



Biological Assets and Firm Value: Do Fair Value Measurement and Disclosure Matter?

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ABSTRACT

This study aims to investigate whether value of biological assets measured by fair value and disclosure of biological assets has influence on firm value. The samples are agricultural companies listed on the Indonesia Stock Exchange between 2018 and 2020 with 51 firm-year observations. Using multivariate analysis, this study found that value of biological assets measured by their fair value has a significantly positive effect on firm value, while the disclosure level of biological assets does have impact on firm value. The control variables, namely profitability, leverage, and growth, significantly affect firm value. This study provides a new perspective and empirical evidence in the research topic because this research focuses on the impact of the application of Indonesian statement of financial standard No. 69 regulating fair value of assets and disclosure of biological assets on firm value.

Aset Biologis dan Nilai Perusahaan: Apakah Pengukuran dan Pengungkapan Nilai Wajar Itu Penting?

ABSTRAK

Penelitian ini bertujuan untuk mengetahui apakah nilai aset biologis yang diukur dengan nilai wajar dan pengungkapan aset biologis memiliki pengaruh terhadap nilai perusahaan. Sampel penelitian adalah perusahaan pertanian yang terdaftar di Bursa Efek Indonesia antara tahun 2018 dan 2020. Berdasarkan 51 observasi firm-year menggunakan analisis multivariat, penelitian ini menemukan bahwa nilai aset biologis yang diukur dengan nilai wajarnya berpengaruh positif signifikan terhadap nilai perusahaan, sedangkan tingkat pengungkapan aset biologis memang berdampak pada nilai perusahaan. Variabel kontrol yaitu profitabilitas, leverage, dan pertumbuhan berpengaruh signifikan terhadap nilai perusahaan. Penelitian ini memberikan perspektif baru dan bukti empiris dalam topik penelitian karena penelitian ini berfokus pada dampak penerapan standar keuangan Indonesia No. 69 yang mengatur nilai wajar aset dan pengungkapan aset biologis terhadap nilai perusahaan..

1. Introduction

Statement of Indonesian financial accounting standards (or *Pernyataan Standar Akuntansi Keuangan/ PSAK*) No. 69, concerning the Agriculture business, adopting IAS 41 Agriculture, has been effective since January 1st, 2018 for all companies in the agricultural sector in Indonesia (IAI, 2018). The application of PSAK 69 creates a new and unique atmosphere in the agricultural business in Indonesia because biological assets are

unique assets, and become the hallmark of agricultural companies. They are unique and distinctive assets because biological assets are tangible assets of companies that live and reproduce in an accounting cycle so that the recognition, measurement, and disclosure of biological assets require special treatment that distinguishes them from other tangible assets (Garcia, 2018). The application of PSAK 69 requires broader and more

extensive disclosures related to the management and accounting of biological assets. The use of the fair value assumption of living and multiplying assets supports broad disclosure (IAI, 2018). It reflects how well the company manages and maintains, especially biological assets (Abdullah & Tursoy, 2019). Therefore, the implementation of PSAK 69 is the answer and solution that can help companies improve their performance and make their value better.

Biological assets can be in the form of live animals or plants that produce agricultural products (IAI, 2018). Biological assets are called unique because these assets will continue to grow and produce agricultural products as long as the assets are still alive (Garcia, 2018). The transformation experienced by biological assets can no longer be explained if they are still using measurements with historical cost assumptions. Consequently, PSAK 69 requires the measurement of biological assets using fair value assumptions. By using fair value assumptions, these assets can be adjusted to the nature of biological assets (IAI, 2018). Due to this unique nature, PSAK 69 regulates how to adjust the measurement and disclosure of biological assets so that they can provide more relevant information.

According to Argilés, Garcia-Blandon, & Monllau (2011), measuring the value of assets using fair value is the right method to show the value of biological assets because this method provides a more predictive picture of future cash flows. Danbolt & Rees (2008) and Marra, (2018) state that the application of fair value measurement can also improve the qualitative characteristics of information in financial statements, thereby increasing the value of agricultural companies. Research by Israeli (2015) states that companies that choose to apply the fair value model exhibit higher book values of equity and more volatile net income thereby sending a positive signal to the market.

In this study, we examine whether the value of biological assets measured at fair value and disclosure of biological assets as stipulated in PSAK 69 increases firm value in the agricultural industry.

To examine the effect of the fair value and disclosure of biological assets on firm value, we build a hypothesis that regulates two sets of incentives as a form of decision to explain the effect of PSAK 69 on firm value. The first hypothesis is that the fair value of biological assets has a positive and significant effect on firm value. Measurement of the fair value of biological assets provide relevant information about biological assets. The fair value of these assets continue to increase considering that biological assets continue to grow which will make reported biological assets reflect their true prices and more predictive future cash flows, which ultimately gives a positive signal to the market and increases the value of the company (Barlev & Haddad, 2003; Herrmann, Saudagaran & Thomas, 2006). This means that the greater the proportion of biological assets as a result of fair value measurement, it will have a positive effect on firm value.

The second hypothesis is that the disclosure of biological assets has a positive effect on firm value. Disclosure of biological assets is something that can attract the attention of stakeholders, especially investors in placing their trust in a company because they assume that the company already has integrity in terms of disclosing important information (Abdullah & Tursoy, 2019). Shareholders show their trust by purchasing the company's products, which increases the company's profit and return on equity (Israeli, 2015). The greater the amount of information obtained by investors, the higher the level of investor confidence in the company. Investors are likely to give a positive response to the company in the form of an increase in stock prices if they have a high level of confidence in financial and non-financial information from biological assets (Abdullah et al., 2015).

The purposes of this study is to examine the effect of value of biological assets measured at fair value and disclosure of biological assets as stipulated in PSAK 69 on firm value in the agricultural industry. The topic of research that specifically discusses the effect of the fair value of biological assets and disclosure of biological assets on firm

value has not received special attention in academic research and has not been widely studied. Many researches on this topic have been carried out, but most of them investigate the application of the IAS 41 Agriculture standard and its impact on financial statements, especially in assessing biological assets (Kurniawati, 2013; Ariyanto, Sukendar & Kurniawati, 2014; Crețu, Crețu, Muscănescu., 2014; Huffman, 2018). For emerging markets such as Indonesia, this study provides a new perspective in looking at the measurement and disclosure of biological assets after the adoption of PSAK 69.

Most of the previous studies examined many factors that affect the disclosure of biological assets after the adoption of PSAK 69 (Yurniwati et al., 2018). This study provides a new space in research where we see the tendency of PSAK 69 regulations that are adjusted according to the unique nature of biological assets including age-adjusted measurements and the nature of this asset that continues to grow so that it will increase market reaction. Likewise, the disclosure of biological assets is used as the main highlight in its contribution to increasing the value of the firm. Previous research such as Wen-hsin Hsu, Liu, Sami & Wan, (2019) showed how the effect of IAS 41 increase stock information, while this study is more specific, stressing the effect of fair value measurement and disclosure of biological assets on firm value and this study uses years after effective implementation so that it is newer and more attractive.

After the introduction, the next section discussed is a literature review, research methods, results and discussion, conclusions and references.

2. Literature review and hypothesis development

Signaling theory

Signaling theory proposed by Spence (1973) is a theory which suggests the way in which management as an important element in managing a company discloses information about its financial performance and the results obtained to all stakeholders. According to Drover, Wood, &

Corbett, (2018) the signaling theory proposed by Spence in 1973 provides evidence and an understanding of how outsiders from companies such as investors and the general public in assessing companies. Stakeholders such as potential investors observe quality signals in the company's financial statements which become a medium for assessing the company (Connelly et al., 2011). This is because stakeholders cannot see directly the state of the company; therefore the signal becomes very important (Bergh et al., 2014). The implementation of signal theory is very useful in a company, because it provides an explanation of the features and business activities and provides a signal about the quality and value of a company to stakeholders (Park & Patel, 2015).

According to Connelly et al. (2011), in making investment decisions, investors and potential investors will use and capture information signals disclosed by the company. When fundamentalist market participants receive and understand information, they first interpret, analyze, and evaluate whether the information reflects good or bad conditions as investors will react to information about earnings (Rupar, 2017; Cookson & Niessner, 2019). Investors will show a positive signal or reaction to the market about high transparency and of course this will build a good image of future prospects and attract the attention of other investors (Ajina et al., 2015). Investment decisions and other actions by investors will be strongly influenced by various factors even in changes in accounting standard regulations and methods applied by company management (Armstrong, Barth, Jagolinzer & Riedl, 2010; Muller III et al., 2011).

The application of PSAK 69 in agricultural companies is a form of applying accounting regulations to improve the quality of financial reports. The application of the fair value of biological assets which is the main item in agricultural companies increase the proportion of assets that indicate the ability of assets to generate cash flows and generate profits as a result of revaluing biological assets through fair value. This

gives a positive signal to stakeholders where they will react through rising stock price movements which will then increase the value of the company (Iatridis, 2012). Likewise with the disclosure of biological assets, the more information provided, the more positive the signal sent to parties with an interest in the company (stakeholders) and shareholders (Gerged et al., 2020). The confidence of stakeholders and shareholders in the company's ability to operate according to applicable standards will be supported by extensive disclosure of biological assets based on PSAK 69 in accordance with the requirements. This trust is shown by investors by giving a positive response to the company in the form of an increase in stock prices.

The influence of fair value measurement of biological assets on firm value

Measurement of the fair value of biological assets provide relevant information about biological assets. The fair value of these assets continue to increase considering that biological assets continue to grow which will make reported biological assets reflect their true prices and more predictive future cash flows, which ultimately gives a positive signal to the market and increases the value of the company (Barlev & Haddad, 2003; Herrmann, Saudagaran & Thomas, 2006). This means that greater the proportion of biological assets as a result of fair value measurement, greater positive effect of fair value measurement on firm value.

According to Garcia (2018), biological transformation in the agricultural industry is referred to as a process of growth, degradation, production and procreation. Because changes that occur in biological assets cannot or are very difficult to assess at cost, fair value measurement is chosen to assess the transformation of biological assets (Franc-Dąbrowska, Mądra-Sawicka, & Bereźnicka, 2018). At the beginning of asset recognition and at the end of reporting, biological assets are always measured at net fair value (less costs to sell) as regulated by PSAK 69, except when the reliability of fair value cannot be measured (IAI, 2018). The alternative in

determining the fair value of biological assets is to group them based on certain criteria such as quality or age, so that it can help determine the value based on the same attributes as those used in an active market.

The fair value measurement of biological assets based on PSAK 69 is considered to be able to show the actual condition of the entity in accordance with Hitz (2007) opinion regarding fair value that using fair value assumptions can reduce bias. This is because fair value assessment in this case biological assets can be applied from market value at level 1 hierarchy (Liao et al., 2019), so that the value of biological assets reflected in the financial statements is the actual condition when conducting financial reporting. Danbolt & Rees (2008) state that timeliness, accuracy, and dependence on the use of fair value can contribute to high firm value in the stock market. High value of this company can be interpreted as positive information or good news for stakeholders and investors. This is related to the signaling theory according to Barlev & Haddad, (2003); Herrmann, Saudagaran & Thomas, (2006) where asset information according to fair value indicates the financial condition of a company will give positive signals to stakeholders.

H₁: The fair value of biological assets has a positive effect on firm value.

The influence of biological assets disclosure on firm value

According to IAI (2018) in PSAK 69, biological assets are living animals or plants that undergo a process of growth, chemical and physical changes, and production, which is called biological transformation. Gonçalves, Lopes & Craig (2017) explain that disclosure of biological assets is the delivery of information about company management activities, such as changing or processing biological assets. Biological transformation changes biological assets in terms of quality or quantity. Orbán, Dékan & Kiss, (2015) and Marques, (2021) mention that the transformation of biological assets cannot be separated from the intervention of the company's

management. For example, management can influence the development of live animals or vegetation, decrease production as a result of the production of new biological assets through breeding programs and can measure the quality and quantity of these modified assets such as sheep and crops.

PSAK 69 explains that disclosure of biological assets must be carried out to inform quantitative descriptive quality (IAI, 2018). Disclosure of biological assets should be included in the section after the explanation regarding the accounts in the financial statements and additional tables to help readers understand the statement of financial position and income statement (Marques, 2021). Differentiation of biological assets that can be used (consumptive) and biological assets that produce (productive), as well as classification as mature or immature assets (Hou, 2015). PSAK 69 explains that the disclosure of biological assets must be done to inform quantitative descriptive quality. Disclosure of biological assets should be included in the related account explanation headings in the financial statements and may include additional explanations or tables to help readers understand the statement of financial position and income statement (Marques, 2021)

PSAK 69 regulates the disclosure of biological assets to be something that can attract the attention of stakeholders, especially investors in placing their trust in a company because they assume that the company already has integrity in terms of disclosing all important information (Abdullah & Tursoy, 2019). Therefore, companies disclose information as widely as possible, especially biological assets in order to increase investor trust related to company information (Orens et al., 2009). The value of this trust will be shown by a positive

response to the company in the form of changes in the increasing share value. Higher share value indicates that higher the firm value (Wen-hsin Hsu et al., 2019).

H₂: Biological assets disclosure has a positive effect on firm value

3. Research method

To test the hypothesis that has been compiled, we collected data related to biological assets to observe the measurement and disclosure of biological assets in the financial statements of agricultural sector companies listed on the Indonesia Stock Exchange from 2018-2020. All agricultural companies were then re-selected into the sample based on predetermined criteria. From panel data collection, information is obtained that biological assets are measured based on fair value where each year the asset value increases or decreases according to the age and type of the biological asset.

Sampling and data collection techniques

This study took a sample of 51 agricultural sector companies listed on the Indonesia Stock Exchange for the 2018-2020 period. The initial year of data is 2018 because PSAK 69 is effective starting January 1, 2018. By reason of, the effective application of PSAK 69 is in 2018, the implementation period tends to be short. After sample selection, we obtained a sample of 17 agricultural companies with a total of 51 sample observations. Due to a small number of agricultural companies listed on the stock exchange plus the short research period, the sample becomes small. The selection criteria and sample selection results are shown in Table 1.

Table 1. Research samples

Sample criteria	For 3 years
Agricultural companies listed for the period 2018-2020 on the IDX	63
The company does not consecutively issue financial statements during 2018-2020	(3)

Companies that do not apply PSAK 69 effectively	(9)
Total	51

The required data are data on the reported value of biological assets and other financial information obtained from the financial statements of agricultural companies. While data related to market information, namely stock price data obtained from information providers. The financial statements of agricultural companies are useful for providing information to investors as a basis for assessing the performance of agricultural companies (Hung, Cuong & Ha, 2018). The information contained in the financial statements is the background studied in this research. First, it allows traceability of the appropriate amount of financial statements according to available information, namely about biological assets. Second, it allows us to look at the fair value measurement of biological assets that are valued after initial recognition as reflected in the statement of financial position and see changes in fair value that have an impact on profits reported in the income statement. The third is looking at the information disclosed which is then assessed based on the disclosure index required by PSAK 69.

Variable operationalization and variable measurement

Dependent variable

Firm value

Tobin's Q method can be used to determine the value of a company and is a popular ratio among researchers to calculate firm value (Tahir & Razali, 2011; Li, Minnis, Nagar, & Rajan, 2014; Ha & Frömmel, 2020; Kim & Shin, 2021). In Abuzayed's (2012) research, the Tobin's Q model formulates the market value of the entity divided by the replacement value of its assets which is used in

assessing the performance of an entity. Tobin's Q has been widely used as a performance indicator in economics, finance, and strategic management such as research by Vomberg, Homburg, & Bornemann (2014) and Gharaibeh & Qader, (2017). Tobin's Q ratio formula to calculate firm value:

$$Tobin's\ Q = \frac{MVE + TA - BVE}{TA}$$

Where, MVE is the market value of equity; TA is total assets, and BVE is book value of equity.

Beside Tobin's Q, we employ Price Book Value (PBV) as the second measurements of firm value. The main measurement is Tobin's Q. The PBV is used as sensitivity analysis with the formula as follows:

$$PBV = \frac{\text{Stock Price}}{\text{Book Value of Equity per Share}}$$

Independent variables

Biological assets value

The focus of the research is the measurement of the fair value of assets, namely biological assets. The research model for measuring biological assets is based on previous research. Starting from the research of Fields, Fraser, & Wilkins (2004) and then developed by several studies such as Cameran & Perotti, (2014), Alexeyeva & Mejia-Likosova, (2016) related to the fair value measurement model. To see the effect of measuring the fair value of biological assets on firm value, the researcher uses the calculation of biological assets as measured by the fair value of biological assets divided by total assets or what is called the intensity of biological assets (Alexeyeva & Mejia-Likosova, 2016)

$$\text{Biological Assets Value} = \frac{\text{Biological Assets measured at fair value}}{\text{Total Assets}}$$

Biological asset disclosure

Disclosure of biological assets is calculated using a disclosure index developed from the research of Clarkson, Fang, Li, & Richardson (2013) and used in several related studies such as Plumlee, Brown, Hayes, & Marshall, (2015), Nor, Bahari, Adnan, Kamal, & Ali (2016) and Gerged et al., (2020) in this case are calculated using the disclosure index formula as follows:

$$\text{Disclosure Index} = \frac{n}{k} \times 100\%$$

Description, n is accumulated score of disclosure by the company; k is accumulated score required by the standard (PSAK 69).

Control variable

The control variables in this study are profitability, leverage and growth. The profitability variable is proxied by ROA (Return on Assets) (Ghoul, Guedhami, & Kim, 2017; Kolsi & Attayah, 2018) measured by the ratio of net income to total assets. The leverage variable is proxied by DAR

(Debt on Assets Ratio) which is the ratio of debt to assets (Gerged et al., 2020). Finally, the growth variable is measured by calculating the percentage change in total assets experienced by the company (total assets for the current year minus total assets for the previous year, the result is divided by total assets for the previous year) (Ha & Frömmel, 2020).

Hypothesis test

We used panel regression analysis with lag 1 to examine the effect of the fair value of biological assets and disclosure of biological assets on firm value. This study employed lag 1 for biological asset value and biological asset disclosure with the consideration that users of firms' financial information such as investors, creditors, and other stakeholders responded to financial information published at t-1. Changes in company value in year t are caused by investor responses to last year's financial information. The following is the regression equation used in this study.

$$FV_{it} = \alpha_0 + \beta_1 BAV_{it-1} + \beta_2 BAD_{it-1} + \beta_3 Pf_{it} + \beta_4 LV_{it} + \beta_5 Gr_{it} + \varepsilon_i$$

Where, FV_{it} is Firm Value; BAV_{it-1} is biological assets value of firm i in the previous year; BAD_{it-1} is biological assets disclosure of firm i in the previous year; pfit is profitability of firm i in current year t; LV_{it} is leverage of firm i in current year t; grit is growth of firm i in current year t; and

ε is error term.

We use two measurements of firm value, Tobin's Q (FV1_Tobin's Q_{it}) and price book value (FV2_PBV_{it}). The main measurement is Tobin's Q. The PBV is used as sensitivity analysis. The equations are as follows:

$$FV1_Tobin'sQ_{it} = \alpha_0 + \beta_1 BAV_{it-1} + \beta_2 BAD_{it-1} + \beta_3 Pf_{it} + \beta_4 LV_{it} + \beta_5 Gr_{it} + \varepsilon_i$$

$$FV2_PBV_{it} = \alpha_0 + \beta_1 BAV_{it-1} + \beta_2 BAD_{it-1} + \beta_3 Pf_{it} + \beta_4 LV_{it} + \beta_5 Gr_{it} + \varepsilon_i$$

4. Results and discussion

Descriptive analysis

Table 2 shows descriptive statistics of all variables tested in this study for the data period from 2018 to 2020. These results descriptive statistics indicate that the average of market value of the agricultural company exceeds the book value

of the company's assets, as much as 1.266 market value (measured by Tobin's Q) and 1.307 (measured by PBV) per 1 company's total assets spread from maximum value 4.584 to minimum value 0.653 (measured by Tobin's Q) and from 6.109 to -0.187 (measured by PBV).

Table 2. Descriptive statistics test results

Variabel	Minimum	Maximum	Mean	Std. Deviation
1_TOBIN'S Q _{it}	0.653	4.584	1.266	0.773
FV2_PBV _{it}	-0.187	6.109	1.307	1.179
BAV _{it-1}	0.002	0.090	0.025	0.024
BAD _{it-1}	0.433	0.867	0.675	0.124
Pf _{it}	-0.583	0.493	0.005	0.135
LV _{it}	0.048	1.925	0.558	0.342
Gr _{it}	-0.371	0.735	0.046	0.161

Note: FV1_TOBIN'S Q_{it} is firm value measured by Tobin's Q. FV2_PBV_{it} is firm value measured by PBV; BAV_{it-1} is Biological Assets Value of firm i in the previous year; BAD_{it-1} is Biological Assets Disclosure of firm i in the previous year; Pf_{it} is Profitability of firm i in current year t; LV_{it} is Leverage of firm i in current year t; Gr_{it} is Growth of firm i in current year t.

The average biological asset value (BAV_{it}) measured at fair value for all agricultural entities is 2.5%. These results indicate that the proportion of biological assets measured at fair value has a 2.5% share of the total assets of agricultural companies. Agricultural companies have the largest proportion of the fair value of biological assets, which is 9.0% of their total assets and the lowest is 0.18% of total assets. Disclosure of biological assets (BAD_{it}) in the observation period has an average value of 0.675. This figure shows that agricultural companies disclose information about biological assets by 67.5% of the total items that must be disclosed, or companies only disclose 23 items out of 34 required disclosure items. The maximum value or the most disclosing information related to biological assets is 86.7% and the company which discloses the least is 43.33%. From this data, we obtained information that the level of disclosure of biological assets after the application of PSAK 69 is around 40 percent to 80 percent and has not yet reached full disclosure. These results are then tested against the firm value calculated by the Tobin's Q.

Profitability (Pf_{it}) as proxied by ROA has an average value of 0.0053. Statistical results with these values indicate that agricultural companies are able to generate a net profit of 0.53% of their

total assets. Or in other words, every one point of the assets managed by the company is able to generate 0.53% profit. Profitability with a maximum value of 49.4% return on assets and profitability with a minimum value is -58.3 percent. On average, the leverage (LV_{it}) of agricultural companies as proxied by DAR is 55.8%. It indicates more than 50% asset of agricultural companies financed by debt. This means that every Rp. 1 of assets owned by the company guarantee Rp. 0.558 of debt. The maximum value is 192.53% and the smallest debt value on assets is 4.8%. The Growth variable (Gr_{it}) has an average value of 0.0469. This result illustrate that the company grew by 4.69% from the previous year as seen from the increase in total assets year by year so that the company grew positively in line with the increase in total assets. Agricultural companies have the largest growth rate of 0.7352 or 73.5 and companies with the lowest growth rate of -0.371.

Classical assumption test

Classical assumption test was conducted to show unbiased and more efficient results in research. The classical assumption test consists of normality, multicollinearity and autocorrelation tests. The test results are shown in Table 3.

Table 3. Classical assumption test

	Kolmogorov-smirnov (KS)	VIF	Tolerance	Durbin-Wattson
Normality	0.200			
Multicollinearity				
BAV _{it-1}		1.335	0.749	
BAD _{it-1}		1.302	0.768	
Pf _{it}		4.787	0.209	
LV _{it}		2.031	0.492	
Gr _{it}		3.082	0.342	
Non-Autocorrelation				2.050

Note: BAV_{it-1} is Biological Assets Value of firm i in the previous year; BAD_{it-1} is Biological Assets Disclosure of firm i in the previous year; Pf_{it} is Profitability of firm i in current year t; LV_{it} is Leverage of firm i in current year t; Gr_{it} is Growth of firm i in current year t.

The effect of fair value of biological assets and disclosure of biological assets as well as control variables of profitability, leverage, and growth on firm value have a residual value of 0.200 greater than 0.05, so it can be concluded that the data are normally distributed. The fair value of biological assets, disclosure of biological assets, profitability, leverage and growth has a tolerance value greater than 0.1 and the value of Variance Inflation Factors is below 10. Thus, there are no symptoms of multicollinearity in the regression model.

The condition for not autocorrelation is to use the equation $du < dw < 4 - du$. For 51 samples (n) and five types of independent variables (k=5), the value of du is 1.7701. The Durbin-Watson value (dw) is 2.050 so the equation becomes $(du) = 1.7701 < (dw) = 2.050 < (4 - du) = 2.2299$. Based on the Durbin-Watson equation, the value (dw) is greater than the

value of du and the value (dw) is smaller than the value $(4 - du)$ so that the conditions for avoiding autocorrelation have been met. The model is free from autocorrelation.

Hypothesis test

Table 5 shows the results of the regression analysis which explains the effect of the value of biological assets measured by fair value and disclosure of biological assets as regulated in PSAK 69 on the firm value of the firms in agricultural industry. Besides, we employ several control variables such as profitability, leverage, and growth. We use two measurements of firm value, Tobin's Q and Price Book Value (PBV). The main measurement is Tobin's Q. The PBV is used as sensitivity analysis.

Table 5. Hypothesis testing results

Independent Variables	Dependent Variable: Firm Value (FV)					
	Tobin's Q			Price Book Value*		
	Coef	T-Stat.	Sig.	Coef	T-Stat.	Sig.
C	2.087	2.715	0.011	2.019	1.738	0.093
BAV _{it-1}	15.525	5.421	0.008	17.124	2.089	0.046

BAD _{it-1}	-2.121	-1.832	0.078	-1.370	-0.782	0.441
Pf _{it}	3.493	2.072	0.048	5.163	2.026	0.052
LV _{it}	0.619	1.548	0.133	-0.138	-0.227	0.822
Gr _{it}	-2.721	-2.019	0.051	-3.556	-1.747	0.092
<i>R Square</i>	0.342			0.340		
<i>Adjusted R Square</i>	0.225			0.222		

Note: BAV_{it-1} is biological assets value of firm i in the previous year; BAD_{it-1} is biological assets disclosure of firm i in the previous year; Pf_{it} is profitability of firm i in current year t; LV_{it} is Leverage of firm i in current year t; Gr_{it} is growth of firm i in current year t. * Price Book Value (PBV) is used for sensitivity analysis purposes.

Based on the value of firm value measured by Tobin's Q (FV1_TOBIN'S Q_{it}), the results are as follows. The value of biological assets in the previous year (BAV_{it-1}) has a coefficient of 15.525 (t-stat. = 5.421) with a significance level of 1%. It shows that the value of biological assets has a positive and significant effect on firm value. So the results support the first hypothesis (H1) that the value of biological assets has a positive effect on firm value. The disclosure of biological assets (BAD_{it-1}) has a coefficient value of -2.121 (t-stat = -1.832) with a significance value of 0.078. The results illustrate that the disclosure of biological assets has a negative and significant effect on firm value at level 10%. Therefore, the results do not support the second hypothesis (H2) that biological assets disclosure has a positive effect on firm value. The control variables – profitability (Pfit), Leverage (LV_{it}), and Growth (Grit) – show a different effect on firm value. Profitability (Pfit) has a positive significantly effect on firm value at level 5% (coef. = 3.493, t-stat. = 2.072, sign. = 0.048). Leverage (LV_{it}) has no effect on firm value (coef. = 0.619, t-stat. = 1.548, sign. = 0.133). Growth (Grit) affects firm value negatively significant at level 5% (coef. = -2.721, t-stat. = -2.019, sign. = 0.051).

Based on the value of firm value measured by price to book value ratio (FV2_PBV_{it}), the results are as follows. The value of biological assets in the previous year (BAV_{it-1}) has a coefficient of 17.124 (t-stat. = 2.089) with a significance level of 5%. It shows that the value of biological assets has a positive and significant effect on firm value. As FV1_TOBIN'S Q_{it}, this result support the first

hypothesis (H1) that the value of biological assets has a positive effect on firm value. The disclosure of biological assets (BAD_{it-1}) has a coefficient value of -1.370 (t.stat = -0.782) and not significance (sign. = 0.441). The results illustrate that the disclosure of biological assets has a negative but not significant effect on firm value. Therefore, the results do not support the second hypothesis (H2) that biological assets disclosure has a positive effect on firm value. The control variables – profitability (Pfit), Leverage (LV_{it}), and Growth (Grit) – show a different effect on firm value. Profitability (Pfit) has a positive significantly effect on firm value at level 5% (coef. = 5.163, t-stat. = 2.026, sign. = 0.052). Leverage (LV_{it}) has no effect on firm value (coef. = -0.138, t-stat. = -0.227, sign. = 0.822). Growth (Grit) affects firm value negatively significant at level 10% (coef. = -3.556, t-stat. = -1.747, sign. = 0.092).

The results show a slightly different effect value between variables with Tobin's Q and PBV as measurements of dependent variables.

Discussion

The effect of biological assets value on firm value

The value of biological assets in the previous year has a positive and significant effect on firm value. The result is consistent with hypothesis 1 (H1). The measurement of assets based on fair value increase companies' comprehensive income and book value of asset. It better reflects the actual condition of a company because fair value reflects a higher relevance than historical cost. Assets that are managed using the assumption of fair value generate profits that are able to explain the value of

the company. The management of biological assets at fair value triggers a positive reaction from the market that can increase the value of the company (Iatridis, 2012).

The explanation shows that the valuation or measurement of fair value of biological assets increase profits when assessing these biological assets. So that it will be a positive signal for shareholders due to the measurement of biological assets according to standards will increase shareholder trust as indicated by rising share prices. The rising stock price reflects the higher the value of the company (Park & Patel, 2015). The measurement of the fair value of biological assets at or after initial recognition will increase the amount of biological assets reported in the financial statements so that it will provide an overview of the amount of cash flows that will be received when the asset is managed or sold which is then considered by investors so as to increase the value of the company. The results of this study are in line with the results of research conducted by Gao et al. (2018) which states that the application of fair value according to IFRS has an effect or has a significant relationship on firm value. The results of this study are also supported by research by Bernard, Merton, & Palepu, (1995) and Magnan, Menini & Parbonetti, (2015) which show that asset structure has an influence on firm value. The fair value measurement of biological assets reported in the financial statements reflects more accurate predictions for the market.

The results also support previous results regarding the effect of fair value measurement on firm value of agricultural companies. Argilés, Garcia-Blandon, & Monllau (2011) measure the value of assets using fair value and state that fair value is the right method to show the value of biological assets because this method provides a more predictive picture of future cash flows hence increasing the companies value. Danbolt & Rees (2008) and Marra, (2018) show that the application of fair value measurement improve the qualitative characteristics of information in financial

statements, thereby increasing the value of agricultural companies. Research by Israeli (2015) illustrates that companies that choose to apply the fair value model exhibit higher book values of equity and more volatile net income thereby sending a positive signal to the market.

Effect of of biological assets disclosure on firm value

The disclosure of biological assets has a negative and significant effect on firm value at level 10%. Therefore, the results do not support the second hypothesis (H2) that biological assets disclosure has a positive effect on firm value. PSAK 69 regulates the disclosure of biological assets to be something that can attract the attention of stakeholders, especially investors in placing their trust in a company because they assume that the company already has integrity in terms of disclosing important information Abdullah & Tursoy (2019). The results obtained are suspected because the disclosure of biological assets is mandatory which must be disclosed because it has been required by PSAK 69 from the beginning to be effective so that investors or other stakeholders feel that it is not necessary to see the disclosure of biological assets described in the notes to the financial statements, because the focus is on investors rely on the number of biological and other assets reported in the statement of financial position in analyzing fundamentals for their investment decisions.

Disclosure of biological assets is mandatory under PSAK 69. There are 34 items that must be disclosed under PSAK 69 regarding biological assets (IAI, 2018). Although the actual results show that the company does not 100% disclose its biological assets based on the number of disclosure items, this does not affect the value of the company. This means that shareholders do not see how much disclosure is made by the company regarding its biological assets but other things outside the context of disclosure in their investment decisions. Disclosure of biological assets does not affect the

firm value of the company because it is caused by several other things, including the tendency of investors to buy shares, inadequate disclosure of biological assets, and disclosure of biological assets cannot be measured directly when valuing the company.

Investors especially in Indonesia buy shares for capital gains, and they buy and sell shares every day, regardless of prospects for long-term viability. Where the disclosure of biological assets is a company's long-term strategy to maintain its continuity, while the benefits of biological assets and their disclosure cannot be felt in the short term. Disclosure of biological assets is still not done evenly, on average companies only disclose 40 to 60 percent of their biological asset information. As a result, this variable does not reflect the effect disclosure on firm value. The results of this study are in accordance with previous studies such as Tandry, Setiawati, & Setiawan, (2014) and Sampong, Song, & Boahene (2018) which state that information disclosure has no effect on firm value. However, different results are shown by research Qureshi et al., (2019) dan Gerged et al., (2020) which state that environmental disclosure has a significant effect on firm value.

After testing, the results are consistent with the first hypothesis that the effect of fair value of agricultural biological asset is positively significant on firm value. Companies' assets that are managed using the assumption of fair value generate profits that are able to explain the value of the company, where investors see how the company's condition is from the profits generated from the management of biological assets at fair value so that the positive reaction given can increase the value of the company (Iatridis, 2012). Investors can use the amount of biological assets measured using fair value as a benchmark for valuing the company and using fair value will reduce asymmetric information (Muller III et al., 2011), so that investors react in harmony with the measurement of the fair value of biological assets. reported in financial statements because they reflect more accurate predictions for

the market (Bernard, Merto, & Palepu, 1995; Magnan, Menini & Parbonetti., 2015). The results regarding the effect of disclosure of biological assets on firm value do not support the second hypothesis. The results obtained are suspected because the disclosure of biological assets is mandatory which must be disclosed because it has been required by PSAK 69 from the start to be effective so that investors or other stakeholders feel that it is not necessary to see the disclosure of biological assets described in the notes to the financial statements, because the focus is on investors are found in the number of biological and other assets reported in the statement of financial position in analyzing fundamentally for their investment decisions (Sheu, Chung & Liu, 2010).

Sensitivity analysis

Sensitivity analysis was carried out to see the effect of the independent variable on the dependent variable which was different measurement from the test with the previous dependent variable. The results of sensitivity analysis are show in Table 5. In this study, the firm value is determined by the Tobin's Q ratio, then to see the difference in the effect of the other dependent variables, we use Price Book Value ratio. After testing with PBV, slightly different results were obtained. The biological asset value has a significance effect on firm value. For the biological asset disclosure variable, the negative effect is not significance. The results conclude that the effect of BAVit-1 and BADit-1 on firm value with price to book value as measurement is sensitive. Profitability variable (Pf) has a significance level of 0.052 compared to 0.048 which explain a small difference of significant level. However, different results were found in the other two control variables. In the PBV measurement, the control variable Leverage (LV) and growth (Gr) have a significance level of 0.822 compared to 0.133 and 0.092 compared to 0.051.

5. Conclusions

This study aims to examine the effect of the fair value of biological assets and disclosure of biological assets on firm value. The results show that the measurement of the fair value of biological assets has a significantly positive effect on firm value. Therefore, fair value measurement gives a positive signal to stakeholders so that stakeholders in the market such as shareholders provide positive feedback. The measurement of the fair value of biological assets at or after initial recognition increase the amount of biological assets reported in the financial statements so that it will provide an overview of the amount of cash flows that will be received when the asset is managed or sold which is then considered by investors so as to increase the value of the company.

While the empirical results for the disclosure of biological assets do not show a significant effect on firm value. In theory, the extent of disclosure of biological assets according to PSAK 69 will give a positive signal to the market. PSAK 69 regulates the disclosure of biological assets to be something that can attract the attention of stakeholders, especially investors in placing their trust in a company because they assume that the company already has integrity in terms of disclosing important information. Stakeholders do not pay any attention to how widely information is disclosed about biological assets in their investment decisions. They look at other fundamental factors about the company to assess a company.

This study has several limitations, such as the small sample size because there are still few agricultural companies listed on the Indonesia Stock Exchange and the timeframe taken is 2018-2020, this is because it is based on the effective application of PSAK 69 so that the implementation period tends to be short. So, the results do not reflect the actual situation. For further research, it is expected to add other independent variables related to PSAK 69 or other variables that affect firm value and expand the sample such as agricultural companies from ASEAN countries. It is hoped that

future research will increase the time span of related research from the beginning of the application to the time of the research conducted so that it can better reflect the actual situation.

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