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Testing the Central Market Hypothesis: A Multivariate Analysis of Global Markets of Pistachios

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The central market hypothesis is important in analyzing market integration, because it implies a specific market structure while avoiding a simultaneity problem. The aim of this study is to investigate the central market hypothesis for global markets of pistachio over the period of 1988 to 2013. In this study central market hypothesis was tested by Johansson method of integration. The results implied the existence of two markets for pistachios. The first market consists of Iran, United States of America and China, and second market contains Italy, Greece, Germany, Turkey, France and Luxembourg. The results of the first and the second markets indicate that Iran and Turkey acted independently and showed to be price leadership in their market respectively. The law of one price was also established on the markets. According to intense competition of America and China (especially America) with Iran, the role of government is to have appropriate policy in identifying the target markets, branding and encourage exports, in the global market.

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Abstract

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Keyword: Pistachios, Johansson Method, the Central Market Hypothesis, Integration.

Introduction

The central market hypothesis or price leadership is crucial concept in analysis of market integration, especially in developing countries. This way, market shocks will not affect the prices if the prices have been set in the central market and then transferred to regional and dependent markets. Transportation and procurement of commodities, transfer of exchange and trade data and facilitation of transportation network for conducting the exchanges are some the factors, which approve the existence of the central market (1). In a convergent markets, price fluctuations of one market have been responded in other markets, as it is so-called the existence of the spatial coverage opportunities. In such conditions, the difference in the price of homogeneous commodities in markets is caused by transportation costs and the Law of One Price (LOP) is established. Existence of a difference, which is more than the transportation costs between the prices of the two regions, is due to the reasons like the improper market structure, the lack of adequate communications, lack of transportation infrastructure, lack of sufficient information and lack of information networks, existence of trade inhibitors, incomplete competition and risk aversion. This would lead to high price fluctuations, high trade costs, heterogeneity and inefficiencies in markets (10).

For enabling the price to play the role of an effective tool and provide the necessary incentive to improve the production rate, it is needed to have an efficient marketing system with the features related to supply of agricultural products. In the process of reforming the market structure, the need to development of the integration of distant markets is sensible and should be explored. Integration of this market is a measure of efficiency in distant markets and has a close relationship with the price behavior in different markets. Such connection leads to the transfer of price fluctuation between different markets (7).

The connection between the prices of agricultural products in different regions is also important. This is a criterion for measuring the market progress. Procurement of commodities from one market and selling them instantly in another market to gain profit, affects the relationship and equality of price in different places. Market integration in different locations depends on price fluctuation, as continues markets are referred to the markets in which the prices of different products cannot behave independently (2). Among agricultural crops, pistachio is of particular importance. Some of the significant features of this product include the possibility of employment together with the proper income, desertification, and, most importantly, earning significant foreign exchange. In the last half century, pistachios have gradually become introduced as the important trade and export commodity. In recent years, Iranian pistachio has received a special place in non-oil exports of the country, as it becomes the second most important export commodity in the country after handmade carpet. There by, Iran gets a significant share of production, cultivation area, global exports value and content in this regard (8).

Some studies have been conducted inside and outside of the country in the case of research subject, as some of which are referred to as follows. Mohammadi and et al. (9) studied the integration of domestic and foreign chicken meat markets in Iran using monthly data for during 2009-2013. Results of the Granger causality test indicate a one-way relationship along with the market for foreign chicken meat. Results of the Coherent test also showed a long-term market integration, which means that in long terms, the price of markets are influenced and adjusted. Nikookar (10), in his study examined the convergence of Iran's pistachio market using the Threshold Spatial Price Transmission Models. The results revealed that the price transmission in most provinces of the country is asymmetrical positive in the short run, so that the marketing agents gain additional benefits by the difference in the rate of convergence of markets during the fluctuation of market price in the source, while the consumers will suffer losses.

But in general, the markets are convergent in the long terms, and there is no long-term asymmetry in price transfers. Karbasi et al. (6) in their research examined the integration and central market hypothesis of saffron crops in the provinces of Razavi, northe and southe Khorasan. The results showed Southe Khorasan Province plays a leading role in price among the mentioned provinces. However among the three provinces concerned, the Razavi and South Khorasan provinces formed a united market, which satisfied the LOP qualifications. North Khorasan Province is also a market that is not affected by the price of the two provinces of Razavi and South Khorasan in long term and instead, acts as an independent market. Olson et al. (11) studied the pricing behavior and integration of the wood market in three countries including Switzerland, Austria and Germany using monthly data through Engle- Grange method. The results showed that three pairs of Austrian-German, the south-Switzerland-central Switzerland and the north-Switzerland-central Switzerland markets are continues. Peng and Marchant (12) studied the spatial price relationship in regional markets of beef in China using monthly data through Engle- Grange convergence method and the error correction model. The results revealed the existence of long-term relationships for most of regional beef markets in China, while based on the error correction model the short-term relationships in most markets were not confirmed. Using the monthly shrimp data, Vinoya (14) studied the market integration and the Law of One Price for the countries like Japan, the USA and the European Union. The results revealed the integration of shrimp market in three noted region. The LOP was established in the United States and Japan, but not in the Japan and the European Union. Weinzell and Bayer (15) studied the integration of wheat markets in 28 provinces of Turkey using the 2-variable Vector Error Correction Model. The results indicate the important role of social networks in interaction of markets.

Materials and Methods

The purpose of this study was to examine the central market hypothesis as well as the convergence of pistachio market in the producing and exporting countries of this product during the years 1988-2013. Countries studied here included Iran, Afghanistan, China, America, Greece, Italy, Syria, Turkey, France, Luxemburg and Germany. According to the statistics of the United Nations Food and Agriculture Organization (FAO), Iran, Afghanistan, China, the United States, Greece, Italy, Syria and Turkey are among the countries that deal with producing and exporting pistachios. While despite the lack of production, the countries of Germany, France and Luxembourg, have been considered as the exporters of pistachios. The US consumer price index (based the constant price of 2010) has been used to calculate the actual price of pistachios in each country. The Johansson-Juselius method has been also used to study the price convergence. In following some descriptions have been provided regarding the research method.

Several studies have examined the integration of markets in developing countries. In these studies, the integration of markets on the basis of price relationships over time, is generally based on solidarity, causality, convergence, and LOP. The main correlation in this regard is shown as Eq (1)

$$\ln P_t^A = \alpha + \beta \ln P_t^B + e_t \quad (1)$$

Where P_t^A is the price at market A at time t and α refers to the costs of trade, transportation, implementation, quality difference and other marketing costs. e_t also shows the error statement. If β is zero, there is no correlation between the two price series of A and B. If β is equal to unity, the LOP is established and the relative price is constant. In such cases, the commodities are fully substituted. If $0 < \beta < 1$, it shows that the relative price is not constant and the substitution relationship is defected.

This correlation has a coincidence problem, because the prices are commonly defined simultaneously, so that all prices respond to each other's changes. If the price does not react to other's changes, it is called "exogenous", and the coincidence problem is resolved only when one of the prices is exogenous. This price is defined based on the terms of supply and demand of the market, which is independent of the price system. However, supply and demand shocks of this market are reflected in other markets as well, because this is an integrated market. Thereby, this is a central market and supply and demand shocks in other markets have been corrected by trading and exchanging good with the central market without affecting the central market price (1).

A convergence technique could be used to investigate the pistachio market integration in the target countries. According to Engel and Granger (1987), if markets are efficient, then prices in different markets should be convergent. The Engel-Granger method is basically a bivariate method that only studies the relationships between the two series of prices. Therefore, it is not possible to study the multivariate models. In addition, this method is sensitive to the prices normalized over other variables.

Frutt and Rogoff (4) introduced the Eq.(1), which can be developed for to any number of commodities. However, structurally, additional information could not be obtained by providing multivariate correlations. But multivariate correlations that follows the Johansson-Jucilius's approach could be used for dynamic data and also are free of structural constraints existed in binary variables. Multivariate models have two advantages. A n-variable model has maximum of (n-1) co-distribution vectors. There is also the possibility of existence of $(\frac{n^2-n}{2})$ bivariate models in a n-variable model. However, multivariate models have a fundamental problem, because the results derived by these models are often sensitive to the number of variables included in them. This problem challenges the accuracy of results of the multivariate models (6). There is no definite strategy to address this problem. By the way, the Johannesen normalization process (1994), which maintains all structural economic information in the system, recommends a two-step solution.

In the first step, a set of bivariate models that contain all possible pair markets will be tested in terms of co-excited and exogenous features. Specifically, the bivariate clauses give us an insight into the random trend of different correlations in order to basically avoid the possibility of existence of dimensions. As we could find less than n-1 co-integrated vectors with n price, which have shared a random trend. In the second stage, more tests have been conducted based on the information obtained in the first stage. For example, it is possible to be aware about the conflicting results obtained by the extraterritorial tests of bivariate correlations, created by the effect of eliminated prices. Prices that are not integrated with any other prices in the system could be also removed, because the product does not belong to the desired market.

In Johansen method, first, the maximum-specific values tests and an effect test have been used to determine the number of co-integrated vectors. Johansen-Jessilius states that in the case of existence of conflicts between results of these two tests for determination of the number of co-integrated vectors, since the "maximum-specific values test" has a more assertive assumption, so it is preferred to the "effect test" (5). The Johansen method is developed based on a vector error correction model. If two markets A and B are considered, assuming that the two series of prices have been unstable but co-integrated in the markets, and a gap is set for the model's dynamism, the relationship between the prices could be expressed as follows.

$$\begin{bmatrix} \Delta P_t^A \\ \Delta P_t^B \end{bmatrix} = \begin{bmatrix} a_1 \\ a_2 \end{bmatrix} [b_1 \ b_2] \begin{bmatrix} P_{t-1}^A \\ P_{t-1}^B \end{bmatrix} \quad (2)$$

If $b_1 = -b_2$, the prices are proportional and the LOP is established. Usually, b_1 is normalized and so the assumption of $b_2 = -1$ is tested. The parameter a_i measures the effect of the deviation from the long-term connection or the weak exogenous. If a_1 is nonzero, a change in the long-term relationship, changes the market A price or P^A to some extent. In a similar way, it is possible to judge market B. If $a_1 = 0$, no change in is made in market A by the price change, and all adjustments will be made by the change in P^B , and vice versa if $a_2 = 0$. So if $a_1 = 0$, market A is a central one. If a_1 and a_2 are opposite zero, there is no central market in this market system. If a_1 and a_2 are nonzero, there is no central market is existed in this system. a_1 and a_2 could not be zero at the same time, because in this way there will be no long-term relationship between two markets.

Results and discussion

In this section, first, the trend of production, export, import and export prices of pistachio have been examined during the period of 1988-2013. Then, results of the Unit Root test and finally the results of the convergence test and the central market hypothesis have been expressed.

Pistachio production in the world

According to information obtained by FAO, the countries that produce pistachios are included Iran, USA, Italy, Afghanistan, Turkey, Syria, Greece and China. The pistachio production statistics of these countries during 1988-2018 have been plotted in Figure 1.

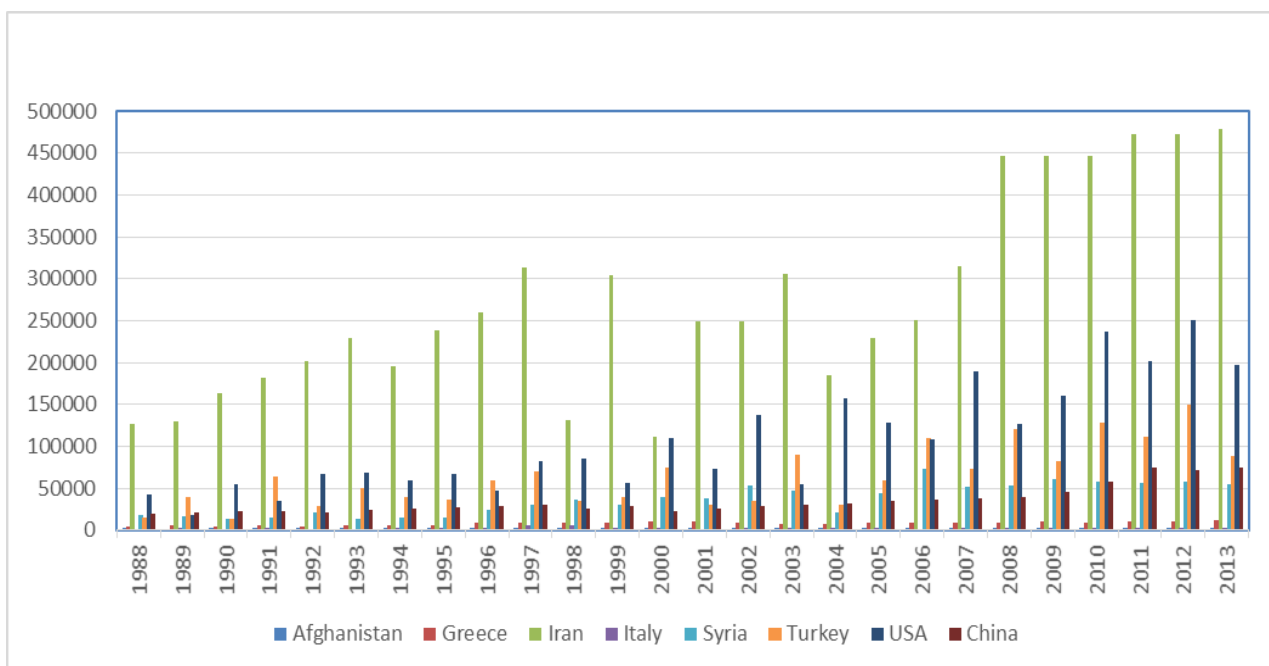


Figure 1- Statistics pistachio production in the world 1988-2013 (Ton)

According to Figure 1, during 1988-2013, Iran has the first place among the world's leading producers of pistachios. The USA and China rank 2nd and 3rd after Iran. The above Figure shows a significant difference between the level of pistachio production in Iran and other countries.

Export of Pistachio in the world

According to information obtained by FAO, countries with high pistachio export rate are included Iran, USA, Italy, Afghanistan, Turkey, Syria, Greece, China, Germany, France and Luxembourg. During the years of the study, with the exception of the years 2009, 2012 and 2013, Iran has the first

place among the countries, which exported pistachios in the world. In the years 2009, 2012 and 2013, the USA has the highest export rate among the target countries. Iran is the world's largest pistachio exporter in terms of the level of production. Also, China and the USA have been considered as the most important competitors of Iran. Because since 2008, the rate of USA's exports has been raised sharply that can reflect their competition with Iran for ruling the global pistachio market. On the other hand, regarding the volume of Chinese's exports, it is clear that this country is planning to rule the global pistachio market at a rate slower than that of the United States.

Import of Pistachio

According to information obtained by FAO, countries with a high volume of pistachio imports are included of USA, Italy, Turkey, Syria, Greece, China, Germany, France and Luxemburg. During 1988 to 1999, Germany owned the largest import volume of pistachios in the studied countries, while during 2000 to 2013, China had the highest import volumes. The high rate of import of pistachios in China could be attributed to the large population of this country, which results in the high consumption rate of pistachios as well as re-export issues.

By comparing the values of production, exports and imports of pistachios in the studied countries, it could be aid that:

1. Some countries, such as Italy, Germany, France and Luxemburg, import pistachios from one hand and export it on the other hand. These countries are about to play a role in the pistachios world market and rule its global price. Among these countries, only Germany has no pistachio production.
2. Iran and Afghanistan are the only countries that have no imported pistachio products despite the high rate of production and export of it. While some countries like USA, Turkey, Syria, Greece and China, also import this product despite the production and export it.
3. The USA, China, Syria, Turkey, Greece and Italy are among the countries that take import activities along with the production and export of pistachio.

Export price of pistachios in the world

In this section, export prices of pistachio-producing countries have been calculated based on the 2010 fixed prices. The average export price is also presented in Figure 2.

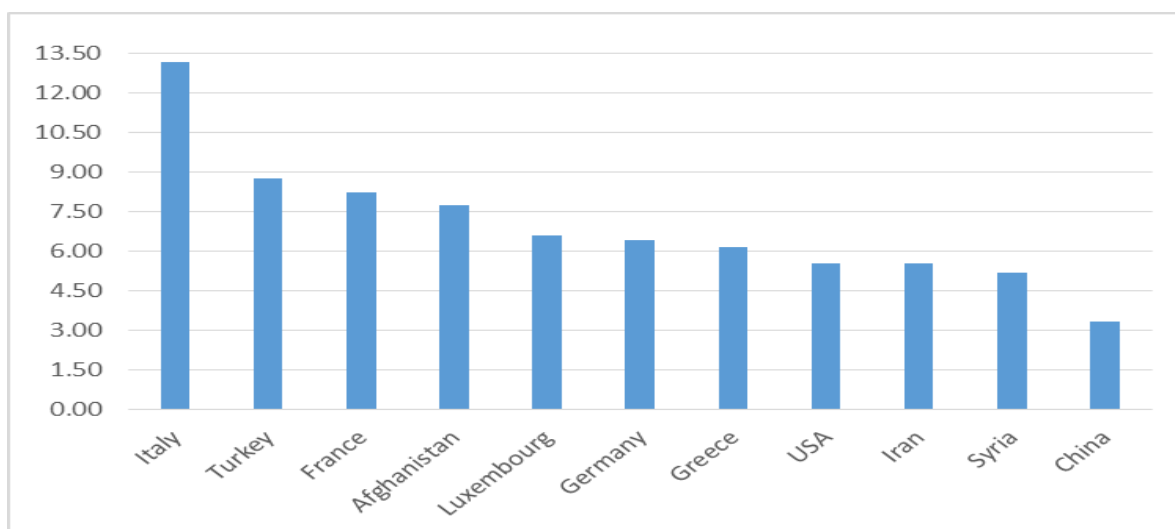


Figure 2- The average price of pistachio exporting countries 1988-2013 (2010=100)

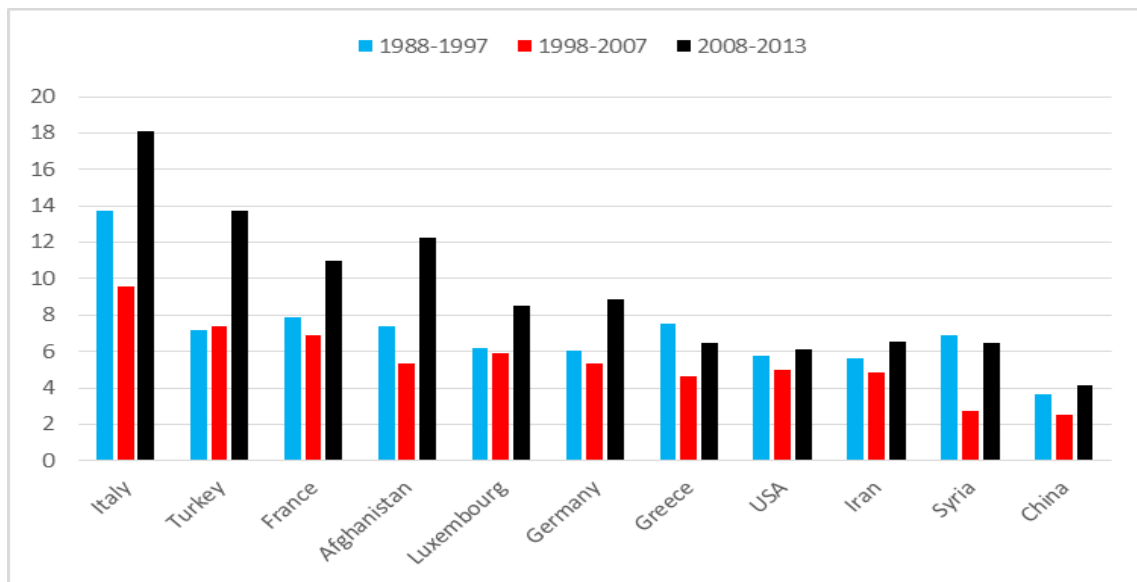


Figure 3- The average price of pistachio exporting countries during three periods (2010=100)

According to the above Figures, Italy has the highest export prices values among the other countries. In the case of the average export price, it could be said that the higher the price, the lower dominance on the pistachio market. Therefore, having the lowest export price, China is seeking to dominate the global pistachio market. With regard to the level of pistachio production in Iran, it is expected that the country will be able to make it difficult for other countries to compete with, but the price trend does not show this point.

Unit root test results

In order to analyze the convergence, it is essential to examine the static properties of the variables. So, in this study, the Augmented Dickey Fuller and Phillips Paron unit root tests have been used in this regard. The results of these tests are shown in Tables 1 and 2.

Table 1- Unit root tests: Augmented Dicky Fuller

Country	Statistics I(0)	Statistics I(1)
China	-0/966	-4/413***
Syria	-1/960	-5/941***
Iran	-2/651	-5/362***
USA	-1/286	-4/608**
Turkey	-1/916	-4/994***
Germany	-0/817	-6/635***
Greece	-2/683	-5/561***
Italy	-1/319	-7/618***
Afghanistan	-1/642	-5/914***
France	-1/526	-7/496***
Luxembourg	-2/255	-5/684***

***, ** significant at 1 and 5 % level respectively

Table 2- Unit root tests: Phillips-Perron

Country	Statistics I(0)	Statistics I(1)
China	-1/105	-4/430***
Syria	-1/897	-6/104***
Iran	-1/902	-5/480***
USA	-1/404	-3/854**
Turkey	-1/882	-6/189***
Germany	-0/045	-10/298***
Greece	-2/590	-5/976***
Italy	-0/922	-13/814***
Afghanistan	-1/642	-5/947***
France	-1/522	-7/141***
Luxembourg	-2/185	-8/653***

***, ** significant at 1 and 5 % level respectively

According to the results obtained from unit root tests, all variables were not stationary at the static level, while their first-order difference was stationary. Therefore their degree of integration is one. Since the degree of integration of all price series is the same, the Johansen's co-integration analysis is a suitable method to analyze the co-integration.

Results of the co-integration test

In order to investigate the co-integration of the price series, all countries have been examined using bivariate tests. The results of the double-markets integrity evaluation and Weakly Exogenous Test of the pistachio exporting countries have been also presented in Table 3.

Table 3- Bivariate cointegration and exogeneity tests (Countries that are related)

Country	Null hypothesis	Statistics Trace	LOP	Exogenous
China	P=0	15/475*	835/438 (0/000)	4/259
Italy	P≤1	1/871		4/206
China	P=0	12/864	123/669 (0/000)	2/233
Syria	P≤1	3/927*		7/001*
China	P=0	14/711*	170/456 (0/000)	2/466
Turkey	P≤1	2/807*		2/045
China	P=0	15/953*	1/233 (0/148)	0/348
Iran	P≤1	6/160*		10/154*
China	P=0	12/613	5/064 (0/024)	0/987
Afghanistan	P≤1	5/687*		7/381*
China	P=0	15/497*	0/639 (0/423)	7/857*
France	P≤1	3/841		9/938*
China	P=0	17/561*	0/688 (0/406)	2/246

Luxembourg	P≤1	2/926*		9/319*
China	P=0	14/336*	1/843 (0/111)	3/363
USA	P≤1	1/837		10/138*
Germany	P=0	15/678*	1/012 (0/156)	2/944
Greece	P≤1	0/265		8/887*
Germany	P=0	14/060*	22/236 (0/000)	2/600
Italy	P≤1	0/062		2/032
Germany	P=0	18/476*	0/841 (0/342)	0/476
Turkey	P≤1	0/0003		4/666*
Greece	P=0	15/533*	1/304 (0/144)	8/006*
Italy	P≤1	0/287		7/162*
Greece	P=0	16/756*	4/121 (0/042)	3/869
Syria	P≤1	3/738*		2/891
Greece	P=0	10/995	2/001 (0/109)	2/825
Turkey	P≤1	4/130*		0/278
Greece	P=0	14/557*	0/239 (0/624)	0/815
USA	P≤1	2/929*		4/849*
Iran	P=0	15/020*	36/024 (0/000)	3/122
Greece	P≤1	3/413*		1/498
Iran	P=0	13/232	252/279 (0/000)	2/422
Italy	P≤1	3/801*		0/336
Iran	P=0	12/031	72/210 (0/000)	4/855*
Syria	P≤1	4/883*		0/735
Iran	P=0	13/517*	150/108 (0/000)	1/163
Turkey	P≤1	2/987*		2/596
Iran	P=0	13/625*	0/820 (0/310)	14/416*
USA	P≤1	3/789*		5/677*
Italy	P=0	16/763*	0/020 (0/884)	0/741
Turkey	P≤1	1/558		2/222
Italy	P=0	14/741*	24/781 (0/000)	0/582
USA	P≤1	0/744		1/462
Syria	P=0	8/816	10/926 (0/000)	0/729
Turkey	P≤1	3/351*		6/430*
Syria	P=0	13/605*	7/280 (0/007)	3/828
USA	P≤1	2/233		6/345*
Turkey	P=0	16/485*	0/751 (0/385)	0/681

USA	P≤1	3/352*		10/559*
Afghanistan	P=0	16/127*	0/049 (0/824)	0/046
Greece	P≤1	2/535		14/150*
Afghanistan	P=0	8/975	9/460 (0/002)	0/893
Iran	P≤1	3/179*		1/071
Afghanistan	P=0	21/311*	4/314 (0/037)	4/820*
Italy	P≤1	1/995		0/620
Afghanistan	P=0	14/368*	12/253 (0/000)	3/775
Luxembourg	P≤1	1/511		14/871*
Afghanistan	P=0	14/099*	0/181 (0/670)	1/370
Turkey	P≤1	2/446		6/747*
France	P=0	21/497*	0/981 (0/321)	5/308*
Germany	P≤1	0/076		1/018
France	P=0	14/717*	1/233 (0/149)	3/475
Greece	P≤1	1/185		9/354*
France	P=0	13/474*	11/547 (0/000)	2/464
Iran	P≤1	0/749		0/419
France	P=0	21/789*	2/009 (0/113)	12/362*
Italy	P≤1	2/030		5/134*
France	P=0	20/624*	0/839 (0/601)	0/936
Luxembourg	P≤1	1/273		11/143*
France	P=0	13/737*	1/119 (0/124)	0/358
Turkey	P≤1	0/743		5/205*
France	P=0	14/949*	3/771 (0/052)	5/637*
USA	P≤1	0/912		10/716*
Luxembourg	P=0	24/597*	0/766 (0/712)	21/870*
Germany	P≤1	0/485		3/150
Luxembourg	P=0	15/884*	1/621 (0/116)	3/031
Greece	P≤1	1/741		8/340*
Luxembourg	P=0	20/732*	44/461 (0/000)	2/845
Italy	P≤1	6/603*		22/336*
Luxembourg	P=0	15/148*	2/001 (0/115)	5/453*
Turkey	P≤1	0/964		3/834
Luxembourg	P=0	17/207*	0/084 (0/771)	10/198*
USA	P≤1	2/009		8/615*

* Significant at 5 % level

According to the results of Table 3, pistachio prices in the countries that form a market with together follows the same random trend. The Weakly Exogenous Test and LOP also confirm this result.

The paired countries which follow the LOP, also form a united market, and as a result, the short-term price changes is transferred between them. The Weakly Exogenous Test has been used to examine the independency of target market from another country (in fact, its leadership test of that country in the pistachio market). If the null hypothesis of exogenous test has been accepted, the price of that country behaves independent of the price of other countries and in fact, it leads the price.

Finally, regarding the results of bivariate co-integration test and global pistachio integration test, it was revealed that there are two global markets for pistachios. The first market includes the countries of Iran, the USA and China, and the second market includes the Italy, France, Turkey, Greece, Luxemburg and Germany. The results of the multivariate market co-integration test are shown in Tables 4 and 5.

Table 4- Multivariate cointegration and exogeneity tests (Market 1)

Country	Null hypothesis	Trace statistics	Critical level of 5%	LOP	Exogenous
Iran	$P \leq 1$	29/119	29/797**	1/099	6/980
China	$P \leq 2$	13/790	15/494*	-	14/965***
USA	$P \leq 3$	2/441	3/841	-	8/669**

***, **, * significant at 1, 5 and 10 % level respectively

According to the results shown in Table 4, three countries of Iran, China and the USA form a united market. The result of the Law of One Price (LOP) also verified this point. Of course, this conclusion is not out of mind, because in the view of average export price, this value is lower for these three countries than the other countries, in the whole study period (Figure 2) and during the three study periods (Figure 3), lower than in other countries. Also, the results of the Weakly Exogenous Test indicate that Iran's price is independent of the prices of China and the USA. In fact, Iran plays the leadership role in price.

Table 4- Multivariate cointegration and exogeneity tests (Market 2)

Exogenous	LOP	Critical level of 5%	Trace statistics	Null hypothesis	Country
6/397	1/230	95/753***	150/329	$P=0$	Turkey
11/318**	-	69/818***	101/462	$P \leq 1$	Italy
14/211**	-	47/856***	68/017	$P \leq 2$	France
20/717***	-	29/797***	41/913	$P \leq 3$	Germany
15/486***	-	15/494***	23/804	$P \leq 4$	Greece
10/181**	-	3/841	1/543	$P \leq 5$	Luxembourg

***, **, * significant at 1, 5 and 10 % level respectively

According to the results of Table 5, the six European countries presented in this study form a united market. The result of the Law of One Price (LOP) test also indicates this point. Although most of the two-by-two connections of the European countries do not form a single market, which could be attributed to the volume of exports and imports of these countries to each other. But as the result of the LOP test shows, six European countries are homogeneously creating a united market. The result of the Weakly Exogenous Test shows that in this market, Turkey plays the price leading role. The reason for Turkey's leadership in this market can be the also attributed to the geographical location of the country as well as the large volume of re-exports to European countries.

Conclusion

The purpose of this study was to examine the central market hypothesis for global pistachio markets. The co-integrated multivariate test of Johansson was used to achieve this goal. Generally, in the literature of the subject, the LOP condition is used for Johansen's co-integration technique, but it is important to be noted that when there are more than two integrated markets, there may be more than one central market. In order to avoid the dimensional problems, which usually occur in multivariate integration where the number of variables is high, a Johansen model could be used based on bivariate tests. According to the results, there are two markets for pistachios.

The first market includes countries of Iran, China and the USA, and the second market includes Italy, France, Turkey, Greece, Luxemburg and Germany. Some points should be noted in the case of the first market: First, the LOP is established in this market, second, Iran plays the leading role in price; and, third, the import and export statistics as well as the growing trend of exports in three countries show that in the next decade, China and the USA could play a decisive role in ruling the global price of pistachios. Also, a few points should be noted in the case of the second market: first, the six countries form a united market and, second, Turkey plays the leading role in price.

According to the obtained results, the second market, which includes European countries, could not play an important role in the global market, due to the high export prices and low export and import rates compared to the first market countries. On the contrary, the main competition in the global market for ruling the price of pistachios is among the three countries of Iran, the USA and China. Considering the export prices it could be realized that China (with the lowest prices), and the USA (by increasing production and exports rate) are trying to rule the global market. By increasing the production level and high storage rate, the USA is somehow seeking a dumping, because the USA has lowered the Iranian exports share by exporting more pistachios to other countries. Thereby, Iran, which has the highest rate of pistachio production and exportation around the world, should play a role in the global market using a proper policy. The policies that the Iranian government could apply in this regard are as follows:

1. Identification of target markets: Unfortunately, Iran has a poor performance in this field and has not been able to identify target markets to penetrate to them. Therefore, it is recommended that the producers identify the target markets under the governmental supports and make an official institution in this regard.
2. Branding: Lack of a well-known brand in the field of pistachio exports is an important factor that may lead to the diminished role of Iran in the global market of pistachios. Therefore, it is suggested that by facilitating the conditions for the private sector, the government will provide the beds for the presence of private commercial companies in the field of export under a national brand and compete with foreign companies.
3. Export encouragement: The government can reward exporters based on the type of product and volume of profit.

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