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THE ROLE OF DIGITALIZATION AND ENVIRONMENTAL, SOCIAL, GOVERNANCE IN ENHANCING VALUE RELEVANCE OF ACCOUNTING INFORMATION

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Abstract

The acceleration of the Industrial Revolution by the Covid-19 pandemic has enhanced the urgency of digitalization. In addition, the issue of ESG (Environmental, Social, and Government) and the achievement of the triple bottom line have become a major concern for businesses. In contrast, previous research indicates a decline in the value relevance of EPS (Earnings per Share) and BVPS (Book Value per Share) and an enhance in value relevance of non-financial information. This study investigates the effect of digitalization and ESG on the value relevance of accounting information, focusing on EPS and BVPS. This study employs four models with 249 samples from the IDX from 2017 to 2021. Using multiple linear regression, it is determined that, despite the positive significant effect of digitalization and ESG score, the presence of such non-financial information does not enhance the value relevance of accounting information. Moreover, the combination of ESG and digitalization still unable to enhance the value relevance of accounting data. Due to the inefficiency and lack of reporting standard of digitalization and ESG implementation. Therefore, the company should effectively implement and report these data.

Keywords: *Accounting information; Digitalization; ESG (Environmental, Social, Governance); Value relevance.*

Abstrak

Revolusi Industri yang diakselerasi oleh pandemi Covid-19 telah meningkatkan urgensi akan digitalisasi. Lebih lanjut, isu ESG (Environmental, Social, Government) dan urgensi penerapan triple bottom line pada perusahaan juga mulai menjadi perhatian khusus. Sebaliknya, penelitian terdahulu menunjukkan adanya penurunan relevansi nilai EPS (Earnings per Share) dan BVPS (Book Value per Share) serta peningkatan relevansi informasi non keuangan. Penelitian ini menyelidiki pengaruh digitalisasi dan ESG terhadap relevansi nilai informasi akuntansi, khususnya pada EPS dan BVPS. Penelitian ini menggunakan empat model dengan 249 sampel dari BEI dari tahun 2017 hingga 2021. Dengan menggunakan regresi linier berganda ditemukan bahwa meskipun terdapat pengaruh positif signifikan dari digitalisasi dan skor ESG, informasi non-keuangan tersebut tidak dapat meningkatkan relevansi nilai informasi akuntansi. Walau demikian, ditemukan bahwa skor ESG yang baik dapat memitigasi dampak negatif digitalisasi. Disisi lain, kombinasi dari ESG dan digitalisasi masih tidak dapat meningkatkan relevansi nilai informasi akuntansi. Hal ini dikarenakan praktik yang masih inefisien dan kurangnya standar pelaporan digitalisasi dan ESG. Oleh karena itu, perusahaan harus dapat mengimplementasikan sekaligus melaporkan data ini secara efektif.

Kata Kunci: Digitalisasi; ESG (Lingkungan, Sosial, Tata Kelola); Informasi akuntansi; Relevansi nilai.

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INTRODUCTION

The widespread digitalization and ESG (Environmental, Social, Governance) trend has raised an inquiry regarding the relevance of these information to stock prices. As technology can contribute to the development of circular economy, sustainability and digitalization are now linked. Based on the Department for Business, Energy and Industrial Strategy (2019), it was found that reporting non-financial information, such as digitalization and ESG can manage risk (47%), determine strategy (44%), and improve company reputation (33%). Therefore, reporting non-financial information can be a driving factor in making decisions in the stock market. On the other hand, Barth et al. (2021) suggest that there is a decrease in value relevance of EPS and BVPS while the relevance of intangible assets and technology are increasing, especially in new economy loss firms.

The increasing public awareness of digitalization and ESG has prompted researchers to examine its role in increasing the value relevance of EPS and BVPS and how these two variables influence decisions in the capital market as reflected in stock prices. Previous studies have shown conflicting results and created a research gap. Some research finds that ESG positively correlated with firm value because it can represent long-term earnings (Miralles-Quirós et al., 2018; Mohammad & Wasiuzzaman, 2021;Yoon et al., 2018; Rangel-Pérez et al., 2023). Contrary to this, Wong & Zhang (2021) found that ESG disclosure on various media channels has a negative relationship with stock prices in the North American market. Furthermore, Serafeim & Yoon (2021) found that the rating disagreement on ESG score had reduced the value relevance of ESG news.

On the other hand, Amrousy et al. (2012) find no market reaction's difference between companies that has a high and low ESG score. Moreover, Narullia & Subroto (2018) found that ESG does not directly affect stock values and it is irrelevant in Indonesia and Singapore. However, ESG is not relevant in Indonesian and Singapore markets because the quality and comparability of the sustainability report are deficient. This causes the lack relevance of ESG information disclosed in the sustainability reports in these two markets.

Market reactions difference in various countries regarding ESG information happen due to differences in investors' perspectives on ESG issues. Investors who consider ESG aspects as important will certainly give more appreciation to companies that have good ESG scores. It is shown by more than 80% investor considering the ESG standards of a company before making decision (United Nation, 2023). On the other hand, there are investors, especially retail investors who do not pay attention to ESG aspect while making decisions in the capital market and some even careless of ESG issue (Foster, 2022). This is allegedly due to the lack of awareness of the importance of ESG issues and the absence of standardization. Therefore, an assessment from credible institution, such as Bloomberg and Refinitiv is needed to provide an ESG score assessment.

On the other hand, Guo et al. (2020) found that digitalization can increase firm performance while in crisis situation. Fritzsch et al. (2021) found that digitalization can increase market valuation which result on higher market capitalization and market-to-book ratios. Wu et al. (2022) has found that digital transformation can minimize the stock price crash risk. Moreover, digitalization are value relevant (Ricci et al., 2020). Therefore, it can be concluded that several studies has found digitalization are value relevant and able to increase stock price, even in a crisis.

However, the impact of digitalization toward stock price is taking a long time to materialize (Jardak & Ben Hamad, 2022). The digitalization process will affecting current operation process, including training and adaptation by management. There is also a possibility that the digitalization process can fail and cause certain losses. Therefore, while in digital transformation process, company should increase it stock value by other variables.

Forcadell et al. (2020) found that good ESG reputation can potentially mitigate digitalization drawbacks. Rangel-Pérez et al. (2023) has also found an impact of ESG on the share price during digital transformation process. This findings are supported with Ricci et al. (2020) which found that higher ESG score could decrease the negative side of digitalization and increase the relevance of digitalization. However, some research has also found that digitalization can reduce negative the negative impact of environment (de Sousa Jabbour et al., 2018; Eisner et al., 2022).

On the other hand, c state that non-financial information can increase firm value which increase the relevance of accounting information. However, they can’t prove this argument. On their research itself, they found that ESG can’t enhance value relevance of accounting information. Although Narullia & Subroto (2018) cannot prove this statement, it is suspected that this was caused by inaccurate sample selection, which are when investors in Indonesia and Singapore are not concerning ESG issue.

According to the existence of this research gap, researchers are willing to have empirical evidence in determining the role of digitalization and ESG in enhancing value relevance of accounting information, which are EPS and BVPS in Indonesia. Previous research which conduct by Narullia & Subroto (2018) has not proven their hypothesis due to lack of investor whose concern about ESG issue. However, currently the ESG issue has been concerned widely which shows on the which requirement to prepare sustainability reports for all public company, as mentioned in Financial Services Authority Circular Letter Number 16 /SEOJK.04/2021 concerning Form and Content of Annual Reports of Issuers of Public Companies. Besides, the decrease in value relevance earnings and BVPS has only been studied in American market by Barth et al. (2021). This shows that there has no evidence of a decrease in the value relevance of accounting information in Indonesia, as in America.

ESG and Digitalization value relevance and how it effects accounting information value relevance has not been examine in Indonesia. Consimilar research was only conducted by Narullia & Subroto (2018) who examined the value relevance of accounting and ESG information in Indonesia. Ricci et al. (2020) examined the moderating role of ESG in enhancing value relevance of digitalization in Italia. Meanwhile, there is no other research that discusses the relevance of the value relevance of digitalization and how digitalization can enhance value relevance of accounting information in Indonesia. This study also different from previous study as this use the dataset of Indonesia listed firms and have Bloomberg ESG scores. Therefore, this research will contribute to the literature regarding the value relevance in Indonesia.

The practical implication of this study is that ESG and digitalization are information's that investors pay attention when deciding in the capital market. Therefore, companies need to disclose these practices well. On the other hand, investors also need to carry out further analysis regarding the credibility of the information reported. It becomes an attraction to invest in companies with high ESG score and digitalization as it provides higher firm value.

LITERATURE REVIEW

Signaling Theory

Signaling theory occurs because there is information asymmetry where management has information that has not been received by the public (Spence, 1973). The existence of information asymmetry can lead to market failure. Annual reports, sustainability reports, and various digital platforms, such as websites and company's official social media are platform to give a signal of company's performance to public. This information will be used by investors to make decisions in the capital market. The market sentiment arise from this information will directly affect investor's decision in the capital market. Thus, signaling theory will affect the value relevance of accounting information in influencing stock prices.

Rational Theory

When making a decision, investors are assumed to be rational as in Efficient Market Hypothesis (EMH) theory. Titan (2015) defined EMH as a market with great number of rational investor which seeks to maximize their profit and predicting company's future market value. Thus, the stock price reflects all information available. In this case, it is assumed that all important information is almost freely available to all investors.

Furthermore, Goldthorpe (1998) states that rationality can expand goals, beliefs, and actions taken towards goals based on their beliefs. Therefore, there is a rational choice theory which is based on the premise of self-focused utility maximization (Zey, 2001). Rational choice theory is a theory in which individuals can make rational decisions based on alternatives that meet the requirements of consistency, transitivity, independence, continuity, and monotonicity. Therefore, all decisions and preferences are assumed to be stable over all individuals and over time.

Pollock (2006) states that human decision-making can be seen through the doxastic-conative loop. Doxastic-conative loop is a cycle which can be seen in Figure 1.

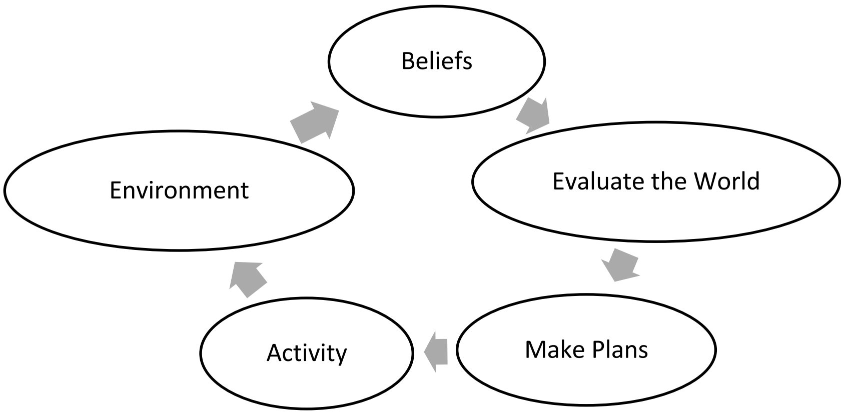

Figure 1. Doxastic-Conative Loop
Source: Pollock (2006)

Through Figure 1, it can be concluded that the beliefs that form the basis of rationality are based on the surrounding environment. The action taken is also a form of rationality. This is closely related to the way investors think. Based on the rational theory, it can be concluded that the surrounding environmental conditions, including sentiment and the reporting of various information in the annual report will affect investors' beliefs and actions.

In this case, digitalization and ESG issue are variables that can be considered by investors when making a decision, besides accounting information. Digitalization can be a signal that a company has operated effectively and efficiently. Therefore, it will be well-perform and conduct more precisely report. Adoption of this digital product can provide positive sentiment to investors.

Furthermore, ESG can be considered as a form of responsibility to society. Therefore, the implementation of ESG can also create an environment that supports investors to believe in the goodness of the company. When a company have a good peformance on digitalization and ESG, thus a rational investor will consider taking it as a variable on their decision-making process.

Value Relevance

Financial reports and sustainability reports presented by the company will be the basis of stakeholders to assess firm value. However, not all information presented in the report can be used as the basis for investor decisions in the capital market. Therefore, there is the concept of value relevance which are the ability of accounting information to influence stock prices (Francis & Schipper, 1999). This indicates that not all information disclosed in financial reports and sustainability reports has value relevance in influencing share prices.

Over the period, Barth et al. (2021) found that accounting information, especially earnings remain relevant for 50 years. However, there was a deterioration in the value relevance of earnings as well as an increase in the value relevance of intangible assets, such as R&D. In this research, it was found that in the new economy era, investors paid attention to technological developments, especially for loss firms. On the other hand, the value relevance of ESG has not yet been researched. Therefore, this research will focus on the role of digitalization and ESG in increasing the value relevance of EPS and BVPS.

Hypothesis Development

ESG and Value Relevance of Accounting Information

In this era, to be sustainable, businesses must pay attention to vulnerability, uncertainty, complexity, and ambiguity (VUCA). Therefore, VUCA shall be considered when formulating strategy. Current market trends that have begun to address sustainability issues which causes low competitive advantages if some companies are not paying attention to it. Therefore, companies need to solve this problem by carrying out sustainability disclosures through sustainability reports, integrated reports, or other digital platforms.

Investors need relevant information in making decisions. This information includes financial and non-financial information which lead to achieve tripple bottom line. Tripple bottom line that consists of people, planet, and profit require company to align its activities through ESG. Therefore, companies need to present relevant information, including ESG related information through published annual report and/or sustainability report. Sentiment on the information disclosed can be a signal for investors, in accordance with signaling theory.

Companies with good ESG score will have a good image in the community which will increase firm value and competitive advantages. However, several studies have shown different results. Mohammad & Wasiuzzaman (2021); Yoon et al. (2018); and Miralles-Quirós et al. (2018) found that ESG is positively correlated with firm value in various countries, such as Malaysia, Korea, and Brazil. However, research on the moderating role of ESG to increase the value relevance of accounting information is still limited.

The value relevance of book value and net operating income was assessed against sustainability reporting by Lourenço et al. (2014). More precisely, they investigated the relative value relevance of book value and net operating income for firms that are part of the Dow Jones Sustainability United States Index (DJSI US). Businesses that are part of the DJSI are regarded as leading indicators of sustainability. They showed that businesses with a track record of leading the way in sustainability place a higher value relevance on net operating income. Logically, ESG information will strengthen investor response to income and book value information.

To get the result, this research will examine the impact of ESG disclosure on the relevance of accounting information. EPS and BVPS will become a proxy to the accounting information. Therefore, the researcher wants to know the relationship between ESG on the relevance of accounting information. This will be seen through the relevance of accounting information to market value which is represented by stock prices.

H_{1a}: ESG enhance value relevance of EPS to stock prices.
H_{1b}: ESG enhance value relevance of BVPS to stock prices.

High ESG score indicates that the company are aware of environmental issues and take action toward it, willing to making good impact to the community, creating a good workforce, promoting diversity and human right, and implementing good corporate governance (GCG).

Digitalization and Value Relevance of Accounting Information

Technology has become integral of people's lives. However, relevancy of intellectual capital disclosure and digitalization towards investor’s decision has been debated. Various studies have attempted to measure intellectual capital by spending on R&D and found that disclosure of intellectual capital affects the decisions of investors in New Zealand, Germany, Kuwait, Qatar, Italy, and several countries in ASEAN (Ricci et al., 2020). On the other hand, Research from World Economic Forum (2016) found that companies can place greater value if it use the latest technology in its business models.

Digitalization can accelerate the reporting and dissemination of information, including accounting information. Furthermore, digitalization can increase the transparency and accountability of companies that result on user confidence toward company's performance. Guo et al. (2020) states that technology adoption can increase organizational flexibility and resilience by helping to increase sense of environmental changes, providing valuable information on high-speed computing, providing better opportunities when a crisis occurs because it can provide fast and precise analysis based on company characteristics, and reconfiguring resources in response to crises. Moreover, Wen et al. (2022) found that digital transformation has indirect effect on manufacturing competitive strategy.

Based on previous research, it can be concluded that the adoption of technology can strengthen investor confidence in profit and other accounting information. Investor trust in the accuracy and transparency of accounting data is bolstered by digitalization. Good company performance can also reflect the increasing competitive advantages of a company.
H_{2a}: Digitalization enhance value relevance of EPS to stock prices.
H_{2b}: Digitalization enhance value relevance of BVPS to stock prices.

This hypothesis is used to examine the role of digitalization in enhancing the relevance of a company's accounting information. In this case, the accounting information are focused on EPS and BVPS. Higher level of digitalization will have higher risk tolerance followed by higher costs for technology investment. Therefore, it will affect the value relevance of accounting information.

Digitalization, ESG, and Value Relevance of Accounting Information

The rise of industry revolution 4.0 has increased the urgency of digital transformation. Moreover, digital products have various advantages to improve operating efficiency and customer satisfaction. On the other hand, a good ESG score can increase the company value because it is considered to have responsibility for its surroundings (Ricci et al., 2020). Various studies have mentioned the role of ESG as a moderation variable in enhancing value relevance of digitalization (Forcadell, Aracil, & Úbeda, 2020; Rangel-Pérez et al., 2023; Ricci et al., 2020).

ESG play a significant role in value relevance of digitalization by reducing information asymmetry for consumers (Cui et al., 2018); reduce the opportunities of inappropriate behavior from companies, such as using inappropriate customer data, eliminate negative reputations due to layoffs that occurs because of automation, being a solution to the issues and challenges of digitalization, and increasing stakeholder's trust (Forcadell, Aracil, & Ubeda, 2020). Rangel-Pérez et al. (2023) found that ESG can be a value to stakeholders while digital transformation is on progress. In this case, it can be concluded that ESG can neutralize the bad effects of digitalization.

Enriching the findings of Barth et al. (2021), accounting information remained relevant information for 50 years. ESG dan ESG and digitalization are expected to further strengthen the relevance of accounting information. ESG activities which are supported by digitalization in their implementation are believed to be able to improve the quality of earnings information. Investors are expected that companies generate profits in an ethical manner and report them transparently. Therefore, a value relevance test will be carried out with ESG and digitalization as a moderating variable. The test will examine it impact regarding value relevance of accounting information with the following hypothesis.
H_{3a}: ESG and digitalization enhance value relevance EPS to stock price.
H_{3b}: ESG and digitalization enhance value relevance of BVPS to stock prices.

Combining ESG and digitalization as a variable which enhance value relevance of accounting information are a critical decision. The urgency to implement digitalization and ESG should be managed wisely. Company shall consider the right proportion of digitalization and ESG implementation to increase its value. The increase of company value will be a progress to generate maximum shareholders return.

There is a relationship between investment and firm value in that investment can improve firm performance, and firm investment decisions can have different performance achievements in normal and crisis times. Using the financial data of listed Chinese companies, Shen et al (2020) find the negative impact of COVID-19 on corporate performance. According Quddus et al (2022), there is sufficient empirical data to suggest that uncertainty worsens business cycles by influencing corporate actions as well as investment decision. It is more pronounced when a firm's investment scale or sales revenue is smaller.

RESEARCH METHOD

Research Object

The unit of analysis used in this research is a company that has been listed on the Indonesia Stock Exchange (IDX) in 2017-2021 that meets the research criteria. First, companies should be listed on Bloomberg database which have ESG score. Bloomberg is choosen as a credible source to evaluate company's ESG score. Second, companies that publish financial reports and annual reports for FY 2017-2021 period with a period ending in December. Third, companies that issue and present financial statements and annual reports in Rupiah as the monetary unit. Last, companies that have stock price data on finance.yahoo.com.

Indonesia is chosen as the research object due to there are lack of research regarding certain topic in this area. Moreover, previously Narullia & Subroto (2018) which testing the role of ESG on enhancing value relevance of accounting information found a contrary result with other research in other country. Therefore, current research is focusing on Indonesia.

IDX are specifically choosen because the publicly listed company has the obligation to report its performance. Moreover, their performance report as mentioned in annual report and sustainability report will be the basis for investors to decide in capital market. Researchers used non-probability sampling with a purposive technique in determining the sample. From those criteria, it is found that there are 249 firm-year are eligible to become this research's sample. This sample selection is detailed on table 1.

Table 1. Sample Selection

Criteria	2017	2018	2019	2020	2021	Total
Listed Company in IDX	566	619	634	685	738	3,242
Sample Criteria						
No ESG Score in Bloomberg	-487	-540	-558	-609	-693	-2,887
Companies with a financial statement closing year other than December 31	0	0	0	0	0	0
Presenting financial statements other than Rupiah as its monetary unit	-14	-14	-14	-14	-7	-63
Unaccessible annual report and/or sustainability report	-3	-1	0	0	-1	-5
No stock price on Yahoo Finance	-1	-2	0	0	0	-3
Outliers	-4	-10	-10	-8	-4	-35
Total sample used as research object	57	52	52	54	34	249

Research Variable Operationalization

This study uses 4 types of variables, which are one dependent variable, four independent variables whereas the two are also act as moderating variables, and three control variables. The details of these variables can be seen through table 2.

Research Model

In order to examine the value relevance of EPS and BVPS due to the disclosure of ESG and digitalization, this research conduct 2 models which modified Ohlson (1995) model. The first model will analyse the role of ESG in enhancing the relevance of accounting information. The second model is used to examine the role of digitalization in enhancing value relevance of accounting information. The third and fourth model is used to examine the role of both ESG and digitalization in enhancing the value relevance of accounting information. The third model are also used to examine the role of ESG to reduce negative impact of digitalization.

$$MV_{it} = \propto_0 + \propto_1 EPS_{it} + \propto_2 BVPS_{it} + \propto_3 ESGS_{it} + \propto_4 EPS_{it} * ESGS_{it} + \propto_5 BVPS_{it} * ESGS_{it} + \propto_6 OCF_{it} + \propto_7 ROA_{it} + \propto_8 SIZE_{it} + \varepsilon_{it} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

$$MV_{it} = \propto_0 + \propto_1 EPS_{it} + \propto_2 BVPS_{it} + \propto_3 DIG_{it} + \propto_4 EPS_{it} * DIG_{it} + \propto_5 BVPS_{it} * DIG_{it} + \propto_6 OCF_{it} + \propto_7 ROA_{it} + \propto_8 SIZE_{it} + \varepsilon_{it} \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (2)$$

$$MV_{it} = \propto_0 + \propto_1 EPS_{it} + \propto_2 ESGS_{it} + \propto_3 DIG_{it} + \propto_4 EPS_{it} * ESGS_{it} + \propto_5 EPS_{it} * DIG_{it} + \propto_6 ESGS_{it} * DIG_{it} + \propto_7 EPS_{it} * ESGS_{it} * DIG_{it} + \propto_8 OCF_{it} + \propto_9 ROA_{it} + \propto_{10} SIZE_{it} + \varepsilon_{it} \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots . (3a)$$

$$MV_{it} = \propto_0 + \propto_1 BVPS_{it} + \propto_2 ESGS_{it} + \propto_3 DIG_{it} + \propto_4 BVPS_{it} * ESGS_{it} + \propto_5 BVPS_{it} * DIG_{it} + \propto_6 ESGS_{it} * DIG_{it} + \propto_7 BVPS_{it} * ESGS_{it} * DIG_{it} + \propto_8 OCF_{it} + \propto_9 ROA_{it} + \propto_{10} SIZE_{it} + \varepsilon_{it} \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots . \dots (3b)$$

Table 1. Variable Operationalization

Types	**Variables**	**Formula**
Dependent Variables	Market Valu	Closing market price at the end of the year from Yahoo Finance
Independen Variables	Earnings pe Share (EPS)	$EPS = \frac{Net\ Income - Preferred\ Dividends}{Weighted\ Average\ Shares\ Outstanding}$
	Book Value per Share (BVPS)	$BVPS = \frac{Total\ Common\ Stockholders\ Equity - Preferred\ Stock}{Number\ of\ Common\ Shares}$
	ESG Score	Measured by Bloomberg
Independen and Moderating Variables	Digitalizatio	Content analysis from annual report with a total score 12 which measurement by $DIG_{it} = SocMed_{it} + Mob_{it} + BD_{it} + CC_{it} + IoT_{it} + PD_{it} + AI_{it}$, where: $SocMed_{it}$= Sosial Media: Instagram, Facebook, LindkedIn, Twitter, and Youtube for company i at the year t with maximum score of 5 Mob_{it}= The use of mobile channels which are websites and mobile application for company i at the year t with a maximum score of 2 BD_{it} = The use of big data for company i at the year t CC_{it} = The use of cloud computing for company i at the year t IoT_{it} = The adoption of internet of things (IoT) on the company's operational activities for company i at the year t PD_{it} = Platform development, especially e-commerce for company i at the year AI_{it} = Artificial intelligence for company i at the year t Therefore, the maximum score of DIG are 12.
	SIZE	$Size = Log\ (total\ aset)$
Control Variables	Operating Cash Flow (OCF)	$OCF = \frac{(NI + \Delta\ Assets\ and\ Liabilities + Non\ cash\ Expenses - \Delta\ Working\ Capit}{Total\ Asset}$ Notes: NI = Net Income Working Capital = Current Assets-Current Liabilities
	Return on Assets (ROA	$ROA = \frac{Net\ Income}{Average\ Total\ Assets}$

RESULTS AND DISCUSSION

Descriptive Statistics

Descriptive statistics aims to provide a general description of the sample objects in this research. However, DIG is a dummy variable. Thus, this variable will be described using frequency statistics. The summary of descriptive statistics is presented in Table 3 while the frequency statistics presented in Table 4.

Results

This study employs a panel data to fit model 1-4 whereas price become the dependent variable of these models. F value of these models are significant at 0.000 as showed on table 5 has indicate significant effect of the independent variable and the control variable on the dependent variable simultaneously within the four models in this study. Table 6 represent the regression result of these 4 models.

From table 6, it can be concluded that all of the independent variable are significant. this findings prove that both financial and non-financial information are significant for investor's decision on capital market. On the other hand, interaction between those variables are not likely to be significant. It means that company must combine that information wisely to gain the best market price.

The key findings are detailed in table 7. From table 7, it can be concluded that all of the hypotheses are rejected. This means that both non-financial information, which are ESG and digitalization could not enhance value relevance of accounting information. However, the combination between ESG and DIG performs better result on enhancing value relevance of accounting information, relative to the impact of each variable alone.

Table 2. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
MV	249	50.00	49,568.61	3,372.827	5,476.675
EPS	249	-1,074.70	6,792.00	286.914	804.366
ESGS	249	0.32	61.92	34.596	14.541
EPS_ESGS	249	-46,183.67	363,205.63	11,172.239	35,748.272
EPS_DIG	249	-3,388.00	47,544.00	1,736.892	5,006.148
ESGS_DIG	249	1.28	654.73	207.092	162.732
EPS_ESGS_DIG	249	-155,409.72	2,542,439.43	71,479.756	242,186.439
BVPS	249	2.00	757.87	165.084	182.159
BVPS_ESGS	249	16.51	46,923.54	6,239.434	8,679.635
BVPS_DIG	249	10.00	6,772.54	952.438	1,375.094
BVPS_ESGS_DIG	249	16.51	46,923.54	6,239.434	8,679.635
OCF	249	-0.14	3.93	0.089	0.262
ROA	249	-0.22	0.37	0.051	0.078
SIZE	249	10.76	15.24	13.559	0.732

Table 3. Frequency Statistics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	23	9.2	9.2	9,2
	2	23	9.2	9.2	18,5
	3	20	8.0	8.0	26,5
	4	30	12.0	12.0	38,6
	5	19	7.6	7.6	46,2
	6	33	13.3	13.3	59,4
	7	27	10.8	10.8	70,3
	8	27	10.8	10.8	81,1
	9	14	5.6	5.6	86,7
	10	16	6.4	6.4	93,2
	11	16	6.4	6.4	99,6
	12	1	0.4	0.4	100,0
	Total	**249**	**100**	**100**	

Table 4. Adjusted R Square and F-test

Model	Adjusted R Square	F-test	
		F	Sig
1	0.779	110.505	0.000[b]
2	0.595	46.536	0.000[b]
3	0.768	83.028	0.000[b]
4	0.275	11.44	0.000[b]

Table 5. Regression Result

Panel A: Model 1 (ESG)			
Variable	**B**	**t**	**Sig. (1-tailed)**
(Constant)	-8,213.148	-2.592	0.005
EPS	20.354	21.044	0.000
BVPS	11.001	3.542	0.000
ESG	92.018	5.774	0.000
EPS*ESGS	-0.382	-17.792	0.000
BVPS*ESGS	-0.207	-2.998	0.002
OCF	493.275	0.714	0.238
ROA	2,522.035	1.015	0.156
SIZE	452.124	1.930	0.028
Panel B: Model 2 (DIG)			
Variable	**B**	**t**	**Sig. (1-tailed)**
(Constant)	-6,810.882	-2.955	0.002
EPS	10.142	14.811	0.000
BVPS	2.276	2.009	0.023
DIG	314.966	3.860	0.000
EPS*DIG	-1.091	-9.849	0.000
BVPS*DIG	-0.210	-1.892	0.030
OCF	528.757	0.571	0.284
ROA	5,115.328	1.695	0.046
SIZE	509.784	3.023	0.002
Panel C: Model 3a (EPS. ESG. DIG)			
Variable	**B**	**t**	**Sig. (1-tailed)**
(Constant)	-4,793.328	-1.365	0.087
EPS	19.129	5.387	0.000
ESGS	39.879	1.320	0.094
DIG	-186.714	-1.008	0.157
EPS*ESGS	-0.348	-3.347	0.001
EPS*DIG	0.662	1.036	0.151

EPS*ESGS*DIG	5.718	1.230	0.110
OCF	-0.014	-0.852	0.198
ROA	389.980	0.548	0.292
SIZE	704.018	0.279	0.390
Panel D: Model 3b (BVPS.ESG.DIG)			
Variable	**B**	**t**	**Sig. (1-tailed)**
(Constant)	-2,3186.035	-3.855	0.000
BVPS	44.803	7.615	0.000
ESGS	37.435	0.698	0.243
DIG	216.340	0.753	0.226
BVPS*ESGS	-1.813	-3.470	0.001
BVPS*DIG	4.069	0.576	0.283
BVPS*ESGS*DIG	-0.578	-4.729	0.000
OCF	144.648	0.115	0.455
ROA	21,926.129	5.035	0.000
SIZE	1,473.810	3.291	0.001

Table 6. Key Findings

Hypothesis	Effect	Exp	Actual	Sig	Conclusion
H1a	EPS*ESGS→MV	+	-	✓	Reject
H1b	BVPS*ESGS→MV	+	-	✓	Reject
H2a	EPS*DIG→MV	+	-	✓	Reject
H2b	BVPS*DIG→MV	+	-	✓	Reject
H3a	EPS*ESGS*DIG→MV	+	+		Reject
H3b	BVPS*ESGS*DIG→MV	+	-	✓	Reject

Discussion

Model 1-3 tested to prove hypotheses 1 to 3 whereas model 1 was used to prove H1a and H1b, model 2 to prove H2a and H2b, model 3a to prove H3a, while model 3b to prove H3b. In this study, accounting information variables used in are EPS and BVPS. Based on the results of the partial test, it was found that EPS has a significant positive effect on stock prices.

Hypothesis 1

Hypothesis 1 aims to determine the role of ESGS in enhancing the value relevance of accounting information in the form of EPS and BVPS. The t-test results show that ESGS significantly affects stock prices. Thus, ESGS is relevant in Indonesia. This supports previous studies that found ESGS relevant in Italy, Malaysia, and Korea (Miralles-Quirós et al., 2018; Mohammad & Wasiuzzaman, 2021; Yoon et al., 2018).

However, it was found that ESGS could not enhance the value relevance of accounting information, neither EPS nor BVPS. This finding supported Narullia & Subroto (2018) who also found that ESG could not enhance the value relevance of EPS or BVPS. Even though there is a liability for a publicly listed company to provide a sustainability report, there are no clear guidelines for companies to implement it. ESG is irrelevant due to the incomparability and unreliability of the information components reported and the lack of investor attention to ESG.

The absence of international standards has made the sustainability report incomparable. Some companies may use the GRI standard, while others do not use any standards for their reports. When the sustainability report is hard to compare, then the measurement of ESGS will also be affected. Therefore, the ESGS variable cannot enhance the value relevance of EPS and BVPS in companies listed on the IDX. The research results actually show the opposite direction: ESG weakens the influence of accounting information on investor assessments. Indonesian investors may still expect that investment in ESG will harm the company's financial performance due to the reallocation of funds to other stakeholders than shareholders. Voinea et al. (2020) found that a good ESG rating indicates environmental costs incurred by the company, which will reduce the company's profit. As a result, there is a negative linear relationship between ESG performance and financial performance caused by the costs incurred on the environment. If costs arising from this environment cannot be overcome, this can reduce the profit impact on enterprise value (Song et al., 2017). Investors also tend to perceive that high ESG performance does not guarantee protection during severe market downturns (Folger-Laronde et al., 2022). Therefore, investors' response to EPS and BVPS will weaken when the company carries out social and environmental responsibilities.

This findings are aligns with Landau et al. (2020). ESG that disclose in integrated report which not follow the latest GRI guidelines will be penalized by lower market value (Landau et al., 2020). Therefore, an increase in ESGS cannot enhance the value relevance of accounting information for both EPS and BVPS.

Eventhough the first hypothesis is going to prove the role of ESG on enhancing value relevance of accounting information, it should be note that ESG consist of Environmental, Social, and Governance. Therefore, failed to fulfill one of the aspects will result on lower ESG score. In this case, ESG is not just some CSR (Corporate Social Responsibility) activities.

Hypothesis 2

Hypothesis 2 aims to determine the role of digitalization in enhancing the value relevance of accounting information, which are EPS and BVPS. The adoption of digitalization rises some pros and cons. The adoption of digital products can increase the competitiveness and operating efficiency of the company. On the other hand, the rapid development of technology has raised many concerns that robots will replace human work. Thus, examining the role of digitalization in increasing the value relevance of EPS and BVPS is carried out to give a consideration for companies when adopt and disclose their digital products adoption.

The digitalization variable is known to have a significant positive relationship with stock prices. Therefore, it can be concluded that digitalization is value relevance. This is allegedly due to the perception among investors in Indonesia that technology companies or startups have the potential to return their investment money by 19.7%, even though the rate of return on the stock and capital markets ranges from 5.9% -7.5% (CNN Indonesia, 2019). The greater rate of return has caused the stock price, as the dependent variable to increase. Therefore, digitalization can be relevant information for investors.

However, interaction between digitalization and accounting information which result on negative significant information related to stock price. It is analysed that the utilization of technology in Indonesia has not reach it efficiency due to employee skills limitation. In fact, World Bank (2021) found that 49% of adults in Indonesia are not connected to the internet. On the other hand, Qualtrics (2022) states that the presence of technology can increase human resource involvement by 230%.

Unreadiness of human resources will lead to several investment in knowledge management which led to a significant profit drop. Reduced profit due to digitalization causes significant decrease in stock price and EPS. Moreover, the bad sentiment of digitalization occur as reduced profit will also affect market value and lower the BVPS. On the other hand, Ifada & Komara (2023) found that the adoption of technology significantly affect the accounting profession. Thus, when the accountant is not ready to face this technology changes, it will result on inefficient cost operation. Therefore, the moderation of digitalization result on significantly negative of EPS and BVPS.

Hypothesis 3

The importance of ESG and digital adoption by companies has encouraged companies to implement both ESG and digital products on the operation process. On the previous model, it is found that ESGS and digitalization independently has negatively affect value relevance of accounting information. Therefore, a test is conducted on the interaction effect of these two moderating variables in increasing the value relevance of accounting information.

However, interaction between ESGS, DIG, and accounting information result on significant negative correlation to stock price. This means that combination of ESG and digitalization could not enhance value relevance of accounting information for both EPS and BVPS. Investment in ESG and digitalization requires big spending on employees and the activities itself. The changes will also require adaptation on the operational processes. As a result, net income and equity will decrease. Decrease in net income and equity will decrease EPS and BVPS that will reduce its relevancy.

However, the results in this study are in line with Ricci et al. (2020), Forcadell et al. (2020), and Rangel-Pérez et al. (2023) who found that a good ESGS can minimize the negative impact of digitalization. As showed in table 4, the moderation of the ESGS towards DIG variables generate higher t-value. However, on the research period, there are few companies and investor who value ESGS and digitalization as a priority. This research conducted on Indonesia listed firms 2017-2021 whereas the urgency of ESGS arise starting on 2021, while digitalization has been a priority since pandemic.

Before those periods, both ESGS and digitalization are done by voluntary basis. Thus, there are no standardize and/or urgency of reporting this issue. In this case, it can be concluded that ESG and digitalization practices has just started. Therefore, it has not effectively and efficiently implemented.

This supports the result that ESGS and DIG has result on lowering value relevance of accounting information for both EPS and BVPS. It happened because investors once consider this information as cost, nor investment. Thus, investors do not consider ESG and digitalization investment as added value to firm value. Therefore, even combining ESGS and DIG will not enhanced value relevance of accounting information.

Meutia et al. (2019) found that inconsistency of the relationship between ESG and financial performance was due to inefficient implementation of ESG. In addition, there is still no standard for ESG reporting, such as the IFRS standards that apply internationally to form a financial statement. Therefore, the implementation that has been carried out is certainly still not optimal so that it is not significant enough to enhance the value relevance of accounting information, both EPS and BVPS. This study is relevant with Barth et al. (2021) where there is an increase in value relevance of non-financial information due to the development of information technology and services in the new economy era. Moreover, it also supports that accounting information, especially EPS and BVPS will remain relevant over the period.

CONCLUSION

This study aims to examine whether digitalization and ESG can enhance value relevance of EPS and BVPS. This research was conducted by examining companies listed on Indonesia Stock Exchange (IDX) 2017-2021 with various criteria. Eventhough EPS, BVPS, ESG, and digitalization are relevant in Indonesia; ESG and digitalization could not enhance value relevance of accounting information. Although this variable has been combined, it still cannot enhance value relevance of accounting information.

However, these findings are caused by low awareness of ESG and negative stigma of digitalization in Indonesia. Unreadiness of the manager regarding this change will significantly affect the successful of ESG and digital implementation. Both ESG and digitalization would increase cost and investment that will directly decrease the return investor will get. This requires a high investment and training that will affect net income and equity. Decreasing net income and equity will result to a lower EPS and BVPS which will cost more if it does not operate efficiently.

Moreover, replacement of human by technology has become another problem when implementing digital product. However, Ricci et al. (2020), Forcadell et al. (2020), and Rangel-Pérez et al. (2023) found that negative impact and stigma of digitalization could be neutralize by having good ESG score. Eventhough combination of digitalization and ESG could not enhance the relevance of accounting information, it is found that ESG can neutralize the negative impact of DIG. Therefore, companies should improve efficiency of ESG practices and digitalization to enhance value relevance of accounting information.

In addition, it is implied that different type of investors and local government regulation will require different information to be disclosed. Previous study found that ESG and digitalization are value relevance. This information found that it is also relevant in Indonesia. However, different result may arise in different period as in previous study Narullia & Subroto (2018) found that ESG are not relevant in Indonesia. Therefore, every company shall be aware of the preference of their stakeholders, especially on the key information disclosed.

This study has limitation which the sample are limited to companies listed on the IDX and have ESG score on Bloomberg for the last 5 years (2017-2021). Bloomberg datasets are limited which not include a wide range of ESG score on IDX. However, this criterion was required in this study to have reliable sources of ESG score calculation. Besides of the limited dataset, the period choosen in this research has not facilitate the best digitalization and ESG performance.

The implementation of digitalization and ESG in Indonesia are yet inefficient. It is because the urgency of digital implementation is happened during Covid-19 pandemic as around 2020 whereas the urgency of implementing ESG are starting from 2021. Moreover, the measurement of digitalization is based on annual report review without knowing the real implementation condition. However, this issue is interesting to be discussed on the future study where ESG and digitalization has been implemented efficiently.

Due to the limitations of this study, authors suggest various recommendations for further research, which are:

(1) Provide more sample of companies by increasing the research period and using all companies listed on the IDX and if applicable use another country as a benchmark. This is intended to get more accurate test results and having a wide view of digitalization and ESG implementation in the world. It is important because one country may focus on different issue than the other. This will directly influence how the investor making a decision in capital market;

(2) Conduct research on digitalization and ESG in Indonesia when efficiency has been achieved in most companies. Currently, digitalization and ESG have not been fully utilized. This is because digitalization has just begun to be massively adopted by various companies since the Covid-19 outbreak struck. Likewise with the issue of ESG which has just started to bloom recently and has become mandatory since 2021 for all companies listed on the IDX. This pandemic has required companies to utilize technology in its operations. Therefore, further research is needed in the next few years to obtain more relevant results;

(3) Adding other moderating variables, such as earnings management and audit quality which is also a current issue in influencing the value relevance of accounting information. Measurement of earnings management is not limited to accrual earnings management, but also to real earnings management.

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