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The Impact of Iran's WTO Accession on the Saffron Export Market

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Abstract: This paper considers the Iran's saffron export market and deals with the Iran's accession to the WTO. Accordingly, the behavior of the saffron export market can be verified. In principle, we try to explore the main determinants of the export market through a model specification and study which role the possible WTO membership can play in the market. Thus, we specify two simultaneous equations of both export demand and supply of saffron, then estimate the equations by 3SLS over 1976-2004. The results imply that the role of WTO is significantly effective in the Iran's saffron export promotion.

Key words: Export market · Saffron · Iran · WTO

INTRODUCTION

Export of agricultural products involves a major share of total Iran's non-oil exports. Saffron has the second ranking on after pistachio which has the first top ranking on exporting goods [1]. In fact, Iran produces so percent of total world saffron per annum [2]. However, Iran faces many problems in exporting the product, while the country is not so effective in the global market in spite of its comparative advantage.

The objective of this paper is to investigate the effects of main determinants of the Iran's saffron exports and particularly to analyze the impact of the country's WTO accession on such exports. The paper specifies simultaneous equations which is suitable foe the saffron export market and then estimates these equations by the 3SLS method using data for the period 1976-2004.

The remaining of the paper is first devoted to Section 2 which includes material and methods, consisting of the price model and demand specifications. Section 3 reports the empirical results, which will be analyzed. Section 4 concludes.

MATERIALS AND METHODS

This section specifies the structural model of Iran's saffron exports including simultaneous demand and supply equations. Then it explains how relevant data are collected and how the equation regressions are estimated.

The export demand equation: Helleiner [3] indicates that export demand for a good is affected by its own export price, the world export price and the importing country's incomes. Hence, the function of form of the export demand is defined as

$$X_t^D = f(Px_t / Pxw_t, Yw_t) \quad (1)$$

where X_t^D denotes the world demand for exports, Px_t/PXW_t stands for the relative world the export price and YW_t is an index the real importers' income. Equation (1) relies on the long-run export demand, while it is assumed that exports are adjusted partially with respect to demand for exports at time t and its past period, t-1 [4]:

$$\Delta \ln X_t = \phi[\ln X_t^D - \ln X_{t-1}] + U_{2t} \quad (2)$$

where $\Delta \ln X_t$ refers to the log of export demand and is the coefficient adjustment. The adjusted function postulates that exports would be modified by the excess demand available in the other countries. Thus, due to the adjustment conditions and following [5], a final form is defined for estimating Iran's saffron export demand:

$$\begin{aligned} \ln X_t &= C_0 + C_1 \ln(PX/PXS)_t + C_2 \ln YS_t \\ &\quad + C_3 \ln ER_t + C_4 \ln X_{t-1} + U_{3t} \\ U_{3t} &= \Phi U_{1t} + U_{2t} \end{aligned} \quad (3)$$

where X denotes the world export demand for saffron, PX is the export price index of saffron, PXS is the Spanish

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export price index (as a proxy for PXW[1] (The reason that Spain is the major trading partner that imports about 80% of Iran's saffron)), YS is the Spain's real income as a proxy for YW, ER denotes real exchange rate and U_{it} (i=1, 2, 3) shows an error term.

The export supply equation: Export supply depends generally on export price, domestic price and domestic production [6]. A functional form of export supply is defined as:

$$X_t^s = f(PX_t / P_t, Y_t) \quad (4)$$

Where X^s is the volume of export supply and PX, P and Y export price, domestic price and domestic production, respectively. The excess supply of exports is also adjusted in the world market [7]:

$$\Delta \ln PX_t = \lambda[\ln X_t - \ln X_t^s] + V_{1t} \quad (5)$$

where $\Delta \ln PX_t$ denotes change in by of export price and λ is the adjustment coefficient. V_{1t} denotes a disturbance term.

As described previously, Spain the major Iran's trading partner in saffron so that the Iran's export supply of saffron is formulated in the following form:

$$\ln PX_t = \alpha_0 + \alpha_1 \ln X_t + \alpha_2 \ln P_t + \alpha_3 \ln Y_t + \alpha_4 \ln PX_{t-1} + V_{2t} \quad (6)$$

Where PX_t is the Iran's export price, X_t denotes the volume of Iran exports of saffron. P_t Is the domestic price index and Y_t stands for the volume of saffron product in Iran. PX_{t-1} refers to the one period lag of PX_t. V_{2t} is a disturbance term. Obviously, Equation (3) and (6) are simultaneous ones in the Iran's export market.

The related data for all variables are in form of time series and have been collected for the period 1976-2004. They are obtained mostly from the FAO [8], Iran's Custom [9] and the annual statistical reports provided by the Iran's Ministry of Agriculture [10, 11].

RESULTS AND DISCUSSION

As the model of Iran's saffron export market was specified in the previous section, which included two simultaneous log-linear equations of demand (lnX) and supply (lnPX), we use three stage least squares (3sls) to estimate those equation systemically. The results have been obtained by Stata, the econometric and statistical computer software.

Accordingly, the empirical results are shown in Table 1-3. Overall, the results indicated the price and income effects on the Iran's saffron export demand and supply of saffron in which some of them are statistically significant. To explore the effect of the WTO membership on the Iran's saffron export market, we have added three dummy variables.

More specifically the variable of WTO in Table 1 catches one for year 1995 (the year of founding the WTO) and after, otherwise zero. The estimate coefficient of this variable (in the supply equation) is statistically significant at the 5 percent significant level, with the expected sign. This reveals the fact that Iran would be able to increase the saffron export if the country directed its economy toward the WTO commitments.

Table 1: Results of the estimated Iran's saffron export market (the *WTO* membership effect)

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lex						
lpspds	0.0894414	0.2151637	0.42	0.678	-0.3322718	0.5111545
lgdps	2.8513570	0.5224484	5.46	0.000	1.8273770	3.8753370
lex						
L1	0.2227324	0.1369680	1.63	0.104	-0.0457200	0.4911848
cons	-45.1104800	8.8735620	-5.08	0.000	-62.5023500	-27.7186200
lps						
ly	1.1384240	0.1172948	9.71	0.000	0.9085306	1.3683180
ler	-0.0536631	0.0582357	-0.92	0.357	-0.1678029	0.0604767
lex	-0.5708119	0.0695956	-8.20	0.000	-0.7072167	-0.4344071
wto	0.4847337	0.2104804	2.30	0.021	0.0721996	0.8972677
cons	-4.4933160	1.4022370	-3.20	0.001	-7.2416510	-1.7449810

Table 2: Results of the estimated Iran's saffron export market(the economic *adjustment* effect)

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lex						
lpspds	0.0588069	0.2149830	0.27	0.784	-0.3625520	0.4801658
lgdps	2.8782800	0.5495674	5.24	0.000	1.8011480	3.9554120
lex						
L1	0.2116869	0.1428079	1.48	0.138	-0.0682114	0.4915852
cons	-45.4321000	9.3031070	-4.88	0.000	-63.6658600	-27.1983400
Lps						
ly	1.2156510	0.1350114	9.00	0.000	0.9510338	1.4802690
ler	0.0165545	0.0623146	0.27	0.791	-0.1055798	0.1386889
lex	-0.5719652	0.0950591	-6.02	0.000	-0.7582776	-0.3856528
adjustment	0.0836616	0.2795793	0.30	0.765	-0.4643038	0.6316271
cons	-6.0635770	1.3218760	-4.59	0.000	-8.6544070	-3.4727470

Table 3: Results of the estimated Iran's saffron export market (the exchange rate *unification* effect)

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lex						
lpspds	0.0629999	0.2149797	0.29	0.769	-0.3583526	0.4843524
lgdps	2.8745790	0.5432651	5.29	0.000	1.8097990	3.9393590
lex						
L1	0.2098263	0.1414925	1.48	0.138	-0.0674938	0.4871464
cons	-45.3369400	9.2022800	4.93	0.000	-63.3730800	-27.3008100
lps						
ly	1.1984330	0.1249202	9.59	0.000	0.9535943	1.4432730
ler	0.0276259	0.0531534	0.52	0.603	-0.0765528	0.1318046
lex	-0.5643937	0.0767781	-7.35	0.000	-0.7148760	-0.4139113
unification	0.0625503	0.1842068	0.34	0.734	-0.2984884	0.4235889
cons	-5.9208950	1.4143950	-4.19	0.000	-8.6930580	-3.1487320

CONCLUSION

The empirical results obtained by this study confirm the significant role of the WTO membership in the Iran's saffron exports. This part is more pronounced than that of other policies, investigated in this study, as we have considered tow other dummies standing for the economic adjustment and exchange rate unification.

Accordingly, the coefficient of the dummy *adjustment* (which the economic adjustment started from 1993 in Iran) and the coefficient of the dummy *unification* (which the policy of the exchange rate unification was implemented in 2002) are not statistically significant (Table 2 and 3). This of course highlights the role of the WTO membership in the country export promotion.

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