

Full Length Research Paper

The economic study of production and exportation of selected products from Iran

Mahmoud Bakhshinejad^{1*} and Esmail Hosseini²

¹Department of Economics, Islamic Azad University, Shahrekord Branch, Iran.

²Faculty of Humanities, Islamic Azad University-Shahrekord Branch, Iran.

Accepted 12 November, 2013

This paper presented an examination of Balassa's 'revealed comparative advantage' (RCA). The results of the research showed that using the RCA should always be attuned in such a way that it becomes symmetric. This paper consisted of three major sections: The theoretical section, the analytical tool and the case studies of comparative advantage' (CA). First, we evaluated the theory and various empirical measures. Then, the analytical tool was applied for the analysis of exported products. The results indicated that Iran had not had CA in the export of walnuts, almonds, hazelnuts, apples and oranges. To increase competitiveness, we suggested several policy recommendations such as increasing agricultural productivity, promoting the development of indigenous technological capabilities, and reducing the cost of doing business. The conclusion was based on a theoretical discussion of the properties of the measure and on convincing empirical evidences according to the Balassa index. The index for 2007 illustrated that Iran had not possessed a CA in the export of walnuts, almonds, hazelnuts, apples and oranges and consequently had reduced its market share in these products.

Key words: Revealed comparative advantage, Iran's agriculture sector, almonds, apples, hazelnuts, walnuts, oranges.

INTRODUCTION

Iran has undertaken a series of economic reforms towards opening up the economy, and the role of agriculture is remarkably significant in this respect since it contributes around 11% to the gross national product and employs one third of labor force. To increase the contribution of agriculture to the GNP in recent years, a great deal of investment has been channeled toward producing items such as almonds, walnuts, apples, oranges and hazelnuts.

Having grasped the issues mentioned above, it seemed necessary to pay due attention to the survey of CA related to these products. This necessity came from the common observation that CA usually were not stable and

tend to change with time. Therefore, it appeared to be necessary to estimate the CA of various export products on a regular basis. In the new epoch of "diversified agriculture", a frequently-asked question was, "where was the true place of the CA of Iran's agricultural products?" That is, which agricultural product of Iran was relatively more competitive and had a better chance to thrive in the long run, given the national and world-wide competition? To answer this question, one needed to first evaluate the competition faced by each product to determine their relevant competitiveness. Then, Iran's CA in each product could be assessed by comparing the products' competitiveness to the other products.

*Corresponding author. E-mail: mahmoud_bakhshi@yahoo.com, Tel: +983813344417, +989133825431.

Iran appeared to have high CA in products which had relatively high competitiveness.

This paper aimed to survey the CA of Iranian export products cited above and their competitiveness in the world market. This investigation might be regarded as the first one that tried to appraise the competitiveness of the afore-cited products in the global market. More specifically, this paper examined the structure of CA enjoyed by Iran in the global market both on an individual basis and in a comparative framework. Following this, an analysis of the CA is intensity factors for the economy to which it is applied. The pattern of CA is also examined for inter-temporal variation over the period 2002 to 2007. To undertake the study of CA, we made use of the Balassa index of revealed comparative advantages (Balassa, 1965).

Using the law of CA has been regarded a proper way to find answers to the question "Who exports what and why?" Analysis of CA is certainly not a novel idea. Although a plethora of studies have occurred in the past 50 years, few have specifically addressed agricultural trade (Winter, 1995). Some suggested that the conspicuous absence of CA analysis from agriculture may be in part due to the magnitude of distortion brought by government policies (Heley, 1985). In the 1950s, Wassily Leontief argued that "...fluctuation in yield here and abroad, not to speak of government intervention, affect foreign trade in from products to such an extent that the amounts of agriculture commodities exported and imported in one single year can be expected to reflect long-run comparative costs much less than is the case for any other type of good." (Leontief, 1974). Clearly, the strength of this argument has been weakened by recent developments in agricultural trade liberalization. As agricultural producers become more expected to market forces, and as dependence on foreign markets increases, the relevance of CA seems to become increasingly apparent.

This study used the "revealed comparative advantage" (RCA) approach to assess Iran's CA in the selected agricultural products. This assessment might provide systematic information about the direct or indirect competition facing Iran's agricultural products. This could be useful for decision-making regarding sustainable agricultural development policies in Iran.

THEORY AND METHODOLOGY

The idea of CA might be attributed to the work of John Stuart Mill, Adam Smith and David Ricardo. It is largely derived from the proposition on opportunity cost and Labor specialization. Smith and Mill first advanced the concept of absolute advantage claiming that a nation will export an item when it is the lowest cost producer of that item. Ricardo refined the idea of CA by recognizing that a nation tends to allocate its resources to their most productive use. A nation may, therefore, import a good even when it is the lowest cost producer of that good (Leontief, 1956). In the meantime, Eli Heckscher and Bertil Ohlin revolutionized trade theory by emphasizing international differences in resource (or factor)

endowments. "Factor abundance theory", or the Heckscher–Ohlin model, predicts that a country will export commodities that are relatively intensive in the factor with which the country is relatively well endowed. Thus, a land-abundant country will export land intensive goods, while a capital-abundant country will export capital intensive goods. The purview of the Heckscher–Ohlin model has been consequently extended through the work of Wassily Leontief, Paul Samuelson, Jaroslav Vanek, and others (Memedovic, 1994).

Empirical tests of CA have often used cost or price information to measure efficiency in production, as well as availability and allocation of scarce resources. Transportation models and linear programming techniques, for example, have determined CA through mark proximity or cost minimizing solution, subjects to resource availability and prices. These forms of analysis, however, have frequently been constrained by a lack of reliable and internationally comparable data. Even when survey methods were used to overcome data scarcity, the estimation of exchange rates, purchasing power and valuation of local land, labor and capital could be problematic. Further complications also arise when taking into account these so-called "milieu factors" such as government policy, history and other likely sources of CA that did not easily lend themselves to quantification.

Ideally, measures of CA should reflect regional or cross-country differences in a hypothetical pre-trade environment known as autarky. Autarky is the condition where equilibrium prices are unaffected by influences external to an economy (Hook, 1992). In reality, since all countries engage in some level of international trade, "true" CA in autarky cannot be directly observed. Bela-Balassa (1965) introduced the notion of "Revealed Comparative Advantage" (RCA) as a way to approximate CA in Autarky. According to Balassa, "the concept of RCA pertains to the relative trade performances of individual countries in particular commodities. As the commodity pattern of trade reflects inter-country differences in relative costs as well as in non-price factors, this is assumed to reveal the CA of traditional countries" (Balassa, 1977). If trade performance is determined CA, then direct observations of trade performance should be "revealed" CA. Barring production or export subsidies, the greater the CA in the production of that commodity. The plausibility of this condition has almost certainly been strengthened by recent trade liberalization. CA reflects relative competitiveness. Competitiveness can be measured by market shares (Mahanta, 2005). The larger Iran's market-share of a product gets, the more competitive it will become relative to other suppliers in the market. For example, if Iran's market share of product A is greater than its market share of product B, then it is relatively more competitive in product A than in product B. In other words. It has stronger CA in product A than in product B. Based on the RCA approach, we collected the data from FAOSTAT and measured Iran's CA in agricultural products by the following index:

$$RCA_j = (S_j / s)^1 \quad (1)$$

The RCA index thus defined compares Iran's market share of each agricultural product (S_j) to its average market share for all agricultural products under comparison. Iran has above-average CA in products whose RCA scores are greater than 1. Iran has stronger CA in products with higher RCA scores.

Competitiveness and CA are unlikely to be constant over time because of the change in consumers' preference, production cost, transportation costs, regulations, etc. Variation of competitiveness can be measured by the changes in market shares. An increase (or decrease) in the market shares indicates the competitiveness gain (or loss). However, it is usually not appropriate to directly use the change of RCA scores for measuring the variation of CA. The

¹ - S_j denotes each agricultural product.

Table 1. Comparative advantage of Iran's walnuts, almonds, hazelnuts, apples and oranges.

Product	2007	2007 vs, 2002
	RCA	RCAV
Walnuts	0.18	-3.72
Almonds	0.0	-5.63
Hazelnuts	0.005	-1.89
Apples	0.018	5.01
Oranges	0.03	6.04

The calculated RCA index was based on wholesale value of export from FAOSTAT. A measure of variation of comparative advantage computed based on the RCAV equation.

following formula provides a more precise measure of CA:

$$RCAV_i = C_{i,t+1} (RCA_{j,t+1} - \beta RCA_{j,t}) \times 100, \quad (2)$$

$$\beta = (1 + g)(1 + \sum c_{j,t} g_j)^{-1}$$

The sign and value of RCAV scores indicate the direction and magnitude of CA variation over time. For example, an Iran's agriculture product RCAV score of (+)5 indicates that Iran has gained comparative in this product, and if without the change in CA, sales of this Iran agriculture product would have been 5% lower than its actual level. The implication for negative RCAV scores would be the opposite. Note that the sum of RCAV scores for all the products is equal to Zero. This captures the shift of CA among products. When Iran becomes relatively more competitive in some products, it automatically becomes relatively less competitive in other products.

The method of analysis outlined above has been applied in case studies of the agriculture and manufacturing in Pakistan, Kenya, India, Mali, etc. In this section we provided only a short summary of the conclusions in one study in Kenya. In the study of Kenya, recently collected data were used together with data from the mid-2000s in many cases from the same firms. This paved the way to examine how Kenya's policy reforms of the late 2000 and early 2009 had affected the country's agricultural sector.

Interestingly, the sector seemed somehow to have gained in comparative advantage but lost in terms of competitiveness. This unexpected result was explained by the fact that several major distortions acted as obstacles to competitiveness, in particular the very substantial interest-rate distortion caused to a large extent by government policy.

RESULTS

The data were analyzed in 2007 (the last year for which complete trade data were available) for both Iran and the rest of the world. In order to acquire better appreciation of trade dynamics, the data of the year 2002 were also

examined. RCA was evaluated for walnuts, which will be discussed in its own place.

The index for 2007 showed that Iran does not have a comparative advantage in these products. Table 1 shows the RCA scores of the agriculture in 2007 and their RCAV scores between 2002 and 2007. These results could be suitable to two main forces namely declining competitiveness and structural change. We used market shares to measure Iran's competitiveness in five selected agriculture products from 2002 to 2007. Iran reduced its market share in these products (Table 2). We used the RCAV index to measure variation of Iran's comparative advantage in the five products between 2002 and 2007. During this period, Iran decreased its comparative advantage in these agricultural products.

DISCUSSION

This paper contended that the analysis of comparative advantage (CA) for agricultural commodities not only has become relevant but also might in fact be an important tool for understanding the future of the world agriculture. Although autarky precludes direct observation of CA, measures of RCA can provide useful approximation of CA.

While Balassa's export-based RCA index overlooked some aspects of domestic consumption and value-added processing, it was nevertheless a meaningful gauge for measuring the relative strength or weakness of agricultural exports. In the case of walnuts, almonds, hazelnuts, apples and oranges, the measurement of RCA showed that CA was a dynamic condition, not a static one. The dynamics of CA became increasingly apparent as agricultural markets became less insulated by government trade and support policies. The fall in the RCA index across a number of sectors presumably reflected the fact that many indigenous and traditionally labor-intensive sectors have found it increasingly difficult to compete. This was caused by quite high rates of wage inflation in Iran over the last decade and greater competition from international markets. As far as

²- C_j denotes the ratio of Iran's supply of each agricultural product in its total supply of all agricultural products; t and t+1 are time subscripts. g_j and g denote, respectively, the growth rate of each individual agricultural product and the average rate for all agricultural products. i denotes the country.

Table 2. Iran's Competitiveness in walnuts, Almonds, Hazelnuts, Apples and Oranges.

Product	Walnuts		Apples		Almonds		Oranges		Hazelnuts	
	Supply	Market share	Supply	Market share	Supply	Market share	Supply	Market share	Supply	Market share
	1000\$	%	1000\$	%	1000\$	%	1000\$	%	1000\$	%
Africa	0	0	0	0	0	0	0	0	0	0
America	19	0	23	0	0	0	0	0	0	0
Asia	2198	0.002	103656	0.005	111732	0.03	0	0	0	0
Europe	7.5	0	340	0	1628	0	0	0	0	0
Oceania	0	0	0	0	0.1	0	0	0	0	0

Wholesale value of export from FAOSTAT.

structural change was concerned, the fall in RCA reflected the fact that CA was dynamic rather than static.

Conclusion

Due to data constraints, the comparative advantage assessment in this article compares the wholesale value of Iran's agricultural supplies to the market with those of other countries irrespective of the final destination of these commodities. A more refined assessment in the future should compare the agricultural production of Iran and that of other countries.

REFERENCES

- Balassa B (1965). Trade Liberalization and Revealed Comparative Advantage. *Manchester School* 33:99-123.
- Balassa B (1977). A Stage Approach to Comparative Advantage. *World Bank Staff Working Paper*, P. 256.
- Heley SL (1985). The Theory of Agricultural Comparative Advantage. Unpub, Ph. D. diss, purdue University, West Lafayette.
- Hook JP (1992). The Comparative Advantage of Agricultural Economics. *Am. J. Agric. Econ.* pp. 1059-1065.

Leontief W (1974). Domestic production and Foreign Trade: The American Capital position Re-Examined. *Economic International*, P. 7.

Leontief W (1956). Factor Proportions and the Structure of American Trade: Further Theoretical and Empirical Analysis. *Review of Economic Statistics*, P. 38.

Memedovic O (1994). On the Theory and Measurement of Comparative Advantage: An Empirical Analysis of Yugoslav Trade in Manufactures with the OECD Countries. pp. 1970-1986. Amsterdam: Thesis Publishers.

Mahanta AK (2005). The Comparative Advantage of Agricultural Economics. *Am. J. Agric. Econ.* P. 156-165.

United Nations Food and Agriculture Organization (1999). FAOSTAT database .Online Available <http://www.fao.org> January 15, 1999.

Winter NA (1995). Measuring the comparative advantage of agricultural activities: domestic resource costs and the social cost-benefit ratio. *Am. J. Agric. Econ.* pp. 243-250.