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Analysis of Hedging Price Policy to Financial Performance for Crude Palm Oil (CPO) Producers in Indonesia

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Abstract: ***This research analyses theimpacts ofthe implementation hedging price policyon the financial performance of Indonesian CPO producers. Prices of CPO havehigh volatility characteristic followingthe market mechanism, despite the fact that Indonesiais thelargest CPO producer in the world. This is becauseof the domestic CPO selling price still refers tothe International commodity market price. The volatility of CPO price has createdexposures to the price risk for CPO producers in Indonesia and to mitigate this risk, companiesused derivative instrument to encounter possible loss. Our research found there areonlyfew CPO companies (three firms) whose implemented hedging price policy. We analysed the financial performance of these three sample firms and evaluated their hedging decision using logistic regression. The results of this analysisshowed that in general firms who implemented hedging policies had better financial performance than those who did not hedge.***

Keywords: crude palm oil, financial ratio analysis, financial performance, hedging price, price risk

1. Introduction

Indonesia is considered as an agriculture-based economy with its contribution to the country's GDP amounted of 13.45 percent in2016. The plantation sub-sector ranked as the second largest contributor ofthe Country's agricultural GDP with its contribution around3.42 percent (BPS 2017) within which the Palm oil production contributed to 20 percent (2014)and 17,8 percent (2015) (Bank of Indonesia 2015).

Indonesia and Malaysia are the two largestCPO producers in the world.The production of CPOin Indonesia has recorded an increase every year between the period 2010-2016 as shown in Table 1. The majority of Indonesia CPO produtcsof around 70 percent was exported to many countries of five continents, with its main target markets are Asian countries such as India, Malaysia, Singapore and China; where the rest of the CPO product would be marketed domestically in the form of finished product such as domestic food, cosmetics, hygienic products and biofuel or biodiesel (Indonesian Ministry of Agriculture 2017).

Table 1: Production and Export of CPO Indonesia

Years	2010	2011	2012	2013	2014	2015	2016
Productions (Million tons)	21.8	23.5	26.5	30.0	31.5	32.5	32.0
Export (Million tons)	17.1	17.6	18.2	22.4	21.7	26.4	27.0
Domestic (Million tons)	4.7	5.9	8.3	9.8	8.3	6.1	5.0

Source: Central Bureau of Statistic, Indonesia (2010-2016)

Oil palm plantations in Indonesia are widely developed in the Sumatra island. Riau province is the largest palm oil producer with a contribution of 28.52 percentof the national production, followed by Central Kalimantan, Jambi, West Kalimantan and West Sumatra (Fauzi et al. 2014).Despite Indonesia is one of the world's largest CPO producer it could not control the CPO's price where fluctuation of domestic price or international price is pretty much in accordance to the market mechanism. The price occurs in the physical market has a positive correlation with the futures market (Yunanto 2009) because the futures price is based on *spot price*, eventhough futures market does not involve actual price (Shuldiner and Norkus 1996). In general, prices in the physical market are lower than prices in the futures market.

CPO's price has high volatility due to its dependency on market mechanisms and trade policies of importingcountries which controlled international commodity market (Amir 2008). Figure 1 shows the extreme fluctuation of CPO price year on year from year of 2006to 2016. High volatility which drives price fluctuations in the futures market consists of fundamental and technical factors. Fundamental factors include amount of exports and imports of CPO, the quota of a country's demand, substitution, CPO production and the commodity price trends as a whole; while technical factors are in the form of price trends from the previous period.

Gupta and Kaur (2015) state that crisis period is one of the factors that could drive an increase in hedging effectiveness due to high price volatility. This certainly could have a drawback for any research due to inconsistencies in conducting hedging policy and the possibility of the company behave more as a speculator. Jian (2015) who examines the structure of hedging at the time of financial crisis in America concluded thatmost companies believed hedging as a tool to prevent extreme losses which was reflected on hedging performance was at an all time high.

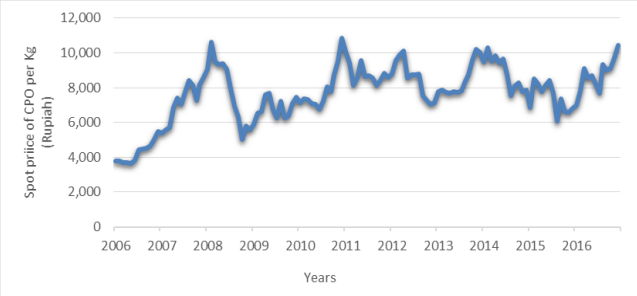

Figure 1: Graph of CPO's price movement year 2006-2016

Source: Central Bureau of Statistic, Indonesia (2006-2016)

Commodity prices are more volatile than foreign exchange rates and interest rates, thus creating price risks for domestic CPO shareholders, especially producers due to market uncertainty and vulnerability of the CPO prices against market conditions; or to simplify, commodity price risk represents risk sources of corporation (Bartram 2005). A wide cross-selection of developing nations in Asia, Latin America, Africa and the Pacifics largely show problems such as demand inelasticity, and, in some cases, supply uncertainty where world commodity prices tend to be much more volatile than those of manufactured goods.

The stockholders in commodity markets, consists of producers and exporters, are those who can influence market prices because they are related to the law of market equilibrium. On the other hand, these stockholders face the highest risk becauseprice movements are not only influenced by demand and supply but also by other factors such as speculative action, positive and negative issues and policies of the exporting countries and the importing countries. Sherlita's in 2007 found differences between countries were responsible to a considerable uncertainty in international trade caused by emergence of risks, including price risk, credit risk, interest rate risk and exchange rate risk.

It is well known in the CPO industry that the price risk is relatively high due to the seasonal and perishable characteristics of the produce and despite this not all CPO producers were encouraged to determine its hedging price policy. This is supported by Zheng and Wang research in 2011 where less than one percent of hedging being applied in the market; Velasco (2014)found a low level of hedging application in Philippines due to a low level of trust in effectiveness of hedging instrument to help reduce the risk. The main factors for the CPO producer in applying hedging policy are market imperfection, corporate income taxes, transaction costs (including bankrupt costs) and agency fees. In Indonesia, most CPO producers choose un-hedge or partial use short-term hedging policies depend on the state of the economy and market conditions. Thus, CPO producers divided into two groups, the first group is those firms who use hedging policy, and second who do not.

The overall objective of this paper is: to analyzethe impact of hedging price decision of CPO producer to the firm's financial performance.

2. Literature Review

Crude Palm Oil

Palm oil is one of the few vegetable oilswith high concentrations of saturated fat. The highly saturated nature of palm oil renders it solid at room temperature in temperate regions, though it will more often appear as liquid in warmer countries, making it a cheap substitute for butter or hydrogenation vegetable oils in cooking where solid fat is desirable. The use Palm oil is cooking mainly popular in Southeast Asia and tropical belt.Palm oil derived from the mesocarp of the of the fruit of the oil palms. Mesocarp consists of about 70 to 80% by weight of the fruit and about 40 to 45% of oil. The extracted oil is known as crude palm oil (CPO), CPO can be processed into derivative products as in Table 2.

Table 2: Process level of CPO products

Process Level	Product variety
Raw material level 1	Palm fruit, kernel palm oil, crude palm oil
Downstream products level 1	Palm kernel mill/expeller, crude palm stearin, crude palm olein, crude palm kernel olein, crude palm kernel stearin, refined bleached deodorized (RBD) palm stearin, RBD palm oil, RBD palm kernel oil, palm fatty acid distillate (PFAD)
Downstream products level 2	RBD palm olein in bulk & RBD palm olein in branding packaging, RBD palm stearin

Table 2: Process level of CPO products (continue)

Process Level	Product variety
Downstream products level 3 & 4	Margarine, shortening, solid soap, special fats (CBS or cocoa butter substitute & CBA).
	Lauric acid (surfactants), plasticizers, palmitic acid (candle- crayon), stearic acid (rubber grade), stearic acid (stabilizers, coating), oleic acids (surfactants), MCT (pharmaceuticals), PK Diethonamide (foam booster), alcohol (detergents), monodiglycerides (stabilizer)
	Gas metahne, hydrogen, listrik ET, pulp/Paper, Bricket H Carbon, bio-lubricant, particle board, anti oxydants (B-carotene, tocopherols, tocotrienols), mineral oil surfactant, bio-avtur (fuel-jet), bio-plastics and Bio-chemicals

Source: Indonesian Vegetable Oil Association

Risk

Riskcan be referred to as a loss due to the unexpected event that has occurred. Risk, however, can be prevaricated through, for example controlling scarcity risk and price fluctuations, providing assurance via insurance (self-insurance) and transferring risk to third parties with derivative instruments by contracting prices over a certain time.

There are 2 types of risk, according to Fahmi (2010), pure riskand speculative risk.Purerisk is classified further into three types of risk:

1) Risk of physical assets, is a risk that resulted in loss of physical assets of a company or organization
2) Employee risk is defined as a high-risk behaviour from employees that can harm a company/organisation.
3) Legal risk, the risk that counterparties to a transaction will not be liable to meet its obligations under law, or the

transaction was not sufficiently well-documented to be legally enforceable.

Speculative risk can be defined more into four types of risk:

1. Market risk, is a risk that occurs from market price movements.
2. Credit risk, is a risk that occurs since the counter party failed to meet its obligations to the company.
3. Liquidity risk, is a risk due to the inability to meet the cash needs.
4. Operational risk, a risk caused by inadequate or failed operational activities.

Risk Management of Commodity Price

The fluctuation in commodity prices which is directly related to income and purchasing power causes uncertainty and hinder the development of Indonesia's economyin which the agriculture sector has a key role.Nonetheless, the government interventionthrough monopoly policy, subsidies and pricing are not sufficient enough in creating a better and stable mechanism for commodity trading (Sofyan, 2010).According to Velasco (2014),derivatives instruments as risk management tools are influenced by three factors. Firstly, derivatives can be used to maximize shareholder value by mitigating market imperfections. Secondly, derivatives can be used to fix agency conflicts between management and shareholders. And lastly, derivative usage is influenced by the presence of other substitute tools that firms may use to curb these market imperfection costs.

Hedging Model

Refering to the the regulation of Bank of Indonesia No. 15/8/PBI/2013 hedgingis defined as a technique to reduce the risks that arise and expected to arise due to price fluctuations in spot markets. The essence of hedging is to act as astrategy to reduce risk and is more popular in futures market. Hedging can be constructed from many types of financial instruments, which basically is an agreement contract between two or more parties with set time and price, such as future contracts, forwards contracts, options and swaps. Hedging instruments are used to manage risk of uncertainty, liquidity and reliability price of the underlying asset and to importance act with optimal pareto allocation of new investment fund. Hedging also acts as an insurance mechanism to cover risk of price and scarcity stock of commodity. Short position in hedge is used by producer who believes if futures price during delivery period are higher than that of spot price on the delivery of underlying asset. Hedging is popular in developed market as well as emerging market like Indonesia.

The Indonesian Commodity Futures Trading Regulatory Agency (Bappebti) provides guidance of benefits of hedging for a hedge (2014) as the following:

1. Hedging is a means of reducing or eliminating the risk of loss resulting from price fluctuations.
2. Hedging provides business certainty as well as controlling the supply of raw materials and agricultural commodities.
3. Hedging provides greater and safer funding. Non-hedged commodities will generally get a loan / bank loan at 50% of the value of the commodity, while for hedge commodities will get a loan of 90 % of the value of the commodity.

According to Wijaya (2002) a futures exchange is an institution established on membership basis that provides services organizing and supervising transactions in the futures market, in accordance with applicable laws and regulations. The world's modern futures exchange commenced in Chicago, US circa 1800, commodity producers and users agreeing to mitigate potential risks caused by price fluctuations due to changes in commodity stock. (Wijaya 2002). For Indonesia futures and option exchange or market, ICDX was established in 19 August 1999 and started its activities in 5thDecember 2000 until today with metal energy and agriculture commodities.

The strategic role of futures exchanges is as a hedging instrument to reduce the risk of price changes as a result of buying and selling transactions, exchange rate changes, interest rates and inflation. Hedging is done by taking a position opposite to its position in the physical market, if there is an increase in physical market prices, this price increase can be offset by the futures market gain, and vice versa. Another strategic role of futures exchange is as a place of price formation (price discovery). Commodity Future Market (Commodity Future Market) is overseen by Bappebti according to the Law no. 32/1997 on commodity futures trading Bappebti conducts coaching, regulation and daily supervision of merchandise activities under the trade ministry.

Derivative products that can be used for price hedging strategies are future contract, forward contracts, option contract and swaps.

Future Contract

A futures contract according to Sofyan (2000) is a legal agreement to buy (long position) or sell (short position) an underlying asset (financial or non financial assets) at a predetermined price and at a specified time in the future in which the delivery is in cash settlement. The buyer of the futures contract will make a profit when the futures price is higher than the initial futures price. The profit function between the seller and the buyer of the future is symmetrical due to the symmetric exposure.

Forward Contract

Wijaya's definition of forward contract (2002) is a legal agreement between the buyer and the seller for a specific commodity, which determine the quantity, price, delivery time and delivery location. At forward contract the price has been agreed upon today andthe delivery will be at maturity of the commodity or specified future time, or also known as 'looking in'. Forward contract is almost equal to the futures contract(Sofyan2000), but there are differences among them as follows:

Characteristics of forwards contract:

1. Contract created in the OverTheCounter (OTC) market
2. Customised contract terms hence less liquid

3. Generally there is only delivery date
4. Settlement is executed at the end of the margin trading contract period

Characteristics of futures contract:

1. The contract is traded on an exchange's clearing house (listed)
2. Standardised contract terms
3. Multiple delivery dates within one period
4. Follows daily settlement through agreed mechanism
5. Contracts are generally terminated (close out position)

Option Contract

An option contract gives the buyer the right, but not an obligation, to exercise the options. A call option gives the right to buy whereas a put option gives the right to sell the underlying assets at an agreed-upon price (strike/exercise price), for delivery at a specified time in the future (expiration date). Option buyer (either call or put) is charged anoption premium by an options seller (option writer) whose value is relatively small compared to its underlying asset price.

Swaps

Swaps refers to a limited agreement between the parties concerned to an exchange of cash flow, which takes place at a specified time in the future at a set price in current time.

Financial Performance Analysis

Financial performance analysis is an appraisal for financial report of a company through financial ratio, and in this study we used five finance ratios: liquidity ratio, activity ratio, leverage ratio, profitability ratio and market ratio.

1. Liquidity ratio

According to Sawir (2001) liquidity ratio measures the company's ability to meet its financial obligations when they become due.

$$\text{Current ratio} = \frac{\text{Current asset}}{\text{Current liability}}$$

$$\text{Quick Ratio} = \frac{\text{Cash} + \text{Stock} + \text{AR}}{\text{Current liability}}$$

$$\text{Cash Ratio} = \frac{\text{Cash} + \text{Stock}}{\text{Current liability}}$$

2. Activity ratio

Activity ratio measure how effectively the company utilities all resources that exist in its control (Helfert 1996). Activity ratios assume that there should be a proper balance between sales and asset elements i.e. inventories, accounts receivable, fixed assets and other assets.

$$\text{Account Receivable turnover} = \frac{\text{Total AR}}{\text{Average of AR}}$$

$$\text{Inventory turnover} = \frac{\text{COGS}}{\text{Average of Inventory}}$$

$$\text{Total Asset Turnover} = \frac{\text{Total sales}}{\text{Average of total asset}}$$

3. Leverage ratio

Sawir (2001) defines leverage ratio function as a financial measure of a company's ability to meet all its financial obligations should the company be liquidated.

$$\text{Debt Ratio} = \frac{\text{Total liability}}{\text{Total asset}}$$

$$\text{Debt to Equity Ratio} = \frac{\text{Total Liability}}{\text{Equity}}$$

$$\text{Capital Structure} = \frac{\text{Long term debt}}{\text{Long term liability}}$$

4. Profitability ratio

According to Utari et al. (2014)a profitability ratio is a measure of profitability of a company.

$$\text{Net Profit Margin} = \frac{\text{EAT}}{\text{Total sales}}$$

$$\text{Rate of Return on Total Asset} = \frac{\text{EBIT}}{\text{Total Asset}}$$

$$\text{Return on Equity} = \frac{\text{EAT}}{\text{Average of equity}}$$

5. Market ratio

According to Sawir (2001) market ratio is valuation of company for investors.

$$\text{Price Earning Ratio} = \frac{\text{Stock price}}{\text{Earning stock}}$$

$$\text{Book Value per Share} = \frac{\text{Equity}}{\text{Number of stock}}$$

$$\text{Dividend Payout} = \frac{\text{Dividend per share}}{\text{Earning per share}}$$

3. Data and Methodology

Data was gathered from 16 population of CPO producersregistered at IDX between 2010to 2016, by applying sampling technique of purposive sampling methodwhilst using the following criteria:

1) Regularly publishing its annual financial statements
2) Never delisting from IDX

3) Regularly issued its annual financial report at end period on 31st December

The sampling acquired six companies as its samples: 1) PT Astra Agro Lestari Tbk; 2) PT London Sumatera Indonesia Plantation Tbk; 3) PTSampoerna Agro Tbk;4) PT Astra Agro Lestari Tbk; 5) PT Sinar Mas Agro Resources and Technology Tbk; 6) PT Bakrie Sumatra Plantation Tbk.

The hedging strategies covered in this research will be applied to future contract and forward contract in local future market in Indonesia and carried out by Indonesian CPO producers. Annual data is used in this study and the analysis financial performance is conducted through calculating five financial ratios of each company selected in the research sample.

Financial Performance of Indonesian CPO Producer

In analyzing the financial performance of CPO producer through its financial reporting, the method was by calculating the financial ratio by performing cross sectional analysis or focusing in one industry within same period (Sjahrial 2012). The study uses 5 ratios including liability ratio, activity ratio, leverage ratio, profitability ratio and market ratio. In real world future commodity markets, standardized ratio used include current ratio, quick ratio, and cash ratio forms of hedging instruments are only available, such as future contract and forward contract on futures market.

Hypothesis

Refer to research of Nur (2013) concludes that companies that do hedging have better financial performance than those who do not, which then drive the confidence of market in the value of the company. This research summaries the beginning conclusion for hypothesis as below:

H_0: Hedge companies have better financial performance than non-hedge companies

H_1: Hedge companies have worse financial performance than non-hedge companies

4. Result and Analysis

The CPO industry is considered as an imperfect market. In addition to supply and demand factors, CPO prices are also influenced by socioeconomic conditions and market global (Walker 1996).If companies operate in imperfection market, they will face the price risk which lead them either to make speculative dealing or do not make optimal static hedging decisions or keep silent using available information (Brown and Khokher, 2007). Giaccotto et al. (2001) added that to decentralized risks a company can make a division of sales method that is partly done in the spot market and partly in the futures market, thus divides the possible losses due to price changes between spot price and forward or future price are correlated negatively.

Table 3 grouped the CPO producer companies into two categories based on their hedging decision: 1) Listed in ICDX (use futures market for commodity selling), and 2) Not listed in ICDX (use conventional market for selling).

Table 3: Classification of CPO Producers in Indonesia

Indonesian CPO Producer	Date of listed in ICDX
I. Hedge Companies	
• PT Sampoernna Agro Tbk	16 Jun 2010
• PT Sinar Mas Agro Resources and Technology Tbk	29 Jan 2010
• PT Bakrie Sumatera Plantation Tbk	8 Oct 2010
II. Non-Hedge Companies	
• PT Astra Agro Lestari Tbk	-
• PT PP London Sumatera Indonesia Tbk	-
• PT Tunas Baru Lampung Tbk	-

Liquidity Ratio or Working Capital Analysis

The liquidity ratio measures the company's ability to pay its short-term debt. Table 4 shows hedge companies have a higher rate of liquidity ratio than non-hedge companies. This shows that the ability of hedge's working capital to meet its short-term obligations is greater than non-hedge. The result by statistic shows quick ratios and cash ratios related to hedging policy ($p < 5\%$).

Table 4: Comparison of variable between hedge and non-hedge by liquidity ratio year 2010-2016

Variable	*Mean*		*Mean Difference*	
	Hedger (H)	Non-Hedger (NH)	(H)- (NH)	p-value
Current Ratio	1.069	1.07	0.62	0.11
Quick Ratio	1.14	0.48	0.66	0.04
Cash Ratio	1.16	0.30	0.86	0.02

Leverage Ratio or Debt Management Analysis

The leverage ratio measures the percentage of company assets financed by its debt. Applying 3 ratios of debt ratio, debt to equity ratio and capital structure found that non-hedge companies show a greater degree of leverage than hedge companies which means non-hedge company using assets and capital to pay its debts as shown in Table 5. Firms that do price hedging tend to maintain the stability of assets owned although there is no relationship between hedging policy with corporate leverage level (p-value> 0.05). Firms with high leverage rates are more susceptible to a bankruptcy due to failure to pay their debts (Tampubolon 2013).

Table 5: Comparison of variable between hedge and non-hedge by leverage ratio year 2010-2016

Variable	*Mean*		*Mean Difference*	
	Hedger (H)	Non-Hedger (NH)	(H)- (NH)	p-value
Debt Ratio	0.24	0.56	-0.31	0.9
Debt to Equity Ratio	0.35	1.92	-1.37	0.6
Capital Structure	0.14	0.59	-0.44	0.9

Activity Ratio

Activity ratio is used to measure the effectiveness of companies in utilizing their assets to generate revenues. The study used receivable turnover account, inventory turnover and total asset turnover, to measure the company's activity ratio. It is found that receivable turnover of hedge companies are higher than non-hedge companies. On the contrary, inventory turnover of non-hedge companies are higher than non-hedge companies.

Table 6: Comparison of variable between hedge and non-hedge by activity ratio year 2010-2016

Variable	*Mean*		*Mean Difference*	
	Hedger (H)	Non-Hedger (NH)	(H)- (NH)	p-value
AR Turn Ratio	138.43	21.88	116.55	0.28
Inventory Turn Over	3.43	8.76	-2.33	0.01
Total Asst Turn Over	0.22	0.68	-0.46	0.52

Profitability Ratio (Profitability Analysis)
Profitability ratio shows the ability of management in generating profit by using the ratio of net profit margin, ROA and ROE as shown in Table 7; the average profitability level of the hedge companies is relatively better than the non-hedges.

Table 7: Comparison of variable between hedge and non-hedge by profitability ratio year 2010-2016

Variable	*Mean*		*Mean Difference*	
	Hedger (H)	Non-Hedger (NH)	(H)- (NH)	p-value
Net Profit Margin	0.16	0.12	0.04	0.04
ROA	0.15	0.15	0.01	0.16
ROE	0.08	0.10	-0.02	0.85

Market Ratio (Valuation Analysis)
The market ratio measures the value of the company in the eyes of investors by using the ratiosare price of earning ratio, book value per share and dividend payout. Based on the results of Table 8, hedge companies have higher corporate prospects, this means that hedge companies are valued by the public and investors have better business prospects and higher returns.

Table 8: Comparison of variable between hedge and non-hedge by market ratio year 2010-2016

Variable	*Mean*		*Mean Difference*	
	Hedger (H)	Non-Hedger (NH)	(H)- (NH)	p-value
Price Earning Ratio	1.560	7.19	8.41	
Book Value per Share	2804.93	1530.46	1274.47	
Dividend Payout	0.32	0.20	0.12	

5. Conclusion and Recommendation

5.1 Conclusion

The financial performance of CPO producer who *applied* price hedging (hedge)is relatively better compare to those who *did not applied* price hedging (non-hedge). This phenomenon can be explained because hedge companies had anticipated the possibilities of risk occurrence in the future and become more alert with potential risk.

The liquidity ratio, profitability ratio and market ratio of hedge companies were higher than non-hedge companies. On the other hand, the leverage ratio of non-hedge companies is higher than hedge companies.

5.2 Recommendation

This research examinedprice hedging policy for CPO commodity producer toward the financial performance between 2010 to 2016 whereby both global crisis and normal market condition occurred. Further investigation is recommended to analyze the impact of the financial crisis had on financial performances of the hedged companies and non-hedged companies.

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Author Profile

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