THE EFFECT OF ECONOMIC GLOBALIZATION ON THE EXPORT OF CUT FLOWERS

O EFEITO DA GLOBALIZAÇÃO ECONÔMICA NA EXPORTAÇÃO DE FLORES *CORTADAS*

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Abstract. In the present study, the effect of economic globalization on the export of cut flowers in Tehran province has been investigated. The study is based on vector error correction model (VECM). In order to check the co-accumulation relationship between the variables of the model, Johansen's co-accumulation test was also used. The period was the study of the years 1371-1400, and the data source used included the statistical yearbook of the country, Central Bank reports, customs yearbook, statistical yearbook of the Ministry of Jihad Agriculture, economic magazine reports of the Ministry of Commerce, Iran Statistics Center, and also Information from other statistical portals. The reason for choosing the period from 1371 is due to the availability of flower export data from this time. In order to analyze the relationship between the studied variables, instantaneous reaction function (IR) and variance analysis (VA) were used, which are widely used in vector Auto Regression (VAR) models. The results of the study show that in the early years, the globalization of the economy (financial openness and commercial openness) had a negative effect and in the long term had a positive effect on the export of cut flowers.

Keywords: Economic globalization, export of cut flowers, Tehran province.

Resumo. Este estudo investigou o efeito da globalização econômica na exportação de flores cortadas na província de Teerã. A análise foi baseada no modelo de correção de erros vetoriais (VECM). Para verificar a relação de cointegração entre as variáveis do modelo, utilizou-se o teste de cointegração de Johansen. O período analisado abrange de 2000 a 2023, com os dados coletados de fontes como o anuário estatístico do país, relatórios do Banco Central, anuários estatísticos das alfândegas e do Ministério da Agricultura da Jihad, relatórios de revistas econômicas do Ministério do Comércio, Centro de Estatística do Irã, além de informações de outros portais estatísticos. A escolha do período desde 2000 deve-se à disponibilidade de dados sobre exportação de flores a partir dessa época. Para analisar a relação entre as variáveis estudadas, foram utilizadas a função de resposta ao impulso (IR) e o análise de variância (VD), amplamente aplicados em modelos de autorregressão vetorial (VAR). Os resultados do estudo indicam que, nos primeiros anos, a globalização econômica (abertura financeira e comercial) teve um efeito negativo na exportação de flores cortadas. No entanto, a longo prazo, o impacto tornou-se positivo.

Palavras-chave: Globalização econômica, exportação de flores cortadas, província de Teerã.

Resumen. En el presente estudio se ha investigado el efecto de la globalización económica en la exportación de flores cortadas en la provincia de Teherán. El estudio se basa en el modelo de corrección de errores vectoriales (VECM). Para comprobar la relación de coacumulación entre las variables del modelo, también se utilizó la prueba de coacumulación de Johanson. El período de tiempo del estudio de 2000-2023 y la fuente de los datos utilizados son el anuario estadístico del país, los informes del Banco Central, el anuario estadístico de aduanas, el anuario estadístico del Ministerio de Agricultura de la Jihad, los informes de las revistas económicas del Ministerio de Comercio, el Centro de Estadística de Irán y también información de otros portales estadísticos. La razón para elegir el período de tiempo de 1371 se debe a la disponibilidad de información de exportación de flores de esta época. Para analizar la relación entre las variables estudiadas, se utilizaron la función de reacción instantánea (IR) y el análisis de varianza (VD), que son ampliamente utilizados en los modelos de autorregresión vectorial (VAR). Los resultados del estudio muestran que en los primeros años, la globalización de la economía (apertura financiera y apertura comercial) tuvo un efecto negativo y, a largo plazo, un efecto positivo en la exportación de flores cortadas.

Palabras-clave: Globalización económica, exportación de flores cortadas, provincia de Teherán.

1. INTRODUCTION

The concept of globalization is closely related to internationalization, which can be defined as the internationalization of economic flows. In globalization, the creation of a single transnational market is envisioned, which is guided by the principles of free trade and strengthened by dynamic flows of information exchange, and provides an opportunity for organizations and individuals to be able to export and import virtually any product, without following national borders (Cervantes, et al., 2020).

In the early 1980s, trade liberalization has been one of the most serious policy concerns for countries around the world, especially for developing countries. Nevertheless, it is believed that trade liberalization increases export performance and economic growth through technological advances and specialization (World Bank, 2002).

From the point of view of international trade, export is the generator of foreign currency, which is necessary for the import of goods and services. Theoretical arguments indicate a positive relationship between international trade and economic growth, and also show the pivotal role of export in facilitating investment and technology transfer, which accelerates the process of globalization (Keesing, 1967) and the free influence. It explains commercialization on export growth in developing countries. Some of these researches confirm that countries that have started liberalization programs have improved their export performance (Uddin, 2000). On the other hand, some researchers have found little evidence about maintaining the relationship between trade liberalization and export growth has been found (Jenkins, 1996).

The International Monetary Fund and the World Bank, as supporters of free trade, believe that trade liberalization ultimately improves exports, especially for developing countries (Miller and Mukti, 2000). With trade liberalization, imports increase at first, this issue can provide the possibility of buying capital goods from abroad and increase technological advances and subsequently the overall decrease in imports, increase in exports and as a result increase in the trade balance (Husted & Melvin, 2001). Although many developing countries do not want to globalize their economy due to the upward trend of imports, the significant decrease in exports and the closure of small or low-efficiency enterprises after trade liberalization (Zakaria, 2014).

Despite the importance of trade, in recent years, the growth of exports (with the exception of oil) among developing countries has decreased sharply, which is a reason for the dependence of these countries on developed countries. Although fossil fuels were the dominant sources of energy and wealth generators in business for many years, they currently provide 80% of global energy and this demand is decreasing due to environmental reasons (Rana et al., 2020). Also, compared to other goods, the increase in oil prices has been much lower than the price indices of non-oil goods (OPEC, 2021). The dependence of Iran's economy on foreign exchange

earnings from crude oil exports has never been less than 35% even after the Islamic revolution, knowing the future of declining oil exports and less dependence, it seems that non-oil sources, including agriculture, industry and services, are more reliable alternatives to oil in exports. Among these, one of the most important sectors of the country's economy is agriculture, which provides an important share of GDP, employment, food needs, non-oil exports, and the need of industries for agricultural products.

Agriculture includes a wide range of activities including agriculture, horticulture, animal husbandry, etc. The World Trade Agreement on Agriculture governs the trade in cut flowers because it recognizes flowers as agricultural products. The current conditions in the world (population growth and urbanization) have faced the business of cut flowers with a rapid growth and the demand for this perishable luxury product is very high (Singh, 2013).

One of the important goals of the flower industry is to increase income and reduce poverty in developing countries. In some productive economies that are not developed, the production of cut flowers is the main source of their relative advantages (Vukajlovic, 2017). Iran in 2022 with nearly 2,200 hectares of cut flower fields and the production of nearly 3 billion flower branches ranked among the first 25 flower producing countries, but in terms of exports, having a relative export advantage and the market 1 billion dollars only among the neighboring countries, its most exports in the research period are less than 20 million dollars, it is ranked between 100 and 120, also Tehran province this year with 1070 hectares of cut flower farms and nearly 1 billion and 300 Million branches of flowers had the highest ceiling in the country's production (Statistics of the Ministry of Agriculture in 2023).

The purpose of this research is to investigate the effect of economic globalization on the export of cut flowers in Tehran province, because it seems that the globalization of the economy can change its export, and according to the purpose, the hypothesis of the research is proposed as follows: Economic globalization has an effect on the export of cut flowers in Tehran province. It is necessary to explain that research on the effect of economic globalization on the export of agricultural products including wheat and pistachio, cumin, pistachio, saffron, has taken, but so far no research has been done regarding the effect of economic globalization on the export of cut flowers in Tehran province, and in this research, this issue has been tried to be investigated.

2. RESEARCH LITERATURE

2.1. Theoretical foundations

Global trade liberalization is an issue that has improved the economic development of countries by dividing labor and expertise among them. Different theories related to the freedom of trade between countries have been proposed until today, which seeks to find a way for countries to benefit from global trade. The intersection of economic theories proposed in the past centuries have formed the basis of international trade theories. Among the most important theories related to trade, we can mention the views of mercantilism (experts and utilitarians), the theories of Adam Smith and David Ricardo, classic economists, and some modern theorists.

The theory of mercantilism

Regarding international trade, the theory of mercantilism is proposed. In this theory, in foreign trade, payments were made by means of gold and silver, and it was possible to obtain it through the export of goods abroad. More exports and less imports, and as a result, achieving a trade balance surplus, was the main idea of mercantilism (Meini, 2013).

2.2. Smith's theory

On the other hand, among the views of classical economists, Adam Smith's theory of absolute supremacy is proposed. From his point of view, every country has different conditions

for producing different goods. He considered the absolute advantage of each country over other countries for the production of goods, and that each country should produce goods in which it has an absolute advantage compared to other countries and import goods from other countries that those countries are superior to it. From Smith's point of view, if a product can be obtained cheaply abroad, that product should not be produced domestically. Countries should produce goods in which they have a distinct advantage, and they can ultimately benefit from the exchange of these goods, and this is to the benefit of the exchange party countries. From a global perspective, specialized production, international division of labor and following Adam Smith's plan increase the productivity of economic resources globally. When more goods are produced, all nations reach a higher welfare level (Kumar et al., 2023). It should be noted that this is possible when political-economic conditions are provided globally for the implementation of all aspects of this theory.

2.3. Ricardo's theory

The law of comparative advantage is one of the oldest theories in international trade literature, which was created by David Ricardo in 1817. He was primarily concerned about two factors called the production factor (labor), and countries in explaining the difference in determining the export and import of a country (Tang, et al., 2022). The principle of comparative advantage assumes that a country will export goods or services in which it has the greatest relative advantage and import goods or services in which it has the least comparative advantage (Ricardo, 1817). In other words, the main premise of his theory is that a country that produces the same product at a lower cost and using labor as an endowment factor, is likely to achieve a comparative advantage over other countries that produce similar products with They produce higher costs compared to international prices (Ricardo, 1817). Considering such a policy, this country can gain benefits from foreign exchanges. Considering the theory of comparative advantage leads to the specialization of a country's productions, and one of its benefits is more profit, in other words, when the labor force has enough facilities and resources, the goods are produced at a lower cost. Slowly, by producing and exporting that product, the producers get more profit.

2.4. Heckscher Ohlin theory

According to Hecksher-Ohlin's theory of availability of factors, availability of resources or, in other words, labor force is one of the factors that a country's leadership can be based on. Therefore, by using the labor force and its abundance, various goods can be exported at a lower price than other countries. Countries that have a lot of labor, subsequently produce more goods and export them at a more reasonable price compared to other countries. Production technologies between countries is a factor that creates a difference between Ricardian and Heckscher-Ohlin models. According to the Heckscher-Ohlin model, there is no difference in prioritization among countries because the availability of various resources that these countries have, is effective on the price and production balance of both countries (Lam, 2015).

2.5. Contemporary theories

Wynne (2005) stated that national wealth is an important determinant of comparative advantage, because wealth reduces financial disadvantages with intensive labor sectors in richer countries. Considering that capital is a combination of natural resources, human capital and production of technical knowledge, Dollar's assumption is that the difference in technology and knowledge levels increases the relative advantage of a country. Because knowledge is like a public good that can be supplied to additional production units at a very low cost (Markusen, 1995).

2.6. Research background

The results of the Purwono et al., (2022) research showed that export development occurs in products that show relative advantage and export skills. Odebode and Aras (2020) found in their research that although trade liberalization has no significant effect on export growth in this region, at the same time, the same policy is still being investigated to encourage a reduction in import activities in the region. Findings Osakwe's (2018) research showed that developing countries that were more open to trade (based on trade intensity) had more diverse export structures than those countries that were less open to trade. Zakaria's research (2014) indicated that exports and imports are stimulated by trade liberalization and the inclusion of interaction terms shows that liberalization stimulates both price and income elasticity of exports, imports and trade balance. The results of the research of Hoque and Yusop (2012) showed that trade liberalization has a statistically significant but small effect on total exports, therefore, a combined and coherent policy to increase GDP growth, technology transfer and domestic price stability, including education, infrastructure and linkage of declining industries are necessary to achieve higher export performance in Bangladesh.

2.7. Economic indicators of globalization

Considering that the globalization of the economy has different dimensions of trade, investment, and international finance and includes services and technology beyond national borders, therefore the need for different indicators of globalization to cover each of these dimensions seems essential. It arrives in the following, composite and non-composite indicators that are widely used in empirical-economic literature are presented.

Among the composite indicators, we can mention the Fraser Institute's economic freedom index, in which trade freedom (17.2), freedom of exchange in financial and capital markets (17.2), legal structure and property rights (16.6), the freedom to use the money of other countries (14.6), the economic structure and the use of markets (14.2), the size of the government (11), and the monetary policy and price stability (9.2) were included in the percentage (Institute Fraser)

Another composite index is the KOF globalization index, which was introduced by Dreher in 2002 as a tool to measure the impact of globalization on economic growth (Dreher, 2006), in which the globalization of the economy is correlated with variable indicators of financial openness (Dreher, 2006). 50%) including the variable number of foreign direct investment shares and liabilities, portfolio investment assets and liabilities, international shares, the number of shares inside and outside the international portfolio debt securities and loans and bank assets and international reserves excluding gold as It is a share of GDP. The trade openness variable (50%) which includes exports and imports and the diversity of trade partners, which is measured in proportion to the GDP.

The Maastricht Globalization Index (MGI) is mentioned as a non-composite index. This index was proposed by Pim Martens (Martens 2012) from Maastricht University. From the point of view of the Maastricht index, the globalization of the economy is evaluated based on the following variables: trade (imports + exports of goods and services as a share of GDP). FDI (gross foreign direct investment as a share of GDP); Capital (gross private capital flow as a share of GDP) (Marginean, 2015).

Another non-composite indicator is trade potential, which define as equivalent to trade openness, and using the relationship $〖(ʎ\_ij/Y\_i)〗^{(1/(1+θ))}$ they show that where ʎij is the country's observed domestic trade share, Yi is the country's observed real GDP and θ is the trade elasticity. Azido (2016) defines business openness as the country's readiness to adopt liberalized

foreign policies regarding trade and investment. Reisen and Yeches (1993) proposed the index of financial openness and measured it based on the interest rate.

3. RESEARCH METHOD AND VARIABLES

The current research is an applied type of study, and Johanson's method of self-explanatory vector and collocation was used to estimate the function. This method is among the methods of determining and checking the long-term equilibrium relationship among a number of time series variables. In order to collect data, from documentary and library methods and to collect statistics and data, from Central Bank reports, customs statistical yearbooks, Ministry of Jihad Agriculture statistical yearbooks, economic reports of the Ministry Commerce, and Iran Statistics Center were used.

This research was carried out between 2000 and 2023 AH in Tehran province. And as mentioned above, for econometrics, Johanson's method of self-explanatory vector and covariate pattern was used, and for data analysis, Eviuse 10 software was used.

The vector self-explanatory approach by Sims in 1972, 1980 and 1982 replaced the macrometric models. The foundation of self-explanatory vector models is empirical relationships that exist between data (Sims et al., 1990). Self-explanatory vector models use fewer variables than other econometric models. The simplicity of these models and the lack of prior information about the causal relationships between variables also show better results by benefiting from the dynamic structure of the data.

In these models, there is no need for structural knowledge of causal relationships between variables or specification of short-term structural relationships. When there is no accurate information about the functioning of the real world process or the factors that determine the variables of the model, the use of these models is inevitable. When we intend to examine the behavior of several variables in a time series, first of all, the condition of the data should be examined. A random process is called mana when its mean and variance are constant over time and the value of covariance between two time periods depends only on the distance or interval between the two periods.

1) $E(Y_t)E(Y_t)= \mu\,\mu$;

2) $Var(Y_t)Var(Y_t)= \sigma^2\,\sigma^2$

3) $E[(Y_t-\mu)(Y_{t+k}-\mu)]= \gamma_k E[(Y_t-\mu)(Y_{t+k}-\mu)]= \gamma_k$ (1)

The Dickey-Fullerke method is based on the following 3 relationships and is one of the appropriate tests to find out the significance of variables.

1) $\Delta Y_t = \delta Y_{t-1} + u_t\, \Delta Y_t = \delta Y_{t-1} + u_t$

2) $\Delta Y_t = \beta_1 + \delta Y_{t-1} + u_t\, \Delta Y_t = \beta_1 + \delta Y_{t-1} + u_t$;

3) $\Delta Y_t = \beta_1 + \beta_2\, t + \delta Y_{t-1} + u_t \Delta Y_t = \beta_1 + \beta_2\, t + \delta Y_{t-1} + u_t$ (2)

By estimating these models and extracting the coefficients, the t value for the significance of the test is obtained. If the obtained t is greater than the standard t, the data series is normal, otherwise it is invalid. To normalize the invalid data, you can use two methods of differentiation or detrending. The result of using unreliable data will be a fake or false regression, which,

according to Granger and Newbold (1974), such regressions have a value of DW≥ R2 (Granger and Newbold). But if the variables used in a model are all stationary and their linear combination is stationary.

$$u_t = Y_t - \beta_1 X_t u_t = Y_t - \beta_1 X_t \quad (3)$$

That is, U_t has I(0), in this case it can be said that X and Y are accumulated. In this situation, the regression is no longer fake and its long-term information is not lost.

Determining the number of breaks for the collective exam is extremely important. The number of breaks can be obtained using Akaike and Schwarz statistics. Failure to use the appropriate number of breaks will cause the model to suffer. If the number of interruptions is less than the desired level, the model cannot explain the error process correctly. Using the number of additional breaks also causes the parameters in the model to be overestimated and the degree of freedom decreases, and as a result, the power of the unit root test decreases.

Johansen and Joseilius (1990) were able to obtain the number of homogenous vectors in the model by using the effect test and the maximum eigenvalue test in a vector autoregression model.

In connection with the test of Johanson and Josilius, a hypothesis has been proposed as follows:

$$H_0 : \lambda_1 \neq 0, \ldots, \lambda_r \neq 0,\ \lambda_{r+1} = \lambda_{r+2} = \cdots = \lambda_m = 0$$

$$H_1 : \lambda_i \neq 0 \qquad i = 1,2, \ldots m$$

The zero hypothesis indicates that the order of the ∏ matrix is equal to r and the hypothesis H(1) indicates that the order of the ∏ matrix is equal to m. Therefore, H(0):rank(∏)= r and H(1):rank(∏)=m. However, if the likelihood ratio is used to test the hypothesis H (0) versus H (1), by removing the extra sentences, The function known as effect test statistic (λtrace) is obtained.

$$\lambda_{trace} = -T \sum_{i=r+1}^{m} ln(1 - \hat{\lambda}_i) \lambda_{trace} = -T \sum_{i=r+1}^{m} ln(1 - \hat{\lambda}_i) \quad (4)$$

In this formula, λˆis the estimate of specific roots resulting from the estimation of ∏ and T is the number of observations. To perform the test, the hypothesis H(0):r=0 is checked first. If H(0) is accepted, the test is stopped and if H(0) is rejected, this process continues until r=m is obtained (Keshavar-Zahdad, 2014). In the test of the largest eigenvalue (λmax), the largest eigenvalues that are statistically significant can be found. For this purpose, the following hypotheses are tested:

$$H_0 : \lambda_1 \neq 0, \ldots, \lambda_r \neq 0,\ \lambda_{r+1} = \lambda_{r+2} = \cdots = \lambda_m = 0$$

$$H_1 : \lambda_1 \neq 0, \ldots, \lambda_r \neq 0,\ \lambda_{r+1} \neq 0, \lambda_{r+2}, \ldots, \lambda_m = 0$$

The likelihood ratio for testing this hypothesis is obtained after simplifying the following function which is λmax:

$$\lambda_{max} = -T\ ln(1-\hat{\lambda}_{r+1}) \lambda_{max} = -T\ ln(1-\hat{\lambda}_{r+1})$$

According to the test, the maximum eigenvalue, the null hypothesis based on the existence of r covariance vector, is tested against the existence of r+1 covariance vector. It is possible to accept the existence of the covariate vector r when the quantity of the test statistic is less than the critical value.

Vector error correction pattern

If in a VAR model, the variables are stationary, that there is co-integration between them.

$$Y_t = \sum_{i=1}^{p} A_i\, Y_{t-i} + \varepsilon_t Y_t = \sum_{i=1}^{p} A_i\, Y_{t-i} + \varepsilon_t \quad (5)$$

For the above VAR model, by adding Y(t-1) to the sides, a vector error correction model is obtained:

$$\Delta Y_t = \Pi Y_{t-1} + \sum_{i=1}^{p-1} A_i^{\circ} \Delta Y_{t-i} + \varepsilon_t \Delta Y_t = \Pi Y_{t-1} + \sum_{i=1}^{p-1} A_i^{\circ} \Delta Y_{t-i} + \varepsilon_t \quad (6)$$

$$A_i^{\circ} = -\sum_{k=i+1}^{p} A_k \qquad i = 1,2,\dots,p^{-1}$$

$$\prod = (A_1 + A_2 + \cdots + A_P) - I$$

In the above model, $A_i^{\circ}\ A_i^{\circ}$ indicates short-term effects or changes and $\prod$ indicates long-term relationship or co-accumulation relationship. Therefore, to find the co-accumulation relation, the $\prod$ matrix should be checked. In the VECM model, (ΔY)t and ΔY(t-i) are I(0) and Y (t-1) are I(1). Now, in order for the model to be valid, the matrix $\prod$ must have cointegration vectors, which when multiplied by Y_(t-1), becomes the valid model. $\prod$ can be defined as $\prod = \alpha\beta'$.

α and β are r m ⊆ matrices. If the order of $\prod$ is considered equal to r, in this case r is an independent vector, r is a linear combination of means or r is a co-accumulation relation between Yi ts, each of these co-accumulation relations corresponds to one of the columns. The number of co-integration vectors depends on the matrix $\prod = \alpha\beta'$. α is the weight given to the error correction sentence and shows the adjustment speed (Uddin, 2000). The ECM error correction mechanism was first used by Sargan and then by Engel Granger to correct imbalances. They believed that if α is statistically significant, it shows what proportion of Y imbalance in one period is corrected to the next period.

Instant response function

The instantaneous reaction function shows how each of the variables of the VAR model reacts to the incoming shocks, in other words, the instantaneous reaction function is the transformation of the vector autoregression process into a VMA vector moving average. To learn more about using the following equation, which is the Mana condition of the system,

$$x_t = \mu + \sum_{i=0}^{\infty} A_1^i \varepsilon_{t-i} \qquad \mu = \begin{bmatrix} \bar{y} \\ \bar{z} \end{bmatrix}^i x_t = \mu + \sum_{i=0}^{\infty} A_1^i \varepsilon_{t-i} \qquad \mu = \begin{bmatrix} \bar{y} \\ \bar{z} \end{bmatrix}^i \quad (7)$$

A bivariate VAR model is considered in matrix form

$$\begin{bmatrix} y_t \\ z_t \end{bmatrix} = \begin{bmatrix} \bar{y} \\ \bar{z} \end{bmatrix} + \sum_{i=0}^{\infty} \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}^i \begin{bmatrix} e_{1t-1} \\ e_{2t-1} \end{bmatrix} \begin{bmatrix} y_t \\ z_t \end{bmatrix} = \begin{bmatrix} \bar{y} \\ \bar{z} \end{bmatrix} + \sum_{i=0}^{\infty} \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}^i \begin{bmatrix} e_{1t-1} \\ e_{2t-1} \end{bmatrix} \quad (8)$$

Using the following equation, if we define the values {e_1t } and {e_2t }, which are defined as sequences of variables y_t and z_t, in terms of sequences {ε_yt } and {ε_zt }, we will have:

$$\begin{bmatrix} e_{1t} \\ e_{2t} \end{bmatrix} = \frac{1}{1-b_{12}b_{21}} \begin{bmatrix} 1 & -b_{12} \\ -b_{21} & 1 \end{bmatrix} \begin{bmatrix} \varepsilon_{yt} \\ \varepsilon_{zt} \end{bmatrix} \begin{bmatrix} e_{1t} \\ e_{2t} \end{bmatrix} = \frac{1}{1-b_{12}b_{21}} \begin{bmatrix} 1 & -b_{12} \\ -b_{21} & 1 \end{bmatrix} \begin{bmatrix} \varepsilon_{yt} \\ \varepsilon_{zt} \end{bmatrix} \quad (9)$$

We can still show the value of ∅_i as follows:

$$\emptyset_i = \frac{A_1^i}{1-b_{12}b_{21}} \begin{bmatrix} 1 & -b_{12} \\ -b_{21} & 1 \end{bmatrix} \emptyset_i = \frac{A_1^i}{1-b_{12}b_{21}} \begin{bmatrix} 1 & -b_{12} \\ -b_{21} & 1 \end{bmatrix} \quad (10)$$

By combining the above 3 equations together, the summarized system is obtained, the moving average of the equation will be a function of {εyt} and {εzt}.

$$x_t = \mu + \sum_{i=0}^{\infty} \emptyset_i \varepsilon_{t-i} x_t = \mu + \sum_{i=0}^{\infty} \emptyset_i \varepsilon_{t-i} \quad (14)$$

In the above relation, by using the coefficients of the matrix ∅i, the effect of impulses ε_yt and ε_zt on the whole time trend {yt}and {zt} can be checked.

To measure the globalization of the economy, two indicators of commercial openness and financial openness have been used: The trade openness index is shown as ((X+M)/GDP), where M represents the country's imports in a fiscal year and GDP the gross domestic product in the same fiscal year. The index of financial openness can be shown as follows:

$$FO = \frac{(\text{Total Assets} - \text{Total Debt}) + \text{Other Countries in Capital} + \text{Foreign Capital Directing}}{\text{Domestic Gross Product}}$$

$$= \frac{(\text{Total Assets} - \text{Total Debt}) + \text{Other Countries in Capital} + \text{Foreign Capital Directing}}{\text{Domestic Gross Product}} \quad (15)$$

4. RESULTS

Based on the mentioned theoretical analysis, we try to estimate a three-variable vector self-explanatory model using the vector self-explanatory technique. The variables used include logarithm of cut flower export (EXP), trade openness (TOI), and financial openness (FOI), which were created using time series. One of the best ways to convert insignificant variables into meaningful variables is differentiation or using the logarithm of the data instead of the original data, and since in the present research, Johanson's method was used and this method was designed for variables, therefore, all unknown variables are tested by the generalized Dickey-Fuller statistic for the first order difference.

Table 1. The results of the analysis of variables

ADF statistic at 0.90 level	ADF statistic at 0.95 level	ADF statistic at 0.99 level	ADF statistic calculated	variable
622989.2-	967767.2-	679322.3-	572597.0-	EXP
625121.2-	971853/2-	689194.3-	069846.5-	d(EXP)
622989.2-	967767.2-	679322.3-	356204.0-	FOI
625121/2-	971853/2-	689194.3-	461362.4-	d(FOI)
622989.2-	967767/2-	679322.3-	822879.1-	TOI

625121.2-	971853/2-	689194.3-	601738.4-	d(TOI)

The significance of the variables must be checked before estimating the model. The generalized Dickey-Fuller test was used to check the mean of variables (ADF). The results of this test showed that all the variables were at the non-significant level at the confidence level of 99%, but in the first difference, they were significant, and it can be concluded that all the variables are in model (1) I, so it can be estimated The model used Johansson's long-term method with confidence.

Table 2. The results of determining the optimal interval of the VAR model

Number	Hannan-Quinn information criterion	Hannan-Quinn information criterion	Hannan-Quinn information criterion
0	945161.5-	801179.5-	902347.5-
1	*83433.12-	*82646.11-	67301.11-
2	84426.11-	26833.11-	*53464.12-
3	45996.12-	02014.11-	03183.12-

The results of table number (2) indicate that the optimal number of interruptions in all three methods is one interruption. In this research, the optimal number of breaks for the model is selected based on the Schwartz criterion.

In order to determine the order of the matrix, two statistics, the effective Landai and the maximum Landai, have been used. The results of the mentioned tests are shown in table number (3).

Table 3. The results of the matrix order test using the statistics of the maximum eigenvalue test and the effect test

H_0	H_1	State 1	State 2	State 3	State 4	State 5
$\Lambda_{trace} r \leq 0$	r=1	*81080.52	*80277.75	*77133.	*35321.61	38923.33
$r \leq 1$	r=2	*865764.19	63024.13	*93534.22	65923.14	23397.10
$r \leq 2$	r=3	214431.2	797197.4	*79008.14	924449.4	750638.0
r=0, Λ_{max}	r=1	*94504.42	*17252.62	*83600.44	*69398.46	*15525.25
$r \leq 1$	r=2	651333.7	*833046.18	186331.8	734781.9	48337.9
$r \leq 2$	r=3	214431.2	797197.4	*79008.4	924449.4	750638.0

After ensuring the existence of long-term relationships or co-collective vectors in Johanson's method, it is necessary to know what these relationships express in the long-term from an economic point of view. Based on the results of table number (3) for the first state (mode without width from the origin and trend), the statistic Λtrace has 2 vectors, and the statistic Λmax has 1 vector, in the second state (state with width from the origin and no trend), Λtrace has 1 vector, and the Λmax statistic has 2 vectors, in the third state (state with width from the origin unrestricted and without trend) the Λtrace statistic has 3 vectors, and the Λmax statistic has 2 vectors, in the fourth state (state with width from the origin unrestricted and trend Each of the statistics shows the presence of 1 vector, in the last case (width from origin and unrestricted trend), the Λtrace statistic shows the presence of 1 vector, and the Λmax statistic without a vector, at a significance level of 5%. Based on Johanson's proposal, the presence of co-accumulation vectors indicates long-term equilibrium relationships between variables, and based on the model's status and the existence of three variables and two co-accumulation relationships, we estimate the VECM model.

Table 4. The results of the co-collective vectors of the model

Variable	Vector 1	Vector 2
EXP1	0000.1	0000.0
FOI	833963.0- (28330.3-)	0000.1
TOI	916057.0- (00089.2-)	713263.3- (61941.2-)

Explanation: The numbers in parentheses are t-statistics.

Table number (4) shows that with a one percent increase in financial openness, the export of cut flowers increases by 0.83 percent. With a one percent increase in trade openness, the export of cut flowers will increase by 0.91 percent. In the next step, the VECM model should be estimated first. In the estimated regression model, classical assumptions such as autocorrelation and variance heterogeneity should be examined first. The values and significance levels of the autocorrelation and variance heterogeneity tests showed that the classical assumptions were not violated and the data obtained from the estimated model can be relied upon.

In this section, the effect of a shock on a specific variable on other variables is investigated using the instantaneous reaction function (IR). By using the functions of instantaneous covariance and analysis of variance, it is possible to experiment and analyze the dynamic interactions of the impulses created in the pattern. In diagrams 1 and 2, the horizontal axis shows the time based on the year, and the vertical axis shows the deviations from the initial equilibrium values. The reaction functions show the dynamic behavior of the model variables over time when a single impulse is applied to each of the variables. This momentum shows the size of one standard deviation.

Also, at this stage, variance analysis is used to analyze the dynamic mutual effects caused by the impulses created in the device. The dynamic behavior of the pattern variables on each of the pattern variables during time and during the impulse is shown by the impulse response (IR) functions. The amount of each impulse is equal to one standard deviation.

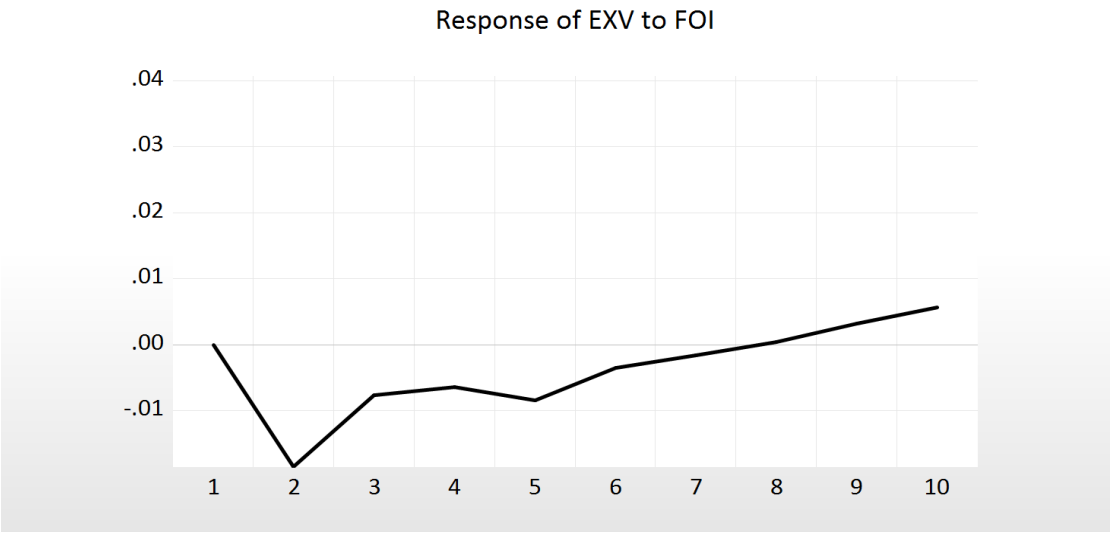

Figure 1. The response of flower exports to a shock of one standard deviation on financial openness.

As shown in the diagram number (1) and based on the cases raised in the theoretical explanations, by imposing a shock equal to one standard deviation on the financial liberalization at the beginning by 19%, the export of flowers will decrease. In the next period, the shock effect decreased and after it was almost increasing in the next two periods, it decreased again in the

fifth period, and then in the eighth period, the impulse effect disappeared and in the period. The tenth flower export has reached 5% higher than the initial balance.

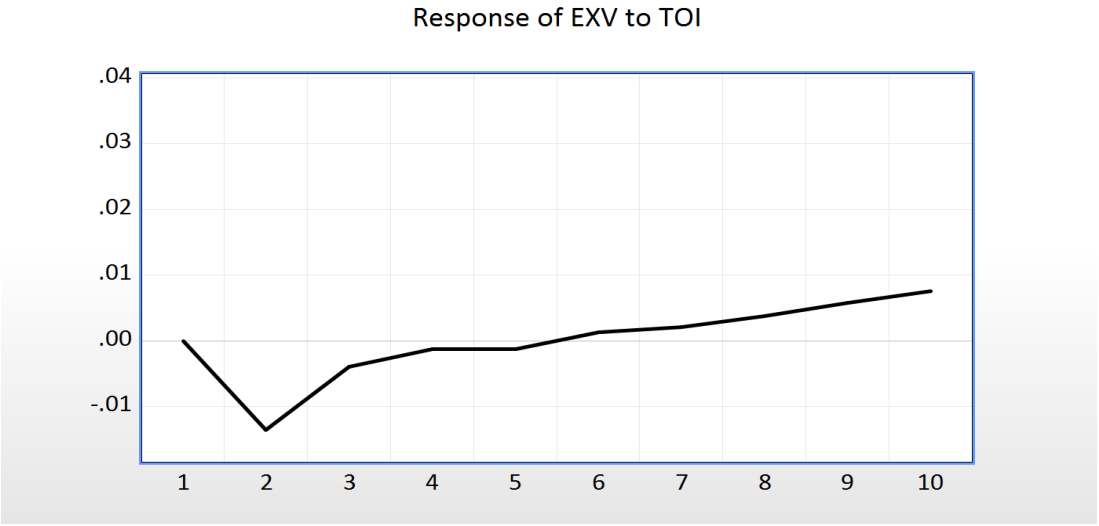

Figure 2. The response of flower exports to a shock of one standard deviation on trade openness

As shown in graph number (2) and based on the issues raised in the theoretical explanations, by imposing a shock equal to one standard deviation on trade openness, flower exports will initially decrease by 14%. In the following periods, the effect of shock gradually decreases and in the fifth period, the effect of shock disappears completely. Finally, in the 10th period, flower export has reached 8% higher than the initial balance.

Variance analysis measures the relative power or exogenous power of variables. Using this method, the contribution of shocks to each variable is reflected in the error variance of other variables in the short, medium and long term. In other words, with this method, the contribution of each variable over time can be measured on other variables.

Table 5. Variance analysis of cut flower export

Period	SD	EXP	FOI	TOI
1	040699.0	0000.100	00000.0	000000.0
2	061710.0	18589.86	932275.8	882836.4
3	070295.0	84731.87	073727.8	078964.4
4	075140.0	69491.88	806556.7	598537.3
5	079559.0	68950.88	075607.8	234891.3
6	082606.0	30544.90	670457.6	024002.3
7	084420.0	66434.89	379158.7	956504.2
8	085572.0	75074.89	183840.7	065424.3
9	086324.0	35556.88	194118.7	450319.3
10	086954.0	34990.88	505782.7	144315.4

In table number (5), the results of analysis of variance indicate that the flower export in different time ranges is mainly explained by impulses related to itself, that this value is 86.18% in the short term, 90.30% in the medium term and in the long term, 88.34% of the variance is the prediction error. Also, in the short term, the financial openness variable of 8.93% and the commercial openness of 4.88% and in total 13.81% have been able to explain the error variance of the flower export variable. In the medium term, the values have decreased due to approaching the initial balance, so that the financial openness of 6.67% and the commercial openness of 3.02% and a total of 69.9% have explained the export of flowers. Finally, in the long term,

financial openness by 7.50% and commercial openness by 4.14% and in total 11.66% of the variance of flower export have been explained.

The mentioned values show that the amount of flower export in Tehran province is more affected by the financial liberalization index and the effect of commercial openness is less on it, and finally the error correction model is estimated. It is necessary to estimate the error correction model when there is co-occurrence among several economic variables. Based on Granger's theory, there is an error correction model for every collective relationship. The main reason for using the error correction model is that it relates the short-term changes of the variable to its long-term values. In this connection, the error correction pattern shows the speed of adjustment from short-term to long-term structure. Based on the information mentioned in this research, the error correction model was estimated.

The results showed that the error correction coefficient was -0.176. According to the error correction coefficient in the ECM model, it can be concluded that the speed of adjustment towards the long-term equilibrium value is very small, because only 17.6% of the imbalance error is adjusted in each period, and the short-term value is adjusted towards the value it is desired for a long time.

5. CONCLUSION AND SUGGESTIONS

In this study, the impact of economic globalization on the export of cut flowers was investigated and an attempt has been made to present reasons based on theories in the results, which indicate that in Iran, the indicators of economic globalization in early years have a negative effect and in the long term a positive effect on flower export. In order to achieve this goal, KOF globalization index, economic globalization with trade openness variable and financial openness variable were used.

Also, due to the fact that the variables were at a non-significant level and became significant in the first difference, Johanson's test was used to ensure the existence of a covariate vector. Johanson's test showed that there is a long-term relationship between model variables. In order to analyze the effect of each of the variables of commercial openness and financial openness on the changes in the export of cut flowers by estimating the VECM model, instantaneous reaction functions and variance analysis, which are widely used in VAR models, were used.

Experimental results show that the variables of globalization have a negative effect on the export of the desired product in the early years, and this negative effect continues for years. This issue can be due to reasons such as lack of planning to enter foreign markets, severe weakness in the country's export management, lack of transparent trade laws, exchange rate stability, inflationary conditions, and most importantly, the excessive dependence of the country's economy on oil revenues.

It can be said that dependence on oil revenues, which is also effective in the occurrence of many of the above cases, causes the Dutch disease in the economy. Kutan and Wizan (2005) state that in countries that rely on oil economy, the wealth obtained moves economic resources from tradable goods to non-tradable goods. This contraction in business sectors is called Dutch disease.

Dutch disease has two harmful effects; first, the exchange rate is strengthened by the increase in oil export income, and secondly, capital and labor are drawn from the agricultural and industrial sectors to the prosperous resource sectors. This increases production costs in the agricultural and industrial sectors and significantly reduces the competitiveness of agricultural and industrial goods for export to the world markets, and on the other hand, the cost of non-tradable service goods faces a sharp increase.

Considering that, on the one hand, there is a high relative advantage in the country's export of cut flowers, and on the other hand, the import of this product by the countries of the Persian

Gulf, Russia, and Central Asia has increased every year and has a high volume, the share of Iran's flower export from The global export of this product during the period (2000-2023) was very small and had a fluctuating trend, and this is in the context that the cut flower trade trend has been stable and increasing in other countries during these years, especially in 2012 which has grown by 291 percent. Therefore, it is important to adopt the appropriate policies of Iran in order to increase the export advantage of this product and ultimately the significant growth of Iran's economy.

For this purpose, it is necessary to adopt policies to solve the infrastructural deficiencies of cut flower production and export, such as production in traditional greenhouses, the use of standard mechanized packaging systems, and fast, reliable and appropriate transportation. Also, on the one hand, the production and on the other hand, the quality of cut flowers should be increased in order to increase the competitiveness of this product.

Conducting research in the field of changing the production method of ornamental plants towards mass production, reducing the cost of production, knowing the markets of flowers and ornamental plants in order to adapt the production to the global consumption pattern, and the rules and regulations for the export of ornamental plants is also essential. Therefore, governments should take steps to strengthen the production sector and remove structural obstacles (obstacles to economic globalization), such as amending laws related to trade and implementing property rights.

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