An Analysis of Crude Palm Oil Price against Prices of Selected Oils and Fats

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INTRODUCTION

Among the 17 oils and fats in the world, palm oil leads in terms of production, trade and consumption. Its global production, export and consumption in 2015 were 62.79 million tonnes or 30.64% of the world production of oils and fats, 47.82 million tonnes or 57.61% of the world's exports of oils and fats, and 61.22 million tonnes or 30.08% of the world's consumption of oils and fats, respectively (Oil World, 2015a; Oil World, 2015b). These statistics indicate the dominance of palm oil in the sectors of production, trade and consumption, mainly due to its supply and demand factors. Its high productivity of 3.6 t ha^{-1} (author's estimate) ensures stability and ready availability of the oil, and its numerous uses in food and non-food applications have been globally accepted by the world. This is evident from the large share of palm oil exports (57.61%) in the total exports of oils and fats in 2015. In terms of palm oil imports, eight countries imported more than one million tonnes in 2015, with India being the largest at about 9.53 million tonnes and Malaysia, the eight largest, at about 1.03 million tonnes (MPOB, 2016). Many other countries imported varying volumes of palm oil (Oil World, 2015a; Oil World, 2015b).

Indonesia and Malaysia are the two largest producers and exporters of palm oil. They registered a combined production of 53.56 million tonnes (or 85.30% of the world production of palm oil) and combined exports of 43.35 million tonnes (90.65% of the world's exports of palm oil) in 2015 (Oil World, 2015a; Oil World, 2015b; MPOB, 2016). Malaysia actively participates in exporting this commodity mainly because of its small population and therefore smaller domestic demand. Palm oil prices can be said to be very much driven by international supply and demand. They also possess price discovery function (Nik Muhammad Naziman et al., 2012; Commodity Basis, 2016). For the purpose of price discovery, futures exchange is significantly relevant. Unlike Indonesia, the futures exchange in Malaysia on which palm oil is traded is *Bursa Malaysia*.

Coming after palm oil is soyabean oil (SBO) which registered a total production of 48.72 million tonnes and an export volume of 12.44 million tonnes in 2015 (Oil World, 2015a; Oil World, 2015b). Unlike palm oil, this commodity recorded a smaller share (14.99%) in the total exports of oils and fats. This is due to the fact that SBO is mostly consumed within the producing countries, leaving less for export. Big producers such as China, USA, and Brazil, for example, exported only 0.55%, 10.49% and 18.10% of what they produced in 2015 (USDA, 2016a; USDA, 2016b). However, this commodity has traditionally been palm oil's strongest and long-standing competitor as both oils can be substituted by one another in many food and non-food applications (Ramli *et al*, 2007; Shri Dewi *et al*, 2011; Yin

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Qiu, 2014). This substitution factor allows consumers to choose an oil which would give them the most economical and nutritional benefits for the price that they pay.

In terms of pricing, palm oil has an advantage over soyabean and other vegetable oils in being normally the lowest of all the prices. Thus, importing palm oil seems to be an obvious choice; thus, price is one deciding factor that is really important to be analysed.

In this article, 2014 and 2015 palm oil prices were analysed with those of selected oils and fats. The analysis dealt, firstly, with crude palm oil (CPO) local delivered price (measured in RM t^{-1}), and, secondly, with the price of RBD palm olein in the international market (measured in USD t^{-1}) for the purpose of comparing this price with the international prices of the selected oils and fats. The analysis on 2014 and 2015 prices is to confirm the continuity of the pattern established many years ago. It also discusses possible factors that could shape the future direction of palm oil price.

WHAT PRICE PATTERN DID PALM OIL EXHIBIT IN THE PAST TWO YEARS?

In 2014, the declining CPO price throughout the year indicated the extent of variability around its mean (of about 0.11), measured by the coefficient of variability (COV), and at the same time indicated the extent of deviation from its mean (standard deviation, S.D.) by about RM 255.68. It averaged at RM 2383.50 t^{-1} in that year (*Figure 1*). In 2015, however, a different price pattern was exhibited as the price settled at RM 2153.50 t^{-1} almost
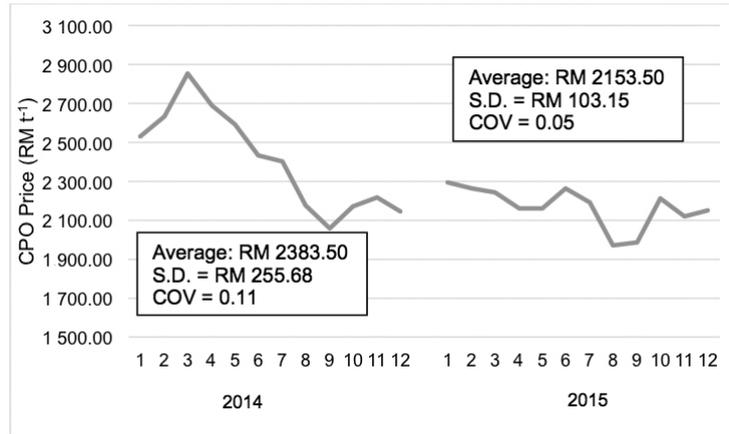
Source: MPOB (2016).

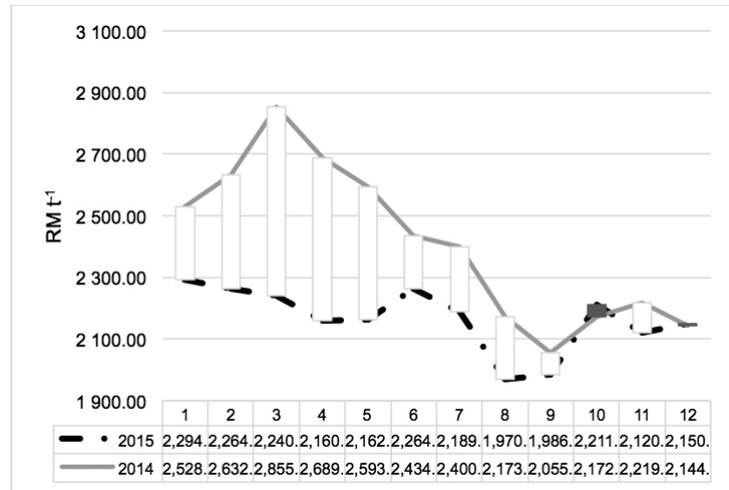*Figure 1. Crude palm oil prices in 2014 and in 2015.*

Figure 2. Differentiating crude palm oil prices in 2014 and in 2015.

throughout the year with S.D. of RM 103.15 and COV of 0.05.

Superimposing 2014 CPO prices with those of 2015 in the same figure gives us another perspective in analysing the price (*Figure 2*). It appears that there was a wide gap between the first half of the 2014 and 2015 price series which then narrowed down in the last four months of the years. Thus, we can see from *Figures 1* and *2* that the two price series had been fluctuating. This is the salient feature of instability established by CPO price. This also means that the feature continues to exist as in the

past as reported by Fatimah and Zainalabidin (1994).

The erratic movement of price can be tracked by comparing the price changes computed between two consecutive months (or a month-on-month (M-on-M)) of 2015 and also comparing the changes computed between the same months in both 2014 and 2015 (or a year-on-year (Y-on-Y)). Using 2015 CPO prices, the low volatility of CPO price in the year was indicated by the small range of M-on-M price change from -10% to 10% (*Figure 3*). Most of the monthly percentage changes are
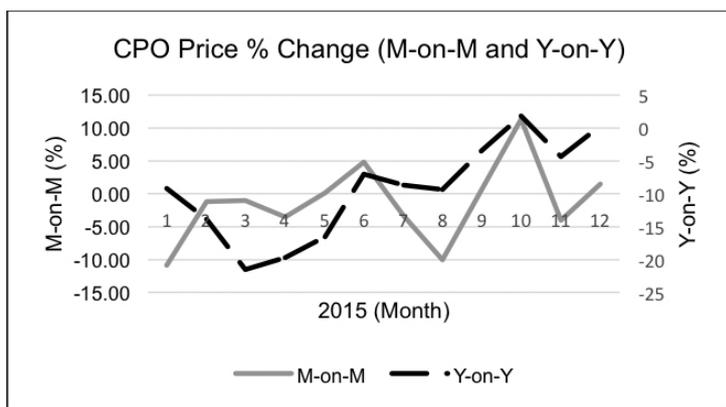
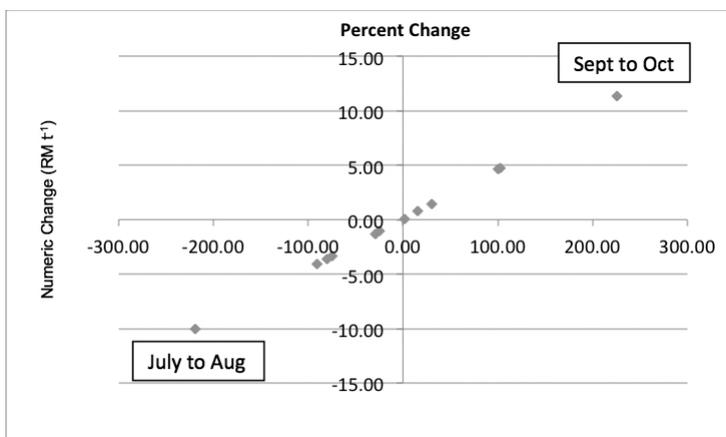Figure 3. Crude palm oil price changes on M-on-M and Y-on-Y basis.

Figure 4. Growth momentum analysis on M-on-M movements in 2015 CPO price.

located around 0% price change. On the Y-on-Y basis, comparing 2015 prices with those in 2014, one can see that 2015 prices were most of the time lower than those in 2014, as the Y-on-Y change was below 0% throughout 2015 except in October and December.

As an alternative to the above price changes, we can also adopt a very widely used method in technical analysis called momentum. Momentum is the measurement of the speed or velocity of price changes (Investopedia, 2003). It can be used to measure the rate of a rise or fall in prices. From the standpoint of trending, momentum is a very useful indicator of strength or weakness in price. Basically, it

compares where the current price is in relation to where the price was in the past (On Line Trading, 2007).

Hence, CPO price was also analysed using the momentum approach on a M-on-M basis. This approach is aided by a scatter diagram (*Figure 4*), showing the various monthly momentums in 2015. The highest price momentum was recorded in July/August which had a negative growth momentum located at the third quadrant. Another one in September/October which was a positive growth momentum is located in the first quadrant. There were altogether six months in 2015 registering positive growth momentums (located in the first quadrant) and another

six months recording negative momentums located in the third quadrant.

In general, CPO price continued to exhibit a volatile and erratic movement pattern year after year.

PALM OIL PRICE AGAINST PRICES OF SELECTED OILS AND FATS IN 2015

There are 17 oils and fats produced, traded and consumed in the world market. Among these, the four major ones are palm oil, SBO, sunflower oil (SFO), and rapeseed oil (RSO). They compete for a share in the world market as they, especially palm oil and SBO, have almost similar applications due to their similar characteristics. Although they are said to be technically feasible to be applied in place of one another, they still face challenges in terms of affordability, acceptability and sustainability (Rushing and Lee, 2013). For palm oil, the form closest in nature with the other three oils is RBD palm olein because it is a processed oil, similar to SBO.

Another two oils, namely, coconut oil (CNO) and palm kernel oil (PKO), contain high levels of lauric acid (Gunstone and Nuzul Amri, 2011). Due to that, they are grouped under lauric oils which can be used in almost similar applications. Prices of these two groups of oils in 2015 are analysed in this paper.

Prices of the four selected oils and fats in 2015, *i.e.* RBD palm olein, SBO, RSO and SFO, are shown in *Figure 5*. Close associations among the oil prices are indicated, much more so in the first half of 2015 than in the second half of the year.
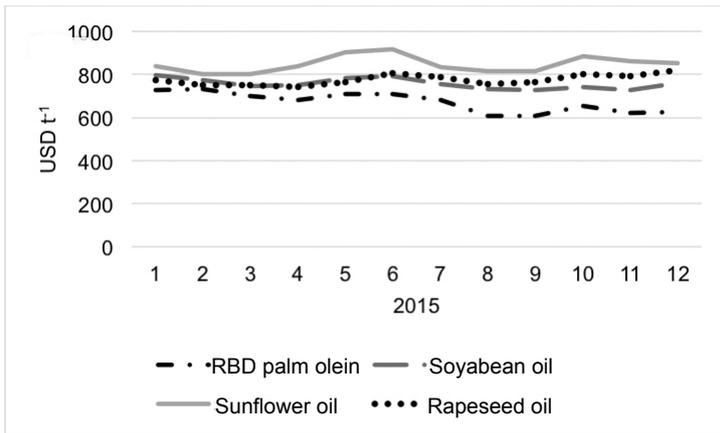
Source: Oil World (2015).
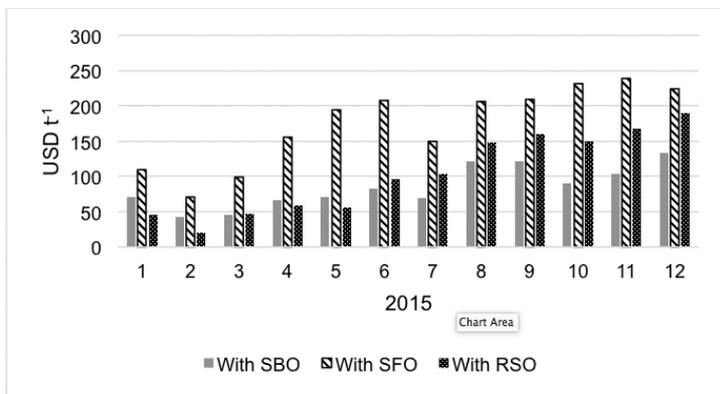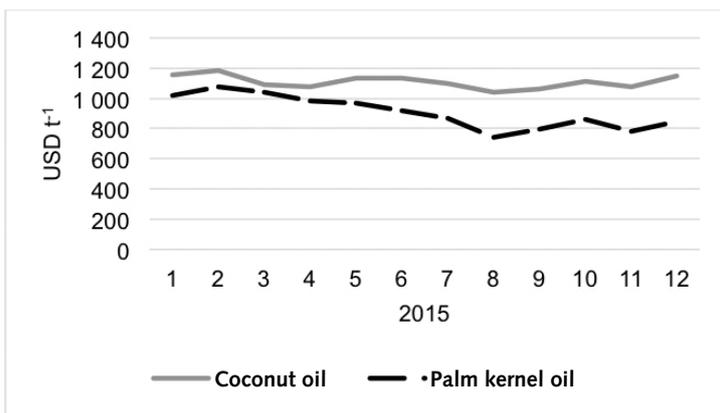
Figure 5. Prices of selected oils and fats in 2015.

Figure 6. Discounts of RBD palm olein price from the prices of its equivalent oils in 2015.

Source: Oil World (2015).

Figure 7. Prices of CNO and PKO in 2015.

It is also clear that the relationship between RBD palm olein and SBO prices was the strongest compared with the relationships of olein with the other two oils. The close relationship between olein and SBO is indicated by a correlation of 0.82, higher than the correlations for olein with SFO and olein with RSO. This close association is in line with their relationship in the past years as studied by Nuttayaporn (2006). This also confirms the belief of many analysts that the price of SBO is the most significant factor affecting palm oil price. Basri and Zaimah (2002), Ramli *et al*. (2007) and Ayat (2012) had also reported that SBO is a competitor to palm oil and has a positive relation with their cross price elasticity.

As mentioned above, palm oil (represented by RBD palm olein) price continued to be discounted by the other three oils, especially its main competitor, SBO, in 2015. This means that RBD palm olein continued to be sold at a cheaper price than its equivalent oils. *Figure 6* illustrates the magnitude of discounts of RBD palm olein price in relation to the other oils. It appears that the smallest discounts from SBO, RSO and SFO were registered in February. Olein price was much closer to RSO than to SBO and SFO prices. The discounts widened towards the end of 2015 with clear deviations of SBO, RSO and SFO prices from the olein price.

For the lauric oils, PKO and CNO prices were also associated with one another with a correlation of about 0.68 (*Figure 7*). CNO price exhibited a steady trend in 2015 which averaged about USD 1109 t^{-1} while that of PKO gradually de-trended towards the end of year. PKO price averaged at USD 909 t^{-1},

ranging from USD 742 (in August) to USD 1079 (in February). PKO price was lower in the second half compared with the first half of the year.

In this group of lauric oils, PKO price was also discounted by that of CNO in 2015 (*Figure 8*). Similar to olein, the discount over PKO price by CNO price increased in the second half of 2015.
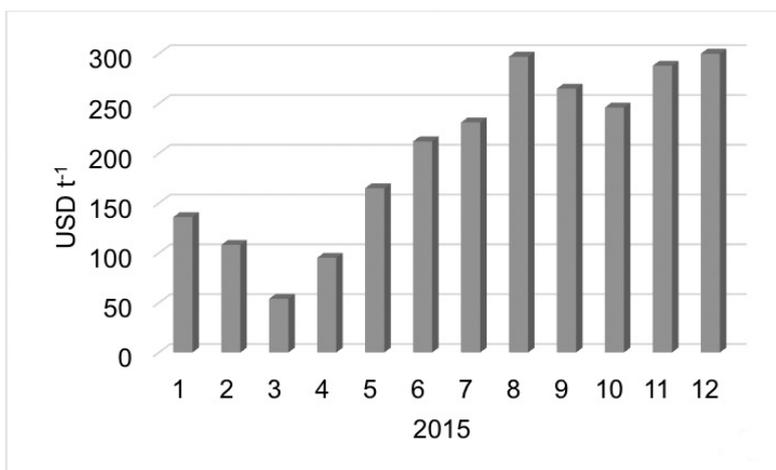

Figure 8. Price difference between PKO and CNO in 2015.

TABLE 1. SHORT- AND LONG-TERM FUNDAMENTAL AND SPECULATION FACTORS

Factor	Source	Outcome
A. **Fundamental factor**		
i) Supply Factors		
a) Production b) Stock c) Consumption d) World economic activity	a) Ayat (2012), OPF (2016) b) Mad Nasir *et al*. (1988), Fatimah and Amna Awad (2012) c) Mad Nasir *et al*. (1988) d) Mad Nasir *et al*. (1988), Trostle (2008)	a) Has a negative relationship with CPO price b) Price is highly sensitive to stock c) Price is highly sensitive to consumption d) Price is highly sensitive to world economic activity
ii) Demand Factors		
a) Export b) Population c) Biofuel d) Exchange rate	a) Ayat (2012) b) Trostle (2008) c) Shri Dewi *et al*. (2011) d) Trostle (2008)	a) Has a positive relationship with CPO price b) Increase in population increases demand c) Results in rapid production expansion d) Affected by dollar devaluation
iii) Price of Substitutes		
a) Soyabean oil	a) Basri and Zaimah (2002), Ramli *et al*. (2007) b) Ramli *et al*. (2007) c) Kantapon *et al*. (2012)	a) SBO – a competitor and has a positive relationship with CPO in price b) Similar characteristics and similar applications c) Has a positive relationship with CPO price
iv) Brent Crude Oil	a) Shri Dewi *et al*. (2011), Ayat (2012) b) Kantapon *et al*. (2012) c) Fatimah and Amna Awad (2012) d) Nazlioglu and Soytas (2012) e) Ghaitz and Awad (2011)	a) Crude oil price influences oils and fats prices b) Weak dependence on CPO price c) Can affect oils and fats prices d) Can affect oils and fats prices e) Can affect oils and fats prices
v) Futures Price	a) Chakriya.and Aasim (2004) b) Reichsfeld and Roache (2011) c) Nik Muhamad Naziman *et al*. (2013)	a) Futures can guide spot prices b) Futures can guide spot prices c) Futures can guide spot prices
B. **Speculation factors**		
i) Extreme weather phenomena ii) Impact of natural disaster iii) New policies/ regulations	a) Trostle (2008), Ayat (2012), OPF (2016) b) Ayat (2012) c) OPF (2016)	a) Adverse weather impacts price positively b) Indirect effect on price c) Exporter policies and importer policies affect prices

Palm Oil Price Factors

Like any other oils and fats, CPO price also depends on a lot of factors that vary according to time. It can be said that no one factor has been the sole cause of changes in the prices of CPO as well as of other oils and fats. According to Trostle (2008), there can be a mix of short- and long-term factors contributing to the changes in price at any one point in time.

Many analysts and experts have dealt with the factors affecting commodity prices. The literature search revealed a number of relevant factors which can be categorised into fundamental and speculation factors. Fundamental factors are clearly quantified and tested in various forms of models to show their significance in affecting prices, while speculation factors are usually in the form of news that can give a shock to the market, leading to changes in prices. These factors are generally known to be the driving forces of the market for oils and fats and not only for palm oil. The factors are tabulated in *Table 1*.

It is clear from *Table 1* that there are a number of relevant and significant factors which can affect prices of palm oil and other oils and fats. The effect is situational, meaning that at one point of time there can be a combination of factors.

As mentioned above, the fundamental factors consist of supply and demand, price of substitutes, brent crude oil and futures price while speculations are news which can be in the form of hearsay. Industry players sometimes speculate on shocking news that may cause prices to be bearish or bullish in the market. With the advance in communication technology, the speculative elements have become an important factor because they can be spread within seconds through the internet which provides speculators with first-hand information. Market players always monitor the changes in prices and attempt to relate them to the news. Meanwhile, analysts usually base their conclusions on past data to relate the role of fundamental elements to the changes in prices. In the complex oils and fats market, a combination of both fundamental elements and speculations has played an important role in futures.

CONCLUSION

Instability and volatility are common features of oils and fats prices as these features have continued to persist in 2014 and 2015. Prices of oils and fats fluctuate due to a number of factors, consisting of a mixture of short- and long-term factors. No one factor alone can cause price fluctuation, and past studies had affirmed the existence of relevant factors that can affect prices at any one point in time. In this modern world in which communication technology is much improved, speculation now plays an important role, and this has increased the complexity of the world market.

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