

Export Competitiveness of Iran Food Value Chain: A Comparison with BRIC

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Abstract. In this paper the export competitiveness of food value chain (FVC) of Iran has been evaluated in comparison with Brazil, Russia, India and China (BRIC) during 2001- 2009. For this purpose, Revealed Symmetric Comparative Advantage (RSCA) index has been utilized and its trend has been calculated. In general, the results show that Iran had not acceptable export competitiveness in FVC, although it had excellent comparative advantage just only in export of the edible fruits. Similarly China and Russia not only did not have export competitiveness but also experienced descending trend. India, also, had a declining trend; however it had a comparative advantage except in 2009 in the chain. Precise studies revealed that India had a fine performance in some part of the chain like edible fruit, tea, spices and cereals. On the other hand, Brazil showed excellent export competitiveness in FVC because of competitiveness in several parts of the chain.

Keywords: Revealed Symmetric Comparative Advantage (RSCA), Export Competitiveness, Value Chain, Food

1. Introduction

Nowadays, food industries become more important than before because of rapid growth in population especially in developing countries. Economically, the food industry is considered as special in order to high value-added, permanent customer availability and the short period of return on investment. Base on Statistical Center of Iran, this industry includes more than 13 percent of total industrial units over the country, Furthermore over 240 thousand persons are working in this industry which is 17 percent of the entire industries[1].

On other hand in the recent years the export promotion guideline in Iran has evidently preferred to import substitution, thus true recognition of comparative advantages and the export competitiveness over the global market is the basic step of identifying the present status and planning the vision of food the industry. Thus in this paper at the first step the evaluating procedure of export competitiveness is investigated; then food value chain (FVC) which even contains the nonindustrial parts is introduced; finally export competitiveness of different stages of FVC in Iran during 2001-2009 is studied. Moreover, in order to better perception of the performance in this value chain, its status is compared with the BRIC countries which includes Brazil, Russia, India and China and considered as recent developed countries during this period.

2. Export Competitiveness

The concept of competitiveness is widely used in modern economic literature. In spite of the various definitions and perceptions of competitiveness, it can be said that remarking the activity in an international free market and acquiring the market share and profit from is the common interface of all. In order to determination of competitiveness the export has been utilized by Lall [2], Nachum and Jone [3], furthermore Rifin [4] has investigated the export competitiveness of Indonesia for export of palm oil product; hence the

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export can be proposed as an index for evaluating the competitiveness. Therefore most of the competitiveness evaluation indexes and determination of comparative advantages in the international markets have been developed on the basis of information of world trade and the rate of import/export of the different countries. Hereof the revealed comparative advantage (RCA) which was introduced by Balassa in 1965 is reckoned very important inasmuch as RCA have been utilized in several cases among them includes those carried out by Ferto" and Hubbard [5], Valibeig [6], Havrila and Gunawardana [7], Shafaeddin [8], Saboniene [9] and Shafaei et al [10]. In general, the results of the researches reveal that RCA can be used as an appropriate and effective tool for measuring the export competitiveness of industries and countries. It is defined as follows:

$$RCA_a^i = (x_{ij}/x_{it}) / (x_{nj}/x_{nt}) \quad (1)$$

In which x indicated the export value, i the country, j product, t total product (except for j th one) and n the group of the countries (except i th country) ; RCA_a^i is the revealed comparative advantage of i th country in the product a [6]. This index measures the export of the country rather than total export of the same country and the performance in export relating to a group of the other countries; a value more than 1 for RCA indicates the presence of comparative value and a value less than 1 shows no presence of such value;

In spite of advantages RCA, several schorals has criticized it from different perspective. RCA index represent post trade relative prices and a prevailing factor as well as product market distortions. Another problem is that RCA is not symmetric; thus in order to overcome the problem of upward biased RCA index values Laursen [11] adjusted the RCA and identified new index as the RSCA which is follows as:

$$RSCA = \frac{(RCA - 1)}{(RCA + 1)} \quad (2)$$

The value of RSCA is in the interval [-1 ,+1]; values larger (less) than zero means the presence of comparative advantage (disadvantage); Laursen [11] suggested that Stability and competitiveness trends can be tested by means of the following regression equation (country by country):

$$RSCA_{i2} = \alpha + \beta RSCA_{i1} + \epsilon \quad (3)$$

α and β are standard linear regression parameters and ϵ is a residual term. R^2 corresponding to equation 3 is the Coefficient of determination which can be considered as the stability of RSCA trend.

Since on one hand RCA index follows retrospection approach which cannot be assigned it for the present potentials and situation inside a country and on the other hand, with one dimensional point view it emphasizes on the export ratio, thus it may not depict the complex dimensions of competitiveness of a country to product a specific goods as clear as possible;

According to Saboniene [9] the RCA results are useful indicators in measuring export competitiveness, especially when used with other related indices such as the RCSA to overcome some of the limitations of the RCA index. Hence this paper utilizes this index for analyzing the export performance in FVC.

3. Introducing the FVC

FVC is composed of raw material part, processing part and distribution and consumption part. Agriculture, ranching and fishery section can be considered as upstream section of this chain which supplies the mid section of the chain in which production procedure is implemented there or in other word the conversion industry is formed in. However the first section product can be provided to the customer without any processing. Ultimately distributors and customers are considered as the underneath section; a general scheme of such FVC is depicted in figure (1).

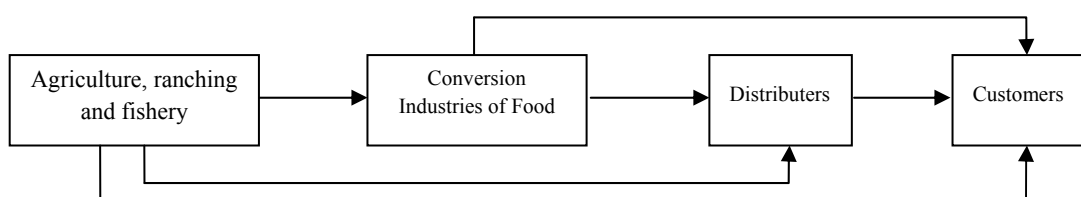


Fig. 1: General Scheme of Food Value Chain (FVC)

This paper deals with the matter beyond the industry part of food production area; in order to investigate and evaluate the export performance of FVC on the basis of RSCA index, this chain is segmented via coding protocol HS nomenclator which is widely used by the international and national organizations such International Trade Center (ITC) and Iran custom. Utilization of this nomenclator is due to better coverage of the all parts of the chain and easy accessibility to international information and statistics pertaining to different parts of the chain. HS two digits product codes which are related to FVC is presented in table (1). It should be noted that each set can be subdivided to detailed sets in the form of four digits, six digits and eight digits.

Table 1: Description of HS two digits product group in FVC

HS code	Description
01	Live animals
02	Meat and edible meat offal
03	Fish, crustaceans, molluscs, aquatic invertebrates nes
04	Dairy products, eggs, honey, edible animal product nes
07	Edible vegetables and certain roots and tubers
08	Edible fruit, nuts, peel of citrus fruit, melons
09	Coffee, tea, mate and spices
10	Cereals
11	Milling products, malt, starches, inulin, wheat gluten
12	Oil seed, oleic fruits, grain, seed, fruit, etc, nes
15	Animal, vegetable fats and oils, cleavage products, etc
16	Meat, fish and seafood preparations nes
17	Sugars and sugar confectionery
18	Cocoa and cocoa preparations
19	Cereal, flour, starch, milk preparations and products
20	Vegetable, fruit, nut, etc food preparations
21	Miscellaneous edible preparations
22	Beverages, spirits and vinegar

4. Evaluating export performance of FVC in Iran²

In order to evaluating the export competitiveness of FVC in Iran, RSCA index has been calculated. Table (2) shows the ranking of subsections of this chain on the basis of RSCA index in Iran. Calculations show that there is no advantage of the total chain in Iran and the RSCA index variation pertaining to the same period alternatively fluctuates and descending trend. More investigations on the subsections in FVC shows that only the code '08 which indicated the fruits, presents the comparative advantage; however this advantage was descending during the nine years of study time duration inasmuch as it reaches from 0.64 in 2001 to 0.27 in 2009. RSCA of code '09 -which indicates coffee, tea, mate and spices-, was greater than zero until 2006 which means the presence of comparative advantage in this group of the products; but this index also has been intensively fallen during 2007, 2008 and 2009. The code of '07 – which determinates edible vegetables and certain roots and tubers-, includes the advantage only in the years of 2001, 2002 and 2006 but the index was not stable and gradually descended over the time; although the code '20- Vegetable, fruit, nut, etc food preparations and in the value chain is placed as the complementary after the codes of '07 and '08- shows the fluctuations. Statistical investigation of these products and calculating the correlation coefficient for this index between the codes of 07 and 20 reveal the correlation of about 59 percent and the codes of 07 and 20 shows the correlation of 80 percent. All of these explains that descending trend of the RSCA for the codes of '07 and '08 is not due to the export promotion and comparative advantage increasing in the downstream of the chain; the main reason should be sought regarding to the inside local markets.

² It is necessary to mention that all data has been used in section 4 and 5 of this paper have been received from International national Trade Center (ITC, 2010), from www.intracen.org/tradstat [12]

Table 2- Export competitiveness of Iran FVC base on RSCA

Rank	HS Code	2001	2002	2003	2004	2005	2006	2007	2008	2009	Mean	β	R ²
	FVC	-0.27	-0.30	-0.24	-0.37	-0.28	-0.16	-0.49	-0.62	-0.65	-0.41	-0.05	0.53
1	'08	0.64	0.64	0.68	0.59	0.64	0.69	0.50	0.36	0.27	0.55	-0.04	0.62
2	'09	0.17	0.17	0.24	0.20	0.05	0.09	-0.26	-0.27	-0.05	-0.01	-0.06	0.62
3	'01	*	-0.88	-0.86	-0.66	0.29	-0.37	0.04	-0.19	-0.31	-0.23	0.10	0.37
4	'07	0.03	0.04	-0.16	-0.25	-0.21	0.12	-0.49	-0.59	-0.49	-0.25	-0.07	0.56
5	'20	-0.28	-0.45	-0.20	-0.42	-0.47	-0.26	-0.34	-0.52	-0.67	-0.42	-0.03	0.35
6	'19	-0.34	-0.59	-0.47	-0.59	-0.30	-0.05	-0.84	-0.84	-0.83	-0.55	-0.05	0.23
7	'17	-0.59	-0.62	-0.53	-0.56	-0.47	-0.33	-0.94	-0.87	-0.96	-0.67	-0.05	0.34
8	'15	-0.36	-0.29	-0.48	-0.62	-0.64	-0.41	-0.92	-0.88	-0.92	-0.70	-0.08	0.74
9	'16	-0.24	-0.51	-0.43	-0.60	-0.77	-0.78	-0.76	-0.92	-0.93	-0.72	-0.08	0.90
10	'03	-0.91	-0.75	-0.65	-0.68	-0.84	-0.78	-0.83	-0.87	-0.88	-0.81	-0.01	0.13
11	'04	-0.63	-0.77	-0.72	-0.89	-0.75	-0.49	-0.93	-0.93	-0.97	-0.81	-0.03	0.28
12	'18	-0.81	-0.90	-0.86	-0.92	-0.83	-0.79	-0.98	-0.80	-0.80	-0.85	0.00	0.03
13	'10	-0.99	-0.99	-0.99	-1.00	-0.99	-0.99	-0.62	-0.79	-0.91	-0.86	0.03	0.32
14	'22	-0.95	-0.93	-0.85	-0.78	-0.72	-0.62	-0.99	-0.97	-0.98	-0.86	-0.01	0.02
15	'21	-0.89	-0.86	-0.81	-0.83	-0.81	-0.69	-0.92	-0.95	-0.95	-0.87	-0.01	0.11
16	'12	-0.73	-0.78	-0.88	-0.90	-0.84	-0.83	-0.83	-0.93	-0.95	-0.88	-0.02	0.56
17	'11	-0.82	-0.97	-0.95	-0.96	-0.87	-0.83	-0.94	-0.81	-0.94	-0.89	0.00	0.01
18	'02	-0.95	-0.93	-0.93	-0.93	-0.94	-0.91	-0.97	-1.00	-0.99	-0.96	-0.01	0.41

5. Export competitiveness of FVC of Iran in comparison with BRIC

In order to better perceive the competitiveness medium in FVC of Iran, the status of this value chain is studied in BRIC. Figure (2) shows the export competitiveness on the basis of RSCA index in the countries over the chain during studied period. It is obvious that Brazil has stable and increasing trend of RSCA index which is more than 0.6 during nine years study. Brazil has 4.30 percent of the chain market share during 2001 to 2009 averagely. In other hand, China has a stable descending RSCA trend which has always been less than zero. All of these show that China has not export competitiveness in this area. Also, Russia is similar to China. Since, Iran's RSCA for FVC has a undulation and never reached to zero level during studied period.

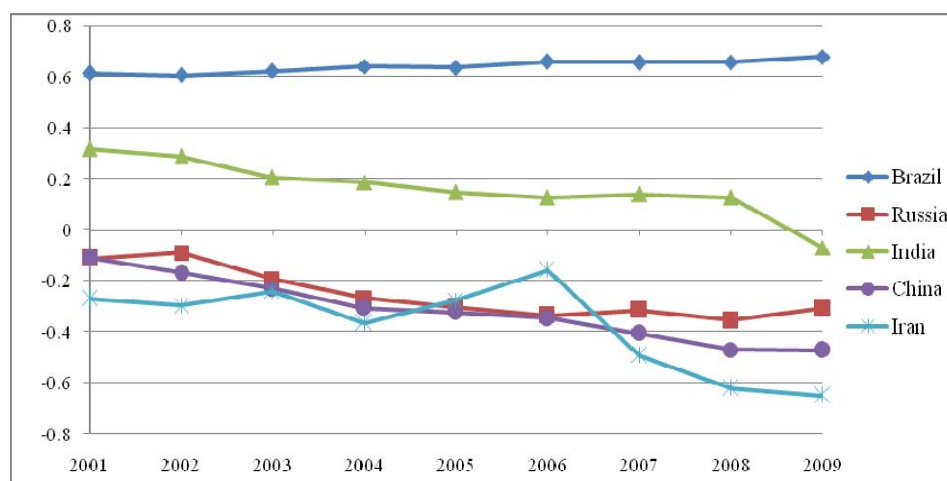


Fig. 2: Trend of RSCA index of FVC in Studied country

Table (3) shows the export competitiveness on the basis of RSCA index in the countries over the chain and its subsidiaries' parts. Brazil has a comparative advantage in 12 product groups of 18 of them. These including meat and edible meat offal (code '02), edible fruit, nuts, peel of citrus fruit, melons (code '08), coffee, tea, mate and spices (code '09), cereal (code 10), oil seed, oleic fruits (code '12), animal, vegetable fats and oils (code '15), meat, fish and seafood (code '16), sugars and sugar confectionery (code '17), '18, food from vegetable, fruit, nut (code 20), edible preparations which does not mentioned in other codes (code '21) and beverages, spirits and vinegar (codes'22).India has advantage in seven product groups including Fish, crustaceans, molluscs, aquatic invertebrates (code '03), edible vegetables and certain roots and tubers (code '07), edible fruit, nuts, peel of citrus fruit, melons (code '08), coffee, tea, mate and spices (code '09), cereal (code 10), oil seed, oleic fruits (code '12) and sugars and sugar confectionery (code '17) most of them

have a descending trend. But Russia has comparative advantage code '09, code 10 and code '03 which all experience descending trend. Similarly, China has export competitiveness code '16, code '20 and partially edible code '07 which all had reclining pace.

Table 3: RSCA index of all parts of FVC in Studied country

HS Code	Brazil			Russia			India			China			Iran		
	Mean RSC A	β	R ²	Mean RSC A	β	R ²	Mean RSC A	β	R ²	Mean RSC A	β	R ²	Mean RSC A	β	R ²
FVC	0.65	0.01	0.91	-0.29	-0.03	0.78	0.13	-0.04	0.83	-0.37	-0.05	0.97	-0.41	-0.05	0.54
'01	-0.01	0.19	0.94	-0.95	0.01	0.61	-0.90	0.01	0.62	-0.48	0.00	0.00	-0.23	0.11	0.50
'02	0.81	0.01	0.66	-0.40	0.01	0.44	-0.02	0.01	0.60	-0.74	-0.05	0.89	-0.96	-0.01	0.41
'03	-0.34	-0.07	0.83	0.01	-0.06	0.86	0.40	-0.05	0.94	-0.02	-0.03	0.79	-0.81	-0.01	0.13
'04	-0.40	0.05	0.69	-0.71	0.00	0.04	-0.44	0.00	0.01	-0.84	-0.01	0.70	-0.81	-0.03	0.28
'07	-0.89	-0.01	0.13	-0.25	-0.01	0.09	0.15	-0.01	0.21	0.07	-0.04	0.92	-0.25	-0.07	0.57
'08	0.08	-0.01	0.51	-0.18	-0.04	0.83	0.22	-0.04	0.89	-0.51	0.00	0.02	0.55	-0.04	0.62
'09	0.84	0.00	0.11	0.38	-0.03	0.77	0.67	-0.02	0.90	-0.26	-0.05	0.92	-0.01	-0.06	0.63
'10	0.20	0.03	0.08	0.24	-0.03	0.44	0.58	-0.02	0.62	-0.54	-0.10	0.75	-0.86	0.03	0.33
'11	-0.53	0.02	0.55	-0.59	-0.08	0.72	-0.26	-0.11	0.80	-0.46	0.00	0.03	-0.89	0.00	0.01
'12	0.88	0.00	0.03	-0.23	-0.03	0.67	0.17	-0.03	0.48	-0.34	-0.07	0.98	-0.88	-0.02	0.57
'15	0.50	-0.03	0.67	-0.52	-0.03	0.60	-0.17	-0.04	0.71	-0.86	-0.01	0.37	-0.70	-0.08	0.74
'16	0.55	0.03	0.89	-0.63	0.03	0.42	-0.33	0.05	0.35	0.34	-0.04	0.83	-0.72	-0.08	0.90
'17	0.89	0.00	0.25	-0.05	-0.04	0.07	0.34	-0.05	0.08	-0.64	0.00	0.00	-0.67	-0.05	0.33
'18	0.11	-0.04	0.71	-0.97	0.00	0.47	-0.93	0.00	0.32	-0.89	0.00	0.02	-0.85	0.00	0.03
'19	-0.43	0.02	0.44	-0.71	0.00	0.06	-0.45	0.00	0.01	-0.54	-0.04	0.97	-0.55	-0.05	0.23
'20	0.61	-0.02	0.52	-0.68	0.01	0.29	-0.39	0.01	0.20	0.14	-0.02	0.80	-0.42	-0.03	0.34
'21	0.30	-0.02	0.35	-0.59	-0.03	0.64	-0.27	-0.04	0.82	-0.49	-0.03	0.83	-0.87	-0.01	0.11
'22	0.18	0.10	0.78	-0.92	0.00	0.28	-0.83	0.01	0.33	-0.73	-0.04	0.90	-0.86	-0.01	0.02

6. Conclusion

This paper evaluates the export competitiveness of FVC of Iran in comparison with BRIC during 2001-2009. To achieve so, Revealed Symmetric Comparative Advantage (RSCA) is utilized and the FVC is categorized on the coding base of HS into 18 two digits product group.

Iran performs a weak competitiveness on the basis of RSCA over the total FVC inasmuch as the average of the index is -0.41 during the study period; the export competitiveness of Iran has been achieved to -0.16 in 2006 in its best record which is still too different from the minimum value level of zero; Iran performs the acceptable export competitiveness only in edible fruits; however the export of tea, mate and spices performs the acceptable competitiveness until 2006; the other areas Iran shows the weak performance.

Investigations on the other countries FVC show that Brazil, the owner of 4.30 percent of world FVC market share, performs an excellent competitiveness on the basis of RSCA. This country has a sustainable increasing trend of RSCA index in FVC from 2001 to 2009 and has an export competitiveness in 12 product groups of FVC. Brazil dedicates a considerable proportion to itself in meat and edible meat offal (code '02), coffee, tea, mate and spices (code '09), oil seed, oleic fruits (code '12), sugars and sugar confectionery (code '17), and food from vegetable, fruit, nut (code 20). India shows averagely competitiveness during study time except 2009; however this country has no identical performance in the entire subsets of the chain. In other words, India has fine performance only in seven product groups including fish, crustaceans, molluscs, aquatic invertebrates (code '03), edible vegetables and certain roots and tubers (code '07), edible fruit, nuts, peel of citrus fruit, melons (code '08), coffee, tea, mate and spices (code '09), cereal (code 10), oil seed, oleic fruits (code '12) and sugars and sugar confectionery (code '17) most of them have a descending trend. But Russia has comparative advantage in code '09, code '10 and code '03 which all experience reclining pace. China similarly has only export competitiveness in meat, fish and seafood (code '16), code '20 and partially code '07 which all had descending trend.

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