Impact of Financial Distress on Stock Price: The Case of Pulp & Paper Companies Registered in Indonesia Stock Exchange

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Abstract: Cellulose is an organic component that is widely found in wood fibers. Cellulose is the main component in the pulp/paper industry. As in wood, the raw material for pulp contains cellulose fibers. Cellulose is often used and processed to produce various types in the paper industry. Pulp is the primary material for different paper products, ranging from factories' boards to daily necessities such as paper, tissue, tea bags, and magazines. Meanwhile, paper is a new change in literature and language that has played a significant role in the history of the development of human civilization. The pulp and paper industry in Indonesia provides a reasonably good contribution to the Indonesian economy. Several pulp & paper companies are listed on the Indonesia Stock Exchange. The results of previous studies indicate that several pulp & paper companies are in a stage of financial difficulty. This study aims to prove empirically that the Z-score as a measure of the company's economic challenges affects stock prices. The results showed that the Z-score affected stock prices. From several ratios that make up the Z-score, it is known that the ratio of working capital to total assets, market value of equity to book value of debt, and sales to total assets have a significant effect on stock prices.

Keywords: financial distress, z-score, stock price

A. INTRODUCTION

The pulp and paper industry makes a significant contribution to the Indonesian economy. In 2019, this industry contributed 17.6% to the non-oil and gas processing industry and 6.3% to the national processing industry. During the Covid-19 pandemic, the paper and pulp trading was still in surplus both in volume and value. Throughout 2020, the net national pulp export reached 1.32 tons, while the net paper exports reached 5.94 million tons.

The pulp and paper industry has a significant role in Indonesia's production and export activities. In 2019 Indonesia was included in the 10 largest pulp and paper producers in the world. Indonesia's pulp and paper exports are mainly from the Asian region, such as China, South Korea, India, Saudi Arabia, and Japan.

Research by Kurniasih et al. (2019) found that pulp and paper companies listed on the Indonesia Stock Exchange (IDX) are in an unhealthy condition or experiencing financial problems (financial distress). Companies experiencing financial distress show poor performance. This information is expected to affect stock prices (Kurniasih, Heliantono, and Herta Sumarto, 2019).

Z-score as a measure to identify the condition of the company whether it is experiencing financial distress or not is calculated using several financial ratios. The ratios are working capital to total assets, retained earnings to total

assets, earnings before interest and taxes to total assets, market capitalization to book value of debt, and sales to total assets.

Several previous studies have tested the effect of Z-score on stock prices. Previous researchers studied companies located in Indonesia and other countries. Junaeni (2018) finds that the Z-score has a significant effect on the stock prices of banking companies listed on the Indonesia Stock Exchange (Junaeni 2018). The Z-score has a significant negative effect on stocks in the Indonesian Syariah Stock Index. Apergis et al. (2011) found that there is a positive correlation between Altman Z-score and stock prices on the Paris, London, and Frankfurt stock exchanges (Apergis et al. 2011).

On the other hand, Lestari et al (2016) found that the financial ratio component measuring the Z-score affected the share price of the Chemical sub-sector companies on the IDX in the 2009-2014 period (Lestari, Oktaviani, and Arafah 2016). Meanwhile, Endri & Yerianto (2019) found that the Z-score component affected the share price of the gas sector listed on the IDX in 2012-2016 (Endri and Yerianto 2019).

It has been found that paper companies listed on the IDX on average show experiencing financial distress conditions in 2013-2018. If financial distress is a condition that is considered by investors, it will certainly affect investors' interest in investing. As is known, investors invest by hoping of getting returns, either in the form of dividends and/or capital gains. Capital gains are obtained if the stock price increases. Positive information will cause stock prices to increase, and vice versa if there is negative information there will be a decrease in stock prices.

This study aims to fill a research gap that is still open, namely regarding the stock prices of pulp & paper companies listed on the IDX and whether the stock prices of pulp & paper companies listed on the IDX are influenced by the Z-score and components of the financial ratios of Altman Z-score.

The questions that this research wants to find answers are: 1) how are the share price of the Pulp & Paper sub-sector companies listed on the IDX in the 2013-2019 period? 2) Does the Z-score affect the stock prices of pulp and paper companies listed on the IDX? 3) Does the Z-score component (working capital to total assets, retained earnings to total assets, earnings before interest and taxes to total assets, market capitalization to book value of debt, sales to total assets) affect the share price of pulp and paper companies listed on the IDX?

On the Indonesia Stock Exchange (IDX) the pulp and paper sub-sector is included in the Basic Industry and Chemical Sector. The Indonesian Pulp and Paper Industry is among the top 10 largest producers in the world, but on the other hand, the condition of companies in the pulp & paper industry is known to be unhealthy or experiencing financial distress. Companies experiencing financial distress are quite worrying if they are made as an investment choice since investors invest by hoping of getting a return on their investment, namely through increasing stock prices.

B. THEORETICAL FRAMEWORK

Aziz *et al.* (2015) explains that the stock price is the price in the real market, and is the price that is most easily determined since it is the price of a stock in the on-going market or if the market is closed. Thus the market price is the closing price (Azis, Mintarti, and Nadir 2015).

Fama (1965) explains that the Random Walk theory on stock prices involves two separate hypotheses, which are (1) price changes are independent, and (2) price changes according to several possible distributions (Fama 1965).

Altman (1968) used the Multiple Discriminant Analysis methods, which resulted in a score known as the Altman Z-score. The score shows the condition of the company in relation to the possibility of bankruptcy (Altman 1968a). Altman uses five types of financial ratios, which are used in the equation of:

$$Z = 1.2Z_1 + 1.4Z_2 + 3.3Z_3 + 0.6Z_4 + 0.999Z_5$$

Notes:

Z1 = *working capital* / *total asset* (WCTA)
Z2 = *retained earnings* / *total asset* (RETA)
Z3 = *earnings before interest and taxes* / *total asset* (EBITTA)
Z4 = *market capitalization* / *book value of debt* (MCAP)
Z5 = *sales* / *total asset* (SALETA)

Based on the revised formula, Altman divides companies based on the Z-score into (Altman 2013):

a. When the Z-score < 1.23, the company is categorized as an unhealthy company and is experiencing major financial problems and the risk of the company going bankrupt is very large.
b. When 1.23 < Z-score < 2.99 the company has the potential to go bankrupt
c. When Z-socre > 2.99, the company is included in the healthy criteria.

Until present, the Z-Score is still more widely used by researchers, practitioners, and academics in the accounting area to find explanation the condition of the company.

Several studies regarding the effect of the Z-score on prices have been carried out by previous researchers. Apergis et al (2011) found that there is a positive correlation between Altman Z-score and stock prices, both in Paris, England, and Frankfurt (Apergis et al. 2011). Choy et al (2016) also found the effect of Z-score on stock prices in Malaysia (Choy et al. 2011). Ozyesil (2020) found that there was a positive relationship between the Altman Z-Score and stock price performance on the Boras Istanbul-30 Index (Özye^{o}il 2020). Meanwhile in Indonesia, Marcelina & Yuliandhari (2014) found that the Z-score had no significant effect on stock prices (Marcelina and Yuliandhari 2014). However, Andriawan & Salean (2016), Ramadhan & Wuryani (2018), and Junaeni (2018) found the Z-score has a positive and significant effect on stock prices (Andriawan and Salean 2016; Junaeni 2018; Ramadhan and Wuryani 2018).

Z-score is formed from several ratios. Lestari et al. (2016) found that working capital to total assets (WCTA) had a significant negative effect, retained earnings to total assets (RETA) had an insignificant effect, and earnings before interest and taxes to total assets (EBITTA) and book value of equity to book value of debt. (BVEBVD) has a significant positive effect on the stock price of chemical companies listed on the IDX (Lestari, Oktaviani, and Arafah 2016). Radityama & Mustafa (2019) found that WCTA and RETA had no significant effect, while EBITTA and book value of equity to book value of total liabilities (BVEBTL) had a positive and significant effect on plantation stock prices listed on the IDX (Radityatama and Mustafa 2019). Wirto & Mustafa (2021) found that WCTA, RETA, EBITTA and BVEBTL have a positive and significant effect on stock prices of the Automotive and Component Sub-sectors listed on the IDX (Wirto and Mustafa 2021).

Signal theory is useful for describing behavior when two parties (can be individuals or organizations) have access to different information (McCabe 1979). Basically, the information owned by investors is not as much as information owned by management or there is asymmetric information between investors and management (asymmetric information). Asymmetric information is the difference in information obtained between one party and another in economic activities. Asymmetric information can occur between investors who will invest in the capital market. Investors need to know the condition of the company whose shares will be chosen to invest. This makes investors will find out the condition of the stock (company) completely and accurately in order to benefit from their investment in the future.

1. Z-score Relationship with Stock Price

Altman Z-score. The score, hereinafter referred to as the Z-score, shows the condition of the company in relation to the possibility of bankruptcy. The higher the Z-score, the better the condition of the company. Companies that have good conditions, give a positive signal, so the price increases.

H1: Z-score has a positive effect on stock prices.

2. Relationship of WCTA with Stock Price

The ratio of working capital to total assets (working capital to total assets/WCTA) is a net measure of the company's current assets to the company's capital. Net working capital is the difference between current assets and current liabilities (Altman 1968b). Companies that have significant working capital are in a liquid state. Liquid companies show good performance. Companies that perform well will increase their share price.

H2: WCTA has a positive effect on stock prices.

3. RETA Relationship with Stock Price

The ratio of retained earnings to total assets (RETA) shows the company's ability to generate retained earnings from the company's total assets. Retained earnings are profits that are not distributed to shareholders. Retained earnings occur since common stockholders allow the company to reinvest profits that are not distributed as dividends. Thus, retained earnings reported in the balance sheet are not cash and are not available for dividend payments or other distribution (Endri 2009). The higher the RETA, the greater the opportunity for the company to make investment. The greater the investment opportunity, the better the company's performance, so that the company's stock price will increase.

H3: RETA has a positive effect on stock prices.

4. EBITTA Relationship with Stock Return

The ratio of earnings before interest and tax (EBIT) to total assets (EBITTA) is used to measure the actual productivity of the company's assets (Kamaludin and Indriani 2012). This ratio is calculated by dividing income before interest and taxes by total assets. The higher the EBIT generated, the better the company's performance. Companies that perform well will increase their share price.

H4: EBITTA has a positive effect on stock prices.

5. MCAP's Relationship to stock returns

Altman (1968) explains that equity is measured by the combined market value of all shares (preferred and common), while debt includes both short-term debt and long-term debt. The market value of equity is the multiplication of the number of shares outstanding with its price, or commonly referred to as market capitalization (Marketcap) (Altman 1968b). According to Altman, the ratio of market capitalization

to book value of debt (MCAP) shows that a company's assets can decrease in value (measured by market value of equity) before liabilities exceed assets and the company becomes bankrupt. The greater the market value of equity (market capitalization) the better the company's performance so that the stock price will increase.

H5: MCAP has a positive effect on stock prices.

6. The relationship of SALETA to stock returns

The ratio of sales revenue to total assets (sales to total assets/SALETA) of the company shows the ability of the business to generate sales based on the assets owned. The higher this ratio implies that management is able to optimize the use of investment in assets. The formula for sales to total assets is to divide net annual sales by the aggregate number of all assets stated in the company's balance sheet. The higher this ratio, the better the condition of the company, so that the company's stock price will increase.

H6: SALETA has a positive effect on stock prices.

The research is expected to be useful for company management, especially companies in the pulp and paper sub-sector so that company management better managed so that company prices can be maintained at a high level. The higher the stock price, the higher the value of the company. The higher the value of the company, the more successful the management in managing the company.

The research is also expected to be useful for investors and potential investors who will invest in the capital market, especially investments in shares of companies in the pulp and paper sub-sector. The information obtained from the results of this study is expected to be useful for investors to help make investment decisions.

The research is also expected to be useful for observers of the pulp and paper sub-sector as well as academics working in the field of financial management. The results of this study are expected to enrich the study of financial distress and its impact on stock prices so that it can be a reference for further research.

C. RESEARCH METHODS

This study is a causality study that aims to find empirical evidence of the influence of the independent variable on the dependent variable. The independent variables of this study are the Z-score and the ratio of the Z-score components consisting of working capital / total assets, retained earnings / total assets, earnings before interest and taxes / total assets, market capitalization / book value of debt, and sales / total assets. The dependent variable of this research is stock price. The research framework is presented in Figure-1.

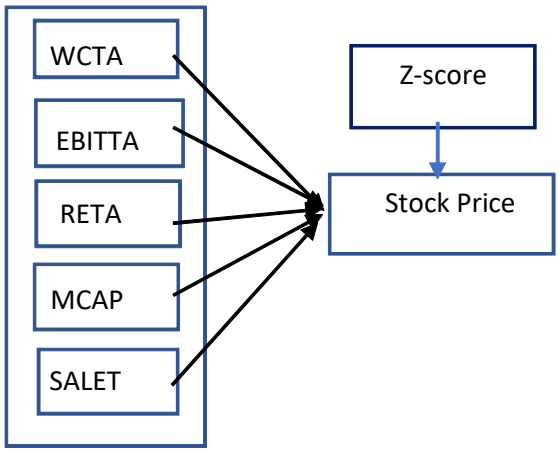

Figure 1 Research Framework

The independent variables of this study and their measurements are as follows:

Z-score = 1,2 Z1 + 1,4 Z2 + 3,3 Z3 + 0,6 Z4 + 0,999Z5

Z1 = WCTA = working capital / total asset

Z2 = RETA = retained earnings / total assets
Z3 = EBITTA = earnings before interest and taxes / total asset
Z4 = MCAP = market value of equity / book value of debt
Z5 = SALETA = sales / total asset

The dependent variable of this study is the daily closing stock price. The share price of a company in a year is measured from the average daily closing share price in 1 year.

The population of this study are pulp and paper companies listed on the Indonesia Stock Exchange. In 2020, the number of pulp and paper companies listed on the IDX is 9 companies. The research sample is pulp and paper companies that are listed on the IDX and meet the sample criteria, which are 1) continuously listed on the IDX in the period 2013-2019 and 2) financial reports (LK) are available and accessible. It takes a long period of time to obtain sufficient research data for statistical testing. The number of companies that meet the sample criteria are 7 companies. One company, PT Sriwahana Adityakarta Tbk. (SWAT) was listed on the IDX on June 8 2018, so it did not meet the sample criteria. While the 2019 LK from PT Paper Factory Basuki Rachmat, Tbk. (Persero) (KBRI) is not available or cannot be accessed. The two companies are not included in the research sample.

The research data are secondary data, cross-sectional and time-series, and are annual data, and ratio scale data. Data were collected using the library method, by noting the figures presented in the company's LK. The data required is the value of current assets, current liabilities, total assets, sales receipts (sales), net profit, retained earnings, EBIT, total debt, and total equity, as well as daily closing share prices. Based on data from LKs, the ratios that make up the Z score and the Z-score value of each company are calculated in the 2013-2019 period. Stock price data is obtained from yahoofinance.com and/or idx.co.id. The stock price in this study is the daily closing price. Based on the daily price for a period of 1 (one) year, the average is calculated so that it becomes the share price of a company i (i the issuer) and year The stock price is Ln (average daily closing price).

The research data was tabulated using the Excel program. The analysis was descriptively and inferentially. Descriptive statistics are used to describe research variables based on the average, maximum, and minimum values. Inferential statistics were used to obtain answers to research questions and were analyzed using a panel data regression approach. The regression equation compiled is as below:

$$SP_{it} = a_0 + bZ\text{-score}_{it} \quad (1)$$

$$SP_{it} = a_0 + b_1WCTA_{it} + b_2RETA_{it} + b_3EBITTA_{it} + b_4MCAP_{it} + b_4SALETA_{it} + \varepsilon_{it} \quad (2)$$

where:

SP	= stock price
Z-score	= Altman Z-score
WCTA	= working capital / total asset
RETA	= retained earning / total asset
EBITTA	= earnings before interest and taxes / total asset
MCAP	= market value of equity / book value of debt
SALETA	= sales / total asset
a_0	= intercept
b_1, b_2, b_3, b_4, b_5	= koefficient regression
ε	= error term

D. DATA ANALYSIS

The following Table 1. presents descriptive statistics of research variables. It can be seen that the average annual share price of pulp and paper companies listed on the IDX for the

Table 1 Descriptive Statistics Research Variables

Variable	Minimum	Maximum	Mean	Std. Dev
Stock Price	153	13.795	1.965	3.144
WCTA	-0.103	0.286	0.102	0.103
RETA	0.009	1.751	0.337	0.508
EBITTA	-0.033	0.210	0.068	0.052
MCAP	0.076	3.233	0.650	0.656
SALETA	0.216	1.783	0.825	0.498
Z-Score	0.614	3.407	2.032	0.831

period 2013-2019 is IDR 1,965 per share. The highest share price was Rp. 13,795 owned by PT Indah Kiat Pulp & Paper, Tbk. (INKP) in 2018. While the stock with the lowest price was Rp. 153 experienced by PT Suparma, Tbk. (SPMA) in 2016.

The average WCTA of pulp & paper companies is 0.102. This means that the company's working capital per year is an average of 10.2% of its total assets. The highest WCTA is 0.286 owned by SPMA in 2018. The lowest WCTA is negative, which is -0.103 indicating the company's current assets are lower than its current liabilities, in other words the company is in an illiquid state. The lowest WCTA was experienced by PT Fajar Surya Wisesa Tbk. (FASW) in 2019.

The average ratio of retained earnings to total assets (RETA) of pulp & paper companies is 0.337. This means that retained earnings in one financial year are 33.7% of total assets. The highest RETA is owned by PT Toba Pulp Lestari, Tbk. (INRU) in 2013 amounted to 1,751. The RETA figure of 1.751 shows that the company's retained earnings are greater than its total assets. The lowest RETA of 0.009 was owned by FASW in 2015.

The average value of operating profit to total assets (EBITTA) is 0.068. This means that the company is able to generate profits before payment of interest and tax obligations of 6.8% of total assets. The highest EBITTA was 0.210 experienced by FASW in 2018, while the lowest EBITTA -0.033 was also experienced by FASW in 2013. A negative EBITTA value indicates the company has experienced operating losses.

MCAP shows the market value of the company. The average MCAP score for pulp & paper companies is 0.650. This figure shows that on average the company's market value is lower than its book value. The highest MCAP was 3,233 experienced by FASW in 2019. FASW's MCAP in 2019 showed the company's market value was higher than its book value. The lowest MCAP was 0.076 experienced by TKIM in 2016.

The SALETA ratio shows the comparison between the company's sales and total assets. In other words, the ratio shows the company's activity. The average value of SALETA pulp & paper companies in the 2013-2019 period is 0.825. This means that every 100 rupiah of company assets is able to generate 82.5 rupiah of sales. The highest SALETA was 1,783 experienced by PT Kedawung Setia Industrial Tbk. (KDSI) in 2019. The lowest SALETA value of 0.216 was experienced by PT INRU (2019).

The average Z-score of pulp & paper companies in the 2013–2019 period is 2.032. This figure shows the company is experiencing financial difficulties, since the Z-score is less than 2.99. The highest Z-score value was 3,407 experienced by FASW in 2018. In 2018, FASW EBITTA was the highest among other pulp & paper companies. The lowest Z-score value was 0.614 experienced by INKP in 2013.

Table 2 Best Model Selection Results

Test	Criteria	Statistics	Results	Decision
Chow	Cross-section F	33,6186	0,000	CEM is not the best model
Hausman	Cross-section random	6,6289	0.010	FEM is the best model

1. Effect of Z-score on Stock Price

The results of the best panel model test show that the fixed effect model (FEM) is the best model. Furthermore, the results of the regression test of the FEM model are presented in Table 2.

Table 3 The Influence of Z-Score on the Stock Prices of Pulp and Paper Companies Listed on the IDX in 2013–2019 with Fixed Effect

Based on Table 2, it is known that the model built is fit. The results of the model test show the $F_{statistic}$ value of 28.8605 with a significance of 0.000. R^2 is 83.13%, indicating that the Z-score is able to explain 83.13% of the variability in stock prices of pulp & paper companies listed on the IDX.

The Z-score regression coefficient is 0.9438, indicating that if the Z-score increases by 1 unit, the stock price will increase by 0.9438. The higher the Z-score, the higher the company's stock price. The higher the stock price, the higher the market value of the company's stock. In other words, investors catch a good signal on the company's shares referring to the Z-score value. As is known, the higher the Z-score means the company is further away from the possibility of experiencing financial distress (financial distress).

The results of the study support the findings of previous studies abroad such as Aspergis et al. (2011) who conducted research in France, England, and Germany, Choy et al. (2011) who conducted researched in Malaysia, and Ozyesil (2020) who researched conducted in Turkey. The results of research in Indonesia from Andriawan & Salean (2016), Syamni et al (2018), Ramadhan and Wuryani (2018), Pratiwi et al. (2018), Junaeni (2018) and Lestari et al. (2016) also proves that the Z-score has a significant positive effect on stock prices. Various previous studies were conducted on various company stocks, both plantations, mining, telecommunications, manufacturing, and banking (Andriawan and Salean 2016; Pratiwi, Sriwardany, and Irma 2018; Junaeni 2018; Lestari, Oktaviani, and Arafah 2016; Syamni, Majid, and Siregar 2018; Ramadhan and Wuryani 2018).

2. The Influence of Z-score Components on Stock Prices

Furthermore, the Z-score calculation consists of several financial ratios, namely WCTA, RETA, EBITTA, MCAP, and SALETA, it is necessary to examine the influence of the ratios

Table 3 The Influence of Z-Score on the Stock Prices of Pulp and Paper Companies Listed on the IDX in 2013–2019 with Fixed Effect Model

Variable	Koeficient	t-stat	Sign	Notes
Contanta	4,8559	15,4064	0.0000	***
Z-score	0,9438	6,2624	0.0000	***
R^2	0.8313			
R^2 adjusted	0.8025			
F-stat		28,8605	0.0000	***

Table 4 Best Model Selection Results

Test	Criteria	Statistics	Results	Decision
Chow	Cross-section F	21,2352	0,000	CEM is not the best model
Hausman	Cross-section random	0,4519	0.9938	REM is the best model

forming the Z-score on stock prices. The results of the best panel model testing for the influence of the ratio forming Z-score on stock prices are presented in Table 3.

The best panel model test results show that REM is the best model. Furthermore, the testing of suitability of the REM mode are presented in Table 4.

Based on Table 4, it is known that the model built is fit. The results of model testing show the value of $F_{statistics}$ 32.9614 with a significance of 0.000. R^2 of 90.74% indicates that the Z-score components (WCTA, RETA, EBITTA, MCAP, and SALETA) together are able to explain 90.74% of the variability of stock prices of pulp & paper companies listed on the IDX. The value of the coefficient of determination indicates that by differentiating the ratios forming the Z-score, the model's ability to explain the phenomenon of stock prices increases.

The WCTA regression coefficient is 2.1996 with a significance of 0.0167. This shows that WCTA has a significant positive effect on stock prices. When the WCTA increases by 1 unit, the share price will increase by 2.1995. The higher the value of working capital, the greater the potential for the company to carry out its operations, so that it is further away from the possibility of experiencing financial difficulties.

The RETA regression coefficient is 0.3102 with a significance of 0.6467. This shows that RETA has no significant effect on stock prices.

The EBITTA regression coefficient is 0.3194 with a significance of 0.8600. This shows that EBITTA has no significant effect on stock prices.

The MCAP regression coefficient is 1.2415 with a significance of 0.000. This shows that MCAP has a significant positive effect on stock prices. If MCAP increases by 1 unit, then the share price will increase by 1.2415. The higher the stock market value, the better the public's assessment of the stock, which indicates the company is healthy and far from the possibility of experiencing financial difficulties.

The SALETA regression coefficient is -1.1481 with a significance of 0.0337. This shows that SALETA has a significant negative effect on stock prices. If SALETA increases by 1 unit,

Table 5 The Influence of Z-Score Components on Share Prices of Pulp and Paper Companies Listed on the IDX in 2013–2019 with Random Effect Model

Variable	Coefficient	t-stat	Sign	Notes
Constanta	6,566	15,3115	0.0000	***
WCTA	2,1996	2.5081	0.0167	**
RETA	0,3102	0,4608	0.6467	
EBITTA	0,3194	0,1776	0,8600	
MCAP	1,2415	7.4003	0.0000	***
SALETA	-1,1481	-2,2059	0.0337	**
R^2	0,9074			
R^2 adjusted	0.8799			
F-stat		32,9614	0.0000	***

the stock price will decrease by 1.1481. The findings of this study indicate that the higher the level of sales of the assets owned, the lower the share price.

E. DISCUSSION

Based on the ratio forming the Z-score, it was found that WCTA had a significant positive effect on stock prices. If the WCTA increases, the share price will increase. This finding is in line with Kadim & Sunardi (2018) who researched the construction industry on the IDX for the period 2013–2017. The higher the value of working capital, the greater the potential for the company to carry out its operations, so that there are more opportunities for increased production and the company is far from the possibility of experiencing financial difficulties. In other word the company is in good shape. The better the condition of the company, the higher the interest of investors to own the company's shares so that the price is higher.

The results of this study indicate that RETA has no significant effect on stock prices. The results of this study are in line with the research of Endri & Yerianto (2019) which examined gas mining companies on the IDX for the period 2012-2016. Also in line with Radityatama & Mustafa (2019) which examined plantation sector companies listed on the IDX (Radityatama and Mustafa 2019). Also supports the findings of Ardian & Khoirudin (2014) who conducting research for manufacturing companies. The greater the retained earnings, it does not necessarily increase the share price, if it is not followed by the company's investment in productive assets which will have an impact on increasing the company's performance (Ardian and Khoiruddin 2014). The results of this study indicate that retained earnings which are of considerable value are not a concern of investors, so they do not affect stock prices. It needs to be further proven that the retained earnings are used for new investments and the company's growth occurs so that it then affects the stock price.

EBITTA was found to have no significant effect on stock prices. This finding is in line with Endri & Yerianto (2019). High EBIT but if it ultimately results in low net profit, making EBIT not something that investors pay attention to. This condition causes stock prices to not be affected by the ratio of EBIT to total assets. Further studies are needed on the interest expense and corporate tax expense and their impact on stock prices (Endri and Yerianto 2019).

It was found that MCAP had a significant positive effect on stock prices. This finding supports the research of Sukmawati et al (2014), Endri & Yerianto (2019), and Radityatama & Mustafa (2019). MCAP shows the ratio between the market value of equity to the book value of debt. The higher this ratio indicates investor confidence in the company's ability to pay off its debt obligations. The higher this ratio, the better the company's performance. Companies that perform well, the stock price will increase (Sukmawati and Adiputra 2014; Radityatama and Mustafa 2019; Endri and Yerianto 2019).

SALETA was found to have a negative and significant effect on stock prices. This finding is in line with the research results of Ardian & Khoirudin (2014). The ratio of sales to total assets shows the ratio of the company's activities. The higher this ratio indicates high company activity or high efficiency and is expected to increase stock prices. The finding that sales

to total assets has a negative and significant effect on the stock price of pulp & paper companies shows that investors perceive higher sales as giving a negative signal if it is not followed by higher net income. Cost of goods sold, interest rates, and taxes that must be calculated by the company need to be studied further to be able to explain the negative effect of the ratio of sales to total assets on stock prices (Ardian and Khoiruddin 2014).

Referring to the three variables that have a significant effect on stock prices, it is known that WCTA has the greatest effect. Thus, if the company's management views the company's stock price as important, so that the stock price continues to increase, management needs to pay attention to working capital management properly. Management needs to properly manage receivables, inventories, and other short-term assets that are expected to be converted into cash in less than one year. Likewise, management needs to properly manage current liabilities including trade payables, tax payables, and the portion of long-term debt maturing within a maximum of one year, so that when these liabilities mature, the company is able to pay them off. The greater the working capital of the company, the higher the share price.

F. IMPLICATIONS AND LIMITATIONS

The results of this study indicate that the Z-score has a positive and significant effect on stock prices. This finding supports several previous studies, and shows that investors pay attention to the company's financial health, and this has an impact on the company's stock price.

Z-score is formed from the ratio of WCTA, RETA, EBITTA, MCAP, and SALETA. The results showed that WCTA and MCAP had a positive and significant effect on the stock prices of pulp & paper companies listed on the IDX. SALETA has a negative and significant effect. Meanwhile, RETA and EBITTA have no significant effect on stock prices.

Altman Z-score model, in particular the ratio of working capital to total assets, market price of equity to book value of debt, and ratio of sales to total assets. The results of this study indicate that these three variables have a significant effect on stock prices.

The ratios that make up the Altman Z-score model have been proven to be an appropriate model in determining the fluctuations in the company's stock price, but the ability to explain it is still relatively limited. For further research, the research model can add new variables such as company interest expense, corporate tax rate, and cost of goods sold in influencing the company's stock price.

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