



**Full Length Research Article**

**IRAN AGRICULTURAL SELECTED PRODUCTS' EXPORTS COMPARATIVE ADVANTAGE INDICES**

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**ABSTRACT**

The Climate variability and proper production potential in agricultural sector allow increasing export earnings by focusing on agricultural exports' development. Comparative advantage measurement is one of very useful criteria for optimized resources' allocation in countries with an open economy and an important role in international trade. Comparative advantage shows a country's ability in goods' production and exportation with lower cost compared to other competitors. In this study export comparative advantage of selected agricultural products of Iran, including date, grapes, kiwi, citrus, raisins and rice was studied during 1961- 2012. The results showed that raisin has the most stable trend and rice has the most fluctuating trend of calculated RCA index. For RSCA index, kiwi has assigned the most fluctuating trend and rice has assigned the most stable trend. The value of  $\chi^2$  export comparative advantage index showed that Kiwi has the most fluctuating time trend and Grapes has the min fluctuating trend of this index.

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**INTRODUCTION**

Iran's foreign trade is known by single product exports and economy's heavy reliance on currency earnings from oil exports. The need to avoid single product export and freedom from problems caused by it, diversify of export products, providing currency for investment and increasing the share in global trade and international markets and dealing with unprecedented sanctions against Iran clearly show the importance of developing non-oil exports. Decreasing dependence on oil earnings and non-oil exports' development are the most important Iran economy strategies in recent years. Movement toward non-oil exports has been determined as the main strategy of export development policy and one of the main and central purposes of the third and fourth five-year economic, social and cultural programs of Islamic Republic of Iran. The success of this policy needs efficient use of work for recombination, resources and draw materials, technology and finally optimized economic and commercial management. Undoubtedly, adopting this strategy is the only way to achieve a fair share of the world economy and trade. Regarding relative advantage of various economic activities is one of the important aspects of economic planning. Of course, comparative advantage is not a permanent and stable advantage, and may change over time and by scientific advances and providing more appropriate technologies, from a

region to another region or country, and/ or within a section, from a product to another product, but the transition process is gradual and it can be maintained or reinforced by applying desirable policies (Ali and Khan, 2013). Most of conducted studies have emphasized on Iran comparative advantage in the field of exporting agricultural products, and especially garden products (Gholi Beiglou, 2005). It is therefore essential to study the products' target markets and develop a frame work for business planning and to attempt to stabilize and develop the country currency earnings through the products exports and on the other side promote Iran export agricultural products position in global markets.

Climate variability and proper production potential in agricultural sector allow increasing export earnings by focusing on agricultural exports' development. In this regard, advantageous export items identification and export target markets recognition are the most important challenges facing planners and managers in the field. Agricultural section is one of the most important economic sectors in Iran that provides an important contribution of GDP, employment, non- oil exports and raw materials of industries. This sector over the past few decades has also played a determinant role in the country economy by slow but steady growth, and even under very undesirable economic conditions also provides prosperity and new capacities. Food security supply by emphasizing on production from domestic resources, raw materials supply of dependent industries, villagers and farmers' income increase, poverty alleviation by reinforcing appropriate production

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infrastructures, development of complementary industries and waste decrease are the most important purposes of Iran agricultural sector development. Climate variability and appropriate production potential in this sector allows increasing export earnings by focusing on agricultural exports' development. In Iran, agricultural sector exports constitutes a major part of the country's non-oil exports in a way that in 2008 and 2007 agricultural sector exports was 3250 and 3084 million dollars, respectively that indicated the share of 17.9 and 15.7 percent of this sector export of the country's non-oil total exports and the share of 3 and 3.2 percent of this sector export of the country's non-oil total exports.

Examining agricultural share trend of total non-oil exports and imports showed that in early four years of the third program, the share of agricultural and food exports has been continuously increased to the total non-oil exports and has been increased from 23.2 percent to 26.4 percent. But in the last year of the third program, the share of agricultural exports has been decreased to 20.9 percent to the total of non-oil exports. During the fourth development program, agricultural and food share of the total non-oil exports had not as table trend and was decreased by fluctuations from the share of 21.8% in the beginning of the program to the share of 19.62% in the final year of the program. In the case of agricultural imports, during the third development program, the share of agriculture and food imports of the total non-oil imports of the country was continuously decreased, so that the agricultural share of 17.9 percent of total imports in the first year has been decreased to 8.6 percent in the last year of the period. But agricultural imports hare trend of total non-oil imports was not stable in the fourth program in a manner that with a fluctuation trend has been increased from 8.1% in the first year to 15.33% in the last year of the period.

In general, during the two the third and fourth development programs, the best condition in terms of the share of agricultural exports belongs to 2003 and the most in appropriate condition belongs to 2008. Also, in terms of agricultural import share of total non-oil imports, the best condition occurred in 2005 and the worst condition occurred in 2000. Comparing the two programs also despite an increase in agriculture and food exports due to faster increase of non-agricultural goods' exports, the average share of agriculture sector of total goods' exports was decreased from 23.94 percent to 20.52 percent in the third development program. Similarly, due to much faster growth of non-agricultural goods' imports, agricultural goods' share of total goods' imports was decreased so that it was decreased from 12.36 percent during the third program to 9.33 during the fourth program. Without a doubt, considering development of exports of agricultural products can also improve trade balance, and plays an important role in employment and currency earnings under available sanctions conditions against Iran.

Comparative advantage measurement is one of very useful criteria for optimized resources' allocation in countries with an open economy and an important role in international trade. Comparative advantage shows a country's ability in goods' production and exportation with lower cost compared to other competitors. In relation to the above concept it should be noted that a country may have a comparative advantage in a product

production so that produces the product cheaper than other countries but this will not guarantee mentioned country's exports success. In other words, the above country may despite having a comparative advantage in goods' production only because of the absence of relative efficiency in marketing the product and steps such as packaging, quality, supply standards, skills of transactions, changes in consumers' preferences, changing market conditions and even political factors in the flow of foreign exchange cannot supply its exports goods at a competitive price compared to other countries exporting the product. So, the presence of comparative advantage in production is a necessary for a country but is not sufficient for because reaching a major share in the world market of the good requires that the above country of fersits goods without demand limitation assuming other identical conditions to other competing countries. Thus it can be said that many factors are involved in determining relative advantage that can be categorized in three areas of production, issuance (or supply) and export demand (Ugochukwu and Ezedinme, 2011). Examining comparative advantage of export of agricultural products has attracted the attention of many researchers.

Burianová (2010) examined commercial competitive trend of Czech agricultural products after joining Europe Union. In this study, using revealed and Michaely comparative advantage indices (RCA), he calculated comparative advantage of agricultural products' exports. Values obtained from indices showed the presence of comparative advantage during the period of 2004- 2008. Pakravan and Kavooosi Kalashami (2011) in a study titled the perspective of peanut exports of Iran, Turkey and the United States examined peanut exports condition of the three countries. For this purpose, RCA index was calculated based on agricultural sector exports and the whole economy and was predicted using ARIMA method for the period of 2008- 2013. The results showed that the countries of Iran and Turkey in the period of 1982- 2007 had a comparative advantage and the US has not a comparative advantage. Also RCA index prediction showed that in the period of 2008-2013, the US exports condition was improved but RCA prediction values of Iran and Turkey are decreasing. Mehrabi Boshrabadi and Poormoghadam (2012) in a study evaluated factors affecting comparative advantage Iran raisins exports. In this regard, using time series data of years of 1961-2009, revealed comparative advantage indices values (RCA); revealed symmetric comparative advantage (RSCA) and  $\chi^2$  indices were calculated for Iran and other major countries producing this product. The results showed that Iran comparative advantage in the export of raisins had many fluctuations and after an ascending trend, has a descending trend. Examining factors affecting raisins export comparative advantage using Vector Auto Regression model during the period of 1961- 2008 showed that variables of currency rate, national production rate, competitors' production rate and exports' world price have a positive effect and Iran raisins exports' price and production fluctuations have a negative impact on RCA index of Iran raisins exports. Nasabian *et al.* (2012) in a study examined comparative advantage of exports of medicinal herbs of fennel, anise and coriander in Iran and eleven countries, the main exporters using RSCA index in the period of 1995- 2008. The results showed that Syria, Iran,

India, Turkey, Singapore, Egypt, Morocco, Bulgaria, and Vietnam have no export comparative advantage. Also, China has export comparative advantage in some years. Al though Iran has a comparative advantage in the export of selected medicinal herbs, but its export competitiveness has fluctuating and descending trend. RSCA export advantage index values in studied period show not only Iran has not been able to achieve the world's top ranks in terms of comparative advantage in the export of selected medicinal herbs, but also its rank degraded from the third to the sixth. Ranking countries in terms of comparative advantage in the export of selected medicinal herbs showed that Syrian except 1998 in the remaining years has the first rank of export comparative advantage. Using available experiences in previous research, in this study export comparative advantage of selected agricultural products of Iran, including date, grapes, kiwi, citrus, raisins and rice was studied during 1961- 2012.

**MATERIALS AND METHODS**

In order to examine export comparative advantage of mentioned products various indices were used. Revealed comparative advantage (RCA) index includes all factors affecting comparative advantage such as production factors, supply and demand factors and is affected less by policies and interferences of the government. Vallrathrevealed comparative advantage index is an appropriate measure for comparative advantage measurement of agricultural products' export. In Vallrathrevealed comparative advantage index, information of all countries and goods is reflected, in this way, global comparative advantage is considered. Presented measure by Vallrath is generalized equation of Balassarevealed comparative advantage. Vallrathrevealed comparative advantage measure is obtained by the following equation (Balassa, 1998).

$$(1) \quad RCA_i^j = (x_i^j / x_i^j) / (x_i^w / x_i^w)$$

In the above equation,  $x_i^j$  is the value of exports of good si by country j,  $x_i^j$  is the value of total exports of country j,  $x_i^w$  is good si export total value in the world and  $x_i^w$  is the total value of world exports.

Revealed comparative advantage index assigns values between zero and  $\infty$ . The value higher than one of the above index shows that the product exporting country has export comparative advantage and has moved toward production specialization. The values lower than 1 of this index show the absence of comparative advantage in the production of given product (Serin and Civan, 2008). In order to solve the problem of a symmetric RCA index, a symmetrical shape of this index is presented below (Brasili *et al.*, 2000):

$$(2) \quad RSCA_{ij} = \frac{RCA_{ij} - 1}{RCA_{ij} + 1}$$

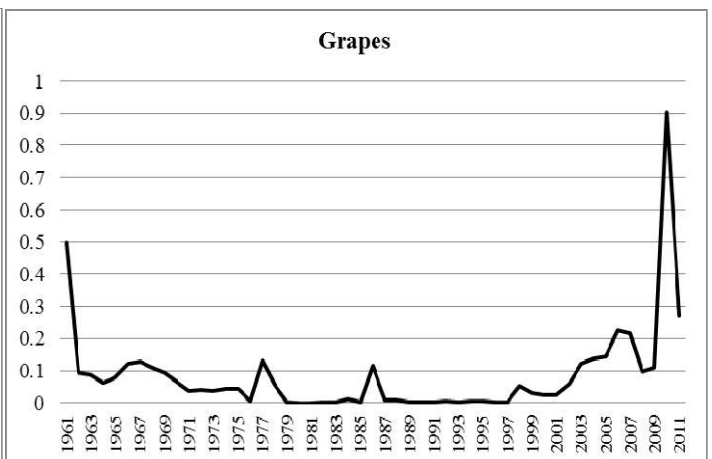
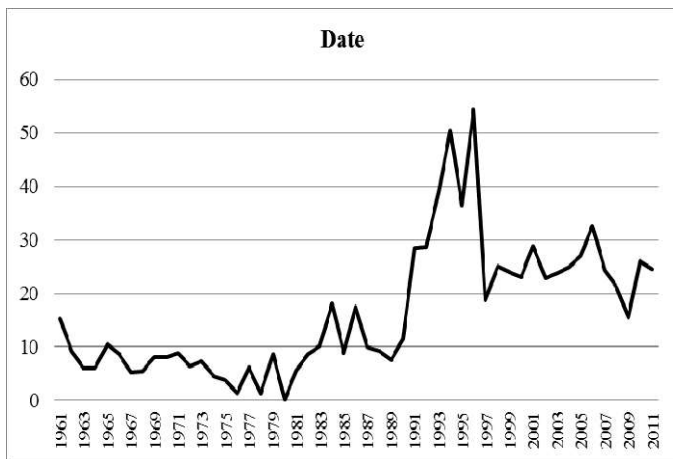
Revealed Symmetric Comparative Advantage (RSCA) includes values between -1 to +1. Positive values of the index show the presence of comparative advantage, while negative values indicate the absence of comparative advantage.  $\chi^2$  index has been presented by Archibugi and Piantain 1992. The index represents the second power of contribution (distribution) of a country's export share of world exports. This index value is between zero and  $\infty$ . The value of the above index shows that to what extent studied country has expertise or advantage to the world export pattern. If the index is closer to zero indicates that the pattern of trade (exports) of given country is close to the world pattern and given country has expertise or advantage in the goods expertise and has competitive power. The above index is obtained as follows (Gopaland *et al*, 2009):

$$(3) \quad \chi^2 = \left[ (X_{ij} / \sum_i X_{ij}) - (\sum_j X_{ij} / \sum_i \sum_j X_{ij}) \right]^2 / (\sum_j X_{ij} / \sum_i \sum_j X_{ij})$$

Needed data collection method is documentation and library and the most important data collection resources include national statistical Year book (Year book of foreign trade statistics), international year books and publications, citation and global information databases (FAO, WB and OECD).

**RESULTS AND DISCUSSION**

RCA index values calculation for various studied products is summarized in the following Figures:



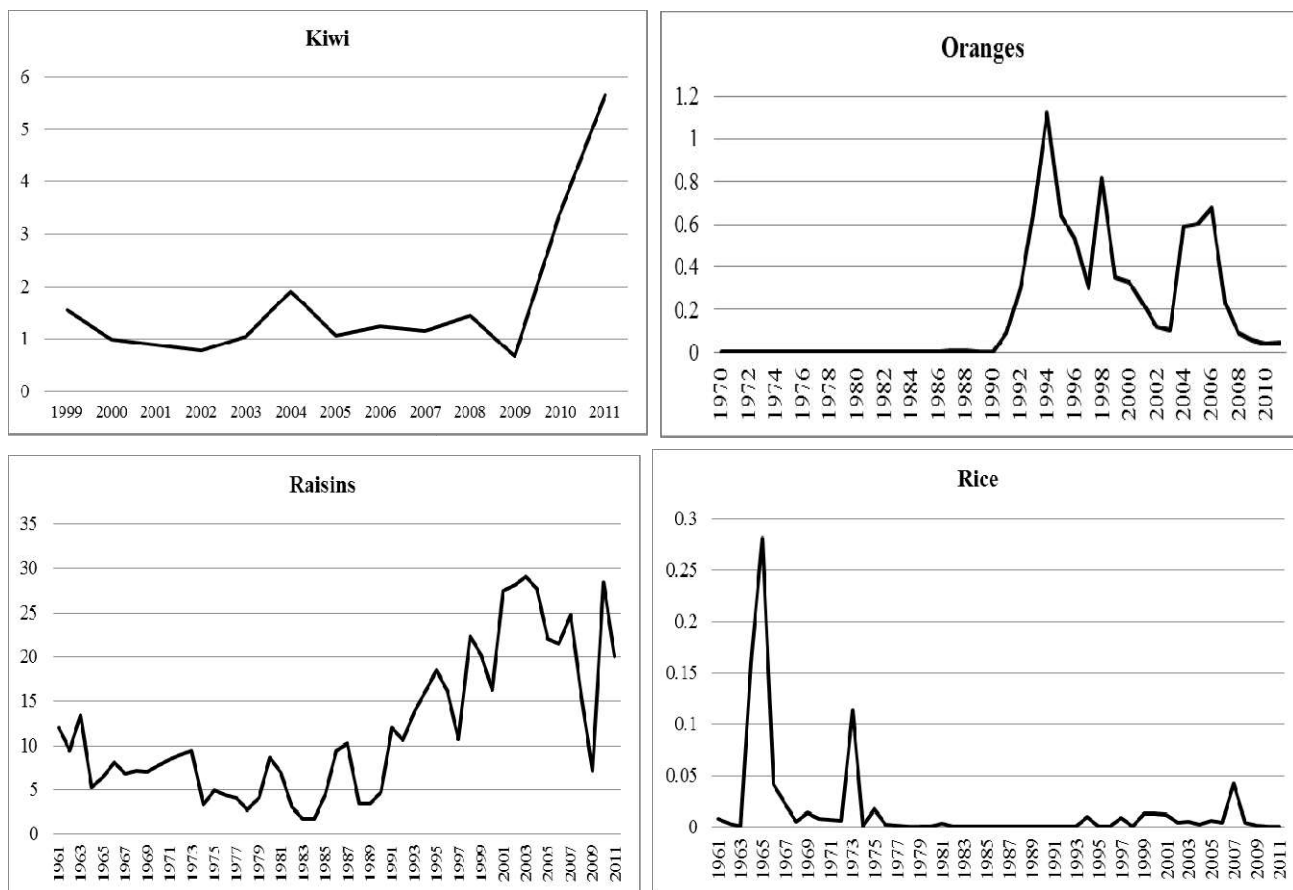
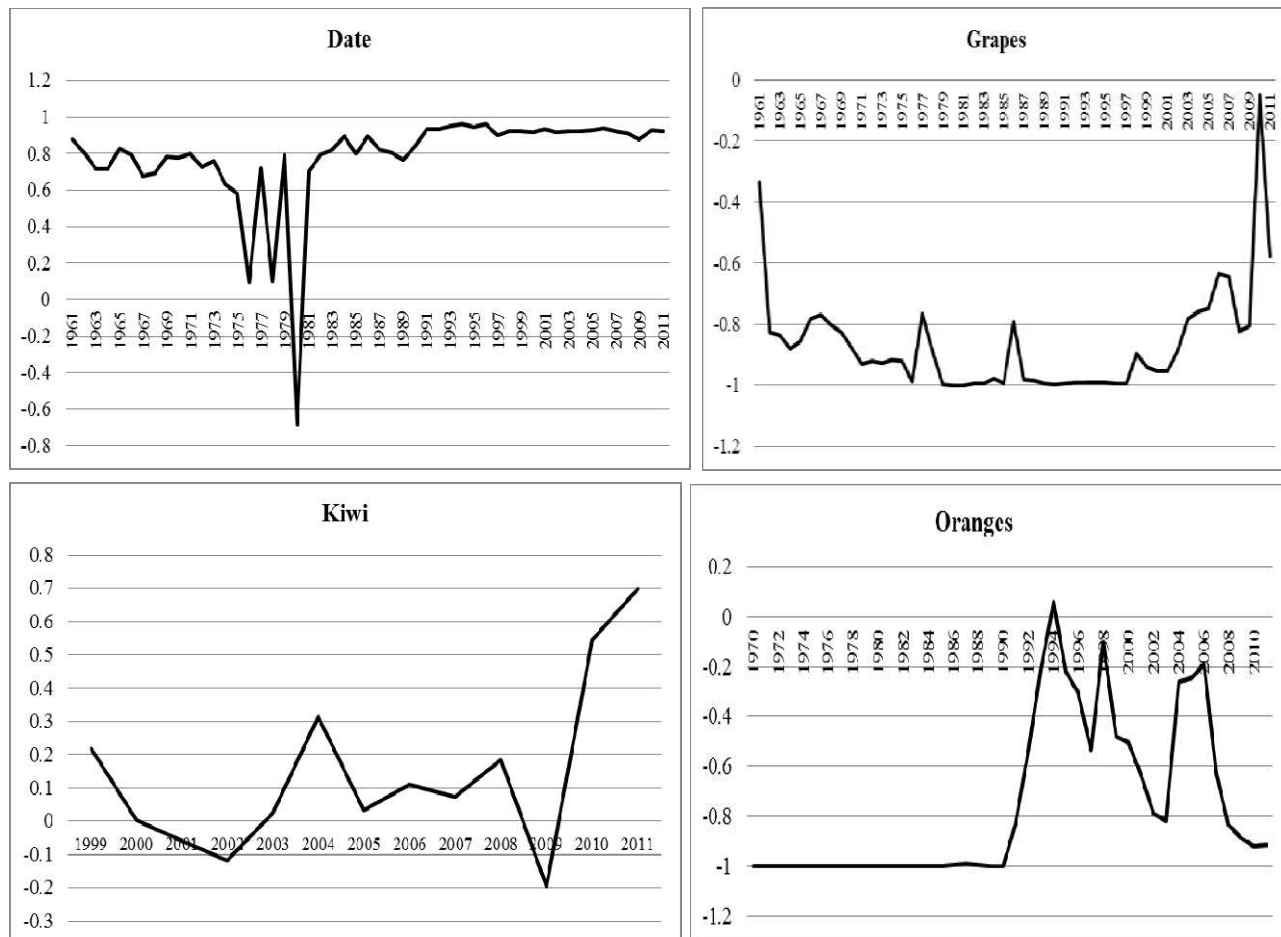


Figure1. RCA index trend for studied products

RSCA index values calculation for various studied products is summarized in the following Figures:



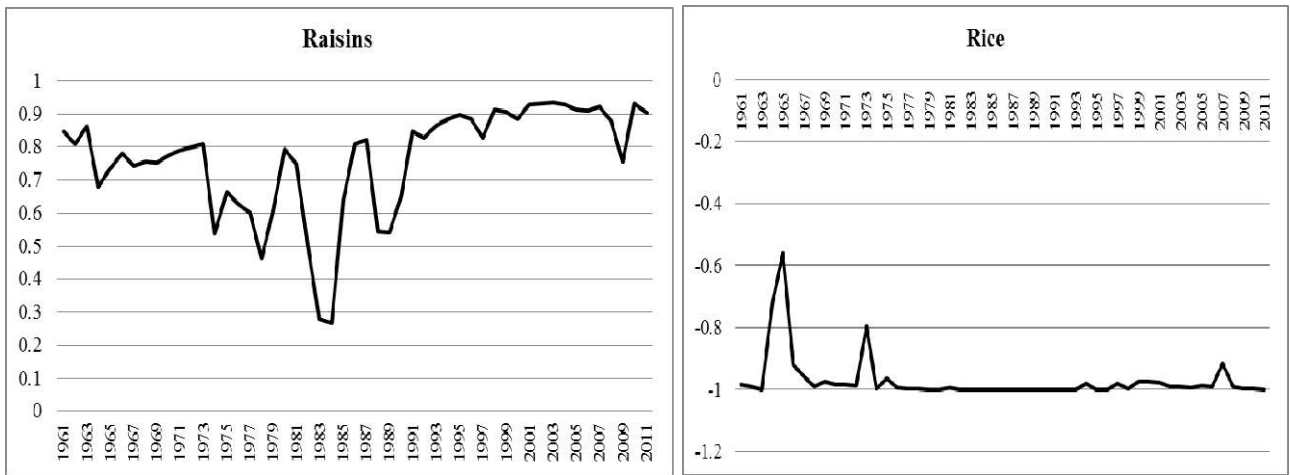


Figure 2. RSCA index trend for studied products

Calculation of  $\chi^2$  for six studied products is summarized in the following Figures:



Figure 3.  $\chi^2$  index trend for studied products

In order to assess the most stable and fluctuating time trends for calculated values of export comparative advantage different indices of studied products, coefficient of variation statistic (CV) was calculated. The statistic calculation presented the following results:

**Table 1. coefficient of variation of export comparative advantage indices' values of Iran selected products**

Product	RCA	RSCA	$\chi^2$
Date	0.75	0.35	1.55
Grapes	1.73	-0.2	0.34
Kiwi	0.82	1.81	2.66
Citrus	1.5	-0.43	0.82
Raisins	0.68	0.21	0.93
Rice	2.89	-0.08	0.63

Accordingly, raisins have the most stable trend and rice has the most fluctuating trend in terms of time series' coefficient of variation of calculated RCA index. For RSCA index, kiwi has assigned the most fluctuating trend and rice has assigned the most stable trend on the basis of calculated time series coefficient of variation of the index. The value of time series changes' coefficient of  $\chi^2$  export comparative advantage index showed that Kiwi has the most fluctuating time trend and Grapes has the minfluctuating trend of this index.

#### Summary and suggestions

In the period 1961- 2011, annual average of Iran date exports is equal to 58774tons. The minimum value of exports in the range was equal to 586tons that is related to 1980 and the maximum value of exports is also equal to 200thousand tons that assigns to 1996. In this period, annual average value of Iran grapes exports is equal to 2,590 tons. The minimum value of exports in the range was equal to zero and the maximum value of exports is also equal to 26790 tons that assigns to 2010. Since 2002, Iran grapes export had significant growth, as the export of the above year has 125 percent growth compared to the previous year. In the period of 1999- 2011, annual average value of Iran kiwi exports is equal to 25577 tons. The minimum value of exports in the range was equal to 8350 that assigns to 2001. Since 2009, Kiwi exports had significant growth, as the value of exports in 2010 compared to the previous year has growth of 189 percent.

In the period of 1961- 2011, annual average value of citrus exports is equal to 7119 tons. The lowest value of exports in the range was equal to zero and the maximum value of exports is also equal to 61425 tons which is related to 1994. Iran citrus exports had considerable fluctuations which show in appropriate planning and the absence of required grounds in the field of the product export. In the period of 1961- 2011, annual average value of Iran raisins exports is equal to 59768 tons. In this period, annual average value of Iran raisins exports is equal to 48255 thousand dollars.

The minimum value of exports in the period was equal to 4186 thousand dollars, which is related to 1964 and the highest exports value of this product is also equal to 318879 thousand dollars that is related to 2010. In the period of 1961- 2011, annual average value of rice exports is equal to 842 tons. Iran rice export had significant fluctuations, which show in appropriate planning and the absence of required grounds in the field of the product export. Regarding the fluctuation of calculated export comparative advantage indices, strategic industrial clusters' development for studied products in the country is an undeniable necessity in order to reinforce value chain, production and exports strategy explanation.

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