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Firm Value of Agricultural Companies in Indonesia: Does Biological Assets and Carbon Emission Matters?

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Abstract

Agricultural sector becomes one of the sectors which contributes to national economic growth, so the development of agricultural sector needs attention. The purpose of this study is to ascertain how the value of agriculture sector companies listed on the Indonesia Stock Exchange in 2019–2022 is impacted by biological assets disclosures, biological asset intensity, and carbon emissions disclosure. Sample of this research was obtained by purposive sampling method based on some criteria, so sample of 43 observation data were acquired. Panel data regression analysis with lag 1 is applied in this research because changes in firm value in year t are a result of investors' reactions to previous year's financial information. The findings of this research indicate that biological assets disclosure has a significant positive effect on firm value, biological asset intensity has a significant negative effect on firm value, while carbon emissions disclosure has no discernible effect on the firm value of agricultural sector companies.

Keywords: biological asset disclosure, biological asset intensity, carbon emission disclosure, firm value.

1. Introduction

Indonesia is an agricultural country that has natural landforms to supports agricultural sector's development. Agricultural sector's growth is becoming more and more significant to address, marked by the enhancement of its contribution to GDP (Widada et al., 2020). According to 2020 Agricultural Indicators statistics, agricultural sector redound 13.70% to the total Gross Domestic Product (GDP), a rise of 0.99% over the previous year (Aminah et al., 2022). The growth of the agricultural sector can be a motivation for companies to increase firm value so they can compete with companies in other sectors (Utami & Prabaswara, 2020).

Firm value describes investor's impressions of the company's level of success as well as becomes important indicator so that agricultural companies can attract investors to invest. It makes agricultural companies can continue to grow. However, previous research about firm value, has concentrated more on financial ratios and good corporate governance in

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manufacturing sector (see, for example, Alfiana, (2021); Karuni & Suci, (2022); Mau & Kadarusman, (2022)). Based on the author's observations, there is a few research that explores the values of agricultural sector companies, so this is an opportunity for the author to explore it. On the other hand, based on the author's observations during the 2019-2022 period, the value of agricultural sector companies experienced fluctuations. These fluctuations will pose a risk for investors to buy stock. Information about firm value is important for stock investment decisions, because it helps investors to know which stocks are performing well (Karuni & Suci, 2022). This will show the fluctuated data of several agricultural sector's firm value during 2019-2022:

Table 1: Fluctuating Firm Value of Agricultural Companies

No.	Code	2019	2020	2021	2022
1	AALI	1,336	1,161	0,905	0,768
2	ANJT	0,823	0,653	0,692	0,533
3	BISI	1,283	1,217	1,082	1,513
4	CPRO	1,442	1,359	1,016	0,996
5	SSMS	1,336	1,551	1,223	1,541

Source: Data Processed, 2023

One of Indonesia's primary economic assets is the agricultural sector, so agricultural sector must continue to be developed. The availability of comprehensive information will increase the growth of the agricultural sector (Sa'diyah et al., 2019). This information is offered as a disclosure in the annual financial report so that both internal and external parties can use this information in their decision-making process. The disclosure of agricultural companies is slightly different from other industries, because agricultural companies have main assets that have unique characteristics named biological assets.

Biological assets are firm assets that take the shape of live plants and/or animals, as defined by PSAK 69. Since biological assets are living resources that run into biological transformation, they are unique assets that have come to define agricultural sector, so they need to be identified, quantified, and reported. PSAK 69 states that the processes of growth, degeneration, production, and reproduction that lead to qualitative or quantitative changes in biological assets are referred as biological transformation. Its transformation affects the value of biological assets which can provide additional value to the company (Ulupui et al., 2021).

Pernyataan Standar Akuntansi Keuangan (PSAK) No. 69 refers to IAS 41 concerning agriculture which became effective in January 2018, creating a new circumstance for agricultural companies in Indonesia because biological assets disclosure is a mandatory for agricultural companies. This is in line with the importance of disclosing biological assets to satisfy stakeholders' information requirements Alfiani & Rahmawati (2019). Fitriasuri & Putri (2022) stated that disclosure of biological assets can raise the agricultural products quality and encourage more investors to fund in agricultural companies which will raise the value of the company. However, there is still a need for academics to investigate the disclosure of biological

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assets in agriculture sector, though, as there are still a number of companies that have not fully disclosed biological assets in practice.

Prior to PSAK 69 enactment, when PSAK 16 was implemented, biological assets were measured at historical cost. This assessment is considered not representative because biological assets undergo biological transformation so that they require appropriate measurement, namely fair value (see, for example, Gonçalves & Lopes (2014) and Maharani & Falikhatun (2019)). Based on PSAK 69, measuring biological assets using fair value requires fair value less costs to sell and biological assets are not depreciated.

Research about measuring biological assets with fair value often uses the term of biological asset intensity (see, for example, Alfiani & Rahmawati (2019) and Nur'aini et al., (2022)). According to Alfiani & Rahmawati (2019), the amount of agricultural company investments in biological assets that is shown in their financial reports is known as biological asset intensity. Research about the effect of the intensity of biological asset still finds inconclusive results. Alfarisyi et al., (2022) revealed that measuring biological assets in fair value significantly raises the value of the company. However, Argilés et al., (2011) displayed distinct outcomes, that are measuring biological assets using fair value did not show significant differences regarding the description of future cash flows compared to measuring assets using historical cost.

Apart from the biological assets that make agricultural sector companies attractive, the agricultural sector also emits quite a bit of carbon. Agricultural companies' carbon emissions come from plantation operations which include factory fuel, nitrogen oxide emissions from fertilizer used, land management, and naturally occurring low-level methane emissions from peat. Based on data from ICDX (Indonesia Commodity & Derivatives Exchange), the agricultural sector also contributes to carbon gas emissions in Indonesia about 12% after the energy sector.

Recently, carbon emissions have also become a hot topic of discussion in Indonesia. Almaeda et al., (2023), who conducted research by literature mapping on carbon emissions in Indonesia, revealed that researchers' interest in researching carbon emissions has increased since the Kyoto Protocol international agreement, which was the initiator of the business strategy movement towards climate change. However, research on carbon emissions mostly discusses the impact of carbon emissions disclosure in Indonesia, while the effect of carbon emissions disclosure on firm value is still small (Nursulistyo et al. 2022).

Research on the effect of carbon emission disclosure on firm value provides inconsistent opinion. Soleha & Isnalita (2022) found that disclosure of carbon emissions has a positive and significant effect on firm value because it acts as a positive signal that creates a good image and impression in investor's eyes. This is different from research conducted by Muhammad & Aryani (2021) which found that carbon emissions disclosure had a negative effect on firm value. Meanwhile, according to Anggita et al., (2022) and Daromes et al. (2020) carbon emissions disclosure has no effect on firm value.

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The following research questions are based on the problem's background description: Does biological assets disclosure affect firm value? Does biological asset intensity affect firm value? Does carbon emission disclosure affect firm value? This research contributes to research in Indonesia by generating new views regarding the impact of biological asset disclosure, biological asset intensity and carbon emission disclosure on the value of Indonesian agricultural firms.

1.2 Literature Review

Signaling theory explains how a company gives related parties about company information in the form of signal (Spence, 1973). According to Brigham & Houston (2016), a signal is a move made by management to give investors guidance on how to assess the company's prospects from the management perspective. Investors will notice that the company's growth indicates that it has profitable elements. Investors interpret information about a company's growth as a sign of improved performance prospects for the future, which will raise the firm value (Gabriela & Widyasari, 2020).

1.2.1 Firm value

In order to reassure investors about the company's prospects and ability to continue as a going concern, firm value shows investor's perspective and credibility on the level of management's performance in running the business (Suwandi et al., 2022). High firm value must be paired with economic performance, social justice concerns, and corporate responsibility for sustainability in addition to being represented in company profitability. (Monica et al., 2021).

1.2.2 Biological Assets Disclosure

There are two categories of disclosure items according to PSAK 69, these are mandatory disclosure and suggested voluntary disclosures. Mandatory disclosure includes gains or losses incurred during the period, an explanation of non-financial measurement procedures, additional disclosures in cases where fair value cannot be accurately determined, disclosures pertaining to the fair value of biological assets that were previously valued at cost, and government grants. While consumable and bearer biological assets, mature and immature biological assets, and the amount of change in fair value decreased costs to sell that impacts profit or loss owing to physical and pricing changes are examples of voluntary disclosure items.

1.2.3 Biological Asset Intensity

The proportion of a company's investment in its biological assets is known as biological asset intensity (Carolina et al., 2020). Fair value is used to measure biological assets in the financial accounts that have incorporated PSAK 69. The price at which an asset would be sold or a liability transferred in a well-ordered transaction between market participants on the measurement date is known as fair value. Therefore, biological assets will be measured at fair value after subtracting all costs incurred during the sale process.

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1.2.4 Disclosure of Carbon Emissions

The amount of anthropogenic greenhouse gases from the agricultural sector is caused by unsustainable agricultural cultivation practices, such as land burning and soil plowing. Land burning and soil plowing will destroy soil aggregation and make soil particles becoming loose and soil carbon being lost to erosion. In addition, soil organic matter is also oxidized, which results in increased CO2 gas emissions and decreased soil carbon stocks, thus sustainable land management is needed to overcome this (Ades, 2018). In Indonesia, disclosing of carbon emissions is currently voluntary. While carbon emissions disclosure is still voluntary, the recent issuance of the Presidential Regulation on the Economic Value of Carbon No. 98 of 2021 indicates that carbon emissions have become one of the government's focuses.

1.3 Hypotheses Development

1.3.1 The Effect of Biological Assets Disclosure on Firm Value

Signaling theory states that if companies disclose information that is accessible to the public will provide positive signals to investors (Tyas & Bandi, 2021). According to PSAK 69, biological assets disclosure might draw the attention of stakeholders, particularly investors, who believe firm has credibility in terms of disclosing crucial information. High disclosure of information respective to biological assets shows a positive signal in increasing firm profits (Soleha & Isnalita, 2022).

H1: Biological asset disclosure has a positive effect on firm value

1.3.2 The Effect of Biological Assets Intensity on Firm Value

Measuring biological assets at fair value can measure biological assets close to the real value while increasing the value of biological assets due to biological transformation, so that the information disclosed in the financial statements can be improved in quality (Carolina et al., 2020). Enhancing the quality of financial statements gives positive signal to investors and other market participants, encouraging them to give positive feedback.

Fair value method of biological assets measure at or after initial recognition, it is possible to increase the amount of biological assets reported in the financial statements and get a better picture of the amount of cash flows that will be received when the assets are managed or sold (Alfarisyi et al., 2022). Investors will then consider this when making an investment in order to boost the firm's value.

H2: Biological asset intensity has a positive effect on firm value.

1.3.3 The Influence of Biological Assets Intensity on Firm Value

Investors can assess various plans against potential roadblocks and detect potential future hazards of the company with the use of carbon emissions disclosure (Monica et al., 2021). Its

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information provides a form of measuring the firm's operational value through the identification of sustainable management that will result in higher firm value.

Disclosure of carbon emissions can also be good news for investors because the risk of investing is considered small and results in a reduced cost on equity so that it will result on the increase of firm value (Bahriansyah & Ginting, 2022).

H3: Carbon emissions disclosure has a positive effect on firm value.

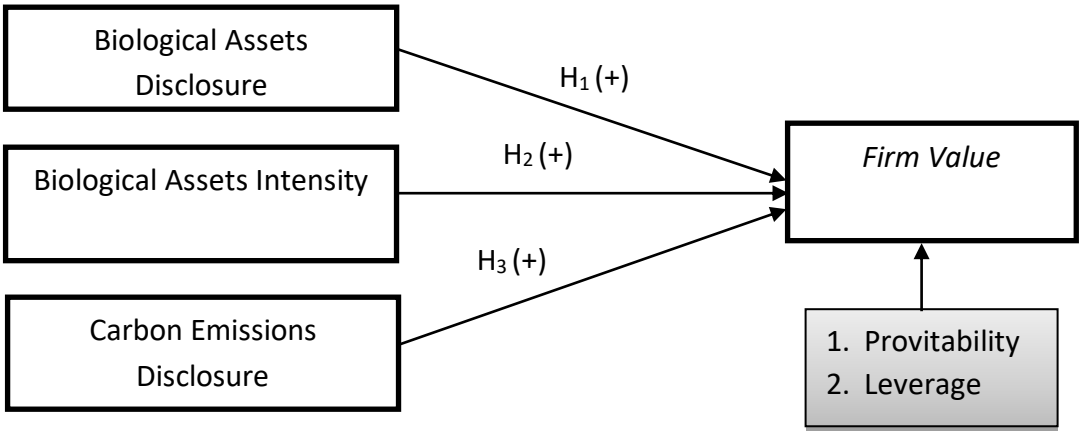

Figure 1. Research Framework

2. Method

This research uses a quantitative methodology to investigate the effect of disclosure of biological assets, biological asset intensity, and carbon emissions disclosure on firm value in agriculture companies in 2019-2022. Profitability and leverage also used as control variable. The effect of independent and control variables on the dependent variable is examined using panel regression analysis with lag 1. Given that signal theory states that financial report users, including creditors, investors, government, society and other stakeholders, react to financial information published in t-1, this research employs lag 1 for the values of biological asset disclosure, biological asset intensity, carbon emission disclosure, profitability, and leverage. Investor reaction to previous year's financial data is what drives changes in the firm value in year t.

2.1 Population and Sample

Population of this research were all agricultural sector companies listed on the IDX during the 2019-2022 period, totaling 23 companies. The reason for choosing agricultural companies because agricultural companies have biological assets that are different from other companies. The sampling technique was carried out by purposive sampling based on certain criteria, so that a sample of 12 companies during the four years of research, so that 48 observation data were obtained. However, in this research there are data that make it difficult to test classical assumptions named outlier data. After doing outliers with boxplot analysis using SPSS 26, 5

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outlier data were obtained, so that the research sample was 43 observation data. The following is the sampling technique in this study:

Table 2: Samples

No	Sample Criteria	Total
1	Agricultural sector companies listed on the Indonesia Stock Exchange in 2019-2022	23
2	Agricultural companies listed on the Indonesia Stock Exchange which not report consecutive and complete annual reports during the 2019-2022 period	(3)
3	Agricultural sector companies which not apply PSAK 69 effectively	(7)
4	Companies that have negative equity for four consecutive years	(1)
	Total number of companies	12
	Number of Years of Observation	4
	Total Data	48
	Outlier Data	(5)
	Total sample after outliers	43

Source: Data Processed, 2023

2.2 Operational Definition and Measurement of Variables

2.2.1 Dependent Variable

Firm value measured by Tobin's Q ratio which is the market value of equity plus the book value of all debt is divided by the book value of all assets (Bahriansyah & Ginting, 2022). Measurement using Tobin's Q is reputed as the best measurement because it considers the amount debt and assets owned by the company (Lingga & Suaryana, 2017). This following is the calculation formula:

$$Tobin's\ Q = \frac{\text{MVE} + \text{DEBT}}{\text{TA}}$$

MVE is the Market Value of Equity (number of shares outstanding X share price); DEBT is company's total debt, and TA is the company's total assets.

2.2.2 Independent Variable

Biological Asset Disclosure (BAD)

This study uses a biological asset disclosure index in accordance with PSAK 69. In this study, not all disclosure items in PSAK are included in the index, but items that are in accordance with the conditions of companies in Indonesia are included. The index of biological asset disclosure contains 30 items. The disclosure index examines the level of biological asset. It measures by assigning a score of 1 (one) to each item revealed in the financial statements and a score of 0 (zero) to those that are not disclosed.

$$BAD = \frac{n}{30}$$

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The proportion of companies' investment in biological assets which measured at fair value in accordance with PSAK 69 presented in the financial statements is called biological asset intensity. This research used the formula as done by Alfiani & Rahmawati (2019) and (Fitriasuri & Putri, 2022) by dividing total biological assets by total company assets.

$$BAI = \frac{Biological\ Assets}{TA}$$

Carbon Emissions Disclosure (CED)

Annual reports and/or sustainability reports are often where carbon emissions are disclosed. This reseach uses disclosure items from The Global Reporting Initiative (GRI) on emissions in 2016 which consists of 37 disclosure items. The determination of carbon emission disclosure is seen from carbon emission aspect of environmental category in GRI, namely GRI 305: Emissions. Each disclosure item is scored on a dichotomous scale. Each item has a value of 1, thus the organization will receive a score of 37 if all items are disclosed.

$$CED = \frac{Total\ item\ disclosed}{37}$$

2.2.3 Control Variables

This study uses two control variables, namely profitability and leverage. ROA (Return on Asset) is the proxy of profitability, measured by ratio of net income divided by total assets (Wirawan & Setijaningsih, 2022). Meanwhile, leverage is proxied using DAR (Debt to Asset Ratio) or the ratio of total debt to total assets as in Alfarisyi et al. (2022) and (Wirawan & Setijaningsih, 2022).

2.3 Research Model

This research examined the impact of biological assets disclosure, biological asset intensity and carbon emissions disclosure on firm value. Additionally, this research incorporated the profitability and leverage as control variables. The research's regression equation model is as follows:

$$Q_{i,t} = \beta_0 + \beta_1 BAD_{i,t-1} + \beta_2 BAI_{i,t-1} + \beta_3 CED_{i,t-1} + \beta_4 ROA_{i,t-1} + \beta_5 LEV_{i,t-1} + \varepsilon_{i,t}$$

Explanation:

Q	: Firm Value
β_0	: Constant
β_1-β_5	: Regression Coefficient
BAD	: Biological Asset Disclosure
BAI	: Biological Asset Intensity
CED	: Carbon Emissions Disclosure
ROA	: Return on Asset
LEV	: Leverage
ε_{it}	: Error

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3. Results

3.1. Descriptive Statistics

Table 1. Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std.Deviation
Q	43	0,5331	1,5507	1,0117	0,2430
BAD	43	0,4000	0,6333	0,5915	0,0724
BAI	43	0,0007	0,0334	0,0141	0,0086
CED	43	0,0270	0,8649	0,3866	0,2517
ROA	43	-0,0875	0,1460	0,0217	0,0558
LEV	43	0,1290	0,9451	0,5324	0,2433
Valid N (listwise)	43				

Source: Data Processed, 2024

Descriptive statistics for all variable data from 2019 to 2022 are displayed in Table 1. The dependent variable of firm value as measured by Tobin's Q from 43 observation data has an average value of 1.0117. The lowest value is 0.5331, namely PT Austindo Nusantara Jaya Tbk and the highest value is 1.5507, namely PT Sawit Sumbermas Sarana Tbk and a standard deviation of 0.243

The first independent variable, the disclosure of biological assets, had an average value of 0.5915 and a standard deviation of 0.0724. PT Astra Agro Lestari Tbk has the lowest value, 0.4000, and the highest value is 0.6333. The result shows that 75% of the 12 sample companies in this study had disclosed biological assets sufficiently.

The second independent variable is biological asset intensity which has an average value of 0.0141 and a standard deviation of 0.0086. PT Bisi International Tbk has the lowest value, 0.0007, and the highest value is 0.0334, namely PT Salim Ivomas Pratama Tbk. This indicates that percentage of the number of biological assets to the company's total assets is still very small. The third independent variable, disclosure of carbon emissions, has an average value of 0.3866 and a standard deviation of 0.2517. Carbon emissions disclosures in 2018 remained comparatively low at 0.0270, or just 2.7%. With an increase in carbon emissions disclosure in 2022 of 0.8649, or 86.49%, the sample companies' disclosure of carbon emissions is improving steadily.

3.2. Regression Analyze

The classic assumption test held before panel data regression is proceeds. The classic assumption test has done by normality test, multicollinearity test, heteroscedasticity test and autocorrelation test. The results of the One Sample Kolmogorov-Smirnov test, which is the basic assumption test, showed that the data is normally distributed with an Asymp. Sig. (2-tailed) value of 0.091 or

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greater than 0.05. The multicollinearity test obtained the results of the Tolerance value of the three independent variables and the two control variables are above 0.01 and VIF values are bellow 10.00, consequently, it may be said that multicollinearity does not occur from the regression model. Heteroscedasticity test using the Spearman Rho test obtained the results that there are no symptoms of heteroscedasticity because the significance probability value of the five variables is above 0.05. Durbin-Watson (D-W) test is used to test Autocorrelation. The results shows that model experiencing autocorrelation problems because the dW value is smaller than dU (1.179 < 1.7794). Therefore, the autocorrelation problem is overcome by the Cochrane-Orcutt method and the results obtained are the value of dU < dW < 4 - dU (1.7671 < 2.055 < 2.2329), so that the regression model is free from autocorrelation.

Table 2. Regression Analysis Test Result

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	0,270	0,308		0,878	0,385
	BAD	1,499	0,664	0,447	2,258	0,030
	BAI	-13,677	4,998	-0,482	-2,737	0,009
	CED	-0,081	0,188	-0,084	-0,433	0,668
	ROA	0,778	0,848	0,179	0,917	0,365
	LEV	0,117	0,213	0,118	0,551	0,585

a. Dependent Variable: Q

Source: Data Processed, 2024

Based on the panel data regression results in Table 2, it is known that the two independent variables, Biological Assets Disclosure (BAD) and Biological Assets Intensity (BAI), have a significant value of 0.030 and 0.009 <0.05. This indicates two independent variables have a significant effect on the value of agricultural companies in Indonesia. The third independent variable in the study is Carbon Emissions Disclosure (CED), has a significance value of 0.668> 0.05. This means that the variable disclosure of carbon emissions has no effect on firm value.
Meanwhile, control variables in the study, namely profitability and company size, have a significance value of 0.365 and 0.585> 0.05. This means that the profitability and company size have no effect on firm value of agricultural sector companies.

4. Discussion

4.1. The Effect of Biological Asset Disclosure on Firm Value

Hypothesis testing for biological asset disclosure variable has a coefficient value of 1.499 with a significance value of 0.030 less than 0.05 (0.030 <0.05), so H1 is accepted, firm value may rise if company discloses biological assets in its annual report in compliance with PSAK 69.

The result consistent with Utami & Prabaswara, (2020) which found that disclosure of biological assets can improve company performance because disclosure is something that can entice investors' attention to make an investment. However, this study do not support Alfarisyi et al.,

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(2022) which found the disclosure of biological assets had no appreciable impact on business value.

Company that discloses biological assets in Financial Statements Notes of annual report have become an obligation of the company to disclose them, but there are still companies that have not made full disclosure. Based on the data collected by researchers, the average sample company disclosed a fairly large biological asset disclosure of 58 percent and there were several increases in company disclosures in 2020. This shows that the company is committed to increasing the disclosure of important company information, so that the information meets the information needs of shareholders. Investors interpret this information as a positive signal about the prospects for future company performance, which will raise firm value.

4.2. The Effect of Biological Asset Intensity on Firm Value

Hypothesis testing for the biological asset intensity variable has a coefficient value of -13.677 with a significance value of 0.009 less than 0.05 (0.009 <0.05), so H2 is not supported, which means that Indonesian agricultural sector companies is significantly impacted by biological asset intensity with a negative relationship direction.

This study supports Utami & Prabaswara (2020), company performance is significantly impacted negatively by the intensity of biological assets. Companies that are increasingly enriching their biological assets tend to reduce company performance. The company's prospects are reviewed from its performance, so that if the company's performance is not optimal, it will reduce the company's value (Mau & Kadarusman, 2022). However, this study does not support Alfarisyi et al. (2022) which found that firm value is significantly enhanced by biological asset intensity.

Since agricultural companies' primary business is agriculture, biological assets are turn to be their most valuable assets because their activitty related to agricultural, plantation, livestock and fishery activities. However, based on the data obtained by researchers, biological assets are no longer the primary assets of agricultural sector companies. Agricultural companies now tend to process biological assets into agricultural products only without increasing the biological assets themselves. This happens because companies tend to achieve a lot of output targets, so that the assets added are fixed assets such as machinery for processing biological assets, and no longer increase the number of biological assets such as clearing land for plantations because companies utilize biological assets obtained from external parties. Therefore, the intensity of biological assets during the 2019-2022 period is very small.

According to PSAK 69, biological assets are living things, such as plants or animals, that go through a biological transformation process thus distinguishes them from other types of assets. Biological assets are more risky than other assets because they go through a biological transformation process that alters them either qualitatively or quantitatively. Risks in biological assets can be in the form of diseases or pests along with seasonal change that caused mortality, so that difficult to fully control these risks (Wibowo et al., 2018). Therefore, the increase of

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biological assets in the company makes investors are generally less interested in investing because they think of greater risks so that the firm value decreases.

4.3. The Effect of Carbon Emissions Disclosure on Firm Value

Hypothesis testing for the carbon emission disclosure variable has a coefficient value of -0.081 with a significance value of 0.668 greater than 0.05 (0.668> 0.05), so H3 is rejected, indicating that disclosing carbon emissions has no influence on business value. This conclusion shows the disclosure of carbon emissions by the corporation does not boost firm value.

According to the findings of hypothesis testing, this research supports Daromes et al. (2020), who claim that information about the company's environmental impact will deter investors from making investments, which will have an impact on equity value and decrease firm value. In addition, Muhammad & Aryani (2021) also stated that investors are not sure whether the benefits resulting from disclosing carbon emissions will be greater than the costs incurred by the company. However, this result not support Permana & Tjahjadi (2020) which states that carbon emissions disclosure is beneficial for investors because they prefer companies that are greener in their production processes.

Carbon emissions disclosure shows firm's participation with various activities to reduce carbon emissions on earth. Based on the data collected by researchers, carbon emissions disclosure by agricultural companies is very small with an average disclosure of 36 percent. Although this disclosure has increased in 2021, this increase cannot increase firm value. Moreover, activities related to the environment take a long time to handle so that the company also incurs enormous costs to finance operational activities in reducing carbon emissions. Therefore, the costs incurred by the company are not necessarily proportional to the benefits that investors will receive, so that firm value is unaffected by the company's disclosure of carbon emissions.

5. Conclusions

The purpose of this study is to ascertain how the agriculture sector's company value is affected by biological assets disclosure, biological asset intensity, and carbon emissions disclosure during 2019-2022. Based on the findings of the data analysis and discussion, the value of the company is significantly increased when biological assets are disclosed. This shows that companies are committed to increasing biological assets disclosure that becomes an obligation for agricultural sector companies. Biological assets disclosure is important to meet shareholder information needs. The information then becomes a positive signal for investors about the company's future prospects, thus it increasing the firm value.

Firm value is significantly impacted negatively by biological asset intensity. Companies with significant large biological resources will reduce firm value because biological assets go through a biological transformation process, they are more risky than conventional assets, which is how this can happen. It will also be making investors less likely to invest because they think of greater risk so that the firm value decreases.

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Firm value of agricultural firms is unaffected by the disclosure of carbon emissions. This is due to the fact that carbon emissions declaration is still voluntary makes agricultural companies ultimately do not disclose much, so that the disclosures made cannot affect firm value.

In this study, there are some limitations and suggestions for future research. Firstly, this research was only conducted in agricultural sector companies in Indonesia. In the observation period 2019-2022, many companies did not have the complete data needed in the study, there were also companies that changed sectors, so that many companies were eliminated from the research sample. Future research can include samples from stock exchanges outside Indonesia

Secondly, this research also uses index in measuring biological asset disclosure and measuring carbon emission disclosure, different results may occur with the use of other index related to disclosure measurement. Therefore, future research can also use other disclosure index related to biological assets disclosure and carbon emissions disclosure adjusted to the conditions of sample. Lastly, this research only uses three independent variables, these are biological asset disclosure, biological asset intensity and carbon emission disclosure, as well as two control variables, namely profitability and leverage, resulting in a fairly low coefficient of determination. Nevertheless, there are numerous variables related to firm value.

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