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Investigating the Elasticity of Supply and Demand for Rice Export in Iran

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Abstract

This article estimates the major determinants of supply and demand for Rice Export in Iran. This study uses annual time series data (1989-2006) and unit root tests and analyze them using Auto Regressive Distributed Lag (ARDL) model by Pesaran et al. (2001). This co-integration technique accommodates potential structural breaks that could undermine the existence of a long-run and significant relationship between supply and demand for Rice Export and its main determinants. Error correction coefficient is negative and small and is equal to – 0.54 and it shows that if there is any shock or imbalance in total production, the system will be back to stability after a 3-year period. Together the independent variables explained 91% of the variance in the dependent variables. The remaining 9% was due to unidentified variables. In relation to that, we can conclude that explanatory power is high for the equation.

Keywords: Export demand function, augmented dickey-fuller (ADF) test, auto regressive distributed lag (ARDL).

Introduction

Trade liberalization policy represents an important policy instrument for developing countries. However, existing empirical literature on the impact of trade liberalization is ambiguous and this uncertainty also extends to Iran economy. In many developing countries, with relatively limited access to international financial markets, exports play an important role in their growth process by generating the scarce foreign exchange necessary to finance their imports of energy and investment goods, both of which are crucial to their capital formation.

Some economists have suggested that dollar devaluations were important factors in the increased demand for U.S. grain during the early 1970's. Furthermore, Schuh[1] argues that an important share of the income problems of U.S. agriculture in the post-World War II period resulted from persistent over-valuation of the U.S. dollar. The argument goes as follows: over-valuation of the dollar implies higher U.S. prices in terms of foreign currencies. This, in turn, reduces the demand for U.S. grain exports, and therefore reduces the total demand (domestic and foreign) for U.S. grain. Consequently, U.S. domestic prices are depressed below those that would apply under correct valuation of the U.S. dollar. Schuh[1] expresses this result as "An under-valuation of our agricultural resources in relation to their world opportunity costs." When the opposite event occurs, namely, devaluation of the U.S. dollar, the reverse sequence of events takes place. The end result in this case is both an increase in U.S. exports and domestic prices. The propositions advanced by Schuh[1] have been challenged by some researchers. Vellianitis-Fidas[2] and Kost[3] suggest that currency realignments have had only a small impact on agricultural trade. A debate on these two conflicting views emerged[1,2-4].

Rice in Iran is a major product. First this product has an important role at basket of household goods and feeding pattern (Based on retail price index coefficient important types of rice is 3:32). Second at present, Iran is considered one of the main importers of this product. Third, production this product, in the country is performed with a high cost, which shows a lack of comparative advantage in producing this product. Fourth, a lot of disruption in production, consumption and imports, there is a strategic product. There are many problems in rice production. That part of it is related to, production structure and various stages of production to convert it to white rice. Being small, field pieces under cultivation, the high cost of production, Lack of comparative advantage in rice production large lesions factories Shali squash and failure to use suitable are considered the byproducts in these cases. On the other hand rice consumption in the country has special problems that the most important can be noted to distribution of subsidies and low product prices, inappropriate consumption patterns and the division of domestic and imported rice market in terms of quality and price. Also rice trade because conditions section country commerce, is disruption of the most important of them can be pointed to, being exclusive and being government imports, lack of coordination between institutions and relevant agencies, imports, too much, disruption in the exchange rate and the lack of a proper tariff system. Rice production in Iran in the period from1368 to 85 with growth of 3.19 percent from 1.22 million tones has reached to more than 2.08 million tons.

In this period witnessed two important events have been rice market. Firstly has increased rice production and secondly, has increased its imports. Resultant these factors have caused domestic supply of rice 1.96 million tons in 1368 will increase To 3.22 million tons in 1385. During the period manufacturing share of total domestic supply of 62.4 percent in 1368 has reached to 64.5 percent in 1385. So despite the numerous self-sufficiency programs in this period remains unchanged Self-sufficiency coefficient. According to table 1 despite the reduced

production in some years, has not increased import or in some years, despite increased production has been upward trend the imports. This issue shows lack of coordination produced and imported rice.The other part of this fluctuation of the can know related to lack of planning in rice imports. Due to lack of sponsorship in the marketing of agricultural products in the country, and incorrectly predicted the gap between demand and supply of rice, there has been no accurate estimate the need for imported rice. Thus, imports of rice could not, so that it expected be effective, in price stability years various and the price under imported rice, has had experience fluctuate a lot. There are many problems in rice production part of which is related to production structure and different stages of production and other part related to the stages after production and convert it to white rice. Although amount of waste this product in country is very different in different sources, But all statistics have indicated of high it amount of waste. Despite having a scrap in the range of 16-30 percent (without regard to waste in the process before the harvesting such as lesions caused by unfavorable climate changes, farm management, pests and diseases etc.), is a very high figure for a strategic product. According to the world food organization (FAO) amount of waste rice in the world is about 21 percent maximum number (about 6-8 percent) belongs to stage harvesting (including harvesting and threshing).

The government recently in order to reduce waste in the product country, action has to the basic efforts like shali kobe factory reform; supply some machines special for the rice harvest, and etc. To reduce waste in the product manufacturing process, it is imperative and inevitable, having sufficient knowledge of the factors causing waste in order to deal with them.

Evaluation Studies in this regard, shows that has been done research on the effects of government policies in agriculture, Somehow has examined policies and support government macro. Although none of the studies were not considered in the form study disruption of agricultural policies, but has a close relationship, to subject considered for research. In research has been analyzed, trade policies and guaranteed price for rice. The results show that there are volatility in imports and market price of rice and addition price guarantee policy for some reason like lack of fit price guarantee with costs, lack of shopping facilities and storage of rice and the time of purchase is not application and large impact.In another study has been calculated support for agricultural products in release rate.The results show that studied products (wheat, rice, barley, corn, cotton, peas, sugar beets, potatoes, onions, etc.) with free exchange rate, were entitled of the negative support. In other words, adopted a policy price guaranteed not only cause support of domestic producers has not been, rather this policy has led to apply the hidden tax on domestic producers. Calculate the tariff equivalent of non-tariff barriers some of agricultural products and comparison with tariff restrictions imposed about this product has shown that at first is negative, tariff equivalent of vast agricultural products. Second given the number of non-tariff, barriers not used of tariff barriers. World Bank studies shows that effects of inappropriate policies foreign exchange, commercial and price is devastating for farmers. So those policies outside the agricultural sector often tax has imposed on farmers and disrupts agricultural growth. Import restrictions and high tariffs in order to support the industry. is cause reduced access to agricultural inputs and increase their prices. On the other hand, direct policies department of agriculture such as product low price (for the context of subsidized food and inexpensive urban consumers) often exacerbates negative effects of non-agricultural sector policies. In research in 10 countries in central and Eastern Europe support rate is adjusted for measuring disrupting the market for agricultural products. (wheat, corn, barley, sugarcane, oilseeds, milk, meat and chicken) is located the calculation and analysis the results show that disturbing the price of agricultural products the intense has been different among the countries studied and between different products and has changed over time. In another study in the countries of central and eastern Europe, was studied the effect of different rates of exchange and disruption that occurs, due to it in prices of agricultural products. Use the official exchange rate, makes diversion in international product prices with it domestic price. The results show that disruption price agricultural products, rates support and cost of funds accession countries to Europe Union, is sensitive to different rates of exchange. The exchange rate adjustment in this regard is more compatible with the existing reality.

The present research explores from macro perspective an alternative way in which the supply and demand for rice export in Iran could be explored employing time series data. Following Goldstein and Khan[5], Export demand for the product is related to various factors such as export price of the product, world price of exports (the average prices of goods in world markets) and income of importing countries. For that purpose, we use the bounds testing (or ARDL) approach to co-integration proposed by Pesaran et al.[6] to test the supply and demand for Rice Export using data over the period 1989–2006. The ARDL approach to co-integration has some econometric advantages which are outlined briefly in the following section. Finally, we apply it taking as a benchmark Goldstein and Khan[5] study in order to sort out whether the results reported there reflect a spurious correlation or a genuine relationship between supply and demand for rice export and the variables in question. This contributes to a new methodology in the export demand literature. Next section starts with discussing the model and the methodology. Then in next section we describe the empirical results of unit root tests, the F test, ARDL co-integration analysis, diagnostic and stability tests and dynamic forecasts for dependent variable and last section summarizes the results and conclusions.

Table -1
Amount demand and supply of rice in Iran in the period from 1990 to 2006

Coefficient of self-sufficiency	Operation Shaltok (ton)	Area under cultivation (Thousand hectares)	Domestic supply (Thousands ton)	Export (ton)	Import (Million ton)	Production Shaltok	Rice production (Million ton)	Year
62.4	3.57	518.9	1960	0	0.34	1.85	1.22	1989
71.7	3.78	524.27	1824	0	0.88	1.98	1.31	1990
74.2	4.05	582.32	2097	20	0.79	2.25	1.56	1991
66.4	3.96	596.04	2345	2161	0.56	2.26	1.56	1992
60.9	3.88	588.47	2471	3438	0.94	2.28	1.51	1993
78.8	4.01	563.38	1893	197	1.16	2.25	1.49	1994
52.7	4.07	565.58	2880	14	0.47	2.3	1.52	1995
64.9	4.47	600.33	2731	26	1.15	2.68	1.77	1996
74.4	4017	563.21	2083	230	0.92	2.25	1.55	1997
77.6	4.51	614.96	2356	12	0.55	2.77	1.83	1998
68.5	4	587.15	2263	425	0.63	2.34	1.55	1999
58.0	3.69	534.33	2244	488	1.02	1.97	1.30	2000
66.9	3.87	514.79	1963	184	1.26	1.99	1.31	2001
67.5	4.73	611	2826	125	0.70	2.88	1.91	2002
65.9	4.76	615.28	2936	325	1.05	2.94	1.93	2003
59.5	4.16	611.45	2820	147	0.88	2.54	1.68	2004
63.4	4.36	628.11	2851	425	1.14	2.74	1.81	2005
64.5	4.16	630	3.12	31.64	1.04	2.62	2.08	2006
-	2	1.15	-31.42	-	6.80	-	3.19	The average annual growth

Source: Islamic Republic of Iran Customs Administration and Ministry of Agriculture

Material and Methods

Export demand for the product is related to various factors such as export price of the product, world price of exports (the average prices of goods in world markets) and income of importing countries[5]. Also in demand pattern, production quantity of other countries has been considered as exogenous variable[7]. Therefore, in logarithmic form, export demand function is introduced as following:

$$LnX_t^d = a_0 + a_1 LnPX_t + a_2 LnPXW_t + a_3 LnYW_t + a_4 LnW_t + U_{1t} \quad (1)$$

Where X^d is the quantity of global demand for export, PX is price index of goods exports, PXW is the global price of exports, YW is the average weight in real incomes of importer countries, W is production quantity in other countries and U_1 is error sentences. In study of Goldstein and Khan[5] real incomes index of importer countries is calculated as following:

$$YW = \sum \alpha_i Y_i \qquad i = 1,2,...,n \qquad \sum \alpha_i = 1 \quad (2)$$

Where a_i is share of i^{th} country in goods import and Y_i is the real income of i^{th} country (gross domestic product in constant prices). In the most studies has been emphasized the importance impact of exchange rate on agricultural exports. For example, Schuh[1] have showed that exchange rate fluctuations can be affect on agricultural exports. In addition, real exchange rate fluctuations have more impact on demand for agricultural exports than changes in nominal exchange rates. Therefore, we include real exchange rate variable in this model:

$$LnX_t^d = a_0 + a_1 LnPX_t + a_2 LnPXW_t + a_3 LnYW_t + a_4 LnER_t + a_5 LnW_t + U_{1t} \quad (3)$$

According to the above model, we are expected to be mark coefficients of variables as following:

$a_1 < 0$, $a_2 > 0$, $a_3 > 0$, $a_4 < 0$, $a_5 < 0$

Also real exchange rate is calculated as following:

$$ER_t = E_t \frac{CPI_{it}}{WPI_{US}} \quad (4)$$

Where ER_t is real exchange rate, E_t is official exchange rate (official market) in terms of domestic currency for one American Dollars, WPI_{us} is the wholesale price index in American and CPI_i is the consumer price index in i^{th} country. Equation 3 shows export demand function in long-term and shows that in any moment is not achievable. So using the

adjustment mechanism ,it is assumed that exports are adjusted than difference between the demand for exports at the time (t) and the real value of exports in the last period (t-1):

$$\Delta LnX_t = \gamma\left[LnX_t^d - LnX_{t-1}\right] + U_{2t} \qquad \gamma \succ 0 \qquad (5)$$

In equation 5, γ is adjustment coefficient and adjustment function assumes that export quantity is adjusted in other countries in the world despite excess demand. By substituting equation 3 to 5, it gives a functional for estimating export demand as following:

$$LnX_t^d = C_0 + C_1 LnPX_t + C_2 LnPXW_t + C_3 LnYW_t + C_4 LnER_t + C_5 LnW_t + C_6 LnX_{t-1} + U_{3t} \quad (6)$$

Exports of goods and services have an important role in the national economies. With the business boom, all countries are trying to carry out appropriate policies that engine of economic growth be making active. Therefore, competition increases in business and in this case, countries that have had a clear strategy and the perspective of export products, they have been more successful[8]. According to previous studies in the field of export, the most important factors affecting on the export supply are including the export price of goods desired, wholesale price index, exchange rate, volume of domestic product of goods desired and Gross Domestic Product (GDP). Here, we survey effective factors on Rice export supply by linear function and logarithmic – linear. The proposed form of logarithmic – linear function is as follows[9]:

$$X_t^s = APE_{it}^{\alpha_1} PD_{it}^{\alpha_2} DP_{it}^{\alpha_3} GNP_{it}^{\alpha_4} ER_{it}^{\alpha_5} \qquad (7)$$

Where: X_t^s = volume of rice export supply, PE_i = rice export price, PD_i = wholesale price index, DP_i = rice domestic product, GNP = Gross Domestic Product, ER = exchange rate, $\alpha_1 > 0$, $\alpha_2 < 0$, $\alpha_3 > 0$, $\alpha_4 < 0$, $\alpha_5 > 0$.

The liner function form has been given in following equation:

$$X_t^s = A + \alpha_1 PE_{it} + \alpha_2 PD_{it} + \alpha_3 DP_{it} + \alpha_4 GNP_{it} + \alpha_5 ER_{it} \qquad (8)$$

Our empirical analysis in next section is based on estimating directly long run and short-run variants of equations (6), (8). All the data in this study are obtained from central bank of Iran (2004), the Islamic republic of Iran customs administration during the period 1989-2006. All variables are expressed in natural logarithm.

For the purpose of empirical analysis, this study uses Auto Regressive Distributed Lag (ARDL) by Pesaran et. al.[6] as the underlying statistical tests. In conducting the liner multiple tests, analysis following control variables are generally included.

Pesaran et al.[6] computed two sets of asymptotic critical values for testing co-integration for a given significance level with and without a time trend. One set assumes that all variables are *I* (0) and the other set assumes they are all *I* (1). If the computed F-statistic exceeds the upper bound critical value, then the null hypothesis of no co-integration can be rejected. Conversely, if the F-statistic falls below the lower bound critical value, the null hypothesis cannot be rejected. Lastly, if the F-statistic falls between these two sets of critical values, the result is inconclusive. The short-run effects between the dependent and independent variables are inferred by the size of coefficients of the differenced variables in equation (9), (10). The long-run effect is measured by the estimates of lagged explanatory variables that are normalized on estimate. Once a long-run relationship has been established, equation (9), (10) is estimated using an appropriate lag selection criterion. At the second step of the ARDL co-integration procedure, it is also possible to obtain the ARDL representation of the error correction model (ECM). To estimate the speed with which the dependent variable adjusts to independent variables within the bounds testing approach, following Pesaran et al.[6] the lagged level variables in equation (9), (10) are replaced by EC_{t-1} as in equation (11), (12):

$$\Delta X^{d}_{t,j} = c_0 + \sum_{i=1}^{n1} c_{1i,j}\Delta X^{d}_{t-i,j} + \sum_{i=0}^{n2} c_{2i,j}\Delta PX_{t-i,j} + \sum_{i=0}^{n3} c_{3i,j}\Delta PXW_{t-i,j} + \sum_{i=0}^{n4} c_{4i,j}\Delta YW_{t-i,j} + \sum_{i=0}^{n5} c_{5i,j}\Delta ER_{t-i,j} \qquad (9)$$
$$+ \sum_{i=0}^{n6} c_{6i,j}\Delta W_{t-i,j} + c_7 X^{d}_{t-1,j} + c_8 PX_{t-1,j} + c_9 PXW_{t-1,j} + c_{10} YW_{t-1,j} + c_{11} ER_{t-1,j} + c_{12} W_{t-1,j} + \nu_t$$

$$\Delta X^{s}_{t,j} = c_0 + \sum_{i=1}^{n1} c_{1i,j}\Delta X^{s}_{t-i,j} + \sum_{i=0}^{n2} c_{2i,j}\Delta PE_{t-i,j} + \sum_{i=0}^{n3} c_{3i,j}\Delta PD_{t-i,j} + \sum_{i=0}^{n4} c_{4i,j}\Delta DP_{t-i,j} + \sum_{i=0}^{n5} c_{5i,j}\Delta GNP_{t-i,j}$$
$$+ \sum_{i=0}^{n6} c_{6i,j}\Delta ER_{t-i,j} + c_7 X^{s}_{t-1,j} + c_8 PE_{t-1,j} + c_9 PD_{t-1,j} + c_{10} DP_{t-1,j} + c_{11} GNP_{t-1,j} + c_{12} ER_{t-1,j} + \gamma e_{t-1,j} + \mu_t \qquad (10)$$

$$\Delta X^{d}_{t,j} = \alpha_0 + \sum_{i=1}^{k1} \alpha_{1i,j}\Delta X^{d}_{t-i,j} + \sum_{i=0}^{k2} \alpha_{2i,j}\Delta PX_{t-i,j} + \sum_{i=0}^{k3} \alpha_{3i,j}\Delta PXW_{t-i,j} + \sum_{i=0}^{k4} \alpha_{4i,j}\Delta YW_{t-i,j} \qquad (11)$$
$$+ \sum_{i=0}^{k5} \alpha_{5i,j}\Delta ER_{t-i,j} + \sum_{i=0}^{k6} \alpha_{6i,j}\Delta W_{t-i,j} + \lambda EC_{t-1,j} + \mu_t$$

$$\Delta X^{s}_{t,j} = \alpha_0 + \sum_{i=1}^{k1} \alpha_{1i,j}\Delta X^{s}_{t-i,j} + \sum_{i=0}^{k2} \alpha_{2i,j}\Delta PE_{t-i,j} + \sum_{i=0}^{k3} \alpha_{3i,j}\Delta PD_{t-i,j} + \sum_{i=0}^{k4} \alpha_{4i,j}\Delta DP_{t-i,j} \qquad (12)$$
$$+ \sum_{i=0}^{k5} \alpha_{5i,j}\Delta GNP_{t-i,j} + \sum_{i=0}^{k6} \alpha_{6i,j}\Delta ER_{t-i,j} + \lambda EC_{t-1,j} + \mu_t$$

A negative and statistically significant estimation of λ not only represents the speed of adjustment but also provides an alternative means of supporting co-integration between the variables.

Results and Discussion

Even though the ARDL framework does not require pre-testing variables to be done, the unit root test could convince us whether or not the ARDL model should be used. During the last three decades, the methods of estimation of economic relationships and modeling fluctuations in economic activity have been subjected to fundamental changes.

The joint null hypothesis of the coefficients being equal to zero means no long-run relationship has been tested with F-statistics. The presence of co-integration between the variables is accepted if F-statistics reject the null at 95 per cent critical bound values generated by Narayan[11] for small sample.

Table -2
Results of Unit Root/ Stationary Test to Rice Export Demand by Perron[10]

Variable	Model		T_b	λ	Critical value in level				t_β	Result
	Constant	Trend			1%	2.5%	5%	10%		
LX^d	*	-	1997	0.85	-4.27	-3.97	-3.69	-3.28	-3.64	stationary
LPX	*	*	1999	0.46	-4.9	-4.53	-4.24	-3.96	-4.28	stationary
LPXW	-	*	1988	0.36	-4.55	-4.20	-3.94	-3.66	-1.26	Non stationary
LYW	-	*	2001	0.59	-4.57	-4.20	-3.95	-3.66	-3.88	stationary
LER	*	*	1980	0.46	-4.9	-4.53	-4.24	-3.96	-4.53	Stationary
LW	*	-	1976	0.36	-4.55	-4.20	-3.94	-3.66	-2.54	Non stationary

Note: (*) denotes that the model contains an intercept or a trend and (-) denotes that the model don't contain an intercept or a trend

Table -3
Results of Unit Root/ Stationary Test to Rice Export Supply by Perron[10]

Variable	Model		T_b	λ	Critical value in level				t_β	Result
	Constant	Trend			1%	2.5%	5%	10%		
X^s	-	*	1997	0.85	-4.27	-3.97	-3.69	-3.28	-1.64	Non stationary
PE	*	-	1999	0.46	-4.9	-4.53	-4.24	-3.96	-4.01	Stationary
PD	*	*	1988	0.36	-4.55	-4.20	-3.94	-3.66	-3.76	Stationary
DP	-	*	2001	0.59	-4.57	-4.20	-3.95	-3.66	-1.28	Non Stationary
GNP	-	*	1980	0.46	-4.9	-4.53	-4.24	-3.96	-5.53	Stationary
ER	*	*	1976	0.36	-4.55	-4.20	-3.94	-3.66	-4.54	stationary

Note: (*) denotes that the model contains an intercept or a trend and (-) denotes that the model don't contain an intercept or a trend

Table -4
Bound Test for Rice Export Demand Co-integration

Dependent Variable (Intercept and no trend)	SBC Lag	F-Statistic	Probability	Outcome
$F_X^d (LX^d \mid LPX, LPXW, LYW, LER, LW)$	1	5.4502*	0.004	Co-integration
$F_{LPX} (LPX \mid LX^d, LPXW, LYW, LER, LW)$	1	1.0217	0.364	No Co-integration
$F_{LPXW} (LPXW \mid LX^d, LPX, LYW, LER, LW)$	1	0.2154	0.549	No Co-integration
$F_{LYW} (LYW \mid LX^d, LPX, LPXW, LER, LW)$	1	1.2356	0.812	No Co-integration
$F_{LER} (LER \mid LX^d, LPX, LPXW, LYW, LW)$	1	1.3452	0.132	No Co-integration
$F_{LW} (LW \mid LX^d, LPX, LPXW, LYW, LER)$	1	0.9863	0.212	No Co-integration

Table -5
Bound Test for Rice Export Supply Co-integration

Dependent Variable (Intercept and no trend)	SBC Lag	F-Statistic	Probability	Outcome
$F_X^s (LX^s \mid LPE, LPD, LDP, LGNP, LER)$	1	6.3312*	0.002	Co-integration
$F_{LPE} (LPE \mid LX^S, LPD, LDP, LGNP, LER)$	1	0.1117	0.465	No Co-integration
$F_{LPD} (LPD \mid LX^S, LPE, LDP, LGNP, LER)$	1	1.0554	0.229	No Co-integration
$F_{LDP} (LDP \mid LX^S, LPE, LPD, LGNP, LER)$	1	1.1651	0.854	No Co-integration
$F_{LGNP} (LGNP \mid LX^S, LPE, LPD, LDP, LER)$	1	0.2212	0.582	No Co-integration
$F_{LER} (LER \mid LX^S, LPE, LPD, LDP, LGNP)$	1	1.1363	0.102	No Co-integration

The estimation results for the long-run relationship between Rice export demand and Rice export Supply and its main determinants are displayed in tables 6. Also, the empirical result based on ARDL tests repeated shows that the most significant break for variables of under investigation are consistent with time of the European Union (EU) rejection in September 1997. Later on, the associated estimated error correction regressions are obtained.

Also, analyzing the stability of the long-run coefficients together with the short run dynamics, the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) are applied. According to Pesaran and Shin[12], the stability of the estimated coefficient of the error correction model should also be empirically investigated.

Conclusion

This study analyses the factors that affect the supply and demand for Rice Export in Iran. The empirical results show that the parameter of the export demand and supply model are statistically significant at high significant levels and have good explanatory power. The goal of this paper was to test the existence of long run relationship determinants of supply and demand for Rice Export in Iran. This objective was aided by the technique of Pesaran et al.[6] approach to co-integration, which presents non-spurious estimates. Subsequently, our work provides fresh evidence on the long run relationship between supply and demand for Rice Export and structural break in Iran. The results at relationship between supply and demand for rice export and its determinants confirm the studies of Goldstein and Khan[5] but our results are more robust. Depending on the nature of the scare and the affected product, consumer trust in the product and demand for the product both fall affecting producers and consumers' well-being. Base on the results, Iran needs to have a more certain and clearer planning in production, marketing, and more importantly observation of health principles in order to maintain its export market shares in the world. Industries should undertake voluntary actions, which determine standards or similar measures for a product because the conditions of Iran and the market facts call for such a move. The policies should be concentrated to increase yields and to achieve higher quality standards which are essential to sustain a suitable profitability level of production on one side and to maintain the country's share in the international markets on the other side. Also to maintain Iran's export share in global market and achieve new markets the following measures should be done Government should regulate for investment in packing and also other requirements of supply and demand for Rice Export Orchards in order to provide financial credits for banks. Government controls the exchange rate fluctuations in Iran. If the government lets the exchange rate to float, it will cause a decrease in export prices and an increase in the volume of Iran's export; following all of these, the prices will become real.

Table -6
Estimated Long-run and ECM Coefficients using ARDL Model for Rice export demand and Rice export Supply

Estimated long-run coefficients (LX^d as dependent variable)			**Estimated long-run coefficients (LX^s as dependent variable)**		
Regressor	**Coefficient**	**t-Ratio(prob)**	**Regressor**	**Coefficient**	**t-Ratio(prob)**
LPX	-0.27	-3.54[001]	LDP	-0.32	-1.54[022]
LPXW	0.72	2.85[011]	LPE	0.53	4.85[000]
LYW	1.18	1.37[026]	LPD	0.28	5.37[000]
LER	1.22	1.12[032]	LGNP	0.22	2.32[017]
LW	1.03	1.65[021]	LER	0.13	2.95[011]
C1	4.64	0.24[045]	C2	5.14	0.35[034]
DU1997	-1.16	-1.45[023]	DU1997	-0.19	-5.36[000]
Estimated ECM coefficients			Estimated ECM coefficients		
Regressor	Coefficient	t-Ratio(prob)	Regressor	Coefficient	t-Ratio(prob)
DLPX	-0.22	-3.85[001]	DLDP	-0.28	-2.25[020]
DLPXW	0.68	2.95[009]	DLPE	0.51	5.35[000]
DLYW	1.17	1.42[021]	DLPD	0.22	6.02[000]
DLER	1.19	1.35[025]	DLGNP	0.09	2.85[010]
DLW	1.01	1.73[017]	DLER	0.01	3.03[008]
DC1	2.54	1.87[003]	DC2	2.66	1.47[028]
DDU1997	-1.15	-1.98[015]	DDU1997	-0.15	-5.98[000]
ECM(-1)	-0.54	-4.08[000]	ECM(-1)	-0.38	-4.08[000]

Note: The order of optimum lags is based on the specified ARDL model.

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