} \beta_{1t} PC_{t-i} + \sum_{i=1}^{n_2} \beta_{2t} Y_{t-i} + \sum_{i=1}^{n_3} \beta_{3t} RER_{t-i} + \sum_{i=1}^{n_4} \beta_{4t} PROC_{t-i} \quad (4)$$

Information needed for the study from period of 1974-2011, was obtained from Foreign Trade Statistical Yearbook of Iran, Statistical Yearbook of the International Monetary Fund, the United Nations Food and Agriculture Organization (FAO) and various publications of the central bank of Iran.

III. Discussion and Results

The first step in estimating a time series model is investigation of static of that model variable. Generally each time series when called static that the average and variance are constant over time and the covariance between two time periods, only the distance or gap between the two based on the real-time computation of covariance and correlation is not (Noferesti, 1999). To purpose of time series static investigation, this study was used tests of Augmented Dickey Fuller and Phillips-Perron. The results show that except in a static variable is the logarithm of domestic caviar (With regard to structural

failure of the dummy variable for the years after 1994) other variables, not static levels, but after a time take a difference, stationary and are I (1). Thus, given that the model (3) there is a combination of variables I (0) and I (1), must be an appropriate method, co-integration relationship between variables are examined. To analyze the long-term and short-term relationships between variables, were used the Autoregressive Distributed Lag Method (Pesaran and Pesaran, 1997). The detailed results of the estimated coefficients in the model (Table 1) are observed.

Table 1: The Detailed Results Obtained from Estimating the Model Coefficients by ARDL (1,0,1,1,0)

Variable	Coefficient	t-statistical	Probability
LXC(-1)	0.56 ***	5.84	0.000
LPC	-0.08	-0.45	0.616
LY	0.09	1.30	0.232
LY(-1)	0.08	0.88	0.383
LER	0.02	0.06	0.943
LER(-1)	0.005	0.07	0.037
LPROC	0.88 ***	3.04	0.000
C	1.40 **	2.04	0.052
DU73	-0.11 *	-1.84	0.079
R^2= %91	R^{bar2}= %88		F= 68.53

***, ** and * indicate the significant order of % 1, %5, and %10 levels.
Source: Author's findings.

In order to ensure the establishment of classical assumptions (absence of autocorrelation, the corollary is correct, normal distribution and homogeneity of variance residual sentences) can be used to detect statistical. The results of the tests are presented in Table 2.

Table 2: Diagnostic Tests

The classics hypotheses	LM test		F test	
	statistic	probe	statistic	probe
Serial Correlation	0.75	0.381	0.63	0.439
Functional Form	1.17	0.279	0.84	0.367
Normality	0.50	0.777	-	-
Heteroscedasticity	0.80	0.369	0.79	0.383

Source: Author's findings

As Table 2 shows, the chances of all statistics computed from 0.05 is more, we can make sure that the assumptions of the classical model. However, immediately after the estimation of dynamic model, we did test the presence or absence of a long-term relationship. To ensure the long-run relationship between the variables in the model, F-test was used (Tashkini, 2005). The results are reported in Table 3.

Table 3: Investigation the existence of long-run relationship

Calculated F Statistics	Critical Values for F Statistics (Significant in 95%)	
	I(0)	I(1)
3.773	2.262	3.367

Source: Author's findings

As shown in Table (3) is known, as regards the calculation of the F statistic is greater than the critical value, we can conclude that the variables of the model are to establish a long term relationship.

After proof the existence of long-run relationship among variables, to provide long-term coefficients obtained from the model estimated. The results are reported in Table 4.

Table 4: The Results Obtained from Estimating the Long-term Coefficients by ARDL (1,0,1,1,0)

Variable	Coefficient	t-statistical	Probability
LPC	-0.52	–1.11	0.276
LY	0.25	1.55	0.134
LER	1.007	0.17	0.859
LPROC	2.11 ***	3.21	0.004
C	3.14	2.17	0.017
DU73	-1.93 ***	–2.88	0.008

***, ** and * indicate the significant order of %1, %5, and %10 levels.
Source: Author's findings.

The table shows that in the long term, logarithmic variables of average global prices average, income of importing countries and the logarithm of the exchange rate on exports of Iranian caviar have no significant effect. Lack of influence of these variables on the export of caviar, is the specific conditions governing the production and export of this product. In this case that the production and export of this product) is located under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) rules. Under the provisions of this Convention, including the export of sturgeon caviar or meat only official manufacturer of licensed and certified will legal and all the fishing and export statistics should be reported to the Secretariat CITES. In Iran, the government has a monopoly on fishing and exporting caviar and CITES also monitors government activities in this field. As a result, These factors have led to the export of this product is not sensitive to other variables and Export caviar production is a function of the amount of such an increase leads to an increase in production 2.11 percent on caviar exports. In addition, Countries such as France and Germany that a high percentage of Iranian caviar was exported to these countries. Today, because of farmed caviar production and exports to the world market, its main competitors in the export of caviar from Iran are. The co-integration exists between a set of economic variables, based on statistical models that provides error correction. These models have become increasingly popular in empirical work. The main reason for its popularity is the error patterns that are related to fluctuations in short-run equilibrium values of the variables. The results of the estimated coefficients on the error correction model are shown in the table 5.

As observed in the table (5), Increase in domestic production of caviar in the short run lead to increase in exports of this product. The error correction coefficient is -0.35 and significant statistically.

Table 5: The ECM Results Obtained from Estimating the Model Coefficients by ARDL (1,0,1,1,0)

Variable	Coefficient	t-statistical	Probability
dLPC	-0.08	-0.45	0.616
dLY	0.09	1.31	0.233
dLER	0.024	0.06	0.942
dLPROC	0.89 ***	3.19	0.000
dC	1.40 **	2.04	0.051
dDU73	-0.11 *	-1.84	0.079
dECM(-1)	-0.35	-2.77	0.019

***, ** and * indicate the significant order of %1, %5, and %10 levels.
Source: Author's findings.

Thus, the model is out of balance, in each period, 35% of non-equilibrium, and when adjusted model takes about 3 years to reach equilibrium again.

SUGGESTIONS

With the increasing of oil sanction and need to reduce dependence on foreign exchange revenues from exports of oil and oil products, It is essential that the potential of the agricultural sector and its subdivisions, as well as a variety of products in this section, Investment required to produce products such as caviar Has a comparative advantage in the export is done. The positive effect of increasing the production of caviar exports, It is suggested that the first law of increasing production through renewable resources sturgeon caviar production, preventing illegal fishing and smuggling it to be effective measures. Second, given that Iran's two major export markets in France and Germany has lost its caviar, recommended to new target markets for its caviar production will. In addition, the strengthening of sturgeon stocks through collaboration and cooperation with other countries in the Caspian region, Context for the development of fisheries by keeping these fish stocks provided through this exchange technology have also seen an increase in exports of the product.

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