Regional Comparative Advantage and Competitiveness of Malaysian Palm Oil Products

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ABSTRACT

This article examines the competitiveness of Malaysian palm oil products compared to other industrial plantation products (cocoa products, coconut, tea and pepper) in selected ASEAN countries (Indonesia, Philippines, Singapore and Thailand) and in China by using the revealed comparative advantage (RCA) and the revealed symmetric comparative advantage (RSCA) indices. The export data for seven groups of products based on the standard commodity categories as defined in the harmonized tariff system (HTS) at the four-digit level were employed. The results indicate that Malaysia has a comparative advantage in six products: palm oil (HS 1511), coconut (copra) and palm kernel oil (HS 1513), cocoa butter (HS 1804), cocoa powder (HS 1805), cocoa paste (HS 1803) and pepper (HS 0904), but a comparative disadvantage in tea (HS 0902). Based on the competitiveness position, Indonesia ranked first while Malaysia ranked second in oil palm products.

INTRODUCTION

The Malaysian economy was mainly dependent on tin and rubber during the early years after the country gained independence in 1957. These two primary commodities accounted for more than 50% of the GDP during that time (Simeh and Ahmad, 2001). The policy then was to nurture economic growth through the sustenance and development of these two export commodities. However, as early as in the 1960s, the government recognized the need to expand the narrow-base economy and diversify into other economic activities to generate growth. The diversification strategy involved initiatives to develop manufacturing through the establishment of industrial estates, and also to diversify agricultural output through industrial plantation products, namely palm oil, coffee, cocoa and tea. Hence, the debut of the Malaysian industrial plantation products changed not only the landscape of Malaysian agriculture and the Malaysian economy but also the lives of millions of her people. In addition, the role of the industrial plantation product exports is very important in Malaysian agricultural development.

Currently, Malaysia is one of the most important producers and exporters of palm oil and processed

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cocoa in the world. According to formal statistics, her oil palm area has grown significantly during the past two decades, from an area of below 0.5 million hectares in 1974 to 7.5 million hectares in 2006. Malaysia is now the largest exporter of palm oil in the world. In 2008, Malaysian oil palm products totalled 21.75 million tonnes and were valued at RM 65 billion (MPOB, 2009). This was approximately 60% of the total world palm oil production in 2008, and the second largest source of edible oils after soyabean oil (FAO, 2009). Most of the palm oil exports from Malaysia are shipped to China, the European Union, Pakistan, the United States of America and India. They are mostly processed into cooking oil, margarine, specialty fats and oleochemicals. Currently, Southeast Asia is the dominant region of palm oil production with Malaysia as the leading producer and exporter of palm oil products.

In the cocoa products sector, only about 20 000 ha were under cocoa with a total production of about 28 000 t in 2008. Nevertheless, the Malaysian cocoa grindings and downstream industries have expanded dramatically. Malaysia, with total grindings of 324 000 t in 2008, occupies the fifth position among the largest cocoa grinders in the world, and is the largest among the ASEAN countries (FAO, 2009).

The remainder of the article is organized into four sections. The data and methodology are described in section two. The third section explains the data source and its standard schedule while the fourth reports and discusses the results. Lastly, a conclusion is presented.

METHODOLOGY

The concept of revealed comparative advantage (RCA) is grounded on conventional trade theory, and it is a useful indicator of competitiveness (Bojnec and Ferto, 2006; 2009). RCA is based on observed trade patterns; it measures a country's export of a commodity in relation to its total exports and to the corresponding export performance of a set of countries. The original RCA index was formulated by Balassa (1965). RCA can be written as:

$$RCA = \left[\frac{X_i/X_{iw}}{X_m/X_{mw}} \right]$$

where X_i is the value of exports of food i from the country in question,

X_{iw} is the value of exports of food i from all countries in the world,

X_m is the value of exports of all food from the country in question, and

X_{mw} is the value of exports of all food from all countries in the world.

A ratio of greater than one is taken as an indication of revealed comparative advantage, which means a comparative advantage is found. Furthermore, if the RCA index is above one for a particular commodity, the country is said to be specialized in producing that commodity, and *vice versa* when RCA is below one (*e.g.* Donges and Riedel, 1977; Bowen, 1983; Vollrath, 1989; 1991).

A problem with the Balassa's index is that its value is asymmetric; it varies from one to infinity for products in which a country has a revealed comparative advantage, but only from zero to one for commodities with a comparative disadvantage. Dalum *et al.* (1998) proposed the revealed symmetric comparative advantage (RSCA) index to alleviate the skewedness problem as follows:

$$RSCA = \frac{RCA - 1}{RCA + 1}$$

RSCA ranges from minus one to plus one (-1 < RSCA < 1) and avoids the problem of zero values. Positive indices show a comparative advantage while negative indices reflect a comparative disadvantage. The study on OECD export specialization patterns by Laursen (2000) as well as the study on the comparative advantage of Iran's chicken meat exports in the West Asia market by Mirzaei *et al.* (2006) employed similar analyses. In this study, the researchers focused on selected industrial plantation products such as palm oil products, cocoa products, coconut, coffee, tea and pepper in selected ASEAN export markets (namely, Indonesia, Philippines, Singapore and Thailand) and in China. The selected countries were chosen based on the characteristics of their export products. The objective of the study was to evaluate the revealed comparative advantage and competitiveness of Malaysian industrial plantation products *vis-à-vis* selected ASEAN countries as well as China in the years 2004 and 2006.

The Data

The study utilized export data sets in order to compute RCA and RSCA, corresponding to the standard commodity categories, as defined in the harmonized tariff system (HTS) at the four-digit level for generalized categories, in China, Malaysia, Indonesia, Philippines, Singapore and Thailand. Hence, we used the export data of seven product groups that included tea, pepper, palm oil, coconut and cocoa taken from the trade data obtained from the OECD's ITCS (International Trade by Commodities Statistics) database for the years 2004 and 2006. The classified groups of plantation products are given in *Table 1*.

RESULTS AND DISCUSSION

The trends of Malaysian imports and exports of palm oil products

TABLE 1. INDUSTRIAL PLANTATION COMMODITIES AT HARMONIZED TARIFF SYSTEM (HTS) FOUR-DIGIT LEVEL

| HS code	Commodity
HS 0902	Tea
HS 0904	Pepper of the genus *Piper*; dried, crushed or ground fruit of genus *Capsicum* or pimenta.
HS 1511	Palm oil and its fractions, whether or not refined but not chemically modified.
HS 1513	Coconut (copra), palm kernel or babassu oil and its fractions, w/n refined but not chemically modified.
HS 1803	Cocoa paste, whether or not defatted.
HS 1804	Cocoa butter, fat and oil.
HS 1805	Cocoa powder, not containing added sugar or other sweetening matter.
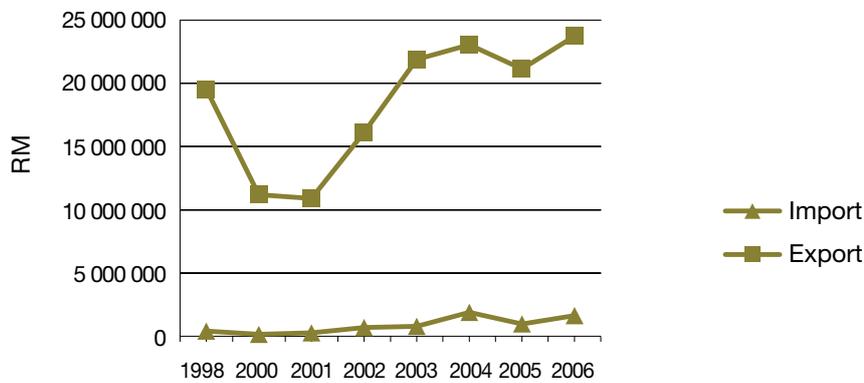
Figure 1. Trends in Malaysian imports and exports of palm oil, 1998-2006.
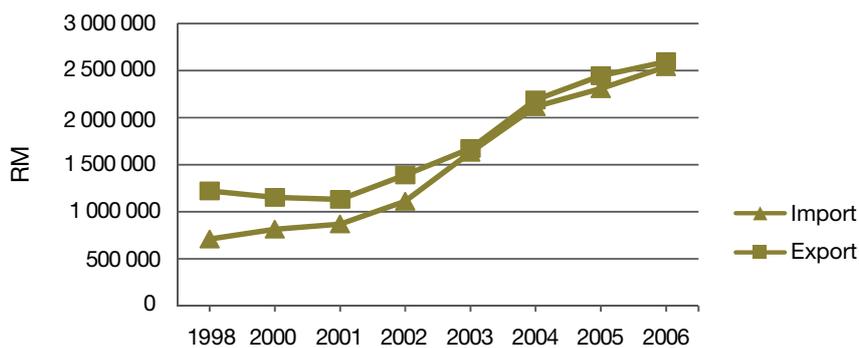

Figure 2. Trends in the imports and exports of the remaining industrial plantation (including cocoa products, coconut, tea and pepper) in Malaysia, 1998-2006.

(including palm oil and palm kernel oil) from 1998 to 2006 are shown in *Figure 1* while the trends of Malaysian imports and exports of the remaining industrial plantation commodities from 1998 to 2006 are shown in *Figure 2*. Despite the fluctuation in the trend, there was still a gradual increasing trend in the amount of exports and net exports of palm oil in the country. On the other hand, for imports 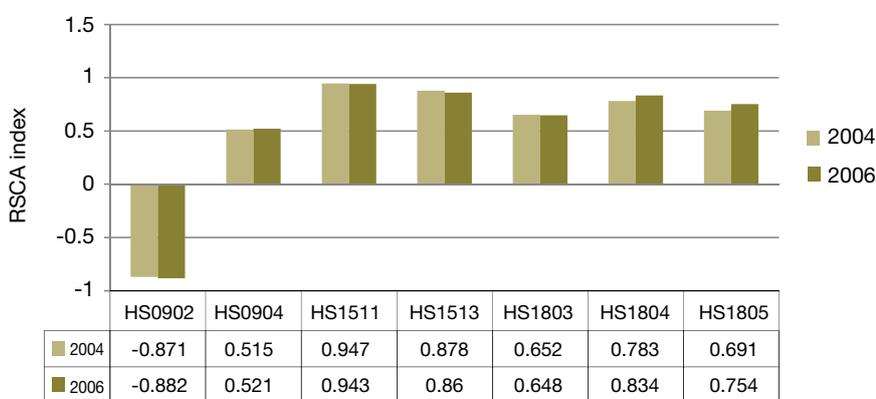and exports of the remaining industrial plantation products (including cocoa products, coconut, tea and pepper), there were steadily increasing trends from 1998 to 2006. Along with this, in spite of the fluctuation in trade balance (net exports) for the other industrial plantation products, the trade balance was positive and continually increasing (*Figure 2*).

As mentioned, the data for this study cover commodities in the HS four-digit group that includes commodities in the sub-groups of tea, pepper, palm oil, coconut and cocoa. In this study, the researchers computed the RCA and RSCA for China and selected ASEAN countries, namely, Malaysia, Indonesia, Philippines, Singapore and Thailand, and the results are summarized in *Tables 2, 3, and 4*. *Tables 1* and *2* show respectively, the HS codes and the RCA indices which reflect the competitiveness ranking for Malaysia and regional countries in 2004 and 2006. Values greater (or less) than one indicate a comparative advantage (or a comparative disadvantage) for a particular product in each country (*Table 2*).

The results of the study indicate that Malaysia had a competitive advantage in six commodities, ranked in descending order: palm oil (HS 1511), coconut (copra) and palm kernel oil (HS 1513), cocoa butter (HS 1804), cocoa powder (HS 1805), cocoa paste (HS 1803), and pepper (HS 0904) in 2004 and 2006. Furthermore, the RSCA indicator confirmed the results obtained from RCA in the selected industrial plantation product exports among selected ASEAN countries and China (*Figure 3*). Malaysia had a competitive disadvantage in tea (HS 0902). On the whole, the results show that the product that possessed the most comparative advantage was palm oil which recorded the largest positive value for RCA and RSCA. Palm oil was followed by coconut

TABLE 2. REVEALED COMPARATIVE ADVANTAGE (RCA) INDICES FOR ASEAN COUNTRIES AND CHINA, 2004 AND 2006

HS code	China		Indonesia		Malaysia		Philippines		Singapore		Thailand	
	2004	2006	2004	2006	2004	2006	2004	2006	2004	2006	2004	2006
HS 0902	2.725	2.3175	6.067	5.3441	0.069	0.0625	0.009	0.0004	0.071	0.0744	0.072	0.0813
HS 0904	2.750	1.8651	8.112	8.4124	3.125	3.1739	0.010	0.0123	1.883	1.6517	0.351	0.2806
HS 1511	0.0004	0.0005	46.888	48.468	36.931	33.799	0.0002	0.0016	0.665	0.4405	0.767	0.6996
HS 1513	0.002	0.0009	46.983	47.749	15.406	13.259	63.075	67.939	0.298	0.2018	1.604	1.4138
HS 1803	0.016	0.0013	1.832	2.0142	4.741	4.6818	0.027	0.1719	2.031	1.6555	0.168	0.0869
HS 1804	0.202	0.3077	7.527	8.6234	8.209	11.039	0.511	0.1935	1.407	1.3831	1.062	1.1094
HS 1805	0.051	0.0769	4.258	3.9669	5.471	7.1315	0.093	0.0798	1.582	2.0447	0.885	0.9066

	HS0902	HS0904	HS1511	HS1513	HS1803	HS1804	HS1805
2004	-0.871	0.515	0.947	0.878	0.652	0.783	0.691
2006	-0.882	0.521	0.943	0.86	0.648	0.834	0.754

Note: * HS 0902 = tea, HS 0904 = pepper, HS 1511= palm oil, HS 1513 = coconut (copra) and palm kernel oil, HS 1803 = cocoa paste, HS 1804 = cocoa butter, HS 1805 = cocoa powder.

Figure 3. Revealed symmetric comparative advantage (RSCA) indices for Malaysian industrial plantation products, 2004 and 2006.*

(copra) and palm kernel oil, cocoa butter, cocoa powder, cocoa paste, and pepper (*Table 3*), ranked in descending order.

In addition, based on the RCA indices of ASEAN and China, Malaysia ranked first in cocoa-based products (including cocoa paste, cocoa butter and cocoa powder) but ranked second in two other commodities, *i.e.* palm oil and pepper. Indonesia ranked first in tea, pepper and palm oil, while Philippine ranked first in coconut or copra. China, Singapore and Thailand did not have comparative advantage and competitiveness in these commodities (*Table 4*).

TABLE 3. REVEALED COMPARATIVE ADVANTAGE (RCA) AND REVEALED SYMMETRIC COMPARATIVE ADVANTAGE (RSCA) INDICES AND THE RANKING OF MALAYSIAN INDUSTRIAL PLANTATION PRODUCT EXPORTS, 2004 AND 2006

HS code	RCA				RSCA			
	2004		2006		2004		2006	
	Amount	Rank	Amount	Rank	Amount	Rank	Amount	Rank
HS 0902	0.069	7	0.06	7	-0.87	7	-0.88	7
HS 0904	3.125	6	3.17	6	0.52	6	0.52	6
HS 1511	36.93	1	33.80	1	0.95	1	0.94	1
HS 1513	15.41	2	13.26	2	0.88	2	0.86	2
HS 1803	4.74	5	4.68	5	0.65	5	0.65	5
HS 1804	8.21	3	11.04	3	0.78	3	0.83	3
HS 1805	5.47	4	7.13	4	0.69	4	0.75	4

TABLE 4. COMPETITIVENESS RANKING OF MALAYSIAN INDUSTRIAL PLANTATION EXPORTS IN 2004 AND 2006

HS code	China		Indonesia		Malaysia		Philippines		Singapore		Thailand	
	2004	2006	2004	2006	2004	2006	2004	2006	2004	2006	2004	2006
HS 0902	2	2	1	1	5	5	6	6	4	4	3	3
HS 0904	3	3	1	1	2	2	6	6	4	4	5	5
HS 1511	5	6	1	1	2	2	6	5	4	4	3	3
HS 1513	6	6	2	2	3	3	1	1	5	5	4	4
HS 1803	6	6	3	2	1	1	5	4	2	3	4	5
HS 1804	6	5	2	2	1	1	5	6	3	3	4	4
HS 1805	6	6	2	2	1	1	5	5	3	3	4	4

CONCLUSION

The study examined the comparative advantage and competitiveness of Malaysian industrial plantation products such as tea, pepper, palm oil, coconut (copra), palm kernel, cocoa paste, coconut butter, and cocoa powder, in selected ASEAN and China export markets. The study employed two common revealed comparative advantage indicators, namely, RCA and RSCA. The export data of these products were based on the standard commodity categories as defined in the HTS at the four-digit level. The results of this study indicate that in comparison both indicators provided the same ranking (*Table 3*) in the competitiveness and the comparative advantage for both study years. However, the results depict different sets of products in the comparative advantage group and competitive advantage group.

First, based on the RCA indicator, Malaysia had comparative advantage in six commodities, which were ranked as palm oil (HS 1511), coconut (copra) and palm kernel oil (HS 1513), cocoa butter (HS 1804), cocoa powder (HS 1805), cocoa paste (HS 1803), and pepper of the genus *Piper* (HS 0904). On the other hand, Malaysia had a comparative disadvantage in tea (HS 0902).

Second, based on the competitiveness ranking, Malaysia ranked first in three of the commodities (cocoa paste, cocoa butter, and cocoa powder) as well as ranking second in two of the commodities (palm oil and pepper); Indonesia ranked first in three other commodities (palm oil, pepper, and tea), while Philippine ranked first in coconut (copra). Finally, it can be clearly seen that as consuming countries, Thailand, Singapore and China did not have comparative advantage and competitiveness in these products.

In spite of the fact that Malaysian palm oil held the first position among plantation products other than palm oil locally, from the competitiveness point of view, for its relative competitive advantage among selected ASEAN countries and China it recorded the second position. Probably better management and use of information technology, more investment in R&D and higher productivity growth in the Malaysian palm oil industry will contribute to a higher competitive advantage for Malaysia in the future.

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