Effective Exchange Rate (EER) Effects on Exports of Oil Palm Products to Selected Markets

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ABSTRACT

The exchange rate is an important economic variable that influences the sale and purchase of agricultural commodities that are internationally and domestically traded. The study explores the relationship of an effective exchange rate for Malaysia and major importing countries on the export volume of various oil palm products. The result indicates evidence of a relationship between the Malaysian exchange rate and the export of crude palm oil, palm kernel expeller and palm-based finished products. Moreover, the relationship also exists for processed palm oil, processed palm kernel oil and oleochemical products to China, and for processed palm oil to India. However, there is no relationship between the exchange rate of European Union and the export of Malaysian oil palm products to that region.

INTRODUCTION

Exchange rate is the value of one currency in relation to another. The value of a country's currency is determined by the supply and demand of that currency, particularly under a floating exchange rate system. It reflects the international trade of goods and services, and also foreign investments of that country. Hence, it is a significant economic variable that determines the relationship between international and domestic prices, and influences directly the sale and purchase of agricultural commodities that are traded either in the global or local market.

Exchange rate movements are particularly important for the Malaysian palm oil industry, where exports account for a major portion of palm oil production. A stronger Malaysian Ringgit (MYR) translates into relatively more expensive Malaysian products in a foreign country, resulting in higher competition with producers of export-competing commodities. On the other hand, a weaker MYR reflects an increase in the volume of exports and higher producer prices as well as a decrease in the volume of imports and higher consumer prices. For instance, a country that has experienced currency depreciation will face higher prices for imports even if the prices and other factors remain the same. The weaker currency will then have a direct effect on the demand for the imported products as it will be perceived that they had a 'price increase'.

There are conflicting theoretical models on the relationship between exchange rate and the level of international trade. Previous studies indicated a negative relationship whereby exchange rate volatility may reduce trade flows, while other studies by contended that exchange rate uncertainty positively

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affects international trade (Mazila, undated). All these theoretical models aimed at examining the effect of foreign exchange rate variability on international trade levels, and concluded that the postulated impact may be positive or negative depending on the assumptions employed. These assumptions could be related to factors such as the traders' attitude towards risk, the presence or absence of hedging facilities, profit opportunities and diversifiable risk, and the nature of the trader and model specification.

The empirical evidence is also mixed whereby several authors found some positive evidence in the relationship between exchange rate variability and trade flows, while others discovered that exchange rate variability negatively affected international trade flows. Previous studies also found both positive and negative effects of foreign exchange rate on trade levels, and even insignificant relationships between exchange rate volatility and trade flows (Mazila, undated).

In the context of palm oil, there has always been a widespread belief that a weaker currency gives an exporting country such as Malaysia a more competitive edge. It was found that Malaysian palm oil exports increased marginally by 8.6% for every 20% increase in the MYR-USD exchange rate, which explained why the quantities of palm oil exported tended to increase during times when the Malaysian currency was weak (Basri and Zaimah, 2002). In addition, exchange rate variability does affect all the five major export categories, *i.e.* electrical and electronic products, palm oil, timber, apparel and rubber, both in the floating and fixed exchange rate periods (Mazila, undated).

With more and diverse palm oil products being exported worldwide and generating substantial export revenue for the country, further and a more thorough analysis should be carried out to distinguish the types of oil palm products that are affected by the exchange rate factor.

OBJECTIVE

The main objective of the study is to explore the movements of exchange rates on disaggregated exports of Malaysian oil palm products, namely crude palm oil (CPO), crude palm kernel oil (CPKO), processed palm oil (PPO), processed palm kernel oil (PPKO), palm kernel expeller (PKE), oleochemicals products (Oleo) and palm-based finished products (FP). By looking at the disaggregated data, different effects across particular products can be determined.

In addition, exchange rate movements of the currencies of major importing countries and regions, *i.e.* China, India and the European Union (EU), will also be investigated to analyse their impact on the exports of Malaysian oil palm products to these respective places.

METHODOLOGY AND DATA

An effective exchange rate (EER) is a better indicator of the macroeconomic effects of exchange rates than any single bilateral rate (Marc and Sau, 2006). It serves various purposes in both policy and market analysis, such as acting as a measure of international competitiveness, as a component of monetary conditions indices, as a gauge for the transmission of external shocks, as an intermediate target for monetary policy, or as an operational target.

The nominal effective exchange rate (NEER) constitutes a summary measure of the external value of a country's (or economic area's) currency vis-à-vis the currencies of its most important trading partners. NEER is particularly useful in gauging exchange rate movements and their potential bearing on import prices and export demand (Luca *et al.*, 2002).

NEER is the geometric weighted average of a basket of bilateral nominal exchange rates, as shown in equation (1):

$$NEER = \Pi\ (e/e_i)^{wi} \quad \text{.....(1)}$$

where e = exchange rate of MYR against USD (USD/MYR in index form)

ei = exchange rate of currency *i* against USD (USD/currency *i* in index form)

wi = weights attached to the country's currency *i* in the index form

The real effective exchange rate (REER) is obtained by deflating the nominal rate with appropriate price or cost indices. It is the most commonly used indicator of international price and cost-competitiveness (Luca *et al.*, 2002):

$$REER = \Pi\ [(e/e_i)(P/P_i)]^{wi} \quad \text{..... (2)}$$

where P = consumer price index (CPI) of Malaysia

P_i = CPI of respective country/currency

The study adopts a simple bivariate model to state the relationship between exchange rate and export, and tests the hypothesis of whether or not changes in exchange rate influence export.

$$Y_t = \alpha_0 + \alpha_1 X_t + \varepsilon_t \quad \text{..... (3)}$$

where Y_t = export of oil palm products at time *t*,

X_t = exchange rate, and

ε_t = error term.

A stable linear steady-state is required in order to determine if any relationship exists between the variables under study. A unit root and cointegration tests are utilized for that purpose. Unit root tests show if the time-series variable is stationary. The Augmented Dicky-Fuller (ADF) unit root test is applied to decide the order of integration of the series of the two variables.

The second step is to check for the existence of cointegration. The Johansen test is utilized, which has the advantage in conducting both estimation and hypothesis testing. If such a stationary linear combination exists, the non-stationary time series is said to be cointegrated. The stationary linear combination is called the cointegrating equation, and may be interpreted as a long-run equilibrium relationship among the variables. The purpose of the cointegration test is to determine whether a group of non-stationary series is cointegrated or not. The minimum sample size for the cointegration test is around 100.

Finally, the standard Granger causality test is used to examine the underlying causal relationship between the two variables within a

bivariate framework:

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \ldots + \alpha_m Y_{t-m} \ldots + \beta_1 X_{t-1} + \ldots + \beta_2 X_{t-2} + \ldots + \varepsilon_t \ldots\ldots(4)$$

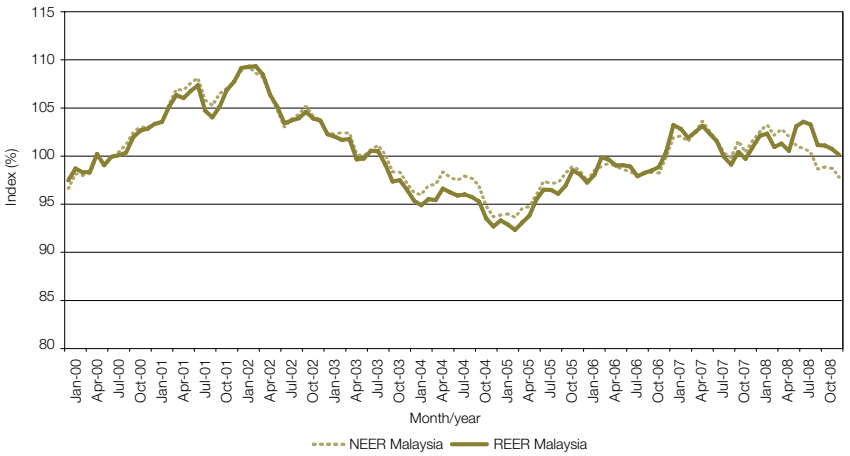
The Granger approach to the question of determining how much of the current *Y* can be explained by the past values of *X*, and then to determine whether adding lagged values of *X* can improve further the explanation of *Y* (LLC, 2004). When the series are not cointegrated, the simple Granger causality is appropriate, but for cointegrated series, an Error Correction Model (ECM) can be used to test for Granger causality. For this exercise, the Granger causality of interest runs in a one-way direction, *i.e.* exchange rate to export, and not the other way round. The null hypothesis is that the exchange rate does not Granger-cause exports of oil palm products.

Monthly data of exports of Malaysian oil palm products from January 2000 to December 2008 which were published by MPOB were used in the study. The Bank of International Settlements (BIS) produces monthly EERs for 51 countries, plus a separate set for the EU area. The data can be accessed at their website.

RESULTS AND DISCUSSION

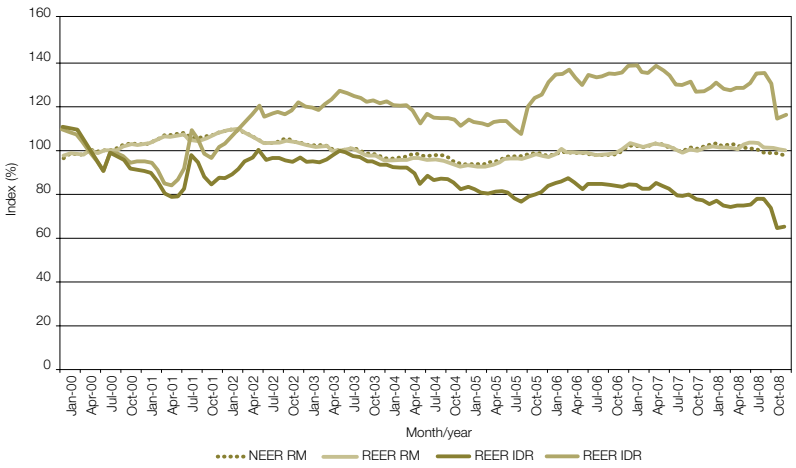
Figure 1 shows that both NEER and REER of MYR closely tracked each other and moved within ± 10% of the average. MYR was fixed at 3.80 per USD1.00 during the financial crisis in 1998, and this pegging was subsequently removed in July 2005. However, both EERs showed an upward trend or appreciated since early 2000, and reached a peak in February 2002, *i.e.* approximately 9% above average. Later, both EERs depreciated to the bottom until the middle of 2005, when the trend was reversed up to 2007, and then started to move within ± 5% of the average since then.

Figure 2 shows the comparative movements between the MYR and Indonesian Rupiah (IDR) effective exchange rates. IDR's NEER shows a downward trend indicating a depreciating IDR, while IDR's REER shows an upward trend indicating



Source: Bank of International Settlements.

Figure 1. Monthly averages of nominal effective exchange rate (NEER) and real effective exchange rate (REER) of Malaysian Ringgit (MYR) (2000-2008).



Source: Bank of International Settlements.

Figure 2. Monthly averages of nominal effective exchange rate (NEER) and real effective exchange rate (REER) of Malaysian Ringgit (MYR) and Indonesian Rupiah (IDR) (2000-2008).

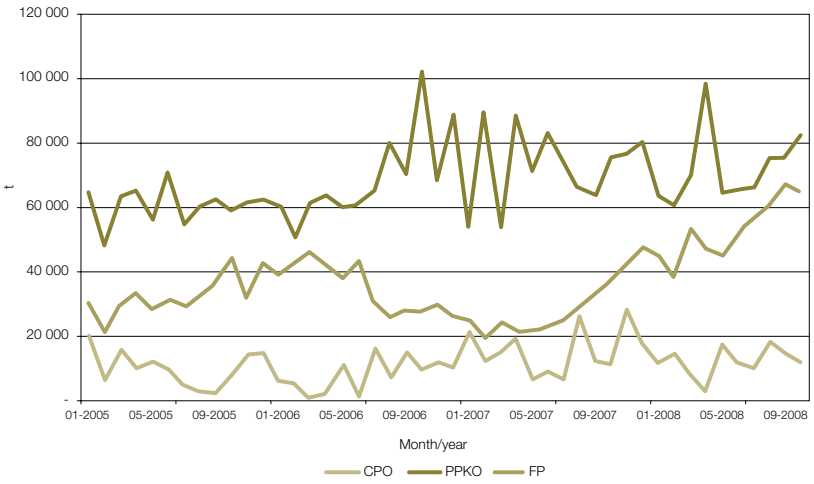
Source: MPOB.

Figure 3. Monthly export volume of crude palm oil (CPO), processed palm oil (PPO), palm kernel expeller (PKE) and oleochemicals (Oleo) products (2005-2008).

a relatively weaker international competitiveness for overall Indonesian export products due to the higher costs of importing input materials. However, in terms of palm oil products, which utilize mostly local resources, the depreciating IDR's NEER can provide an advantage to Indonesian palm oil products as compared to Malaysian ones in the international market.

Figures 3 and *4* show monthly export movements of various oil palm products namely CPO, PPO, CPKO, PPKO, PKE, Oleo and FP.

Table 1 gives a brief summary of the export volume of the above-mentioned products. Export of PKE is stable with



Source: MPOB.

Figure 4. Monthly export volume of crude palm kernel oil (CPKO), processed palm kernel oil (PPKO) and palm-based finished products (FP) (2005-2008).

TABLE 1. SUMMARY OF MONTHLY EXPORTS OF OIL PALM PRODUCTS

	CPO	PPO	CPKO	PPKO	Oleo	PKE	FP
Average	172 097	1 114 823	11 515	69 536	177 530	172 951	38 205
S.D.	59 825	220 135	6 266	12 763	36 661	22 370	13 654
C.V. (%)	34.76	19.75	54.42	18.35	20.65	12.93	35.74

Note: CPO – crude palm oil.
PPO – processed palm oil.
CPKO – crude palm kernel oil.
PPKO - processed palm kernel oil.
Oleo – oleochemicals.
PKE – palm kernel expeller.
FP - palm-based finished products.
S.D. – standard deviation.
C.V. - coefficient of variation.

the lowest coefficient of variation (CV) relative to the other products, while export of CPKO varies the most as compared to the others.

Table 2 shows the results of ADF unit root tests for the Malaysian effective exchange rates and exports of oil palm products in levels and first difference. The null hypothesis of the existence of unit root cannot be rejected for each of the variables in the level, and it is concluded that the series are non-stationary with the presence of unit root. However, the null hypothesis is rejected at the 1% level of significance for all of them are in their first differences. This indicates that the stationary state is achieved by them after the first differencing, and the series can be characterized to be integrated at order one, *i.e.* they are I (1).

TABLE 2. UNIT ROOT TEST FOR MALAYSIAN EFFECTIVE EXCHANGE RATES (EERs) AND EXPORTS OF OIL PALM PRODUCTS

Variable	ADF	
	Level	1st difference
NEER	-0.104872	-8.288463 **
REER	0.115491	-8.275194 **
CPO	0.445021	-6.430517 **
PPO	0.427380	-8.275194 **
CPKO	-0.299103	-17.01463 **
PPKO	0.938800	-17.97673 **
Oleo	0.823263	-12.04108 **
PKE	0.595480	-9.993980 **
FP	0.744093	-12.30789 **

Note: ** denotes 1% significance level.
ADF – Augmented Dicky-Fuller.
NEER – nominal effective exchange rate.
REER – real effective exchange rate.
CPO – crude palm oil.
PPO – processed palm oil.
CPKO – crude palm kernel oil.
PPKO - processed palm kernel oil.
Oleo – oleochemicals.
PKE – palm kernel expeller.
FP – palm-based finished products.

Table 3 shows the trace and Max-eigenvalue statistics for testing the rank of cointegration. The results of both test statistics deny the absence of a cointegrating relationship between EERs and the exports of CPO, and suggest the presence of more than one cointegrating relationship between them at the 5% significance level. However, both tests also indicate that exports of other oil palm products neither cointegrate with NEER nor REER. Hence, only one long-run relationship exists, *i.e.* between EERs and the export of CPO.

Using a lag length of 2, the estimated ECM for export of CPO is as follows:

1) For NEER:

$$\Delta CPO_t = 0.061 - 0.196\ \Delta CPO_{t-1} - 0.021\ \Delta CPO_{t-2} + 16.58\ \Delta NEER_{t-1} - 21.79^*\ \Delta NEER_{t-2} - 0.269\ z_{t-1} + \varepsilon_t$$

2) For REER:

$$\Delta CPO_t = 0.062 - 0.199\ \Delta CPO_{t-1} - 0.025\ \Delta CPO_{t-2} + 12.34\ \Delta REER_{t-1} - 18.19^*\ \Delta REER_{t-2} - 0.271\ z_{t-1} + \varepsilon_t$$

Note: * denotes 5% significance level.

Δ = the first difference operator.

Both the equations show the existence of significant Granger-cause relationships between changes in the Malaysian EERs with a lag of 2 and the export of CPO at the 5% significance level.

For the non-cointegrating series, the standard Granger causality test is used to highlight causality linkages. *Table 4* shows that there is no presence of Granger causal relationships between EERs and exports of oil palm products in general, except for REER that can Granger-cause exports of PKE and FP at the 5% level of significance, and also for NEER with export of FP at the same significance level.

Figure 5 shows NEER movements of three major export destinations for Malaysian oil palm products, namely China (Renminbi), Indian Rupee (INR) and the European region (Euro). The movements of Renminbi and MYR are quite close, but since 2008, the Renminbi has appreciated faster than MYR. Meanwhile, the INR

TABLE 3. COINTEGRATION TESTS FOR MALAYSIAN EFFECTIVE EXCHANGE RATES (EERs) AND EXPORTS OF OIL PALM PRODUCTS

Variable		Trace		Max-Eigen	
		Case 1	Case 2	Case 1	Case 2
NEER	CPO	17.68*	2.60	15.08*	2.60
	PPO	12.29	2.14	10.14	2.14
	CPKO	5.60	1.45	4.15	1.45
	PPKO	10.85	1.90	8.95	1.90
	Oleo	6.34	1.40	4.94	1.40
	PKE	12.06	2.23	9.83	2.23
	FP	6.85	1.12	5.73	1.12
REER	CPO	16.40*	2.67	13.72	2.67
	PPO	8.99	2.47	6.52	2.47
	CPKO	5.37	1.52	3.85	1.52
	PPKO	9.29	2.22	7.07	2.22
	Oleo	5.15	1.58	3.57	1.58
	PKE	10.72	2.25	8.47	2.25
	FP	4.17	1.23	2.94	1.23

Note: Case 1: H_o: no cointegrating relationship.
Case 2: H_o: at most one cointegrating relationship
* Denotes 5% significance level.

NEER – nominal effective exchange rate.
REER – real effective exchange rate.
CPO – crude palm oil.
PPO – processed palm oil.
CPKO – crude palm kernel oil.
PPKO - pocessed palm kernel oil.
Oleo – oleochemicals.
PKE – palm kernel expeller.
FP – palm-based finished products.

TABLE 4. GRANGER CAUSALITY TESTS FOR MALAYSIAN EFFECTIVE EXCHANGES RATE (EERs) AND EXPORTS OF OIL PALM PRODUCTS

Dependent variable	Independent variable (Lag)	F-statistics
PPO	NEER (6)	0.607
	REER (3)	0.657
Oleo	NEER (1)	0.803
	REER (6)	0.828
CPKO	NEER (4)	1.234
	REER (4)	0.866
PPKO	NEER (1)	1.270
	REER (1)	0.679
PKE	NEER (6)	1.584
	REER (6)	2.361*
FP	NEER (4)	2.374*
	REER (4)	2.728*

Note: * denotes 5% significance level.

PPO – processed palm oil.
Oleo – oleochemicals.
CPKO – crude palm kernel oil.
PPKO - processed palm kernel oil.
PKE – palm kernel expeller.
FP – palm-based finished products.

Source: Bank of International Settlements.

Figure 5. Monthly averages of nominal effective exchange rate (NEERs) of MYR (Malaysian Ringgit), IDR (Indonesian Rupiah), INR (Indian Rupee), Renminbi (China) and Euro (European Region) (2000-2008).

TABLE 5. UNIT ROOT TEST FOR EFFECTIVE EXCHANGE RATES (EERs) AND EXPORTS OF OIL PALM PRODUCTS

Country	Variable	ADF	
		Level	1st difference
China	NEER	0.552216	-7.180466 **
	REER	0.630571	-8.275194 **
	CPO	0.445021	-6.430517 **
	PPO	0.796007	-15.93599 **
	PPKO	0.151374	-7.974887**
	Oleo	0.805617	-14.33704**
India	NEER	-1.207986	-8.056831**
	REER	0.744093	-12.30789 **
	CPO	0.549352	-7.972844**
	PPO	-0.746738	-9.538046**
EU	NEER	1.302185	-6.880504**
	REER	1.173308	-7.152735**
	CPO	0.335336	-10.66814**
	PPO	0.305069	-9.693675**
	PPKO	0.118917	-8.884208**
	PKE	0.098596	-10.30926**
	Oleo	0.437708	-10.77477**

Note: ** denotes 1% significance level.
ADF – Augmented Dicky-Fuller.
NEER – nominal effective exchange rate.
REER – real effective exchange rate.
CPO – crude palm oil.
PPO – processed palm oil.
PPKO - processed palm kernel oil.
Oleo – oleochemicals.
PKE – palm kernel expeller.

has depreciated quicker than MYR, but slower than IDR. This movement has placed INR in a relatively weaker position compared to MYR but stronger than IDR.

In contrast, the Euro has appreciated consistently and has reached nearly 40% above average in the middle of 2008, but later dropped slightly to 30% above average. This demonstrates also the increasing strength of Euro as one of the major currencies in the world.

Table 5 shows the results of ADF unit root tests for the EERs for China, India and EU, and also Malaysian exports of oil palm products to those countries in levels and at first difference. The results show that the stationary state is achieved for them after the first differencing, *i.e.* the series are I (1).

Table 6 shows the absence of cointegration relationships between China's EERs and exports of PPO, Oleo and PPKO to China, while *Table 7* shows China's REER granger-caused exports of PPO and PPKO, while NEER Granger-caused the export of oleochemical products to China.

Table 8 shows the absence of a cointegration relationship between India's EERs and export of PPO, while *Table 9* shows India's NEER with a lag of 4 Granger-caused the export of PPO to India.

Table 10 shows the trace and Max-eigenvalue statistics for testing the rank of cointegration. The results of both test statistics deny the absence of cointegrating relationships between EU's EERs and exports of PPO and PKE, and suggest the presence of more than one cointegrating relationship at the 5% significance level between them. However, both tests also indicate that exports of other oil palm products neither cointegrated with NEER nor with REER.

Using a lag length of 2, the estimated ECM for export of PPO is as follows:

$$\Delta PPO_t = 0.002 - 0.169\,\Delta PPO_{t-1} - 0.033\,\Delta CPO_{t-2} - 1.008\,\Delta NEER_{t-1} + 2.013\,\Delta NEER_{t-2} - 0.706\,z_{t-1} + \varepsilon_t$$

$$\Delta PPO_t = 0.003 - 0.168\,\Delta PPO_{t-1} - 0.033\,\Delta CPO_{t-2} - 0.493\,\Delta REER_{t-1} + 1.228\,\Delta REER_{t-2} - 0.708\,z_{t-1} + \varepsilon_t$$

Note: * denotes 5% significance level.
Δ = the first difference operator.

TABLE 6. COINTEGRATION TEST FOR CHINA EFFECTIVE EXCHANGE RATES (EERs) AND MALAYSIAN EXPORTS OF OIL PALM PRODUCTS TO CHINA

	Variable	Trace		Max-Eigen	
		Case 1	Case 2	Case 1	Case 2
CPO	NEER	-	-	-	-
	REER	-	-	-	-
PPO	NEER	8.89	2.38	6.51	2.38
	REER	5.81	0.34	5.47	0.34
Oleo	NEER	13.59	2.03	11.56	2.03
	REER	10.59	0.31	10.28	0.31
PPKO	NEER	12.85	1.98	10.87	1.98
	REER	12.24	0.48	11.77	0.48

Note: Case 1: H_o: no cointegrating relationship.
Case 2: H_o: at most one cointegrating relationship.
* denotes 5% significance level.
- denotes less than minimum observation.
NEER – nominal effective exchange rate. PPO – processed palm oil.
REER – real effective exchange rate. PPKO - processed palm kernel oil.
CPO – crude palm oil. Oleo – oleochemicals.

TABLE 7. GRANGER CAUSALITY TEST FOR CHINA'S EFFECTIVE EXCHANGE RATES (EERs) AND MALAYSIAN EXPORTS OF OIL PALM PRODUCTS TO CHINA

Dependent variable	Independent variable (Lag)	F-statistics
PPO	NEER (3)	0.989
	REER (6)	2.403*
Oleo	NEER (5)	3.024*
	REER (6)	1.060
PPKO	NEER (3)	1.207
	REER (1)	4.252*

Note: * denotes 5% significance level.
NEER – nominal effective exchange rate. Oleo – oleochemicals.
REER – real effective exchange rate. PPKO - processed palm kernel oil.
PPO – processed palm oil.

TABLE 8. COINTEGRATION TEST FOR INDIA'S EFFECTIVE EXCHANGE RATES (EERs) AND MALAYSIAN EXPORTS OF OIL PALM PRODUCTS TO INDIA

	Variable	Trace		Max-Eigen	
		Case 1	Case 2	Case 1	Case 2
CPO	NEER	-	-	-	-
	REER	-	-	-	-
PPO	NEER	4.11	1.29	2.82	1.29
	REER	8.53	2.81	5.71	2.81

Note: Case 1: H_o: no cointegrating relationship.
Case 2: H_o: at most one cointegrating relationship.
* denotes 5% significance level.
- denotes less than minimum observation.
NEER – nominal effective exchange rate. CPO – crude palm oil.
REER – real effective exchange rate. PPO – processed palm oil.

Similarly, using a lag length of 2, the estimated ECM for export of PKE is as follows:

$$\Delta PKE_t = 0.011 - 0.181\,\Delta PKE_{t-1} - 0.077\,\Delta PKE_{t-2} - 0.434\,\Delta NEER_{t-1} - 1.848\,\Delta NEER_{t-2} - 0.855\,z_{t-1} + \varepsilon_t$$

$$\Delta PKE_t = 0.009 - 0.178\,\Delta PKE_{t-1} - 0.078\,\Delta PKE_{t-2} - 0.752\,\Delta REER_{t-1} - 1.232\,\Delta REER_{t-2} - 0.855\,z_{t-1} + \varepsilon_t$$

Note: * denotes 5% significance level.
Δ = the first difference operator.

All the equations show the absence of Granger-caused relationships between changes of EU's EERs and exports of PPO and PKE to EU at the 5% significance level.

For the non-cointegrating series, *Table 11* shows that there was no presence of Granger causal relationships between EERs with exports of CPO, PPKO and Oleo.

Figure 6 shows EERs that affect Malaysian exports of oil palm products. Products such as CPO, PKE and FP are influenced by Malaysia's EERs, while other products are not affected at all. However, certain products are affected by EERs of the importing countries, for example, PPO is affected by both China's and India's EERs, while PPKO and Oleo are affected by China's ERRs. The only product immune from the exchange rate movements is CPKO. There is no evidence of EU's EERs affecting the exports of Malaysian oil palm products to EU.

So, the movement of the exchange rate of the importing country or region with a strong currency relative to MYR (such as EU) does not affect the exports of Malaysian oil palm products, while countries with a currency which is weaker or of similar level relative to MYR can influence the exports of Malaysian oil palm products to those countries.

TABLE 9. GRANGER CAUSALITY TEST FOR INDIA'S EFFECTIVE EXCHANGE RATES (EERs) AND MALAYSIAN EXPORTS OF OIL PALM PRODUCTS TO INDIA

Dependent variable	Independent variable (Lag)	F-statistics
PPO	NEER (4)	2.783*
	REER (4)	1.756

Note: * denotes 5% significance level.
PPO – processed palm oil.
NEER – nominal effective exchange rate.
REER – real effective exchange rate.

TABLE 10. COINTEGRATION TEST FOR EUROPEAN UNION'S EFFECTIVE EXCHANGE RATES (EERs) AND MALAYSIAN EXPORTS OF OIL PALM PRODUCTS TO EUROPEAN UNION

	Variable	Trace		Max-Eigen	
		Case 1	Case 2	Case 1	Case 2
CPO	NEER	13.33	2.75	10.58	2.75
	REER	13.27	3.38	9.89	3.38
PPO	NEER	24.41*	0.88	23.53*	0.87
	REER	24.61*	1.21	23.40*	1.21
PPKO	NEER	11.08	1.59	9.49	1.59
	REER	10.79	1.86	8.92	1.86
Oleo	NEER	9.76	1.44	8.31	1.44
	REER	8.78	1.76	7.02	1.76
PKE	NEER	26.52*	1.01	25.52*	1.08
	REER	26.72*	1.34	25.47*	1.34

Note: Case 1: H_o: no cointegrating relationship.
Case 2: H_o: at most one cointegrating relationship.
* Denotes 5% significance level.
NEER – nominal effective exchange rate.
REER – real effective exchange rate.
CPO – crude palm oil.
PPO – processed palm oil.
PPKO - processed palm kernel oil.
Oleo – oleochemicals.
PKE – palm kernel expeller.

TABLE 11. GRANGER CAUSALITY TEST FOR EUROPEAN UNION'S EFFECTIVE EXCHANGE RATES (EERs) AND MALAYSIAN EXPORTS OF OIL PALM PRODUCTS TO EUROPEAN UNION

Dependent variable	Independent variable (Lag)	F-statistics
CPO	NEER (5)	1.036
	REER (3)	1.538
PPKO	NEER (3)	2.338
	REER (3)	1.710
Oleo	NEER (6)	1.016
	REER (6)	0.884

Note: + denotes 10% significance level.
NEER – nominal effective exchange rate.
REER – real effective exchange rate.
CPO – crude palm oil.
PPKO - processed palm kernel oil.
Oleo – oleochemicals.

CONCLUSION

There is evidence that the Malaysian exchange rate has an impact on the exports of Malaysian oil palm products, namely CPO, PKE and FP. However, other products such as PPO, CPKO, PPKO and olechemical products are not influenced by this particular factor.

Nevertheless, close substitutes between Malaysian and Indonesian oil palm products can pose problems to the exports of Malaysian oil palm products and place them at a disadvantage, particularly when IDR depreciates and MYR strengthens.

The position of the exchange rates of importing countries also plays a part in dictating the exports of oil palm products, particularly for countries with currencies which are weaker or at the same level relative to MYR. For instance, China's exchange rate can affect the exports of PPO, PPKO and oleochemical products to China, while India's exchange rate can affect the export of PPO to India.

However, the exchange rate of countries or regions with strong currencies such as EU has no effect on the exports of oil palm products from Malaysia.

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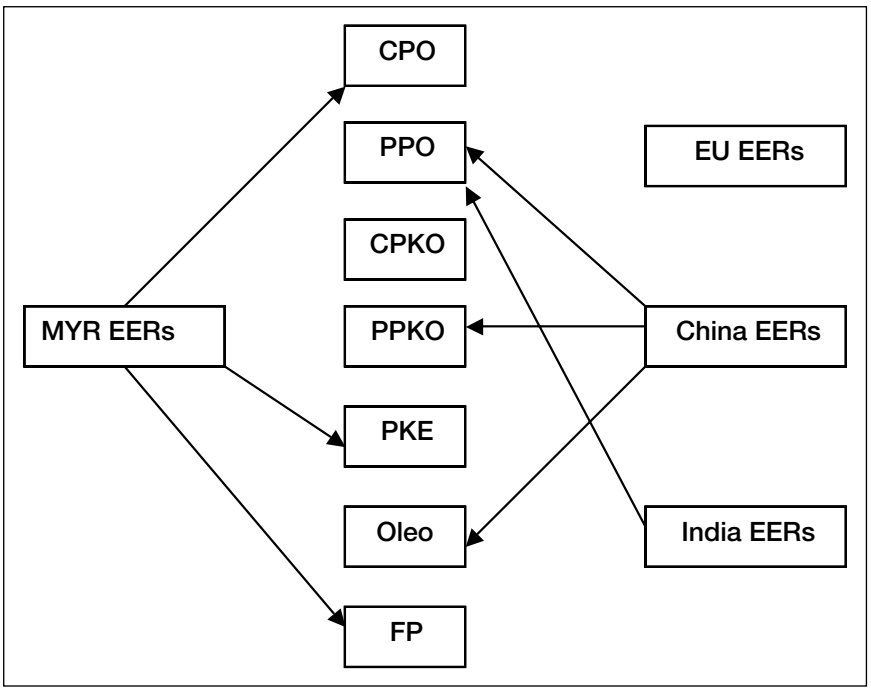

Figure 6. Effects of effective exchange rates (EERs) on exports of oil palm products.

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