DETERMINANT OF FIRM VALUE: EVIDENCE OF OIL PALM PLANTATION COMPANIES

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Abstract

The company's market value or firm value (*FV*) is essential for shareholders to maximize wealth (Jensen, 2010). *FV* is a function of various factors, especially company-specific factors, which are the main drivers (Chen et al., 2019). This study aims to estimate the impact of stock returns (*SR*), return on assets (*ROA*), leverage (debt-to-equity ratio, *DER*), and company's total assets (*SIZE*) on *FV* proxied by price-to-book value (*PBV*) by methods of data analysis using panel data regression model. The research sample comprised 14 large private oil palm plantation companies on the Indonesia Stock Exchange (IDX). The study's results prove that *SR* and *SIZE* positively affect *PBV*, while *ROA* and *DER* have no effect. Recommendations from the research result that company management must pay attention, so that share prices and total assets are strived to continue to increase because they impact increasing *FV*, which is profitable for shareholders. A positive response to stock prices can be achieved through better-assessing profitability and leverage ratios and the company's investment in its fixed assets.

Keywords: Firm Value, Stock Returns, Return on Assets, Leverage, Size

Authors' individual contribution: Conceptualization — I. and D.W.; Methodology — S.L. and E.E.; Investigation — D.W. and H.; Resources — I. and S.L.; Data Curation — H. and E.E.; Writing — Original Draft — I. and D.W.; Writing — Review & Editing — H. and E.E.; Supervision — I. and E.E.; Project Administration — S.L. and E.E.; Funding Acquisition — I., D.W., and H.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

1. INTRODUCTION

Palm oil is still the dominant vegetable oil in the world. World palm oil production reached 73.5 million tons in 2018-2019, and projected production of 240 million tons in 2050 (Tullis, 2019). Since 2006, Indonesia has become the largest palm oil producer in the world, with a production of more than 20.9 million tons (United States Department of Agriculture, Foreign Agriciltural Service [USDA FAS], 2007). The total palm oil production doubled to more than 42.9 million tonnes in 2018. The US Department of Agriculture (USDA) predicted Indonesia's palm oil production to reach 46 million metric tons (MMT) during 2023–2024 (USDA, 2023). This number increased by 3% from the previous period, namely 2022–2023, recorded at 44.7 MMT. This production increase estimate assumes no extreme weather changes. According to a report by the Food and Agriculture Organization (FAO), Indonesia's palm oil production

has increased by more than 400% from 1994–2003 to more than 8.7 MMT (Thomas & Orden, 2004). At the end of 2010, crude palm oil (CPO) exports accounted for 60% of total production and increased by 69.2% in 2018. The successful performance of Indonesian palm oil production and exports is supported by the sizeable private palm oil companies, which control 59.3% of Indonesian palm oil production.

The significant development of Indonesian palm oil production and exports since 1994 is inseparable from the contribution of large palm oil companies. These companies are enjoying a boom in global demand for palm oil and enjoy the availability of land and an abundance of low-paid labour. In addition, 14 conglomerate companies have core palm oil businesses that have become large conglomerate businesses in Indonesia. However, the Indonesian palm oil business opportunity has challenges and obstacles. Increasing concern for environmental issues caused by declining land fertility due to oil palm plantations, deforestation, and air pollution are issues that surface in the global community. While the positive impact of increasing business prospects, palm oil producers face productivity and efficiency challenges related to modernization and the adoption of new technologies that must be responded to by company management through increasing business scale mechanisms, either by increasing profitability, using bank loans, or funding in the stock market, namely on the Indonesia Stock Exchange (IDX). Cooperation between companies (issuers) and investors through investment mechanisms on the IDX represents the dynamics of the Indonesian stock market in supporting the performance of palm oil companies (listed on the IDX), which is an interesting topic for investigation.

Firm value (*FV*) is a significant concern for investors in maximizing the wealth of their shares. One proxy indicator of *FV* is the price-to-book value ratio (*PBV*). *PBV* is a prevalent measure of *FV* because it can relate the market value of stock capital and its balance sheet value (Abd. Majid & Benazir, 2015). Myšková and Hájek (2017) state that *PBV* represents the final and comprehensive assessment of the entire company in the capital market. Chabachib et al. (2020) concluded that *PBV* assesses a company's management, profitability, liquidity, and prospects. The *PBV* expressed as a multiple (the number of times the company's shares traded compared to the book value per share) indicates how much shareholders pay for the company's net assets. A high *PBV* will increase market confidence in the company and indicate shareholder prosperity. When investors want to buy shares or start investing, investors will see how much stock returns or capital gains will be obtained and other supporting indicators. As stated by Endri and Fathony (2020), the *FV* is considered essential because a higher *FV* will increase the prosperity of shareholders.

Maximizing *FV* is challenging because internal and external factors become obstacles to achieving goals. Internal factors of the company, especially financial performance, can determine the *FV*. The financial performance, which is the focus of this research, consists of stock returns (*SR*), return on assets (*ROA*), debt-to-equity ratio (*DER*), and

company's total assets (*SIZE*). Empirical studies of the effect of *SR*, *ROA*, *DER*, and *SIZE* on *FV* still provide contradictory findings. Lee (2019) and Nguyen et al. (2016) proved that *SR* positively affects the *FV* of Biotech. Blanchard and Simon (2001) found that stock prices that are less stable in large-scale companies can increase *FV*. The achievement of profitability performance (*ROA*) is essential in increasing *FV*. Ahmadi et al. (2021) concluded that a higher *ROA* could increase *FV*. A study by Nurwulandari et al. (2021) and Nguyen et al. (2021) proved that *ROA* did not affect *FV*. Dang et al. (2019) proved the effect of *DER* on *FV* in several different industries, which found a positive influence on the food and beverage industry, while the real estate and the wholesale and construction industries had a negative effect. Research by Bui et al. (2021), Nguyen et al. (2021), Sudiyatno et al. (2020), and Vo and Ellis (2017) also prove that *DER* has a negative effect on *FV*. Different research results prove that a high *DER* can increase *FV*, among others; Jihadi et al. (2021), Jiraporn and Liu (2018), Bahraini et al. (2021), Khan et al. (2021), and Shahnia et al. (2020). Empirical findings also reveal that *DER* decisions have no impact on *FV* (Nurwulandari et al., 2021). *SIZE* can determine firm value. Research by Dang et al. (2019), Nguyen et al. (2021), and Sudiyatno et al. (2020) found that *SIZE* had a positive impact on *FV*. Bahraini et al. (2021) found otherwise, that an increase in *SIZE* reduces *FV*. Several empirical studies have also found that size does not affect *FV*, including Endri and Fathony (2020) studies.

The discrepancy from the results of previous studies is the motivation to prove the internal determinants of the *FV* of oil palm plantations in Indonesia. Four financial factors, *SR*, *ROA*, *DER*, and company's total assets (*SIZE*), were tested empirically for their effect on *PBV*.

The paper is structured as follows. Section 2 is a literature review discussing the company's value and determinants. Section 3 is a research method for empirical testing of firm value determinants. Section 4 presents the research findings and a discussion of the results. Section 5 contains the conclusions of the research results, limitations, and suggestions.

2. LITERATURE REVIEW

Firm value (*FV*) is essential for investors because it can evaluate company performance and achieve goals to maximize welfare. *PBV* is a measurement of company value that uses relative valuation, a valuation model that assesses an asset through comparison with the prices of other similar assets. Investment advisers, fund managers, and investors use *PBV* as a reference for stock valuation because it can determine if a stock can be sold below book value which is considered undervalued, and vice versa if it is overvalued. For this proposition to hold, *PBV* dictates that stocks with low price-to-book value ratios outperform stocks with high price-to-book value ratios. While more investors use a low price-to-book value ratio as an investment consideration to determine undervalued stocks, others combine the price-to-book value ratio with their fundamentals to make a similar decision. The theoretical basis used in this case is the net surplus. The net surplus states that the company's

value is reflected in the accounting information in the financial statements (Ohlson, 2001). Based on the theory of net surplus, Ohlson (2001) stated that the *FV* is shown in the income statement and balance sheet. Therefore, it is essential to investigate several factors that are predicted to be indicators of intense competition and business opportunities when companies want to survive and even develop and realize they need funding that allows them to be more broad and flexible in responding to the dynamics of demand for their products which automatically represent the *FV* in the capital market.

Consequently, a successful public *FV* is reflected in its shares' market value. According to Bahraini et al. (2021), an increase in the purchase of a share has implications for investors who provide a higher share value than the value recorded on the company's balance sheet so that the *PBV* is high. Several other studies also show the other side of the importance of *PBV* as a measure of *FV*. Financial performance is important for investors when deciding to buy shares. Financial performance can be evaluated with four types of ratio analysis, namely liquidity, activity, solvency and profitability (Endri et al., 2020a).

Profitability is the company's ability to generate net profit from investment assets. Profitable companies signal that companies are relatively more sensitive to bankruptcy and other forms of financial distress than less profitable companies. Therefore, increasing stock prices will show companies' optimism for prospects. The financial performance of the profitability ratio, namely *ROA*, reflects that with the assets owned, the company can provide benefits. The higher *ROA* value indicates that the company provides the best performance for the owner. Shahnia et al. (2020) and Linawati et al. (2022) found that *ROA* has a positive effect on *FV*. Harahap et al. (2020) also prove the positive effect of profitability on the *FV* of firm value in automotive and component sub-sector companies. Sabrin et al. (2016) found that profitability has a positive effect on *FV* through dividend payments, so that stock prices have increased. Zuhroh's (2019) research also found that profitability directly has a positive effect on *FV*.

The impact of capital structure between debt and equity (*DER*) on *FV* has been debated theoretically and empirically: theoretically, differences in capital structure decisions with the same goal, namely maximizing firm value. Empirical research provides ambiguous findings. Research by Harahap et al. (2020), Kurniasih et al. (2022), Linawati et al. (2022), and Bahraini et al. (2021) found that *DER* had a positive effect on *FV*. On the other hand, Sinaga et al. (2019), in the case of global economic instability, which is characterized by a downward trend in the selling price of CPO, proved that the *DER* has a negative effect on *FV*. Liao et al. (2022), Hang et al. (2021), and Liu et al. (2020) also prove that leverage has a negative effect on *FV*. However, Kodongo et al. (2014) prove that *DER* does not affect *FV*. Research by Jihadi et al. (2021) revealed that leverage has a significant effect on *FV*, while Sudiyatno et al. (2020) found that capital structure has a negative effect on *FV*.

Company size (*SIZE*) shows ownership of company assets that can be used optimally to increase *FV* (Endri, 2020a). Companies with a large size can increase *FV* through asset investment

activities which are easier to obtain funding from various sources. Linawati et al. (2022), Lamuda et al. (2020), Rizqia et al. (2013), and Endri and Fathony (2020) show that firm size has a positive impact on *FV*. Susanti and Restiana (2018), and Bahraini et al. (2021) prove that *SIZE* has a negative effect on *PBV*. Different findings revealed by Pustika et al. (2022), Setiadharma and Machali (2017) and Tui et al. (2017) found that *SIZE* did not affect *FV*.

Charitou and Constantinidis (2004) examined the behaviour of stock prices about market prices on book value, profitability, and firm size in Japan. The study results show that market prices on book value, firm size, and profitability determine expected stock returns. The research findings of Iqmal and Putra (2020), Zaini et al. (2018), Fidhayatin and Dewi (2012), and Suhadak et al. (2019) show a positive relationship between *SR* and *FV*. Harjoto and Jo (2015) found that stock return volatility can increase *FV*. Based on the literature review and the results of previous studies, this study uses several independent variables, namely: *ROA*, *DER*, *SIZE*, and *SR*, to test its effect on firm value. The following is the theoretical framework of this research. Based on the existing theory and related research, the proposed research hypotheses are as follows:

H1: Return on assets affects firm value.
H2: Debt-to-equity ratio affects firm value.
H3: Total assets affect firm value.
H4: Stock returns affect firm value.

3. RESEARCH METHODOLOGY

The research methodology uses a quantitative approach to estimate empirically based on data collected by time series and cross-section. Quantitative research uses numerical data with a ratio-scale sourced from the company's financial statements.

3.1. Data source

The research data is quantitative from the IDX. This data was taken through the online publication of the IDX regarding the summary of the performance of large private palm oil companies. This study examines the effect of *ROA*, *DER*, *SIZE*, and *SR* on the *FV* of sizeable private palm oil companies listed on the IDX. The *FV* variable used is *PBV* as the dependent variable. Meanwhile, *ROA*, *DER*, *SIZE*, and *SR* are used as independent variables. This study includes 14 sizeable private palm oil companies listed on the IDX, with a research period of 2016–2018.

3.2. Variable operational definitions

3.2.1. Price-to-book value ratio (PBV)

According to Endri (2019), firm's value (*FV*) is an investor's assessment of how good the condition of a company is, and this condition can be reflected through the company's stock market price. The *FV* can be seen from the comparison between the market price per share and the book value per share. The *FV* in this study is confirmed through the following:

$$PBV = \frac{Market\ price\ per\ share}{Book\ value\ per\ share} \qquad (1)$$

3.2.2. Return on asset (ROA)

ROA used in the company is a ratio that shows the return on the company's total assets. In addition, *ROA* is a better indicator of profitability because it can reflect management's effectiveness in using assets to generate profits. The formula used to calculate *ROA* is as follows:

$$ROA = \frac{Net\ income}{Total\ asset} \times 100\% \qquad (2)$$

3.2.3. Debt to equity ratio (DER)

DER is the ratio used to assess debt to equity. *DER* is calculated by comparing total debt to equity. The higher the *DER* value, the more unfavorable the company is due to the increased risks borne by possible financial failures. The value of *DER* is formulated as follows:

$$DER = \frac{Total\ debt}{Equity} \qquad (3)$$

3.2.4. Company's total assets (SIZE)

The size of the company in this study was measured using the value of the natural logarithm (Ln) of the company's total assets (Endri & Fathony, 2020). Company size, apart from being a scale where companies can be classified into small to large companies according to various ways (total assets, the natural logarithm of total assets, stock market value), reflects the ability to face the dynamics of competition between companies on a large scale. In this study, a reflection of the company's ability to compete and adapt in the era of global dynamics, company size is used as the natural logarithm of the company's total assets.

3.2.5. Stock returns (SR)

According to Razak et al. (2020), *SR* results from investments. *SR* can be formulated as follows:

$$Stock\ returns = \frac{P_t - P_{t-1}}{P_{t-1}} \times 100\% \qquad (4)$$

where,
- P_t = stock price in *t* period;
- P_{t-1} = previous period price.

3.3. Analysis method

Data analysis methods were carried out using statistical tests consisting of descriptive statistics presented in tables and graphs and inferential statistics through hypothesis testing of the panel data regression model. The panel data regression method consists of three models, namely: 1) common effect model (CEM), 2) fixed effect model (FEM), and 3) random effects model (REM). Panel model selection was determined by the Chow test (CEM vs. REM), the Lagrange-Multiplier test (CEM vs. FEM), and the Hausman test (FEM vs. REM) (Sugianto et al., 2020).

The descriptive analysis presents statistics briefly in a form that is easy to understand. The descriptive analysis presents an overview and development of the variables to be studied in the following. These variables are *ROA*, *DER*, *SIZE*, *SR*, and *PBV* with an observation period of 2016 to 2018 for 14 sizeable private palm oil companies listed on the IDX. The variable description is done through the statistical summary table and graphic visualization. The inferential analysis used in this study is panel data regression. This analysis is used to see the effect of *ROA*, *DER*, *SIZE*, and *SR* that affect the company's performance by considering observations (company) and time. Finally, the modelling results will be used to see the effect of *ROA*, *DER*, *SIZE*, and *SR* on the *FV* of 14 sizeable private palm oil companies listed on the IDX in the 2016–2018 period.

The empirical model used in this study is as follows:

$$PBV_{it} = \alpha + \beta_1 ROA_{it} + \beta_2 DER_{it} + \beta_3 SIZE_{it} + \beta_4 SR_{it} + e_{it} \qquad (5)$$

where,
- *i* = cross section;
- *t* = time series;
- α = intercept;
- β = parameter to be estimated;
- *e* = error term.

4. RESULTS AND DISCUSSION

4.1. Descriptive analysis

Table 1 describes the statistical data from the research variables, which aim to provide an overview of the research object. Descriptive analysis was carried out by looking at each variable's mean, standard deviation, and minimum and maximum values.

Table 1. Summary statistics

Variable	Mean	Median	Std. dev	Min	Max
PBV	1.04	0.895	0.862	-0.21	4.19
SIZE	6.86	6.92	0.414	5.99	7.55
ROA	-0.653	0.31	8.86	-43.6	9.94
DER	0.393	1.25	5.73	-30.6	11.3
SR	2.75	-6.93	46.4	-48.5	226.0

Source: Data processed in 2022 using Gretl Software.

In this study, the data used was 42 observations of 14 sizeable private palm oil companies on the IDX in the 2016–2018 period. The calculated average *PBV* is 1.04, with a maximum value of 4.19 or 5 times the average value and a minimum of -0.21. Total assets as *SIZE* have an average value of 6.86 with an excellent standard deviation of 0.41. *ROA* during the study period fluctuated, with a minimum value of -43.6 and a maximum value of 9.94. *DER* has an average value of 0.393, with a minimum value of -30.6 and a maximum of 11.3. The movement of *SR* fluctuates with an average value of 2.75, a negative minimum value of -48.5, and a maximum value of 226.0. In Table 1, the most significant standard deviation value is in the *SR* variable of 46.4.

This shows that stock returns experienced a sharp decline during the 2016–2018 period. On the other hand, other factors, namely, *SIZE*, *ROA*, and *DER*, experienced more stable fluctuations during 2016. In other words, during the 2016–2018 observation period, on average, there was no pattern

of increase or decrease in the three company-specific variables, which are the basis for making important business decisions (*SIZE*, *ROA*, and *DER*). However, observing the changes in each company during the 2016–2018 observation period is fascinating.

If we break down the total assets of each company, it shows that of the 14 palm oil companies, nine have above-average asset values. Total assets that are concentrated in several companies indicate a strong allegation that a conglomeration has occurred, which can drive palm oil production and export performance (among other things, the most prominent are PT Sinar Mas Agro Resources and Technology Tbk (PT SMART), and PT Salim Ivomas Pratama Tbk (PT SIMP). In addition, out of 14 large private conglomerate companies, six companies experienced adverse conditions. The most severely affected were PT SMART and PT Gozco Plantations Tbk (PT GZCO) in commercial business since 2007. On the other hand, the companies with the highest *ROA* are PT Sawit Sumbermas Sarana Tbk (PT SSMS) and PT Sampoerna Agro Tbk (PT SGRO), which show an increase in the company's business activities. In general, the proportion of the use of third-party funds is relatively the same and flat. Only two companies are somewhat different, namely PT Jaya Agra Wattie Tbk (PT JAVA), and PT Bakrie Sumatra Plantations Tbk (PT UNSP). For stock returns, overall the distribution pattern of stock returns is generally flat, and several companies (PT GZCO, PT Provident Agro Tbk (PT PALM), PT JAVA) experienced pressure during the period 2016–2018.

4.2. Inferential analysis

Table 2 shows a test of the panel data model selection using the Hausman test. Several stages must be carried out in panel data regression to choose the best model between the CEM, FEM, and REM using the Chow and Hausman tests. The following Table 2 is a summary to ensure the best model is selected. First, a Chow test was conducted to choose between CEM or FEM as the best model. Then, when the FEM is the best model from the results of the Chow test, a Hausman test will be carried out to choose between the FEM or REM model. The results of these two tests are shown in Table 2.

Table 2. Results of Chow test and Hausman test

Effect test	Chow test			Test summary	Hausman test		
	Statistic	*df*	*Prob.*		*Statistic*	*df*	*Prob.*
Cross-section F	12.0105	(13.24)	0.0000	Cross-section random	19.7954	4	0.000

Source: Processed data in 2022 using Gretl Software.

In the Chow test, if the p-value is less than 5%, the model chosen is the FEM. Table 2 shows that the p-value obtained (F test) is 0.0000, which is smaller than 5%, which means that the FEM is better than the CEM. Subsequent tests were conducted to select the best model between FEM and REM. The Hausman test results show a p-value of 0.0000; the value is smaller than the 5% significance level, which means that the FEM is better than the REM.

Table 3. Fixe effects model

Variable	Coeff.	Std. error	t-stat.	p-value
Const	20.3212	7.45519	2.726	0.0118**
ROA	0.00585467	0.00749312	0.7813	0.4422
DER	0.0145540	0.0110014	1.323	0.1983
SIZE	−2.81487	1.08759	−2.588	0.0161**
SR	0.00348206	0.00121905	2.856	0.0087***
Mean dep. var	1.035714	S.D. dep. var		0.861598
S-squared resid	1.790164	S.E. of regression		0.273112
LSDV R^2	0.941184	Within R^2		0.389842
LSDV F(17, 24)	22.59111	P-value(F)		9.07e-11
Log-likelihood	6.667193	Akaike criterion		22.66561
Schwarz criterion	53.94367	Hannan-Quinn		34.13026
rho	−0.070856	Durbin-Watson		1.101451

*Note: *** Significant at 0.01 Level, ** Significant at 0.05 Level. Dependent variable is PBV.*
Source: Processed data in 2022 using Gretl Software.

Table 3 shows the estimation results of the FEM selected from the panel data regression method, which empirically proves the effect of *ROA*, *DER*, *SIZE*, and *SR* on *PBV*. Table 3 shows that the probability of the F-test result is 0.0000, which means that at a significance level of 1%, at least one independent variable has a significant effect on *PBV*. With the FEM, the adjusted R^2 value is 0.94118, which indicates that the independent variables can explain 94.12% of the variation in *PBV* value in the model. The *SIZE* variable significantly affects the *PBV* value with a regression coefficient of -2.81487, which means that if a company's total assets increase by 1 percent, it will impact decreasing *FV* by 2.8 percent. The negative relationship between *SIZE* and *PBV* indicates that to increase *FV*, oil palm plantation companies must limit their ownership of company assets. The assets of oil palm plantation companies are not in the form of physical assets but in the form of biological assets. Biological assets are products that grow on productive plants, such as fresh fruit bunches of oil palm on oil palm trees that are processed and owned by companies with the aim that the companies will benefit in the future. Ownership of significant biological assets is not profitable for

the company during extreme weather changes and falling world CPO prices. The research results are supported by the findings of Paminto et al. (2016) that company growth proxied by assets has a negative and significant effect on *FV*. The research results are different from the findings of Fathony et al. (2020) and Rizqia et al. (2013), who revealed the positive effect of *SIZE* on *FV*.

The *SR* variable positively affects the *PBV* value with a regression coefficient of 0.00348, which means that for every 1-point increase in *SR* assuming ceteris paribus, the *PBV* value will increase by 0.00348. In other words, stock returns can increase the *FV*. If *SR* increases, it will create investment opportunities that benefit the company because the value of the company's shares in the eyes of investors is high. This study's results align with previous studies, including Fidhayatin and Dewi (2012) in Indonesia and Charitou and Constantinidis (2004) in Japan, all of which show a positive relationship between *SR* and *FV*. Two other variables, *ROA* and *DER*, positively affect the *PBV* value but are not statistically significant. Thus, the results of this study indicate that the variables that are thought to affect *PBV* all give signs and effects according to the theoretical reference. However, using data from 14 large private Indonesian palm oil companies, *SIZE*, and *SR* are statistically proven to be significant.

5. CONCLUSION

This research investigates the impact of company-specific factors, namely *ROA*, *DER*, *SIZE*, and *SR*, on *FV*. The research data is in the form of a panel, a combination of 14 palm oil sector companies listed on the IDX during the 2016–2018 period. The FEM method was chosen to estimate the research model. The estimation results prove that *SIZE* negatively affects *PBV*, while *SR* has a positive impact. The company's main asset is *SIZE* in the form of oil palm trees, and it determines performance. Suppose the number of oil palm trees that produce a large amount of palm oil (CPO) can motivate investors to buy stock so that the price increases and the *PBV* increases. The financial performance ratio of profitability (*ROA*) and leverage (*DER*) shows no impact on *PBV*. However, the achievement of the company's performance still needs to reflect the *FV*. It is still highly dependent on world CPO prices which fluctuate significantly yearly.

The research findings provide recommendations to management so that the *FV* increases and can maximize shareholders' welfare; then, the size of the company's assets and stock price are the primary concerns. The main limitation of this research that can be used as a benchmark for further investigations is that the determinants of *FV* are only a few company-specific factors and need to reflect internal conditions comprehensively. Recommendations for the future research agenda include using a broader range of factors consisting of internal and external companies. Internal factors can be developed from financial performance, including all financial ratios. In addition, factors specific to the palm oil industry can be investigated, from world CPO prices, cooking oil prices, market share, and government policies regarding subsidies and biodiesel. Macroeconomic factors also determine the company's value, GDP, inflation, interest rates, and exchange rates require further investigation to estimate their effect.

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