

Investigating the Quantitative Effect of Trade Liberation on Export Supply of Agriculture Sector: Export of Fruit and Its Dried Products in Iran

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Abstract:

This paper deals with the effects of trade liberation policy regarding agriculture sector. To this end, the quantitative effects of coherence, structural-technical obstacles, the consumption gap of domestic demand, exchange price and the relative prices of the export supply of fruit and its dried products in Iran during 1963-2001 have been investigated. The significance of the co-integration of variables and the results of the estimation of the parameters of the model, using minimum squares method show that: firstly, there is a difference between the short and long run ties of export in this sector. Secondly, assuming constant conditions, the short and long run price elasticity of export supply of fruit and its dried products is trivial and less than unity. Therefore, liberating the foreign trade of this sector will not maintain its share in the world market. Thirdly, the effect of coherence, structural-technical obstacles, as well as those related to technology and legality, and the variable of consumption demand gap are more serious compared to relative prices. Fourthly, the oil shock of the 60s has brought about significant positive differences between the short and long run ties of the export supply model of these products.

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1. Introduction

Along with globalization, the field of competition expands globally, and those countries which are more flexible and have more power in order to compete internationally will be more successful. In this regard, the agriculture sector in Iran is one of the real factors defining the relationship between national and international and international economy. Since with the decline of the Communist Party in the USSR (1991), GATT (General Agreement Tariff and Trade) was replaced by WTO (World Trade Organization, 1995) and globalization has been propounded rapidly by the late 20th century and expanded in five fields of financial markets, multi-nationality companies, investment, labor markets, and trading (Fitzpatrick, 2002), Iran tries to join WTO. Therefore it is necessary to pay great attention to the capabilities of Iran's foreign trade especially agriculture export regarding foreign trade elasticities, and to predict the possible consequences of trade liberation under an economic framework. Considering that fruit and its dried products (tree products) have a low flexibility and that collective foreign trade elasticities do not reflect their manner, this study focuses on the effect of liberation on the supply of fruit and its dried products. In order to achieve this, using the controlling and exogenous variables of export supply, the capacities and capabilities of this sector and the effect of trade quantification on the manner of export supply of fruit and its dried products are examined and evaluated. In order to investigate this under a statistical framework and then to estimate the econometric model of the export supply of these products during (1963-2001), the statistical data published in reports and balance sheets of Central Bank of Iran and the statistical yearbooks of the Statistics Center of Iran during different years were exploited. In addition to the introduction, this paper includes five sections. The first section presents the theoretical essentials of foreign trade models. Then, the empirical studies conducted in this respect are reviewed. The fourth section examines the manner of export supply of fruit and its dried products and also analyzes the empirical results of the

research. The final section is devoted to summary and conclusion.

2. Theoretical essentials of foreign trade models

An oft-asked question regarding the international economy is: why do countries trade? To answer this question, absolute preference theory (Adam Smith), relative preference theory (David Ricardo), supply and accumulating supply factors (Heckscher-ohler), or the superiority of production technology and the definition of the expenditures of production opportunities all show that relative prices reflecting the productive conditions of countries are the most important factor of their foreign trade. These theories have been proposed based on the restricting assumptions such as the homogeneity of production factors and neglecting supply conditions and are not in conformity with real world. For instance, if the efficiency is not fixed in relation to the scale, or there is an expense of transporting goods and services among countries, these theories will not have the power to predict the manner of foreign trade.

Leontieff's puzzle is the most famous reason for this conclusion (See Adeli, 1986, pp, 54-58). Therefore, later theories, such as Linder's (1961) supply similarity theory question the productive conditions. According to this view, supply conditions should be defined and explained in terms of foreign trade theories. Although the relative frequency of production factors has an important role in determining the trade models of natural-resource goods, Linder argues, in trading industrial (produced) goods what counts is the supply structure which is initially explained in terms of income per capita of a country. That is, generally, consumers in countries with high income per capita have supply models for goods with higher quality (more luxurious and more complex capital) whereas in countries having a low income per capita, the models of supply are inclined to goods with a lower quality. Therefore, exportation will take place among countries with similar supply models (ibid, pp. 85-88). Recent theories presenting the indifference curves of the society

and deriving trade offer curves, examine the state of demand and supply in the society concurrently. (Salvatore, 1989) Investigating these theories shows that: first, the relative frequency theory can explain models of trading in natural resources and fails to provide sound explanations regarding the supply of produced industrial goods, since it is the supply structure that is important in industrial products. Second, these theories only provide short run and stable explanations of trade models and ignore the middle and long run factors. In the above mentioned theories considering these factors is explained in terms of the transmission of knowledge or the technology of production. Posner (1961) proposing the theory of 'technology gap and the cycle of production life' argues that factors such as innovations, inventions and proposing new productive methods have a vital role in trading and transmitting production markets (Hefferan, 1990). In this model, the transmission of production and consumption markets is accompanied with two lags, namely reaction lag and imitation lag. The Former is resulted from the delay between the time of production in the innovator country and the time of purchasing the technology by other countries. The Latter is created due to the delay between the time of purchasing the technology and the time of putting it into operation. In the reaction lag the export of the country having the technology will increase whereas in the production lag it is vice versa. This is because the importation of the country purchasing the technology is replaced by its domestic products. Posner's theory clearly reveals the importance of the lag or delay in foreign trade models. Hufbayer, relying on Posner's theory and the influence of technology innovation on trade models, defines export supply as a result of innovating a 'new method of production' during a restricted period (Hefferan, 1990). Vernon (1966) expanding these theories and assuming the free movement of technologies proposes three stages of production in foreign trade, namely the New-product stage, the Maturing-product stage and the Standardized-product stage. Thus, it can be observed that later economists fail to describe the stability of foreign trade models as

proper models due to the assumption of a fixed and stable technology. Rather, considering the role of time and lags in trade models, they propose dynamic and lagged models for investigating foreign trade models.

Overall, examining the foreign trade theories suggests that variables of relative price (considering demand and supply), income (demand only) and time lags in forms of dynamic models, and the distinction between short and long run manner are the leading factors which interpret foreign trade.

3. Empirical studies on foreign trade

Investigating empirical studies on foreign trade models shows that there is a great amount of sensitivity regarding the underestimation of elasticities, especially those of prices. One of the factors that has been paid attention to in the empirical studies is the problem of estimating the concurrent equations for all countries. Under the empirical research framework, in order to concurrently estimate the foreign trade elasticities of countries, import demand is proposed at micro or individual level, whereas export supply function is considered at a macro or mass level (Linneman, 1966). Such models are designed in order to determine the consequences of integrating countries based on economic issues; so they are not appropriate for studying the countries individually. In this respect, the International Money Fund has developed models and has paid more attention to investigating the export supply functions of countries as a determining factor of import demand. Another solution is to consider the demand for exporting goods and services in individual and small countries as completely elasticible (Khan, 1974). Under this framework, assuming that the export supply function is not influenced by economic shocks and is not transmitted, the transmission of export supply function will not be accompanied by changes in price, and one of the problems of downward bias estimating the elasticities for small countries will be obviated. The other solution which removes this defect is classification or separation of export goods (Bond, 1987). Khan

(1975), in another study, proposed the bias resulting from collective import estimation compared with classification of goods and showed the downward bias of price elasticities. In Ball and Marwash (quoted in Mizz, 1988, P. 194), this method was used after changing the sample and the same results were obtained. Another point which has been considered regarding the estimation of price elasticities is the instability of price elasticities (Goldstien and Khan, 1976). This is explained by arguing that due to limitations, structural obstacles and the technical problems of production, long run modification of export supply is more than that of the short run modification. Thus, elasticities are significantly different in short and long run. This suggests the necessity of being a delayed or predetermined export variable in trade models. Studies conducted by Linneman (1966), Khan (1988), Sandarajan and Subhash (1974), Khan and Ross (1975), Goldstien and Khan (1978), Arize (1988), Khan and Knight (1988), Sarwar (1996) propose the following generalized and balanced model for examining the quantitative manner of foreign trade:

$$\ln X_{jt} = \alpha_0 + \alpha_{1j} \ln w_{jt} + \alpha_{2j} \ln \left(\frac{p_{x_{jt}}}{p_{wx_{jt}}} \right) + U_{jt} \quad (1)$$

where x_i is the ratio of export goods of the j th country to those of other countries, w_{jt} is the gross domestic production index or the national income of the countries except the j th country, p_{x_i} (trade parties) is the index of export price of the j th country, and p_{wx_j} is the index of export price of the same goods and services in the rest exporting countries.

Since this model is considered to be the same for the studied countries, it lacks the structural characteristics of countries as individuals. Thus, using this model will create errors in specification and bias due to their weaknesses and insufficiencies in managing warehouse stock, marketing and planning in the supply section, most of the countries cannot adapt themselves with the rapid changes of supply in trading issues. If these insufficiencies are not considered in the proposed model, there

will be bias in the estimation of the parameters of the export supply model. Bond (1987) presented the export supply model assuming to find the optimum point in domestic and foreign markets. According to this model, it is necessary to provide conditions under which the relative prices reflect real conditions of production in the society. In this regard, export supply model of goods is presented as follows:

$$\ln XS_R^K = \beta_0 + \beta_1 \ln\left(\frac{Px_R^K}{P_R}\right)E_R + \beta_2 \ln\left(\frac{Px_{R-1}^K}{P_{R-1}}\right)E_{R-1} \quad (2)$$

$$+ \beta_\gamma \ln \bar{y}_R + \beta_\delta SSR + \beta_\epsilon t$$

Where XS_R^K is the amount of export of K, and S means supplied from R region, P_R is the domestic price of the producing countries in the region R, E_R is the exchange rate of the producing countries of region R, \bar{y}_R is the index of the total capacity of production in region R, SSR is the supply stock in region R, and t is the trend variable. This model, considering the delayed relative prices, shows the coherence and adaptation lags of balance process with one-year lag.

In Iran a couple of studies have been conducted on the foreign trade. In the empirical research of Kalbasi and Jalayee (2002) which investigates the effect of globalization on Iran's foreign trade, export supply model is presented as follows:

$$\log E_t = \beta_0 + \beta_1 \log\left(\frac{Pd}{P_x}\right) + \beta_2 \log E_{t-1} + \beta_3 \log IIT_t \quad (3)$$

Where E_t is export supply, Pm is the price index of real goods, Px is the index price of export goods, E_{t-1} is the supply of the delayed export, IIT is the index of foreign trade investigation which is defined as : $IIT = 1 - \frac{M_t - X_t}{M_t + X_t}$. If IIT = 0 then there will be no foreign trade, and if IIT = 1 there will be complete foreign

trade in the sector under investigation. The model above is estimated in terms of three groups of intermediate, investmental and consumer goods during 1959-2000. In this study, the coefficients of relative prices and supply of delayed export for intermediate goods of agriculture sector were not significant. Also, in consumer export supply, relative prices were not significant, and its delayed variable was negative contrary to the assumptions of the model. Since the results do not report any significance of variables, it is proposed that the group of goods under question be more detailed in order to reach sound results. In another study conducted by Ahangari and Zeynivand (2004), to investigate the exchange and export policies of agricultural products during 1963-2001, two models examining the relationship between the official exchange price and subside of agricultural products and the rate of export exchange are presented as follows:

$$\ln XAg_t = \alpha. + \alpha_1 \ln\left(\frac{pf}{pd}\right)_{t-2} + \alpha_2 \ln OER_{t-1} + \alpha_3 \ln SX_t + \alpha_4 \ln Yf_t \quad (4)$$

$$+ \alpha_5 D_1 + \alpha_6 D_2$$

$$\ln XAg_t = \beta. + \beta_1 \ln\left(\frac{pf}{pd}\right)_{t-2} + \beta_2 \ln EERX_{t-1} + \beta_3 VAA + \beta_4 \ln Yf_t \quad (5)$$

$$+ \beta_5 D_1 + \beta_7 D_2$$

where XAG is the export of agricultural products, $\frac{pf}{pd}$ is the relative prices with a two-year lag, OER is the official exchange price with one-year lag, SX is export subside, Yf is the gross domestic production of industrial countries, VAA is the surplus value of agriculture sector, EERX is the efficient exchange price D_1 and D_2 are dummy variables of the revolution and war. This model is presented in terms of export demand. When investigating the effects of globalization on the economy of a country, domestic economic affairs receive more importance than the exogenous factors of national economy, for they function as

exogenous factors of world economy, and the economy of one country, especially a small one, does not affect these factors. That is why oil price is considered as an exogenous factor (dominance of oil demand) not only for individual countries exporting oil but also for OPEC as well. Therefore, it seems more reasonable to use models of export supply instead of those of export demand, since export supply focuses on domestic affairs of economy whereas export demand is concerned with the state of affairs of trading parties.

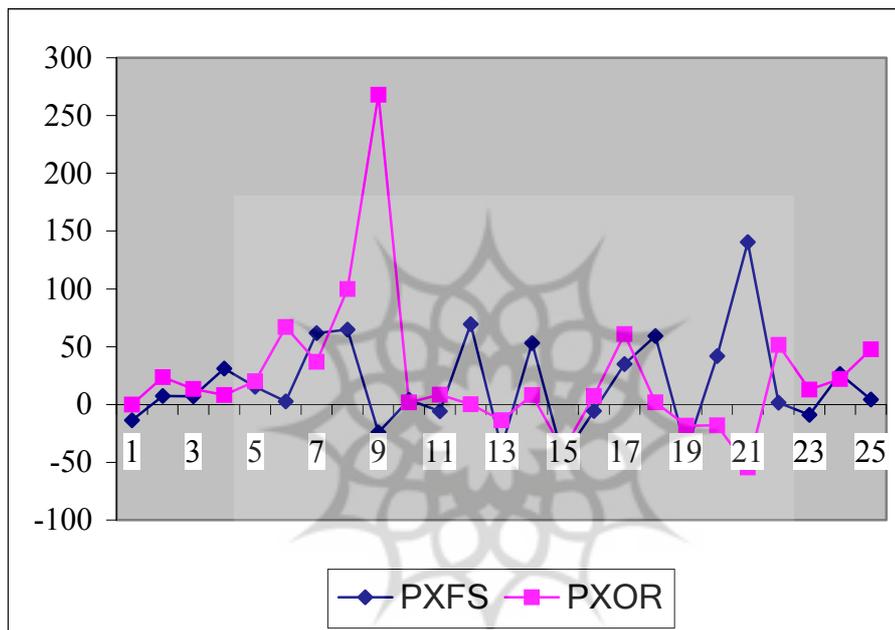
4. Investigating the manner of export supply of fruit and its dried products in Iran

In this section factors influencing export supply of fruit and its dried products in Iran are investigated. The data and statistics concerning the export supply of these products reveal that various types of fruit, especially dried ones, have made up an important portion of non-oil export in Iran for about a century. In this regard, raisin, almond, walnut, pistachio, and hazelnut have a greater share, and despite the annual fluctuations of non-oil export, this group has still retained its standing in terms of the value and the volume of their share. As for income resulting from oil and gas, investigating the trend of export of fruit and its dried products shows that the mean share of fruit export ($\frac{XFS}{XFS + XOR} \times 100$) was 1.86 percent and 2.14 percent in pre and post revolution periods respectively. With the increase of exchange income in year 1973, this index has fallen from 1.83 percent to 0.38 percent in year 1974 (Table 1.) and has remained less than 0.58 percent until the revolution. After the revolution, in year 1985, it reached 0.82 percent with minor fluctuations. The oil-shock in this year and the year 1986 coupled with the intense decrease of exchange income of gas and oil brought about a growth rate of 140 percent for fruit export and raised its share from 0.82 percent to 3.33 percent in the year 2001.

In fact, with the fall of exchange income resulting from oil and gas dropped from 13.7 billion dollar in year 1985 to 6.2

billion dollar in year 1986 (54.4 percent decrease). During this period, due to the strong deficit in payment balance, fruit export raised from 113.3 million dollar to 272.4 million dollar (over twice as much). Examining the trend of fluctuations of exchange income of oil and gas and that of fruit shows that the relationship between these two variables is negative as such their correlation coefficient is (-0.99). Figure 1. illustrates this relation graphically. This relation shows that oil shock has a positive effect on export.

Figure 1: The trend of fruit export and the exchange income of oil and gas



Source: The Statistics Center of Iran

Under the framework of the literature on macro-economics, it seems that the decrease of exchange income of oil and gas will bring about the relative recession of national economy and the decrease of national income per capita. The decrease of national income per capita itself, based on long and short run consumption theories, decreases national consumption and by so doing widens

the gap of consumption demand of the society. Since widening the gap of consumption demand of the society increases the surplus supply of agricultural products, export supply of agricultural products will be provided at an expensive level.

As far as literature is concerned, it seems that with the decrease of exchange income of oil and gas and national economy facing serious bottlenecks, government officials resorted to exchange income of agricultural products (due to their weak dependence on primary and middle materials). Eliminating official and legal obstacles and providing short run facilities, governments can obviate the obstacles of export supply development in agriculture sector. The trend of exchange income of fruit and its dried products shows that this policy may bring about an immediate (lasting one year) 100 percent increase in export supply (in year 1986). The above trend demonstrates that adopting appropriate policies, planning and removing legal obstacles by the government have a tremendous effect on the manner of export supply and will enhance the flexibilities of this sector in short and long run.



Table 1: Depicts the trend of income of oil and gas as well as that of fruit and its dried products (million dollar)

year	Relative changes of oil and gas	Relative changes of fruit (%)	Income of oil and gas (%)	Fruit export
Year	PXOR	PXFS	XOR	XFS
1966	NA	-	608/2	19/9
1967	23/6	7/5	751/6	21/4
1968	13/5	7/0	853/4	22/9
1969	8/1	31/0	922/8	30/0
1970	20/2	15/3	1109/3	34/6
1971	66/9	2/6	1851/1	35/5
1972	37/0	61/7	2536/0	57/4
1973	100/0	64/8	5073/0	94/6
1974	268/0	-24/1	18672/0	71/8
1975	2/0	4/0	19054/0	74/7
1976	8/5	-5/9	20670/0	70/3
1977	0/2	69/6	20713/0	119/2
1978	-13/7	-37/2	17867/0	74/9
1979	1/8	53/1	19315/0	114/7
1980	-39/9	-46/0	11607/0	61/9
1981	7/3	-75	12455/0	58/4
1982	60/1	34/9	20049/0	78/8
1983	2/0	59/3	20/456/0	125/5
1984	-18/2	-39/4	16726/0	79/8
1985	-19/0	42/0	13710/0	113/3
1986	-54/4	140/4	6255/0	272/4
1987	51/5	1/7	9478/0	277
1988	13/0	-8/8	10709/0	252/6
1989	22/1	26/3	13081/0	319/1
1990	47/6	4/4	19395/0	333
1991	-3/3	59/6	18661/0	531/6
1992	6/5	8/7	19868/0	577/6
1993	-9/0	16/8	18080/0	674/5
1994	7/5	-6/8	19434/0	628/0
1995	-5/5	-7/7	18360/0	580
1996	22/0	10/2	22391/0	639/2
1997	-13/9	-47/2	19271	337/5
1998	-48/5	75/4	9933	591/9
1999	-72/0	-12/6	17089	517/3
2000	42/1	-2/6	24280	504/1
2001	-20/4	32/2	19339	666/2
2002	0	17/0	22807	779/4

Source: reports and balance sheets of the Central Bank of Iran, annual statistics

Overall, factors such as gap of domestic consumption and oil price shock can be identified as having an important role in the

specification and presentation of export supply model of fruit in Iran. In theoretical investigation of foreign trade as well as empirical studies on foreign trade, it was observed that the variable of relative prices in export supply model of fruit and its dried products is defined as the ratio of world price to domestic price based on a unitary currency. This ratio, on the one hand, shows the effect of exchange price alteration and determines the price of alternative goods at global level on the other. Since it is possible to estimate the price reaction of supply of delayed agricultural products in economic structures with low flexibility and less developed technical elasticities, the present study considers this delay in specifying the model.

5. Presenting and estimating the export supply model of fruit and its dried products

In the previous section, factors influencing the export supply model were examined. In order to, specify the influence of these factors the export supply model of fruit and its dried products is considered as a surplus of domestic supply and a function of relative prices, exchange price and population:

$$XFS_t = XFS_t(PW_t, PD_t, (\frac{C}{\bar{C}})_t, E_t, D_t) \quad (6)$$

where XFS is the export fabric supply, C is consumption, \bar{C} is the mean consumption of the period, $\frac{C}{\bar{C}}$ is pressure or gap of domestic consumption demand, PW is world price, PD is domestic price, E is exchange price, and D_t is oil price shock. Since logarithmic models provide the possibility of access to mean price elasticities and decrease or remove heteroskedasticity variance and the multicollinearity among the influencing factors in the model, the export supply model of fruit which investigates the effect of oil shock on price elasticity and consumption gap elasticity is presented logarithmically as follows:

$$\ln XFS_t = \alpha_0 + \alpha_1 \ln\left(\frac{PW \times E}{PD}\right) + \alpha_2 \ln\left(\frac{C}{C}\right)_t + \alpha_3 D_1 \ln\left(\frac{PW \times E}{PD}\right)_t + \alpha_4 D_1 \ln DD_t + U_t \quad (7)$$

Based on foreign trade theories and the structure of Iran's economy, the coefficients of the models are expected to be positive, that is:

$$\alpha_1 > 0, \alpha_2 > 0, \alpha_3 > 0$$

According to the traditional context of producing and supplying fresh and dried fruit and the low flexibility of supply, this sector is not relying on new technology and research innovations (e.g., choosing seeds, methods of using toxicities and irrigation), bottlenecks in agriculture (e.g., structural, planning and policy making), it seems that there is a sharp distinction between the short and long run elasticities. The detailed modification theory is presented as follows:

$$\Delta \ln XFS_t = \wp (\ln XFS_t^d - \ln XFS_{t-1}) \quad , \quad \wp < 1 \quad (8)$$

where \wp is modification or depreciation coefficient and (d) is the indicator of the expected or planned export. With this assumption, the dynamic export supply model of fruit is presented below:

$$\ln XFS_t = \beta_0 + \beta_1 \ln\left(\frac{PW \times E}{PD}\right)_t + \beta_2 \ln DD_t + \beta_3 D_t \ln\left(\frac{PW \times E}{PD}\right) + \beta_4 D_1 \ln DD_t + (1 - \wp) \ln XFS_{t-1} + U_t \quad (9)$$

where DD is the demand gap and is obtained by calculating the deviation from the balance. This deviation or demand gap is defined as the difference between the real consumption of the country and its potential consumption. In this regard, based on mathematic formulas, the average or mean of the period is considered as consumption alternative variable.

$$-1/075 \ln \hat{D}D + 0/37 \ln XFS_{t-1} \quad (10)$$

$$(-1/697) \quad (2/992)$$

$$\bar{R}^2 = 0/95, \quad D.W = 2/19, \quad F = 150/57(0/000), \quad ADF(\hat{e}_t) = 4/032$$

The ADF's statistic for the disturbance terms does not reject the co-integration of the variables at $\alpha = 0.05$ significance level. Therefore, a balanced long run relation does exist between the variables and is estimated as (9). To verify the classic assumptions, tests of pathology of the model are performed. To make sure of the lack of any co-integration disturbance terms, LM test was performed, and its statistic ($F=0.48$) indicates the absence of any self-co-integration among the disturbance terms. White's test was utilized to examine the heteroskedasticity of variance of disturbance terms. White's test statistic ($F=0.89$) indicates the heteroskedasticity of variance of disturbance terms. The coded RESET test confirms the proper specification of the model ($F=0.001$). The statistics of normality histogram test ($J.B=0.84$) indicates the normal distribution of disturbance terms. Therefore, at 0.05 significance level, the hypotheses of self-co-integration of disturbance terms, heteroskedasticity of variance, error specification and non-normal distribution of disturbance terms are all rejected. Comparing the detailed F_t and R^2 statistics of the model rejects strict multicollinearity. Furthermore, the estimated coefficients are compatible with theories of international economy and the structure of export supply of fruit. Thus, this model can be said to be capable of explaining 95 percent of the manner of export supply of fruit and its dried products.

5.2. Results of the model for pre and post oil shock periods

As observed, the export supply model presents a great percentage of changes in export supply of fruit and its dried products in Iran. Since in export supply of agriculture sector, reaction is delayed and the decreasing trend of exchange income from oil had begun since 1984 and continued to fall to its lowest

point (6.2 billion Rials) in the year 1986, the oil shock of 1984 is considered as a dummy variable of export supply model. This model is divided into two separate periods of pre and post oil shock (1963-1984 and 1985-2001 respectively).

5.2.1. Export supply of fruit and its dried products in pre oil shock period

The export supply model of fruit and its dried products for the pre oil shock period is presented as follows:

$$\ln \hat{XFS}_t = 1/003 + 0/30 \ln \left(\frac{PW \times E}{PD} \right)_t + 0/72 \ln \hat{DD}_t + 0/37 \ln \hat{XFS}_{t-1} \quad (11)$$

5.2.2. Export supply of fruit and its dried products in post oil shock period

The export supply model of fruit and its dried products for the post oil shock period is presented as follows:

$$\ln \hat{XFS}_t = 1/003 + 0/42 \ln \left(\frac{PW \times E}{PD} \right)_t + 0/35 \ln \hat{DD}_t + 0/37 \ln \hat{XFS}_t \quad (12)$$

As observed above, the oil shock of 80s had brought about alteration in the manner price elasticity and consumption demand gap of export supply of fruit and its dried products as such that the coefficient of price elasticity has increased 0.12 percent, but the coefficient of domestic consumption elasticity has decreased 0.37 percent. Therefore, if foreign price level had increased 10 percent, export supply would have increased 3 percent prior to the oil shock whereas it is increasing 4.2 percent after the oil shock. Of course, though after the oil shock and with the improvement of export conditions, price elasticity has also been improved, in both periods fruit and its products are less elasticible. Since structural as well as policy making bottlenecks and the problems and obstacles of technology have an important role in the modification of export supply of fruit and its dried products in Iran, the modification coefficient of the calculated

model ($\phi=0.630$) will create distinction in both short and long run sensitivity analysis. Thus, long run elasticity of export supply prior to the oil shock is obtained based on the following formula:

$$\hat{\beta} LR = \hat{\beta} SR / \hat{\phi} \quad (13)$$

where $\hat{\beta}$ indicates the estimate parameter and SR & LR are the delayed changes in the model. Therefore, by using this formula, the long run price elasticity is estimated 0.48 percent and 0.67 percent for pre and post oil shock periods respectively. As observed, the long run price elasticity of export supply of fruit and its dried products is still less elasticible as such that if the exchange price increases in a way that leads to 10 percent increase of relative prices $(\frac{PW \times E}{PD})_t$, the export supply of these products will reach 4.8 percent and 6.7 percent for pre and post oil shock periods respectively. The lag median of the model is obtained from $\frac{-\text{Log}2}{\text{Log}(1-\phi)}$ (Gujarati, 1993, p. 671). According to the definition of lag median, in order for 10-percent increase of relative prices of agricultural products to affect 50-percent of the total export supply, at least an 8-9 (8.9) months period is needed.

6. Conclusion and summary

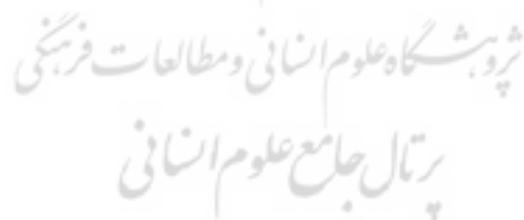
Globalization, or becoming globalized, regardless of the views of its advocates or opponents is rapidly increasing with more countries joining the WTO. In order to take full advantage of this trend and minimizing its negative consequences, it is necessary that all various sectors and sub-sectors become under close scientific scrutiny, and models of the manner of sub-sectors of agriculture be explained fully. The specified and estimated model of the export supply of fruit and its dried products for pre and post oil shock periods (1963-2001) shows that price elasticities of export supply in short and long run are distinct and

less elasticible: 0.3 and 0.42 in the short run, and 0.48 and 0.67 in the long run (for per and post oil shock periods respectively). These results show, provided that all governmental and structural factors, price alterations such as exchange price and domestic as well as world prices are fixed, trade liberation in agriculture sector will be accompanied with the weak and low reaction of export supply of fruit and its dried products. Also, the results suggest that according to price elasticity of pre and post oil shock periods, establishing appropriate opportunities and paying more attention to providing legal facilities in this sector can increase the percentage of price elasticity from 0.3 to 0.42 for the short run and from 0.48 to 0.67 for the long run. This change of manner in export supply of fruit shows that improving the conditions of export supply has a positive impact on increasing the propensities of suppliers of these products. Furthermore, estimating the modification amortization coefficient shows that as for the transformation of liberation, this sub-sector has delayed reaction, and facing the rapid changes and removing the relative legal obstacles of this sector (as in some of the studied years), export supply of fruit and its dried products will be 2.4 as much in the short run (the increase in 1986) (Table 1). Under such circumstances, it seems that in order for profits gained from liberation to be increased, there should be serious changes in all fields relating to this sub-sector.

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بررسی اثر کمی آزادسازی تجارت خارجی بر عرضه‌ی صادرات بخش کشاورزی: صادرات میوه و خشکبار ایران (۱۳۸۰-۱۳۴۲)

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چکیده:

این مقاله اثر سیاست آزاد سازی تجاری را از منظر بخش کشاورزی مورد توجه قرار می‌دهد. در این راستا اثر کمی چسبندگی‌ها، موانع ساختاری-فنی، شکاف مصرفی تقاضای داخلی، نرخ ارز و قیمت‌های نسبی بر عرضه‌ی صادرات میوه و خشکبار ایران طی دوره‌ی (۱۳۴۲-۱۳۸۰) بررسی شده است. معنی‌دار بودن انباشتگی^۱ متغیرها و نتایج برآورد پارامترهای مدل به روش حداقل مربعات معمولی نشان می‌دهد که اولاً، در این بخش میان کشش‌های کوتاه مدت و بلند مدت عرضه‌ی صادرات تفاوت وجود دارد. ثانیاً، با فرض ثابت ماندن سایر شرایط، کشش قیمتی کوتاه مدت و بلند مدت عرضه‌ی صادرات میوه و خشکبار کمتر از یک و جزیبی است. از این رو، با آزاد سازی تجارت خارجی این بخش نمی‌تواند سهم خود را در بازار جهانی حفظ کند. ثالثاً، تاثیر چسبندگی‌ها، موانع ساختاری-فنی، تکنولوژی، حقوقی و نیز متغیر شکاف تقاضای مصرفی در مقایسه با قیمت‌های نسبی شدیدتر است. رابعاً، شوک نفتی دهه‌ی شصت موجب افزایش تغییرات معنی‌دار و مثبتی بر کشش‌های کوتاه مدت و بلند مدت الگوی عرضه‌ی صادرات این محصولات شده است.

طبقه بندی JEL: D00, C22

واژه‌های کلیدی: عرضه‌ی صادرات میوه و خشکبار، کشش قیمتی، شوک نفتی، آزاد سازی

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¹ Cointegration

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