

The Impact of Firm-Specific Risk on Exchange Rate (Evidence from Indonesia, Malaysia, and Thailand)

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One of the risks that are inherent to export is the exchange rate. Exchange rate exposure can be measured by identifying systematic risk. Systematic risk consists of country-specific risk and firm-specific risk that is an unsystematic risk. Studies on exchange rate exposure of palm oil especially on firm-specific risk are limited, so the purpose of this research is to fill the gap. This research method is a modified formula of the exchange rate used by Jorion (1990), which consists of two risks, namely country-risk and firm-specific risk. The results show that the coefficient of correlation and multiple linear regression analysis of firm-specific factors significantly influence the exchange rate exposure. The determinant of firm-specific risk that has a significant value consists of market-to-book value, the quick ratio and the openness from a country-specific risk. The volatility of the exchange rate exposure can be influenced by 18.09% with firm-specific factors.

Key words: *Firm-specific, exchange rate exposure, palm oil.*

Introduction

The economic system of a country aims to grow the nation (Miles and Scott, 2005). Economic policies determined by the government are interrelated with changes in science, politics, technology, society, culture, and the defence and security of a nation. The rapid development of science and technology in the last few decades has impacted the boundaries of a country, so that its economic activities are linked to those of other countries. The era of globalization demands changes in the economic system of some countries, including Indonesia and other ASEAN (Association of Southeast Asian Nations) countries.

One of the commodities that has a competitive advantage in ASEAN countries is palm oil. Since 2005, global consumption of palm oil has succeeded in shifting the consumption of

soybean oil in the worldwide production of oil and fats (Oil World Annual, 2018). The high level of world demand for palm oil has spurred countries to increase productivity. Palm oil producers in the international market are not only from Indonesia. Other countries may gain a competitive advantage as they produce the same product. Palm oil producing countries are generally countries in the tropical climate zone because palm oil can physiologically develop optimally in this climate. Of the 13 producing countries, the top three countries are from the ASEAN region, namely Indonesia, Malaysia, and Thailand (please refer to Table 1).

The role of the palm oil sub-sector for several ASEAN countries, especially Indonesia, is important, in relation to contributions to the balance of payments of each country. The balance of payments in a certain period determines the amount of foreign exchange of a country which is generally in units of hard currency, namely the US dollar. The greater the export of a country, the more surpluses in foreign exchange that lead to the appreciation of the domestic currency (Eiteman, Stonehill, and Moffett, 2010).

Table 1: World Palm Oil Producers: 2008-2018 (thousand tons)

Country	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Indonesia	20500	22000	23600	26200	28500	30500	33000	32000	36000	39500	41500
Malaysia	17259	17763	18211	18202	19321	20161	19879	17700	18858	19683	20800
Thailand	1540	1287	1832	1892	2135	2000	2068	1804	2500	2780	2900
Nigeria	850	850	971	970	940	880	940	955	990	1025	1015
Colombia	778	805	753	945	974	1041	1110	1268	1099	1633	1625
Papua New Guinea	501	510	488	580	520	500	537	570	650	630	630
Ecuador	418	429	380	473	539	499	484	520	565	573	580
Cote D'Ivoire	345	330	360	371	418	415	415	415	486	483	514
Honduras	280	275	320	395	425	460	470	490	620	580	580
Brazil	240	250	270	310	340	370	400	415	485	500	525
Costa Rica	199	206	227	242	256	300	203	188	251	270	270
Guatemala	194	177	231	291	365	434	510	625	740	852	852
Venezuela	94	74	21	15	15	15	15	15	15	15	15
Total	43198	44956	47664	50886	54748	57575	60031	56965	63259	68524	71806

Source: Oil World Annual, 2018 (reprocessed)

International trade is very closely related to the international payments using different currencies. The difference in the value of the currencies of the palm oil producing countries and their consuming countries poses an exchange rate risk in trade transactions. Exchange rate volatility causes the value of the firm to change. Firm-value volatility is caused by transactional and operational activities with different currencies (Eiteman, Stonehill, and Moffett, 2010).

The risk of exchange rate is a macroeconomic risk of a systemic nature. This cannot be ignored by every company because the risk of a country's exchange rate can be a tequilla effect for other countries. The decline in the value of the Asian currencies against US Dollar from about July 1997 to December 1997 widely spread across Asian countries, such as the Thai Bath, the South Korean Won, the Malaysian Ringgit, the Phillipines Peso, the Taiwanese Dollar, the Singaporian Dollar, the Indian Rupee. The decline in the currencies will impact not only the financial crisis, but also a political and social crisis that is already extremely bad (Miles and Scott 2005).

Moreover, exchange rate exposure is a measure of profitability, net cash flow, and market value of the potential of a company against the change caused by the exchange rate (exchange rate). The responsibility of a financial manager is to measure the value of the exchange rate exposure and manage finances in order to get maximum profit, cash flow, and market value. Some of these financial elements are relative references assessing the success of the company (Eiteman, Stonehill, and Moffett, 2010).

Many studies have shown that hedging activity reduces the exchange rate exposure. Research by Nance, Smith, and Smithson (1993), He and Ng (1998), Muller and Vershoor (2006), and Hutson and O'Driscoll (2010) has taken several approaches to estimate the exchange rate exposures that occurs at the company level by detecting exposures after the company has carried out exchange rate risk management. The study divides the cross-sectional regression into two specific factors: country-specific factors and firm-specific factors.

Country-specific is proxied by trade openness variables. Bodnar and Gentry (1993) examined the relationship of exchange rate exposure with industry characteristics in US, Japanese, and Canadian companies. The research shows that the involvement of macroeconomic factors such as state openness contributes to the exchange rate risk. Chen, Naylor, and Lu (2004) examined the hypothesis that openness in small countries is more sensitive to the exchange rate risk than in the US. This is because companies in the US have specific characteristics in the US market, such as low exchange rate, pass rates, and cash flow models that show the size of US companies. Firm-specific risk can be viewed from several factors that are closely related to hedging activities, including company size, company growth, and company liquidity.

Prior research has focused on how to investigate the relationship between a country and firm specific factors with exchange rate exposure. For instance, Hutson and O'Driscoll (2010) showed that the exchange rate exposure rates of companies in the euro zone and non-euro zone increased since the introduction of the euro. Muller and Vershoor (2006) found that companies with low liquidity positions tend to have smaller exposures. He and Ng (1998) discovered that about 25 percent of multinational companies in Japan had positive and economically significant exposures for the period of January 1979 to December 1993. The exposure was explained

by the export ratio and hedging variables. Measurement of exposure is proxied from firm size variables, export ratios, dividends, quick ratios, and debt to equity ratio. The research shows that companies that have high levels of debt, and low liquidity have a low exposure tendency. However, not enough studies have sufficiently discussed exchange rate exposure in the palm oil sector, specifically in ASEAN countries. This research gap is the reason for this research.

Based on the background of the research that has been described previously, some of the research questions in this study include: What is the influence of country-specific risk and firm-specific risk on the exchange rate exposure level of oil palm sub-sector companies? The aim of this study is to investigate the influence of country-specific risk and firm-specific risk on the level of exchange rate exposure of oil palm sub-sector companies.

Literature Review

Exchange rate is a measurement of the level of a currency that can be exchanged for another currency or the price of that currency (Eiteman, Stonehill, and Moffett, 2010). Exchange rate exposure is a measurement of profitability, net cash flow, and the potential market value of a company against changes caused by the exchange rate. Many companies try to manage exchange rate exposure with hedging activities. Hedging is taking a position to get a cash flow, asset, or contract that will potentially increase or decrease the value, and balance it with the previous position. The main objective of hedging is to protect company assets from losses due to exchange rate exposure.

Madura (2006) explains that hedging is an action taken to protect a company from exposure to exchange rates. Hedging consists of on-balance-sheet instruments in the form of liquidity reserves and off-balance-sheet instruments such as futures, forward, and options. In general, hedging is synonymous with the use of off-balance-sheet instruments. Many studies have shown that hedging activity reduces exchange rate exposure. Nance, Smith and Smithson (1993), He and Ng (1998), Muller and Vershoor (2006) and Hutson and O'Driscoll (2010) have made several approaches to estimate exchange rate exposure that occurs at the company level by detecting exposure after the company carries out the risk management exchange rate. The research divides cross-sectional regression into two specific factors, namely the country-specific factor or country-specific, which could potentially influence the incentives faced by managers and firm-specific factors that have been investigated and influence the hedging decisions of financial managers.

Jorion (1990) measures exchange rate movements along with capital market movements which simultaneously influence stock prices as a measure of firm value. This regression utilizes measurements with the market model. This is based on the assumption that capital markets

react quickly to exchange rate movements. Besides that, some research in Indonesia by Sumiati (2004) analyzed the influence of market returns and several macroeconomic factors on stock returns. It showed that the return market is the most influential factor on individual stock returns. Country-specific risk is proxied by the trade openness variable. Bodnar and Gentry (1993) examined the relationship of exchange rate exposure with industry characteristics in US, Japanese, and Canadian companies. The study shows that the involvement of macroeconomic factors, such as state openness, contributes to the exchange rate risk. Therefore, the first hypothesis of this research is:

H1: Country-specific risk has a positive effect on exchange rate exposure.

Firm-specific risk can be viewed from several factors that are closely related to hedging activities, including company size, company growth, and company liquidity. These three components are described in more detail and are divided into several variables as a proxy for firm-specific factors.

Firm Value

The size of a company is proxied by market value. Market value reflects the value of the company's current wealth. Market value is a measurement of the firm size of a company where the company can experience failure or success. Market value is a fundamental factor that plays a role in exchange rate sensitivity (Apergis, Artakis, and Sorros, 2011). It is explained that small companies tend to be more sensitive to the exchange rate movement than large companies (Dominguez and Tesar, 2006). Market value is a determinant of exchange rate sensitivity for two possible reasons. The first is the probability of large companies hedging against exchange rate exposure because hedging activities indicate the company's economies of scale (Hagelin and Pramborg, 2006). Second, large companies are more likely to be multinational companies (Agarwal and Ramaswami, 1992) and these companies operate across countries that are associated with exposure (Pantzalis, Simkins, and Laux, 2001). Therefore, the second hypothesis of this research is:

H2: Firm value has a positive effect on exchange rate exposure.

Company Growth

Company growth is proxied by the market to book value. Geczy et al. (1996) used the company's market to book value (MTBV) ratio as a proxy for company growth. MTBV is calculated as the ratio of company size compared to the year-end book value. The company's growth rate is measured by looking at the MTBV ratio. Investors predict that companies with high growth will produce positive earnings.

Hutson and O'Driscoll (2010) use a proxy that explains the level of value of firm. Value of firm is the level of the investors' assessment of company performance. Overall, company's activities aim at the welfare of shareholders if they override agency problems. Companies with large MTBV values are trusted by investors to have growth and good future prospects. Companies that are growing generally have high investment. Therefore, company funds are rarely allocated to hedging.

Market to book value is the value of the ratio of total equity per share to the value of the investment in the market. Total equity is the previous investment cost recorded at that time. The investment value is then assessed by investors; that is, how much investors value the company's investment will contribute to company profits, and then the value in the market will increase, or vice versa. Therefore, the third hypothesis of this research is:

H3: Company growth has a positive effect on exchange rate exposure.

Company Liquidity

Company liquidity is proxied by two variables, namely quick ratio and dividend payout ratio. Nance, Smith, and Smithson (1993) explain that hedging instruments are divided into two, namely off-balance-sheet and on-balance-sheet. These instruments have different characteristics, and the use of off-balance sheet requires a lot of funds, thus reducing the company's quick ratio. On the other hand, on-balance-sheet instruments require excessive funds, especially in the form of foreign currencies to facilitate all foreign transactions. This certainly requires the company to have a lot of current funds which can be seen from the high quick ratio.

Quick ratio or acid test is a ratio that explains the level of company liquidity without involving inventory. Supplies are ignored in the quick ratio because inventory is considered the most difficult asset to be disbursed. A record of the book value of inventory is less reliable with market value because of the quality that is declining due to storage or other damage. In addition, the inventory of a company is relatively not in accordance with the actual amount of market consumption, so that the proportion of excess inventory occurs. Therefore, the fourth hypothesis of this research is:

H4: Quick ratio has a positive effect on exchange rate exposure.

Along with the liquidity proxy above, the purpose of the dividend policy payout ratio is the proportion of corporate compensation to the shareholders for the amount of investment that has been given. This value becomes important for investors as a basis for investment preferences.

In order to seek regular dividend payments, companies must guarantee the availability of large amount of cash, so that the remaining operations can pay dividends. Therefore, companies use off-balance-sheet hedging to protect the expected value of the exchange rate risk. Therefore, the fifth hypothesis of this research is:

H5: Dividend policy has a positive effect on exchange rate exposure.

Material and Methods

The data sources in this study are limited to only 2008-2018 using secondary data from Datastream, Thomson Reuters Eikon, and the World Bank. The following data and data sources will be used in this study:

- The weekly stock prices of the oil palm sub-sector companies that have been adjusted in stock over a ten- year period from January 2008 to December 2018 in Indonesia, Malaysia, and Thailand from Datastream. Datastream's code is P.
- Dividends of company oil palm sub-sector over a period of ten years since January 2008 to December 2018 in Indonesia, Malaysia, and Thailand that are obtained from Datastream Thomson Reuters Eikon.
- The weekly joint stock price index over a ten- year period from January 3 to December 2018 in Indonesia and Malaysia. Datastream's D code is JAKCOMP, FBMKLCI, and BNGKS50.
- Weekly trade-weighted exchange rate index over a ten-year period from January 2008 to December 2018 in the countries of Indonesia, Malaysia, and Thailand. Datastream's code is JPMIDNB, JPMMYNB, and JPMTHNB.
- Openness of country over a period of ten years from January 2008 to December 2018 in the countries of Indonesia, Malaysia, and Thailand. The data were obtained from the World Bank.
- The company's annual market value of the palm oil sub-sector over a period of ten years from January 2008 to December 2018 in Indonesia, Malaysia, and Thailand. Datastream code is MV.
- The company's annual market to book value of the palm oil sub-sector over a ten- year period from January 2008 to December 2018 in the countries of Indonesia, Malaysia, and Thailand. Datastream's code is MTBV.
- The company's annual quick ratio of the palm oil sub-sector over a ten- year period from January 2008 to December 2018 in the countries of Indonesia, Malaysia, and Thailand. Datastream's code is WC08101.

- The company's annual dividend payout ratio of oil palm sub-sector during the ten - year period from January 2008 to December 2018 in Indonesia, Malaysia, and Thailand. Datastream code is POUT.

Exchange Rate Exposure Measurement Model

Jorion regression is a model to measure changes in exchange rates to stock returns by controlling market returns. The value of the coefficient of the exchange rate can be obtained by regressing the free variable return of the market and the trade-weighted exchange rate to generate returns stocks as the dependent variable (Jorion, 1990). The model can be written in the following formula 1:

$$1. \quad r^{i,j} = \alpha^j + \alpha^j R^j + \alpha^j S^j + \varepsilon^j_t$$

Information:

$r^{i,j}_t$: stock return I to country j

R^j_t : composite stock index return in period t in country j

S^j_t : trade-weighted exchange rate in period t in country j

Firm-Specific Risk Measurement Models

Measurement model of firm-specific risk is presented by Hutson and O'Driscoll (2010). Firm-specific risk model takes into account the company - specific factors that affect the exchange rate exposure. These factors are financial statement data or stock exchange activity to measure the exchange rate exposure.

This model developed that of Nance, Smith, and Smithson (1993). The difference between these two models is that there is an overall element of the ratio that is proxied as a hedging value, whereas in this model the elements are summarized. Removal of some proxy components refers to components that are empirically significant. The model can be written in the following formula 2:

$$2. \quad \Psi_i = \lambda_0 + \lambda_1 OPEN_{j,i} + \lambda_2 MV_i + \lambda_3 MTBV_i + \lambda_4 QR_i + \lambda_5 DIV_i + \varepsilon_i$$

Information:

Ψ_i : absolute root of the coefficient of stock i derived from the first equation

$\lambda_1 OPEN_{j,i}$: openness of state j with stock i

$\lambda_2 MV_i$: market value stock i

$\lambda_3 MTBV_i$: market to book value stock i

$\lambda_4 QR_i$: quick ratio stock i

$\lambda_5 DIV_i$: dividend payout ratio stock i

The variables used in this study are important to explain in order to avoid biases. The explanation aims to make collecting research data and data processing easier because it specifically shows the object of research and research instruments. Therefore, all important variables are precisely defined.

A dependent variable is a variable that is influenced by an independent variable. The dependent variable used in this study is the absolute root of the exchange rate exposure coefficient from the Jorion (1990) regression results. Exchange rate exposure is the level of exposure for exchange rates that occur in each company. The stock prices and dividends of each company are simultaneously regressed together with each country's benchmark, namely the market return and trade-weighted exchange rate. After the regression is done, the coefficient for the exchange rate exposure variable is then known. The coefficient value will later be used for firm-specific exposure regression.

An independent variable is the determinant variable of a dependent variable. The independent variables used in this study are divided into two main factors, namely the country risk factor which is represented by the level of openness of each country and the firm-specific risk factor as a specific measure of each company. Firm-specific independent variable used for firm-specific exposure is the specific size of each company derived from financial statements and trading activities on the stock exchange between market value, market value dummy, debt to assets, market to book value, quick ratio, and dividend payout ratio. The value of each variable is derived from the following calculation:

a. Openness. The measurement scale used to calculate openness of each country is the scale used by World Bank (2018). The openness can be written in the following formula 3:

$$3. \text{ Openness} = \frac{\text{Export} + \text{Import}}{\text{GDP}}$$

b. Market Value. The measurement scale used to calculate the market value of each company is the scale used by Ross (2010). The market value can be written in the following formula 4:

4.
$$\text{Market Value} = \text{Total Standing Share} \times \text{Share Price}$$

c. Market to Book Value. The measurement scale used to calculate the market to book value of each company is the scale used by Ross (2010). The market value can be written in the following formula 5:

5.
$$\text{Market to Book Value} = \frac{\text{Market Value}}{\text{Book Value}}$$

d. Quick Ratio. The measurement scale used to calculate the quick ratio of each company is the scale used by Ross (2010). The market value can be written in the following formula 6:

6.
$$\text{Quick Ratio} = \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}}$$

e. Dividend Payout Ratio. The measurement scale used to calculate the dividend payout ratio of each company is the scale used by Ross (2010). The market value can be written in the following formula 7:

7.
$$\text{Dividend Payout Ratio} = \frac{\text{Cash Dividend}}{\text{Net Income}}$$

This study uses a sample of oil palm sub-sector companies that have gone public since January 2008 in three countries. After the sample selection meets the criteria, there are 25 companies that can be used as research samples. The company is the object of firm-specific exposure research by using secondary data in the form of several company sizes that have been explained in the previous chapter.

Table 2: Sample Selection Procedure

Stages	Criteria	Indonesia	Malaysia	Thailand	Total
1	The oil palm sub-sector companies in three countries	10	32	3	45
2	Palm oil sub-sector companies in three countries have conducted an initial public offering	5	23	2	30
3	Company palm sub-sector in the three countries that has value for the entire variables used	5	18	2	25

Source: processed

Results and Discussion

Table 3: OLS Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.727821	0.082232	8.850820	0.0000
Openness	0.001668	0.000811	2.057591	0.0409
MV	-2.14E-05	1.19E-05	-1.805141	0.0725
MTBV	0.071693	0.025029	2.864422	0.0046
QR	-0.031772	0.010114	-3.141526	0.0019
DIV	-0.002151	0.001120	-1.920250	0.0562
ID_MY	0.015396	0.124591	0.123570	0.9018
ID_TH	-0.268074	0.117467	-2.282117	0.0235
R-squared	0.208320	Mean dependent var		0.732657
Adjusted R-squared	0.180885	S.D. dependent var		0.346339
S.E. of regression	0.313454	Akaike info criterion		0.555020
Sum squared resid.	19.84714	Schwarz criterion		0.682529
Log likelihood	-50.27709	Hannan-Quinn criterion		0.606567
F-statistic	7.593352	Durbin-Watson stat		1.655074
Prob(F-statistic)	0.000000			

Source: Eviews results

Based on Table 3, the coefficient value of each variable presented in the table is the estimator value that describes the actual data. The results of Eviews with the above formula have the following coefficient values:

$$\Psi = 0.727821 + 0.001668OPEN - 0.000002MV + 0.071693MTBV - 0.031772QR - 0.002151DIV$$

This equation means that the exchange rate exposure is positively related to the openness variable and market to book, and negatively related to market value variables, quick ratio, and dividend payout ratio. Therefore, this study supports H1 and H3. The rest cannot be supported.

Country-Specific Factor

Positive relationship of openness according to the alternative hypothesis explains the relationship between openness and the change in the exposure rate. The more open a country is, the higher trading activities with foreign currencies are and the more they will have an impact on the exchange rate risk (exchange rate exposure). The theory is consistent with the empirical evidence resulting from the regression, and this research indicates a more open regional trade exposure- and then a higher exchange rate as more extensive network of trade and more currency in a country are used. Companies in the country are increasingly risky with the movement of the exchange rate. This indicates that openness among ASEAN countries plays a role in forming the value of exchange rate exposure. Based on World Bank data, the level of openness of ASEAN countries from year to year is increasing. This needs to be anticipated by the government as a macro policy determinant in order to establish regulations which guarantee that trade activities run smoothly and companies as micro-actors continue to do hedging business to minimize the increasing exchange rate risk.

Firm Value

Market value does not contribute to changes in exchange rate exposure significantly at α level of 5%, but if the market value of a variable is at α level of 10%, it will affect the exchange rate exposure. The market value is inversely related to changes in exchange rate exposure. In other words, the market value is related to the economies of scale of the company. When a company has achieved its maximum capacity levels in production, it produces enough products or inventory to meet the demand. The demand for palm oil is increasingly high every year resulting in growing sales and, in the end, the company has more cash flow each year. The cash flow is managed by companies for various purposes. One of which is hedging activities with high-cost off-balance-sheet instruments. This is the reason why hedging with off-balance-sheet instruments is difficult for small and medium-sized companies that have not yet reached the economies of scale. Empirically, oil palm sub-sector companies in ASEAN have achieved economies of scale carry out off-balance-sheet hedging activities but are not fully hedging.

Growth

Market to book value relates to the direction of the exchange rate exposure and is significant. Companies with large MTBV values are trusted by investors to have growth and good future

prospects. Companies that are currently growing generally use their cash flow to re-invest (plow back). Expansion and reinvestment of company assets using the composition of internal funds are the indicators that the company has a goal of growth. The funding for the growth of the company is generally not small, so that the use of internal funds from the company's cash flow is the main choice in funding growth efforts. Therefore, the company with a growth target allocates a portion of the cash flow obtained each period to expand in order to get a larger expected value of firm, so that the remaining cash flow is limited to hedging. Empirically, companies with high market to book value have a high exchange rate exposure value. This is due to the maximum anticipated exchange rate exposure because hedging is only part of the remaining funds. The results of this study are in line with the research of Hutson and O'Driscoll (2010) in European companies which show that there is a positive and significant relationship between market to book value and exchange rate exposure.

Liquidity

Quick ratio relationships are the opposite of the exchange rate exposure and are significant at the 5% of α level. This is in line with the research conducted by Muller and Verschoor (2006), who showed that the quick ratio was negatively related to changes in exchange rate exposure. Theoretically, a company with a great QR value have big corporate liquidity. The liquidity indicates that the company's current assets are greater than the current liabilities. Current assets are in the form of assets that are easily "liquidated" other than inventories, such as cash, account receivable, marketable securities, etc. The company's liquidity is interpreted as the ability to interfere with the exchange rate. This can be explained if there is a loss from the exchange rate transaction of the company using its funds to cover the loss, so that the value of the exchange rate exposure can be minimized. Empirically, the palm oil sub-sector companies in ASEAN generally prefer to provide funds in the form of foreign currency to anticipate the exchange rate risk in addition to hedging with off-balance-sheet instruments because the funds are needed to do off-balance sheet. This is evidenced by a significant level of α level of 5%.

Dividend payout ratio is the company's policy in managing liquidity. This is alongside the QR variables that explain the liquidity factor, but it has different functionality with QR DIV for the allocation of the company's liquidity that is intended for shareholders in the form of dividends. Theoretically, when deciding to pay dividends, the company tries to manage the company's cash inflow as much as possible to exclude dividend date. Off-balance-sheet hedging is an effort to ensure corporate funds in the future. It can also be interpreted that dividends are a signal that the company has the ability to hedge. However, empirically many oil palm sub-sector companies use instruments on-balance-sheet, and the dividend payout ratio proxy cannot affect the decrease in exchange rate exposure at the α level of 5%. However, several

oil palm sub-sector companies also undertake off-balance-sheet hedging business, so that the dividend value on the out ratio can significantly affect the decrease in exchange rate exposure at α level of 10 %. The result of the research is in line with the research of He and Ng (1993) and Muller and Verschoor (2006), which proves that the dividend payout ratio of companies has a negative relationship with exchange rate exposure.

The state dummy variable (ID_MY) empirically proves that globally the economic situation between the countries of Indonesia and Malaysia does not differ greatly, while the economic situation between the countries of Indonesia and Thailand (ID_TH) has proved significantly different. This difference is driven by company-specific factors in the two different countries, including production capacity. Indonesia and Malaysia produce palm oil which is relatively the same, while Thailand's production capacity slightly exceeds in number when compared to the two countries.

The results of the study state that the regression model is proven to explain the role of 25 oil palm exporters (cross-section) in establishing the value of exchange rate exposure in the last ten years (time-series). Value Adjusted R Square in Table 3 is the coefficient of determination of all independent variables. The Eviews results explain that all variations in openness variables, market value, market to book value, quick ratio, and dividend payout ratio can simultaneously explain the exchange rate exposure of 18.09%.

This shows that there is a risk to the formation of exposure to the oil palm sub-sector in the three countries in the ASEAN region. The hedging activities of these companies turned out to be able to minimize exposure, or vice versa. Exposure is a risk consisting of systemic and non-systemic risks. An accumulation of hedging activities is a non-systemic activity that can diversify the exchange rate risk. Although hedging is only a non-systemic effort, it can accumulatively reduce systemic components.

The previous research that was used as a reference for this research was a research on firm-specific exposure conducted by Hutson and O'driscoll (2010) in 11 European countries. The study shows that the exchange rate exposure level in companies in the euro zone and non-euro zone has increased since the introduction of the Euro. Hutson and O'driscoll (2010) prove that 208 companies in Europe can affect 32% of exchange rate exposure with three variables that are proven to reduce exposure significantly. The three variables include: (1) openness, (2) market to book value, and (3) dividend payout ratio. These variables are in line with this study, except the last variable, which is different. This is caused by the use of different types of hedging instruments. Hedging in the European region is assumed to be carried out with off-balance-sheet instruments, while in the ASEAN region it is possible to do it with on-balance-sheet instruments. This is the basic reason why the level of coefficient of determination of the two studies is different. Off-balance-sheet instruments are

considered to be more able to influence the exchange rate exposure compared to on-balance-sheet instruments.

The results of the study indicate that country-specific risk and firm-specific risk affect the level of exchange rate exposure in general. This is in line with the research of Hutson and O'driscoll (2010), which explains the significance of several company variables as a determinant of exchange rate exposure. Globally, the overall proxy hedging component contributes to 18.09% of the exchange rate exposure. This shows that palm oil exporter companies in the three countries have engaged in hedging activities, which means that this risk diversification affected 18.09% of the exchange rate risk in 2008-2018.

Some firm-specific factors that affect the company's exchange rate exposure in the palm oil sub-sector are market to book value and quick ratio. This proxy describes the growth and liquidity of the company. In addition, country-specific factors significantly influence the exposure exchange rate which is proxied by the openness variable.

The author recommends several things. The scope of the research can be expanded to include more than just the export side, such as palm oil. Firm-specific comparisons of the import side or the entire sector of each ASEAN country can also add to the quality of the research. The observed research period can be extended in order to explain the relationship between independent variables and dependent variables. This might reflect the actual type of relationship. Independent variables can be refined by using other variables that are more in line with the conditions in the three ASEAN countries in general, such as involving foreign loans for debt to assets variables and comparing the hedging costs of each company.

Calculation of exchange rate exposure value can use other models to get representative exposure values, such as add risk model value. Firms should make efforts for hedging off-balance-sheet risks so that the exchange rate exposure can be better diversified. Empirical evidence has shown that variables that significantly affect exchange rate exposure include market to book value and quick ratio. These variables should be considered when going into a hedging business.

Investors should evaluate the exchange rate exposure risk because it will affect the value of the firm. If there is limited data regarding hedging, the investor can proxy the value of the firm - specific risk to describe the activities of hedging of the company.



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REFERENCES

- Agarwal, S., & Ramaswami, S. N. (1992). Choice of foreign market entry mode: Impact of ownership, location and internationalization factors. *Journal of International Business Studies*, 23(1), 1–27.
- Allayannis, G., & Ofek, E. (2001). Exchange rate exposure, hedging, and the use of foreign currency derivatives. *Journal of International Money and Finance*, 20(2), 273–296.
- Apergis, N., Artikis P., Sorros J. (2011). Asset Pricing and Foreign Exchange Risk. *Research in International Business and Finance*, 309-32.
- ASEAN. (n.d.). Competition Policy. October 10, 2013. <http://www.asean.org/>
- Bangkok Stock Exchange. (n.d.). List of Stock. November 20, 2019 <http://www.set.or.th/en/>
- Billotte et al. (2001). Development, characterisation, and across-taxa utility of oil palm (*Elaeis guineensis* Jacq.) microsatellite markers. *Genome*, 44(3), 413-25.
- Bisinfocus. (2012). Prospek Perkebunan dan Industri Minyak Sawit di Indonesia 2012-2025. Indonesia.
- Block, S.B., & Gallagher, T.J. (1986). The use of interest rate futures and options by corporate financial managers, *Financial Management*, 15, 73-78.
- Bodie, Z., Kane, A., & Marcus, A.J. (2011). *Investments dan Portofolio Management*. New York: McGraw-Hill.
- Bodnar, G. M., Dumas, B., & Marston, R.C. (2002). Pass-through and exposure. *Journal of Finance*, 57(1), 199-231.
- Bodnar, G. M., & Gentry, W. M. (1993). Exchange rate exposure and industry characteristics: Evidence from Canada, Japan and the USA. *Journal of International Money and Finance*, 12, 29–45.
- Chen, J., Naylor, M., & Lu, X. (2004). Some insights into the foreign exchange pricing puzzle: Evidence from a small open economy. *Pacific Basin Finance Journal*, 12.
- CIA. (n.d.). Country Comparison: Exports. December 10, 2018. <https://www.cia.gov/library/>



- Dominguez, K. M. E., & Tesar, L. L. (2006). Exchange rate exposure. *Journal of International Economics*, 68(1), 188–218.
- Froot, K. A., Scharfstein, J. S., & Stein, J. C. (1993). Risk management: Coordinating corporate investment and financing policies. *Journal of Finance*, 48(5), 1629–1658.
- Eiteman, D.K., Stonehill, I.A., & Moffett, H.M. (2010). *Multinational Business Finance*. U.S.A: Person Education.
- Ge' czy, C., Minton, B. A., & Schrand, C. (1997). Why firms use currency derivatives. *Journal of Finance*, 52(4), 1323–1355.
- Hagelin, N., & Pramborg, B. (2006). Empirical incentives concerning incentives to hedge transaction and translation exposure. *Journal of Multinational Financial*.
- Hargreaves, D., & Strong, C.M. (2003). JPMorgan effective exchange rates: revised and modernized. Economic research note.
- He, J., & Ng, L. K. (1998). The foreign exchange exposure of Japanese multinational corporations. *Journal of Finance*, 53(2), 733–753.
- Henry, A.E. (2011). *Understanding Strategic Management*. (2nd edition). Oxford: University Press.
- Hutson, E., & O'Driscoll, A. (2010). Firm-level exchange rate exposure in the Eurozone. *International Business Review*, 19, 468-478.
- Indexmundi. (2018).CPO Production. December 10, 2018.
<http://www.indexmundi.com/agriculture/>
- Jorion, P. (1990). The exchange rate exposure of US multinationals. *Journal of Business*, 63(3), 331–345.
- Kuala Lumpur Stock Exchange. (n.d.). List of Approved Securities. December 2, 2018.
<http://www.klse.info/>
- Levine, D.M. (2008). *Statistic for Managers Using Microsoft Excel*. New Jersey: Prentice Hall.
- M. E., dan Tesar, L. L. (2006). Exchange rate exposure. *Journal of International*



- Madura, Jeff. (2006). *International Corporate Finance*. South-Western Publishing Company.
- Mayers, D., & Smith. C. (1982). On the corporate demand for insurance. *Journal of Business*, 55, 281-296.
- Miles, David & Scott, Andrew. (2005). *Macroeconomics: Understanding the Wealth of Nation*. New York: McGraw-Hill.
- Muller, A., & Verschoor, W. F. C. (2006). European foreign exchange risk exposure. *European Financial Management*, 12(2), 195–220.
- Nance, D. R., Smith, C., & Smithson, C. (1993). On the determinants of corporate hedging. *Journal of Finance*, 48(1), 267–284.
- Oil World Annual. (2018). Palm Oil Data. December 8, 2018. <http://www.oilworld.biz/app>
- Pantzalis, C., Simkins, B. J., dan Laux, P. A. (2001). Operational hedges and the foreign exchange exposure of US multinational corporations. *Journal of International Business Studies*, 32(4), 793–812.
- Smith, C. W., & Stulz, R. M. (1985). The determinants of firms' hedging policies. *Journal of Financial and Quantitative Analysis*, 20(4), 391–405.
- Stephen A Ross, Randolp W. Westerfield, Jeffrey Jaffe. (2010). *Corporate Finance*. U.S.A: McGraw-Hill.
- Stulz, R. (1984). Optimal hedging policies. *Journal of Financial and Quantitative Analysis*, 19, 127-140.
- Sumiati, Ati (2004). Analisis pengaruh market return dan beberapa faktor makroekonomi terhadap return saham (case study pada sektor industri barang konsumsi di BEJ periode 1999-2003). Jakarta: Tesis Pascasarjana Universitas Indonesia.
- World Bank. (2018). Trade Openness. November 2018. <http://data.worldbank.org/indicator>