The Effects of Agricultural Trade Openness on Food Price in Iran

M. Ghahremanzadeh [1*], M. Samadpour[2], J. Hosseinzad[3]

Abstract

Trade liberalization of agricultural products and its effect on food prices, because of the importance of food in the household consumption basket, is one of the most important goals of governments for public access to health and food security. The present study investigated the effect of trade liberalization on domestic food prices in Iran. In this context, the single-equation error correction model (SEECM) was applied using the required time series data during 1989-2019. The results show that in the short-term, only increases in global food prices, liquidity, and exchange rates significantly affect domestic food prices. However, domestic food prices show more reaction to exchange rate fluctuations than to world prices. The estimated long-run equilibrium relationship demonstrated that world food prices have a positive and trade liberalization has a negative effect on domestic food prices. In addition, in the long run, the effect of liquidity on the domestic food price of food is more than other factors. The estimated error-correction term indicates that in the long run, if a shock occurs to the domestic food price, the domestic market can adjust it by only 35% annually. Considering the fluctuations of global prices and exchange rates, and their impacts on domestic prices, it is necessary to pay attention to these fluctuations in revising trade policies.

Keywords: Exchange rate, Food stuff, Global prices, Trade openness
Classification JEL: C32, F12, Q12

Introduction

The sharp increase in global prices of basic food is a serious threat to global development. The trend of rapid increase in global food prices leads to a significant increase in poverty, a decrease in the level of nutrition and limited access to services such as education and health, all of which have a negative effect on the growth of the global economy in the future (Ivanich and Martin, 2014). It is expected that the increase in food prices in the world markets will be transferred to domestic prices in different countries. In particular, the influence of world markets is greater in countries that import food and face high inflation (Javdan *et al.*, 2017).

Food prices have always been the focus of governments and policymakers due to the importance of food in maintaining health, growth and food security in addition to household economy. Since the price of food determines the consumer's ability to provide food, the importance of access to sufficient food at a reasonable price is an important issue. It gets more important especially in countries that import food and as a result, the cost of providing food includes a large share of the total household expenses (Jafari and Farajzade, 2019). In such countries, trade liberalization leads to an increase in the price of exported food products and a decrease in

1, 2 and 3- Professor, M.Sc. Graduated and Associate Professor, Department of Agricultural Economics, Faculty of Agriculture, University of Tabriz, Tabriz, Iran, respectively.

(*- Corresponding Author Email: Ghahremanzadeh@Tabrizu.ac.ir)

the price of imported food products, because domestic prices are adjusted to the global prices. However, exporters who supply food increasingly to the international markets will eventually experience price inflation at home (Eclac, 2008). With the liberalization of agriculture, the price of some agricultural products usually increases, because some developed countries spend significant amounts on granting export subsidies, and naturally, with the removal of these subsidies, the price of these types of products increases (Salem and Yousefpour, 2012). The price of agricultural products fluctuates more compared to the price of other goods, which in general can be considered as a result of changes in food supply or demand. In addition, when food producers see that their products can be sold at a higher price abroad, they allocate a greater share of their production to the exports. Therefore, the domestic supply of these products decreases (Javdan *et al.*, 2017). Investigating the effect of the trade liberalization on the food prices can be a good help for the policy makers in this field in planning appropriate and efficient policies. As one of the developing countries, Iran's economic structure is highly dependent on imports, and this can have a significant impact on the domestic prices.

According to the Central Bank of Iran (2019), it can be seen that in 2017, the amount of export of agricultural products and food industries was 6956 thousand tons and worth 6400 million dollars, which was 5.9% in terms of weight and 4.4% in terms of value. It accounts for 14% of the country's total export of non-oil goods. The export value in 2017 compared to the 2016 has decreased by 5.7% and compared to the average of the years of the fifth plan, it has decreased by 3.8%. The amount of import of agricultural products and food industries in 2017 was 20,485 thousand tons with a value of 10,841 million dollars, which was 63.9% by weight and 25.4% by value of the country's total imports. In general, the amount of production of agricultural products in Iran in 2013 was equal to 85,593 thousand tons and with a growth of 18.9% in

2018 reached at 101,744 thousand tons. Meanwhile, the import of agricultural products in 2013 was equal to 39,481.07 thousand tons with a value of 11,517.02 million dollars and in 2018 with 35,816 thousand tons with a value of 7,671.26 million dollars. In other words, 26% of the domestic demand is provided through the import channel. This shows the significant importance of importing agricultural products to ensure the country's food security, and on the other hand, it reflects the impact of domestic food prices on the global price changes. In the meantime, according to the report of the Central Bank of the Islamic Republic of Iran, the consumer price index in the country had a slight upward slope from 1991 to 2011, but since 2011, this index has been increased with a relatively steep slope, where one of the main reasons for that was the economic sanctions from the United States of America. In 2018, the consumer index reached a rapid growth rate of 221, which indicates a significant increase in the food prices in the country. Considering the changes in the exchange rate and world price and in order to properly manage the effect of the increase in the world price on the domestic price, it seems that it is necessary to examine the sensitivity of the domestic price to the increase in the world price, and considering that Iran is an importer of some food items, the potential of being affected by the global prices of these goods seems high. Therefore, identifying the factors affecting the domestic price of food has great importance in Iran's economy. Hence, the current research seeks to evaluate the effect of trade liberalization on food prices in Iran.

Cudjoe *et al.* (2008) studied the affectivity of domestic prices from the global crisis in the transmission of food prices in Ghana using vector error correction mechanism (VECM). The results showed that the price transfer between the regional producer markets and the markets located in the biggest city of the country is very high. Sanusi (2010) developed a structural vector auto-regression (SVAR) model for the Ghanaian economy to estimate the impact of exchange rate changes on the

consumer prices and showed that although the transmission of exchange rate changes to the consumer prices is incomplete, it is significantly high. Debab and Radhi (2011) evaluated the effects of trade liberalization on domestic consumer prices in the Persian Gulf Cooperation Council. Their results show that the policy of trade liberalization regarding domestic consumer prices is positive due to economic growth and capital increase. Flachsbarth and Garrid (2014) investigated the effect of trade liberalization on food prices and using the SEECM method, and how different levels of trade openness affect the transmission of food prices. According to the results, the integration of most markets causes an increase in global price transmission elasticities. Elgaili Elsheikh *et al.* (2015) have investigated the effect of wheat import tariff change on gross domestic product, wheat import, ear corn export and domestic wheat production in Sudan during different scenarios using the calculable general equilibrium model. The results show that decreasing the wheat tariff increases its import and reduces its domestic price. It also led to better GDP, trade and investment balance, and reduced private sector consumption. Berlingieri *et al.* (2018) have studied the impact of trade agreements on EU consumer welfare. The effect of welfare has been investigated in three categories of product price, variety and quality. According to research findings, trade agreements in the European Union increase the quality by about 7 percent on average, but do not affect the price or variety. High-income member states in the European Union see much stronger quality increases and greater overall benefits for consumers. Lim and Breuer (2019) analyzed the agreement of trade liberalization and market integration in South Korea. The results confirmed that free trade agreements reduce tariffs and trade costs and have led to the convergence of domestic prices to foreign prices.(Olipra, 2020) emphasized the impact of agricultural policy liberalization and agricultural trade on price transmission in agricultural markets and showed that market-based agricultural policies and trade

liberalization improve price transmission in global agricultural markets. Sun and Zhang (2021) studied the effect of agricultural trade liberalization on four components of food security including food supply and price in Central Asian countries and showed that the negative effects of trade liberalization are still a convincing reason to pursue the food self-sufficiency program in these countries. Inusa and Umaru (2021) investigated the effect of trade liberalization on the agricultural sector in Nigeria using an autoregressive model with time lags (ARDL) with seasonal data from 2010-2020 and showed that trade liberalization had a positive effect on agricultural production. But, financial liberalization has a negative effect on agricultural production.

In Iran, Abrishami *et al.* (2005) investigated the effect of trade liberalization on export and import growth of some developing countries using the dynamic method of panel data and it was concluded that trade liberalization has a positive effect on export growth and it has a positive and significant effect on imports, too. Gholipour *et al.* (2011) used the VAR model in examining the long-run and short-run relationship between the commercial liberalization of the agricultural sector and the share of imports and exports of each of the agricultural sectors in the total export and import of goods and services of Iran during the period of 1340-87. The findings indicated that the increase in trade liberalization in the agricultural sector has increased the share of imports in the agricultural sector in the long and short term, and on the other hand, in the short term, the share of exports in the agricultural sector has been decreased under the influence of these policies. Ghahramanzadeh *et al.* (2018) investigated the extent of trade tariff rate pass-through to the price of major groups of agricultural products in the urban and rural parts of the country during the period of 2014-2016 and the results show incomplete and low pass-through of the tariff rate to the price of the agricultural goods group in Iran. is; Thus, in urban areas, the rate of passing the tariff rate to the prices of agricultural products is in the range of zero

and 17%, and in the rural part, it is in the range of zero and 26%. Sarlak and Ghiasi (2017) evaluated the effect of trade liberalization on the growth of exports and imports of member countries of the Organization of Islamic Cooperation using the dynamic method of panel data during the period of 1981-2015. For this purpose, using the generalized method of moments GMM, it has been shown that trade liberalization has had a significant effect on the growth of exports and imports of these countries, and this effect on the growth of imports is far greater than the effect on the exports. Salarpour and Narooie (2018) have investigated the effects of trade liberalization on the export and import of some agricultural products in Iran. The results showed that with trade liberalization, the amount of export supply and import demand increases. In other words, these two variables have a positive relationship with the commercialization process. Dehkiani *et al*. (2018) analyzed the potential effects of commercial liberalization of the agricultural sector on backward and forward linkages using the updated data-output table and showed that the final demand and added value in the country's economy increases coincided with the commercial liberalization of the agricultural sector and subsequently, the output value will also increase. In addition, the back and front links of the three sub-sectors of agriculture and horticulture, animal breeding and forestry will be smaller. However, the key sectors of Iran's economy will not change before and after the commercial liberalization of the agricultural sector.

Based on the mentioned contents, it can be seen that the issue of trade liberalization is one of the important issues of the economy and several factors effect on it and it has significant effects on the domestic prices of agricultural products and it is in the center of attention of economic studies. On the other hand, despite the importance of the effect of trade liberalization on the price of food, there have not been many studies done in the country on this issue, and the evaluation of the studies, especially the internal studies, shows that in most of these studies, the price transfer between the stages of marketing in the country have been investigated and in them the effect of global price changes on the domestic price has not been taken into consideration. On the other hand, previous limited studies have used VAR and SVAR methods. However, in the present study, this important issue is investigated using the SEECM model, and an attempt is made to analyze the effect of agricultural trade liberalization on food prices in Iran.

Materials and Methods

Methods

Trade liberalization is a term that refers to the removal or reduction of government support for the business sector. This causes the privatization of production, better management and division of work, and ultimately increases income (Salatin and Olfat, 2019). Theoretically, although trade liberalization increases exports and imports, its effect on trade balance and balance of payments is ambiguous and depends more on the relative effects of export and import growth as well as changes in real exchange rates (relative prices). From the supply point of view, trade liberalization leads to economic growth. But from the point of view of demand, this policy has been led to the deterioration of the balance of payments and this will have an adverse effect on economic growth (Abrishami *et al*., 2006). In the discussion about the price effects obtained from trade liberalization, we must first know what are the trade barriers that are removed from international trade during liberalization. The main obstacles include tariff barriers and export subsidies. Tariffs are applied to imported goods so that the domestic price of the imported goods becomes expensive in the importing country, thus supporting the domestic goods. In general, trade policies such as tariffs affect the gap between domestic and foreign prices. When the tariff is reduced, it will affect the internal price of goods and its relative price in the economy. The change in relative prices will cause an imbalance in the market of

production factors, and as a result, it will lead to the adjustment of the income of the production factor (especially wages) (Yazdanshenas *et al*., 2010).

In general, as a result of the removal of tariffs on imports, the prices of products and production of the sector that is accepted by liberalization will decrease. But subsidies are often imposed on export goods so that the producer with government support can compete with foreign goods and sell his goods to the world market (Salem and Yousefpour, 2012). Trade liberalization has been of great interest to economic planners and policy makers. It is a common belief that liberalization leads to economic growth. Therefore, different countries are looking for trade liberalization in order to benefit from its benefits (Salatin and Olfat, 2019). Adoption of support policies in order to support domestic goods is one of the most important areas that provide government intervention in the economy. There is a high level of protectionism in many countries, which is a source of irritation for economists who favor free trade policies. One of the most important and oldest means of supporting industries and one of the most obvious aspects of the government's intervention in the process of international trade is the imposition of customs tariffs. Tariff is a type of tax on imported goods. Imposing a tariff on a product increases the price of that product in the domestic market, generally reduces imports and increases the demand for similar domestic products.

The review of the literature on the subject and theoretical foundations shows that the factors that determine food prices are created by two groups of tradable and non-tradable factors. The process of data generation for the price variable can be expressed as a function of the prices of tradable and non-tradable goods in the form of equation 1 (Flachbarth and Garrid, 2014).

$$P_A = F\left(p_{agt}, p_{agnt}\right) \tag{1}$$

Where P_A, p_{agt} and p_{agnt} are the domestic price of food, tradable, and non-tradable goods, respectively.

Non-tradable products cannot be imported or exported, and their price is determined through the interaction between domestic demand Q_{agNT}^d and domestic supply Q_{agNT}^s, whose mathematical form is given in equation (2).

$$Q_{agNT}^d = Q_{agNT}^s \tag{2}$$

As in developing countries the share of food expenditure in household budget is increasing, it is expected that the demand for agricultural products is influenced by aggregate demand. The domestic price of food is a function of some common economic factors such as money supply, global oil price, exchange rate (Ghahremanzadeh *et al*., 2020).

As (Flachsbarth and Garrid, 2014) explained, the implicit form of the domestic food price relationship can be shown as equation (3):

$$P_A = f\left(Pw_{AG}, xrt, top, M2, Pw_{oil}\right) \tag{3}$$

Where P_A is domestic food price, $M2$ is money supply, Pw_{oil} is world oil price, top is trade liberalization index, xrt is exchange rate, and Pw_{AG} is world food price. The top is the percentage of trade to GDP (Pazhooian *et al*., 2018). The effect of global price changes on the consumer price index (CPI) can be examined by applying equation (4):

$$\frac{\partial P_A}{\partial Pw_{AG}} = \gamma + \chi \times top \tag{4}$$

Which γ and χ are long-run coefficients.

To investigate the mechanism of the effect of world prices and the degree of liberalization on the domestic price of food, the single equation error-correction model (SEECM) can be used, which is a new model and will be used in the current research. In trade liberalization, a cause and effect relationship between world prices and domestic food prices is investigated using the error-correction method of single equations. By using this

model, the impact of domestic food prices on world prices can be investigated and measured for both short-run and long-run periods. This model provides the possibility of measuring the domestic price response to the price shock in global markets for both short-run and long-run periods. Based on the existing literature, a standard modeling approach to move towards ECM models occurs when the two series in question are co-occurring and there is a unidirectional causality relationship between them. In that case, the two-stage Engel and Granger method (EGECM) is used. However, Berlingieri *et al.* (2018) proposed a single-equation error correction model (SEECM) instead of the EGECM model to investigate this co-integration relationship, which has two distinct advantages over the EGECM model.

The advantages and reasons of using the SEECM model are i) in this model, it is not necessary that all relevant time series of a certain degree have a single root in order to provide a long-run equilibrium relationship between them to create an ECM model. Because in order to establish an ECM process, it is necessary that the series have similar characteristics of stationary, that is, they are of a similar degree of integration; ii) by using a SEECM model, a stronger test can be obtained to measure the existence of co-integration between variables and also to relatively estimate parameters with the least bias (Ghahremanzadeh *et al.*, 2020).

Now, if we want to consider the short-run and long-run dynamics regarding equation (3), it can be rewritten as relation (5).

$$P_{A_{it}} = \alpha_0 + \alpha_1 P_{A_{it-1}} + \psi_0 Pw_{AG_{it}} + \psi_1 Pw_{AG_{it-1}} + \phi_0 xrt_{it} + \phi_0 xrt_{it-1} \quad (5)$$
$$+ \zeta_0 M2_{it} + \zeta_1 M2_{it-1} + \beta_0 top_{it} + \beta_1 top_{it-1} + \omega_0 \left(Pw_{AG_{it}} \times top_{it}\right)$$
$$+ \omega_1 \left(Pw_{AG_{it-1}} \times top_{it-1}\right) + \eta_0 Pw_{oil_{it}} + \varepsilon_{it}$$

To obtain SEECM, subtraction of $P_{A_{it-1}}$ from equation (5) is obtained first, whose mathematical form is given in equations (6):

$$P_{A_{it}} = \alpha_0 + (\alpha_1 - 1) P_{A_{it-1}} + \psi_0 \Delta Pw_{AG_{it}} + (\psi_0 + \psi_1) Pw_{AG_{it-1}} + \phi_0 \Delta xrt_{it} \quad (6)$$
$$+ (\phi_0 + \phi_1) xrt_{it-1} + \zeta_0 \Delta M2_{it} + (\zeta_0 + \zeta_1) M2_{it-1} + \beta_0 \Delta top_{it}$$
$$+ (\beta_0 + \beta_1) top_{it-1} + \omega_0 \left(\Delta Pw_{AG_{it}} \times \Delta top_{it}\right)$$
$$+ (\omega_0 + \omega_1) \left(Pw_{AG_{it-1}} \times top_{it-1}\right) + \eta_0 \Delta Pw_{oil_{it}} + \varepsilon_{it}$$

Equation (7) can be derived by arranging equation (6), where $\delta = (\alpha_1 - 1)$; $\lambda_0 = \psi_0$; $\lambda_1 = (\psi_0 + \psi_1)$; $\theta_0 = \phi_0$; $\theta_1 = (\phi_0 + \phi_1)$; $\kappa_0 = \zeta_0$; $\kappa_1 = (\zeta_0 + \zeta_1)$; $\mu_0 = \beta_0$; $\mu_1 = (\beta_0 + \beta_1)$; $\pi_0 = \omega_0$; $\pi_1 = (\omega_0 + \omega_1)$.

Now, the long-run equilibrium relationship estimated by equation (7) between domestic prices and world prices is equal to:

$$\Delta P_{A_{it}} = \alpha_0 + \vartheta \Delta Pw_{AG_{it}} + \rho \Delta xrt_{it} + \kappa \Delta M2_{it} + \mu \Delta top_{it} + \pi \left(\Delta Pw_{AG_{it}} * \Delta top_{it}\right) \quad (7)$$
$$+ \eta \Delta Pw_{oil_{it}} + \delta \begin{pmatrix} P_{A_{it-1}} - \gamma Pw_{AG_{it-1}} - \varphi xrt_{it-1} - \xi M2_{it-1} \\ -\varepsilon top_{it-1} - \chi \left(Pw_{AG_{it-1}} * top_{it}\right) \end{pmatrix} + \varepsilon_{it}$$

Based on this relationship, the following variables show short-run effects: $\vartheta = \lambda_0$: Short-run effect for world prices, $\rho = \theta_0$: Short-run effect of exchange rate, $\kappa = \kappa_0$: Short-run effect of liquidity, $\mu = \mu_0$: Short-run effect of world oil price, $\eta = \eta_0$: Short-run effect of trade liberalization index.

And the following variables show their long-run effects on the growth of domestic food prices:

$\gamma = \left(1 - \frac{\lambda_1}{\delta}\right)$: Long-run effect of change in world price on domestic food price, $\varphi = \left(1 - \frac{\theta_1}{\delta}\right)$: Long-run effect of change in exchange rate on domestic food price, $\xi = \left(1 - \frac{\kappa_1}{\delta}\right)$: Long-run effect of change in liquidity on domestic food price, $\varepsilon = \left(1 - \frac{\mu_1}{\delta}\right)$: Long-run effect of change in world oil price on domestic food price $\chi = \left(1 - \frac{\pi_1}{\delta}\right)$: The long-run effect of changes in the trade liberalization index on the domestic food price, and δ: shows the amount of error-correction or the speed of adjustment.

Based on equation (7), the long-run equilibrium relationship between the investigated variables can be shown as equation (8):

$$P_{A_{it-1}} - \gamma Pw_{AG_{it-1}} - \varphi xrt_{it-1} - \xi M2_{it-1} - \varepsilon top_{it-1} - \chi \left(Pw_{AG_{it-1}} \times top_{it}\right) = 0 \quad (8)$$

In this relationship, it is assumed that ($\gamma \neq 0, \varphi \neq 0, \xi \neq 0, \varepsilon \neq 0,$ and $\chi \neq 0$)is a process of stable data generation. By satisfying the above condition, there is a long-run equilibrium relationship between the domestic price and other variables. For the φ test, the (Campa and Gulberg, 2005) test can be used. According to this method, if the value of φ is not significantly different from zero, it means that there is no effect of changes from the variable to the imported goods, while if its value is equal to one, it means the full effect of the changes of the variable to domestic prices, and if both are rejected, it can be said that there is an incomplete effect. Finally, according to what has been said, by estimating the relationships mentioned under the conditions of each of these models, it is possible to examine and analyze the effect of the liberalization of trade in agricultural products on the domestic price of food.

Data

The required data and information including CPI, Iran's food exports and imports, volume of liquidity, and exchange rate have been collected from the database of the Central Bank of the Islamic Republic of Iran and the Customs of the Islamic Republic of Iran during the years 1989-2019. World food prices were also obtained from FAO and MFI. According to Table 1, in recent years, Iran's total imports have been decreasing due to the US economic sanctions against Iran. However, Iran's total exports have followed an upward trend during 2012-19. On average, 14.5 percent of the total exports and 21.2 percent of the total imports are related to the agriculture sector, which directly impacts the household's consumption basket. As it is clear from Table 1, the share of export and import of the agricultural sector is associated with a downward trend, and the reason for this can be the imposition of sanctions against Iran.

Table 1- Descriptive statistics of variables in the period 2012-2019

Year	Total export (billion dollars)	Agricultural export (billion dollars)	Share of Agricultural export from the total export	Total import (billion dollars)	Agricultural import (billion dollars)	Share of Agricultural import from the total import
2012	32.6	5.6	0.17	53.4	11.5	0.21
2013	31.6	4.6	0.15	49.8	10.6	0.21
2014	36.6	6.1	0.17	53.6	10.09	0.18
2015	35.6	5.2	0.15	41.5	6.7	0.16
2016	36.7	5.5	0.15	43.7	6.3	0.14
2017	40	5.7	0.14	54.5	7.6	0.13
2018	44.7	5.1	0.12	43.2	7.9	0.18
2019	40.3	5.7	0.14	43.7	8.3	0.18

Figure 1 shows the Iran's liberalization index during the period of 2012-2019. Five types of movement can be seen in the mentioned diagram. It can be clearly seen that the trade liberalization index experienced an upward trend with a gentle slope until 1995 and after this year until 2000, it went through a downward trend. After this year, there are low and somewhat stable fluctuations, which are caused by the government's control policies. It is clear that during the years 2012-2018, there were many fluctuations in the downward trend of trade liberalization, which could be the

result of American economic sanctions against Iran.

Results and Discussion

In the following, in order to determine the appropriate estimation strategy, the variables' stationary test was conducted first. It should be noted that all variables are in logarithmic form. By comparing the DF-GLS test statistic for the data level with the critical values reported in Table 2, all variables are *I(1)*. Same results were obtained through Augmented Dickey Fuller (ADF) test, and the co-integration test can be applied to these variables.

To estimate the co-integration vector by the *Johanson*'s co-integration test, the number of optimal lags using the Akaike (AIC), Schwartz (SBC) and Hannan and Quinn information criterion (HQIC) was determined to be equal to 4. Then the co-integration test was estimated, and the results are shown in Table

3. Based on this Table, the null hypothesis of the existence of at most one co-integration vector is not statistically rejected at the 5% level. In other words, there is a co-integration vector between these variables.
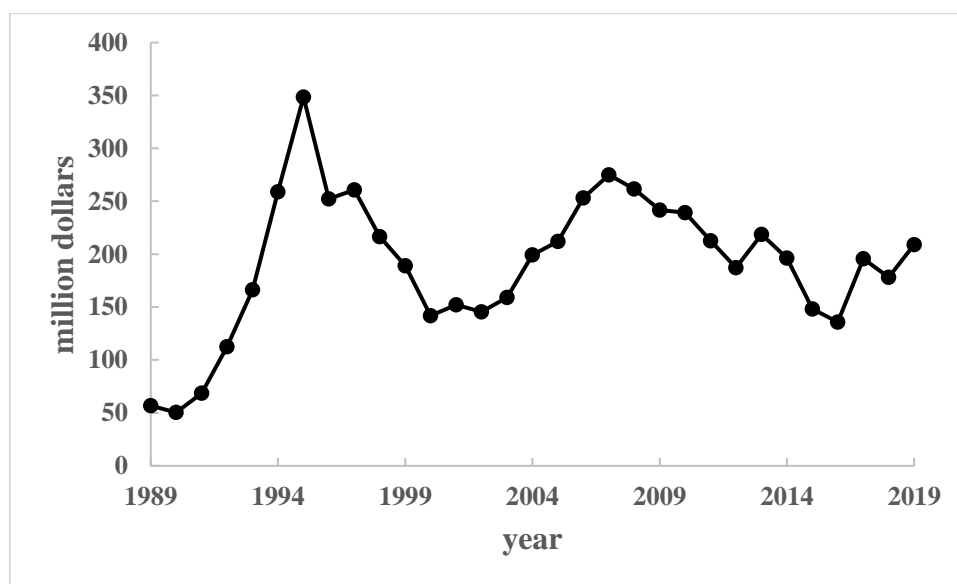

Figure 1- Index of trade liberalization based over 1989–2019 (2016=100)

Table 2- Results of the ADF and DF-GLS tests of the variables

Variables	DF-GLS test		ADF test	
	Data levels	First order differential	Data levels	First order differential
World oil price (Pw_{oil})	-1.897	-3.954***	-1.251	-4.912***
World food price index (Pw_{AG})	-1.728	-3.859***	-1.342	-5.069***
Trade liberalization index *(top)*	-1.982	-3.284***	-2.992	-3.865***
Liquidity *(M2)*	-1.746	-3.760***	-1.803	-3.087***
Exchange rate (xrt)	-1.849	-2.840***	-0.466	-3.812***
Food price index (P_A)	-2.912	-3.296***	-0.006	-4.365***

*** Indicates significance at the 1% probability level.

Table 3- Result of the Johansen co-integration test

Null Hypothesis	*Trace* statistic	Critical values (5%)
r=0	94.93	94.15
r≥1	49.45*	68.52
r≥2	29.71	47.21

* Indicates the number of co-integration vectors

Results of SEECM model

After determining the number of co-integration vectors, the long-run and short-run equilibrium relationship between the variables was estimated through the SEECM model.

According to the last row of Table 4, the Breusch-Pagan Godfrey LM test to measure the presence of autocorrelation problem from the first lag (LM test) indicates that at the 10% probability level, the fitted model has no

autocorrelation problem and the *Jacobra's* normality test (JB test) also indicates the normality of the distribution of disturbance components of the estimated model. According to the Table 4, δ shows the adjustment speed. Also, as it was expected, the value was between 0 and 1 with a negative sign. According to Table 4, the error-correction coefficient was equal to -0.345. It means that in the long run, if a shock occurs on the domestic price of food, the domestic market can adjust it by 30%. It can be seen that in the short term, only the growth of global food prices (ψ_1), liquidity (θ_1) and exchange rate (ϕ_1) have a significant effect on the growth of domestic food prices. Therefore, one percent increase in the global price of food, liquidity, and exchange rate, causes an increase in the growth of domestic food price by 0.21, 0.23 and 0.43 respectively in the short term. However, the effect of exchange rate growth on Food price growth is more than of the liquidity and global food price growth. As a result, this indicates that domestic prices react more to exchange rate changes than global prices, so this clearly indicates the importance of the government's foreign exchange policy position in the nation. One of the ways to prevent the increase of the price of agricultural products, following the occurrence of a currency shock, is to support the import of the most affected sectors. Such support can be provided through the reduction of import tariffs on agricultural products; if it is not possible to produce them inside; or priority in the allocation of preferred currency; to import their products. Of course, the implementation of these policies can be effective in the short term, but in the long term, it is suggested that the government implement the necessary policies to reduce dependence on imported intermediate inputs, which are mainly related to manufactured goods; The noteworthy point is the high exchange rate fluctuations, which can be seen that the rate of exchange fluctuations in the country is much higher than the global price fluctuations, which is one of the reasons for the formation of internal price fluctuations of these inputs.

Table 4- SEECM model result

Short-run equation			Long-run equation		
Parameter	**Coefficient**	**t-statistics**	**Parameter**	**Coefficient**	**t-statistics**
α_0	1.322	2.44	β_1	0.13***	3.42
δ	-0.345***	-2.59	β_2	0.27**	2.56
ζ	0.13	0.36	β_3	-3.5	-0.10***
ψ_1	0.21*	1.84	β_4	0.36***	12.2
ω_1	-0.07	-0.08	β_5	0.65***	15.5
θ_1	0.23***	2.92	β_6	0.37***	7.3
ϕ_1	0.43***	3.01			
	JB test: 7.90 (0.001)		LM test: 2.456 (0.117)		

*, **, and *** indicate the significance level of 1%, 5% and 10%, respectively.

According to the results of Table 4, β_1 is equal to 0.13, which is significant and has a positive effect. It explained, if the global price of oil increases by 1% in the long term, the domestic price of food will increase by 0.13%.

β_2 represents the logarithm of the world food price, which is statistically significant at the 5% probability level and indicates that in the long term, if the global food price increases by 1%, the domestic food price will increase by

0.27%. β_3 represents the logarithm of the trade liberalization index, whose value is equal to -0.1, which indicates the negative effect of liberalization on the level of domestic prices, so that the price level has decreased with trade liberalization. β_4 represents the logarithm of the unofficial exchange rate, which is significant and has a positive effect, and its value is equal to 0.36, which means that if the unofficial exchange rate increases by one percent, the domestic price of food will increase by 0.36. β_5 shows the logarithm of the liquidity, which is equal to 0.65 and has a positive and significant effect, so that if the volume of liquidity increases by one percent, the domestic price of food will increase by 0.65 percent. β_6 indicates the application of the economic sanctions and has had an effect on the domestic price in the long term and has caused an increase in the domestic price in the long term. In the meantime, the effect of liquidity on the domestic price of food is more than other variables.

The obtained results are line with Flachsbarth and Garrid (2014) and Ghahremanzadeh *et al.* (2020) which they indicated that the global food price have affected significantly the domestic food prices. Also, exchange rate appreciation can curb price shocks to some extent, and monetary policies seem to be a suitable tool to stabilize food prices to protect food access to the poor population.

Conclusion and Suggestion

Considering the importance of food security, lack of food or its price fluctuations can lead to a decrease in social well-being. Due to the fact that Iran supplies a significant amount of food through imports, changes in exchange rates and global prices affect the domestic price of food products. According to the graphical analysis of price changes, it can be seen that the global price of food has a gentle and constant slope until 2017, and this is also true in the domestic price of food. But after this year, international and domestic prices have experienced an upward trend and

instability. The graphical analysis of the changes in the trade liberalization index shows five types of movement and the results indicate that the trade liberalization index has an upward trend with a gentle slope until 1995 and after this year until 2000 it went through a decreasing trend and during the years 2012-98, there have been many fluctuations in the downward trend of the degree of trade liberalization, which can be the result of the economic sanctions against Iran. Also, the analysis of the graph related to the export and import of agricultural products shows that Iran's export has always experienced a downward trend since 2013, and the reason for this can be related to the economic sanctions against Iran, and the import is relatively less in a downward trend, and the reason for this is maintaining the market is free trade. The results of Iran's total export and import chart confirm that the export has gone through a downward trend from 2011 to 2018 and the total import has a mild slope with an upward trend. Examining the GDP chart shows an upward trend until 2015, after which it became a downward trend, the most important reasons of which can be found in policy errors at different levels of the country, exchange rate fluctuations, and increasing international sanctions. The liquidity figures show that in recent years, the increase has been high and the most important factor in the growth of liquidity is the government's budget deficit. The reviewing the trend of exchange rates shows that until the end of 2019, they had a steady trend or an increasing trend, but in the last few years, there has been an increasing trend, the main reason of which was the imposition of economic sanctions against Iran.

The results of the estimation of the SEECM model indicate that, as expected, there is a significant long-run relationship between the degree of trade liberalization and the domestic price of food products. The degree of trade liberalization on the domestic price of agricultural products is -0.10 and it indicates that the higher the trade liberalization, the lower the domestic price of food and the reason is that when imports are made in a

country, cheap goods are imported and put pressure to the domestic prices and this causes the prices in the importing country to decrease. Also, the error-correction coefficient is as expected and has a negative sign and a value between zero and one. In the short term, the variable growth of world food prices, exchange rate and liquidity have a significant effect on the growth of domestic food prices, among which the greatest effect is related to the exchange rate with 0.43 and the least effect is related to the world food price with 0.21 on the domestic price of food. In the long-run, the largest effect on the domestic price of food is related to the volume of liquidity, and the world price of oil has the least effect on the domestic price of food. The agricultural trade liberalization shows that consumer prices of food will increase during periods of global price growth. Thus, for poor consumers, world price shocks can worsen in the short run and domestic food prices slowly converge to a higher long-run equilibrium. Especially in increasingly integrated economies, effective policies to contain food price shocks should be implemented, but should be carefully planned with the required available budget. Also, exchange rate appreciation can curb price shocks to some extent, and monetary policies seem to be a suitable tool to stabilize food prices to protect food access to the poor population.

Considering the importance of food in the household consumption basket and the need to import some food items and the effect of trade liberalization on the reduction of food prices, it is recommended to apply trade policies including border tariff measures and price limit system. The adoption of appropriate support policies, both compensatory and complementary, plays an important role in the success of commercial liberalization and reduction of rural poverty in the agricultural sector. On the other hand, considering the effect of exchange rate changes on the domestic price of agricultural products, it is suggested to apply appropriate currency policies to prevent the unreasonable increase of the exchange rate as well as its extreme fluctuations in order to witness price stability.

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تأثیر آزادسازی تجارت محصولات کشاورزی بر قیمت مواد غذایی در ایران

محمد قهرمان زاده[1]* - مینا صمدپور[2] - جواد حسین زاد[3]

چکیده

گسترش تجارت و آزادسازی آن، از متداول‌ترین سیاست‌ها برای دست‌یابی به رشد و توسعه اقتصادی در اغلب کشورها به شمار مـی‌رود. آزادسـازی تجارت محصولات کشاورزی و اثر آن بر قیمت مواد غذایی، به دلیل اهمیت مواد غذایی در سبد مصرفی خانوار، یکی از مهم‌ترین اهداف دولت‌هـا بـرای دسترسی عموم جامعه به مواد غذایی سالم و کافی است. در مطالعه حاضر، تأثیر آزادسازی تجاری بر قیمت مواد غذایی در ایران بررسی شده‌است. بـدین منظور، از مدل تصحیح خطای تک‌معادله‌ای (SEECM) با استفاده از داده‌های سالانه مورد نیاز طی دوره زمانی سال‌های ۹۸-۱۳۶۸ بهـره گرفتـه شـد. نتایج برآورد مدل SEECM نشان‌دهنده آن است که ضریب تصحیح خطا معنی‌دار و برابر با ۰/۳۴۵- بوده و بیانگر این امر است کـه در بلندمـدت اگـر یک شوکی بر قیمت داخلی مواد غذایی وارد شود بازار داخلی می‌تواند سالانه فقط ۳۰ درصد آن را تعدیل کند. همچنین روابط تعـادلی بلندمـدت بـرآورد شده در مدل SEECM مؤید آن است که قیمت جهانی محصولات غذایی اثر مثبت و آزادسازی تجاری، اثری منفی بر قیمت مواد غذایی داخلی دارنـد. با توجه به نوسانات قیمت‌های جهانی و تأثیرپذیری قیمت‌های داخلی از آن، لزوم توجه به نوسانات قیمت‌های جهانی و نرخ ارز در تـدوین سیاسـت‌هـای تجاری توصیه می‌شود.

واژه‌های کلیدی: آزادسازی تجاری، قیمت‌های جهانی، مواد غذایی، نرخ ارز

۱، ۲ و ۳- به‌ترتیب استاد، دانش آموخته کارشناسی ارشد و دانشیار، گروه اقتصاد کشاورزی، دانشکده کشاورزی، دانشگاه تبریز، تبریز، ایران

(Email: Ghahremanzadeh@Tabrizu.ac.ir :نویسنده مسئول -*)