

Revealed Comparative Advantage and Competitiveness of Malaysian Palm Oil Exports against Indonesia in Five Major Markets

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ABSTRACT

This study analysed the extent to which Malaysia had a comparative advantage over Indonesia in crude palm oil (CPO) and processed palm oil (PPO) exports to five major markets, namely, China, India, the European Union (EU), Pakistan and the USA. In addition, this study examined how Malaysia's competitiveness and comparative advantage changed over the period 1999-2014 in major markets by adopting a widely used Revealed Comparative Advantage (RCA) index. The results suggest that Malaysia retained its comparative advantage in exporting CPO to Pakistan from 2009 to 2014 and started to gain comparative advantage in exporting CPO to India in 2014. Meanwhile, for PPO market, Malaysia sustained its comparative advantage in the USA along the study period, but gradually reduced comparative advantage onset 2012. In Pakistan, the study found that Malaysia started to lose comparative advantage for PPO to Indonesia in 2012 and 2014.

Keywords: trade, revealed comparative advantage, export competitiveness, palm oil, CPO, PPO, Malaysia, Indonesia, China, India, EU, Pakistan, USA.

INTRODUCTION

Malaysia and Indonesia are the two largest producers and exporters of palm oil in the world. In 2014, Malaysia produced 19.7 million tonnes of palm oil, contributing 33% of the world's production while Indonesia produced 30.8 million tonnes or 51% of the

world's production (MPOB, 2015; Oil World, 2015). Collectively, 85% of the world's palm oil came from these two countries (MPOB, 2015). Malaysia was previously the world largest palm oil producer and successfully retained this position for decades. However, since 2007, Indonesia overtook Malaysia due to the rapid expansion of oil palm

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plantations in the region (Awalludin *et al.*, 2015).

Indonesia has a large domestic market for its palm oil as compared with Malaysia; domestic consumption in Indonesia constitutes 30% of its total production while 70% of the output is exported. In contrast, Malaysia exports 90% of its total palm oil production. Collectively, both countries accounted for 90% of the world's total palm oil exports in 2014, with Indonesia leading at 22.1 million tonnes, followed by Malaysia with 17.3 million tonnes (MPOB, 2015).

Comparing Malaysia's and Indonesia's export performance indicators, Malaysia's export to production ratio significantly declined to 88% in 2014 from the highest on record at 98% in 2010 (Table 1). Malaysia's palm oil export registered at 17.31 million tonnes in 2014, having declined from 18.15 million tonnes in 2013, or down by 4%. However, in the same year, local demand for palm oil increased to 2.82 million tonnes compared with 2.27 million tonnes

in the previous year, or up by 24%. In contrast, Indonesia's export to production ratio for the past five years has been stable at around 70%-75% (Table 2). Indonesia's crude palm oil (CPO) production and palm oil export stood at 31 million tonnes and 22.95 million tonnes, respectively, in 2014.

Meanwhile, closing stocks of Malaysian palm oil registered at 2.02 million tonnes in 2014 compared to 1.99 million tonnes in 2013, an increase by 1%. Malaysia's stocks to export ratio registered at 12% in 2014 compared to 11% in 2013. In contrast, Indonesia managed to reduce its stocks in the last two years. In 2014, Indonesia's palm oil stocks reduced by 19% to 2.42 million tonnes from 3 million tonnes in 2013. Indonesia's stocks to export ratio registered at 11% in 2014 compared to 14% in 2013.

The growth in Indonesia's production and export is partly attributed to the rapid expansion in its oil palm planted area which has almost doubled over the past decade to an estimated 10 million hectares in 2014. The potential

land area for oil palm cultivation in Indonesia is vast and estimated at about 22.9 million hectares. About 10.59 million hectares or 46% had already been planted with oil palm by 2013 (Statistics Indonesia, 2015). Plantations owned by private companies make up nearly 49% of the total oil palm planted area, followed by smallholdings that comprise approximately 43%, while nearly 8% are state plantations. Nearly 66% of the planted areas is located in Sumatera, 30% in Kalimantan, 3% in Sulawesi, while the rest is spread across other parts of Indonesia, including Papua (Statistics Indonesia, 2015).

On the other hand, the growth of Malaysia's production and export is attributed to the higher productivity and increase in new areas coming into production, especially in Sarawak. In 2014, Malaysia's average CPO extraction rate registered as the highest achieved of 20.62%, increased by 9% from 18.86% recorded in 2000 (MPOB, 2015). The oil palm planted area in 2014 reached 5.39

TABLE 1. MALAYSIA'S EXPORT AND STOCKS PERFORMANCE (1000 t)

Palm oil	2010	2011	2012	2013	2014
Production	16 994	18 912	18 785	19 216	19 667
Export	16 664	17 993	17 576	18 147	17 306
Local demand*	2 065	1 783	2 031	2 266	2 818
Export to production ratio	98%	95%	94%	94%	88%
Closing stocks	1 616	2 057	2 627	1 987	2 016
Stocks to export ratio	10%	11%	15%	11%	12%

Note: *Own calculation.
Source: MPOB (2015).

TABLE 2. INDONESIA'S EXPORT AND STOCKS PERFORMANCE (1000 t)

Palm oil	2010	2011	2012	2013	2014
Production	22 400	24 300	26 900	28 520	31 000
Export	16 450	17 070	19 094	21 471	22 950
Export to production ratio	73%	70%	71%	75%	74%
Closing stocks	2 280	3 250	3 950	3 000	2 420
Stocks to export ratio	14%	19%	21%	14%	11%

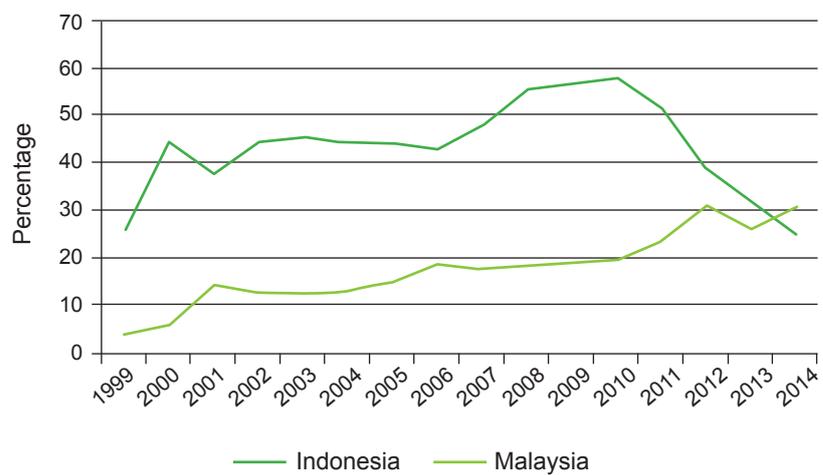
Source: *Oil World* (2014; 2015).

million hectares, an increase of 39% as against the last 10 years. Sabah is the largest oil palm planted states in Malaysia which represented 28% of the total oil palm planted area, followed by Sarawak with 23% and Johor with 14% (MPOB, 2015). In terms of ownership, private estates contributed to 62% of the total planted area, followed by organised smallholders and independent smallholders with contributions of 23% and 15% respectively (MPOB, 2015).

Traditionally, Indonesia dominated the CPO export market while Malaysia concentrated more on exporting refined palm oil which has more value-added (Figure 1). However, over the years, Malaysia has been increasing its CPO export portion at compound annual growth rate (CAGR) of 15%, from only 3.8% of its total palm oil exports in 1999 to 30.5% in 2014. In contrast, Indonesia's CPO export portion has been increasing at CAGR of 2.5% between 1999 and 2010.

Nevertheless, the Indonesian palm oil industry has gradually transformed to give more emphasis to its downstream industry. This is a significant move to improve the value-added palm oil industry. In addition, it helps to boost the competitiveness of Indonesia's palm oil industry in the international market. Beginning in 2011, Indonesia changed its palm oil export policy, by introducing a new palm oil export tax structure which encourages more oil to be processed locally. As a result, between 2011 and 2014, Indonesia's CPO export portion shrunk at 19% CAGR, from 58% of total palm oil exports to only 25% (UN Comtrade, 2015).

Although Malaysia and Indonesia are the largest palm oil producers in the world, there is still limited empirical evidence that illustrate their relative competitiveness in exporting



Source: UN Comtrade (2015).

Figure 1. Malaysia vs. Indonesia: percentage of crude palm oil (CPO) export over total palm oil exports (1999-2014).

downstream products. Thus, the objective of this study was to assess the competitiveness of Malaysian CPO and processed (PPO) exports in comparison with Indonesia by calculating a widely used index, namely, the Revealed Comparative Advantage (RCA) index. In this regard, the study focused on the five major market destinations, which are China, India, European, Pakistan and USA. In addition, this study examined how Malaysia's competitiveness had changed over the period 1999-2014 in those markets.

This method has been employed in some other studies relating to palm oil. Simeh (2004) calculated the RCA index for several vegetable oils in several countries which included palm oil from Indonesia and Malaysia. The result indicates that RCA for Indonesia's palm oil decreased from 3.705 in 1990 to 2.474 in 2002. Meanwhile, RCA for Malaysia's palm oil was reduced from 4.957 in 1990 to 9.099 in 2002, implying that Malaysia had a comparative advantage over Indonesia in exporting palm oil.

Idris (2011) analysed Malaysia's comparative advantage in producing and exporting palm

oil from 1964 to 2009. The study found that Malaysia's RCA index always exceeded 1 which indicated that Malaysia had a comparative advantage in producing palm oil during the period studied.

Arip *et al.* (2013) on the other hand, used the RCA approach to assess the comparative advantage of the Malaysian and Indonesian palm oil-related industries between 1989 and 2010. Based on 20 palm oil products, the findings indicate that the RCA indices for both countries were unstable during the period of study. It was found that Malaysia was more competitive than Indonesia in most of the downstream palm oil-related industries. As the biggest producers of palm oil, the study suggests that both countries should put more emphasis on downstream industrial products, which are of higher value-added, by capitalising on their comparative advantage in the upstream industries.

METHODOLOGY

The data used in this study are secondary data collected from the United Nations Comtrade Database for the years 1999 to 2014. The

annual import data of CPO, PPO and all merchandise products for China, India, European Union (EU), Pakistan and USA were employed based on the standard commodity categories as defined in the harmonised tariff system (HTS) at the six-digit level. For the purpose of this study, palm oil was grouped into two broad categories: CPO and PPO. While CPO represents crude palm oil, PPO represents all processed palm oil products, such as refined, bleached and deodorised (RBD) palm oil, RBD palm olein, RBD palm stearin and palm fatty acid distillate.

This article conducted a two-step analysis. The first step calculated the market shares of Malaysian and Indonesian CPO and PPO in the Malaysia's five major market destinations as listed above. For the purpose of comparison, the market share was calculated for two years, 2005 and 2014.

The second step assessed the comparative advantage of the Malaysian and Indonesian palm oil products from 1999 to 2014. Following Bhattacharyya (2011), comparative advantage is the term used to describe the tendency for countries to export commodities in which they are relatively adept at producing, *vis-à-vis* the rest of the world. In other words, if a country can produce a commodity at a lower relative cost than other countries, then that country should devote more of its resources to the production of that particular commodity for trade. Through trade, that country can obtain other goods at a lower price (opportunity cost), in exchange for the commodity in which it has a comparative advantage.

Several techniques have been used to measure the weak and strong sectors of a country such as constant market share analysis (CMSA) and domestic resource cost (DRC) ratio (Amzul, 2011).

One of the most widely used methods involves the concept of RCA developed by Balassa (1965). The Balassa index measures normalised export shares, with respect to the exports of the same industry in a group of reference countries. Although the strengths and weaknesses of the Balassa index are still debated, it stands as the most widely used RCA index (Serin and Civan, 2008).

The RCA index (also referred to as the Balassa index) is measured by the formula:

$$RCA = \ln [(X_{IB} / X_B) / (X_{IA} / X_A)],$$

where

X_{IB} – Malaysian exports of CPO (or PPO) to the five market destinations;

X_B – Malaysian total exports to the five market destinations;

X_{IA} – Indonesian exports of CPO (or PPO) to the five market destinations; and

X_A – Indonesian total exports to the five market destinations.

A positive value of RCA might be interpreted as an indication of Malaysia's comparative advantage over Indonesia in the five market destinations. *Tables 3 and 4* list the Balassa index values calculated for CPO and PPO, respectively.

RESULTS AND DISCUSSION

The analysis for CPO focused only on four market destinations, namely, China, India, EU, and Pakistan, since USA did not have any importation of CPO from the two countries. However, the analysis of PPO has included the five market destinations into the analysis.

Market Share Analysis

From *Table 3*, it can be noted that within the 10 years studied, Malaysia had strengthened its

CPO export performance in all four major markets. The CAGR for Malaysian CPO exports to India, EU and Pakistan from 2005 to 2014 increased significantly to 29%, 6% and 2% annually, respectively. Nonetheless, Malaysian export to China reduced at CAGR of 25%. In terms of market share, Malaysia improved its CPO market share in China, Pakistan and India. For the EU market, even though Malaysian CPO export had increased, more than 10% of its market share had been lost. On the other hand, Indonesian CPO export to EU had strengthened with an average annual growth rate of 13%. At the same time, Indonesia managed to increase its market share to EU from 37% to 50%.

For PPO, Indonesia's export to the five major market destinations increased significantly over the 10 years (*Table 4*). On the other hand, Malaysian exports to EU, Pakistan and China dropped to 7%, 6% and 0.1% per annum, respectively, while exports to USA and India increased to 4% to 9% per annum, respectively. In terms of market share, Malaysia lost some of its market share to Indonesia in the five major market destinations.

Comparative Advantage Analysis

A positive RCA index may be interpreted as an indication of Malaysia's comparative advantage over Indonesia in the five market destinations. *Tables 5 and 6* list the Balassa index values calculated for CPO and PPO, respectively.

For the CPO market, as measured by the Balassa index, Indonesia had a significant comparative advantage over Malaysia in all the major market destinations except Pakistan. In the Pakistan market, Indonesia had a comparative advantage over Malaysia until 2008. From 2009 onwards, the

TABLE 3. CRUDE PALM OIL EXPORTS, 2005 – 2014

Destination	Origin	2005 (million tonnes)	2014 (million tonnes)	CAGR (%)	Market share	
					2005 (%)	2014 (%)
China	Malaysia	48.34	4.95	-24.78	46.42	100.00
	Indonesia	55.46	-	-100.00	53.25	0.00
India	Malaysia	336.11	2 638.60	29.38	16.72	40.75
	Indonesia	1 665.09	3 712.92	10.54	82.84	57.35
EU*	Malaysia	958.89	1 561.76	6.29	37.33	28.87
	Indonesia	986.86	2 707.74	13.45	38.42	50.06
	World	2 568.91 [#]	5 408.95 [#]			
Pakistan	Malaysia	85.91	99.29	1.83	60.26	95.66
	Indonesia	56.53	4.50	-27.12	39.65	4.34

Note: As reported by destination countries:

*EU (2005-2013).

[#]Estimation.

CAGR - compound annual growth rate.

Source: UN Comtrade (2015).

TABLE 4. PROCESSED PALM OIL EXPORTS, 2005 – 2014

Destination	Origin	2005 (million tonnes)	2014 (million tonnes)	CAGR (%)	Market share	
					2005 (%)	2014 (%)
China	Malaysia	2 892.24	2 865.31	-0.12	68.44	53.87
	Indonesia	1 325.25	2 453.40	8.00	31.36	46.13
India	Malaysia	283.52	387.32	3.98	27.60	26.57
	Indonesia	736.41	1 045.97	4.48	71.70	71.74
EU*	Malaysia	841.69 [#]	488.45	-6.58	56.15	35.43
	Indonesia	570.06	818.91	4.63	38.03	59.40
Pakistan	Malaysia	878.01	541.20	-5.87	55.55	24.06
	Indonesia	683.24	1 703.17	12.09	43.23	75.73
USA	Malaysia	387.83	751.23	8.62	93.28	63.29
	Indonesia	14.98	420.11	51.70	3.60	35.39

Note: As reported by destination countries:

*EU (2005-2013).

[#]Estimation.

CAGR - compound annual growth rate.

Source: UN Comtrade (2015).

comparative advantage in the Pakistan market switched over to Malaysia. A lower cost in producing CPO by Indonesia in the earlier years may have been an influencing factor in this observation.

Malaysia used to have the comparative advantage in exporting PPO to the world. However, during the last three years, Malaysia lost this comparative advantage. Comparing the five markets, Malaysia had a

significant comparative advantage over Indonesia in USA and Pakistan, except in 2012 and 2014 for Pakistan. On the other hand, Indonesia had a significant comparative advantage over Malaysia in India since 2013. The same scenario follows for the EU and China markets where the latest development shows that Indonesia has started to claim comparative advantage in there.

CONCLUSION

This study presented an analysis of the competitiveness of Malaysia's palm oil exports against Indonesia using market share and comparative advantage analyses. The empirical findings suggest that Indonesia is more competitive in exporting its products to the world market. With the implementation of

TABLE 5. REVEALED COMPARATIVE ADVANTAGE INDEX FOR CRUDE PALM OIL					
Year	World	China	India	EU	Pakistan
1999	-1.56	-1.88	-1.70	N/A*	0.77*
2000	-2.07	N/A*	-2.16	-1.81	-2.45
2001	-0.80	-0.88	-0.49	-0.77	N/A*
2002	-1.32	-7.69	-0.92	-1.04	-1.06
2003	-1.27	-7.63	-1.32	-0.54	-1.43
2004	-1.55	-2.71	-1.89	-0.64	-1.13
2005	-1.54	-0.47	-2.33	-0.41	-0.93
2006	-1.23	-0.46	-2.31	-0.34	-0.60
2007	-1.52	-1.00	-2.57	-0.16	-0.32
2008	-1.62	-0.56	-2.39	-0.47	-0.44
2009	-1.52	-0.67	-1.53	-1.14	1.01*
2010	-1.43	-1.34	-1.61	-1.16	1.96*
2011	-0.95	-0.84	-0.98	-0.92	1.91*
2012	-0.58	-0.35	-0.24	-0.51	3.65*
2013	-0.73	-0.50	-0.15	-0.81	1.18*
2014	-0.49	N/A*	0.10*	N/A*	3.54*

Note: *Indicate comparative advantage for Malaysia over Indonesia.

N/A – not available.

EU – European Union.

TABLE 6. REVEALED COMPARATIVE ADVANTAGE INDEX FOR PROCESSED PALM OIL						
Year	World	China	India	EU	Pakistan	USA
1999	0.82*	0.87*	0.18*	N/A*	4.11*	0.79*
2000	0.86*	0.73*	0.46*	0.44*	3.85*	0.88*
2001	0.66*	0.89*	0.23*	0.54*	1.53*	2.72*
2002	0.43*	0.73*	0.12*	0.36*	0.78*	1.73*
2003	0.54*	0.37*	-0.12	0.43*	0.72*	6.70*
2004	0.18*	0.10*	-0.97	0.22*	0.17*	0.62*
2005	0.04*	0.19*	-1.65	0.09*	0.02*	1.72*
2006	-0.05	0.35*	-2.30	-0.17	0.12*	1.16*
2007	0.09*	0.55*	-2.23	-0.18	0.09*	1.40*
2008	0.25*	0.36*	-1.19	-0.21	1.04*	1.73*
2009	0.19*	-0.10	-0.37	-0.35	1.26*	1.34*
2010	0.32*	-0.24	-0.30	-0.20	1.86*	2.61*
2011	0.37*	0.27*	-0.12	0.21*	0.58*	3.09*
2012	-0.18	-0.25	-1.08	-0.10	-0.01	2.59*
2013	-0.38	-0.10	-1.05	-0.62	0.03*	0.41*
2014	-0.72	-0.54	-1.08	N/A*	-0.41	0.13*

Note: *Indicate comparative advantage for Malaysia over Indonesia.

EU – European Union.

N/A – not available.

the 2011 export duty structure, Indonesia has successfully boosted its PPO to CPO export ratio from 42:58 in 2010 to 75:25 in 2014 while Malaysia reduced its focus on PPO exports from 80:20 in 2010 to 70:30 in 2014. This study also indicates that recent trends in exports show that Malaysia has lost its comparative advantage in

both products, CPO and PPO, in most of the major market destinations, except for PPO in the Pakistan and USA markets.

Given that Malaysia is one of the leading global palm oil producers, the country has potential to further enhance its comparative advantage in exporting palm oil products. Malaysia must spend extra effort

in improving its position in the existing markets where the country has a low market share, especially in China and EU. In this regard, Malaysian exporters must coordinate their actions to aggressively market Malaysian palm oil products so that Malaysian palm oil export could be further improved.

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