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Green accounting practices, financial health, the audit and its impact on the value of the company

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Abstract

To provide empirical evidence on financial and non-financial factors affecting corporate governance and financial sustainability, this study examines the impact of return on assets, financial distress, firm size, corporate social responsibility (CSR), and audit opinion on firm value. The SEM-PLS method employs discriminant validity, multicollinearity tests, and the Heterotropy-Monotropy (HTMT) ratio to ensure model robustness. The results show that return on assets, financial distress, and CSR have a positive impact on firm value, highlighting the importance of financial stability and responsible business practices. However, firm size does not have a significant linear impact, indicating that growth dynamics are more complex than size alone. Audit opinion moderates the influence of financial ratios on firm value, in line with previous studies emphasizing financial health and sustainability as key success factors. Although this study provides novel insights and practical guidance for financial executives, its industry and geographic limitations limit generalizability. Future research should expand the dataset to include different industries and geographies for broader applicability. This study contributes to the accounting and finance literature by integrating CSR and audit perspectives into firm valuation analysis. The use of SEM-PLS ensures methodological rigor and provides new insights into how financial and non-financial factors interact to shape firm value. Findings have practical implications for managers, auditors, and policymakers seeking to improve financial performance and sustainability.

Keywords: Corporate social responsibility, Financial distress, Firm size, Firm value, Return on assets.

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1. Introduction

Until recently, both in Indonesia and internationally, many companies only acted responsibly under the pressure of national and global forces related to environmental sustainability issues. This is where green accounting comes in as a crucial mechanism for evaluating how companies weigh their fiscal success against their ecological responsibilities [1]. Green accounting techniques that calculate material costs, resource usage, and environmental risk evaluations can help increase operational efficiency and the value of firms [2]. Apart from that, these strategies can enhance the long-term sustainability of the economy, which consequently improves corporate goodwill and investor confidence [3, 4]. Additionally, corporate environmental responsibility is a key mechanism through which CSR matters, affecting firm value and investment decisions by influencing sustainability practices [5, 6]. As a developing country like Indonesia, where industrial transformation and environmental problems become a threat, the internalization of green accounting is the key to the sustainability of enterprise value and long-term growth [7].

While the significance of green accounting has increased, the empirical literature remains controversial regarding its effect on firm value. Although sustainability strategies are becoming the norm in many corporations, a schism regarding their financial impacts has so far limited widespread adoption. Previous research has produced inconsistent results, some revealing a positive association between green accounting and enterprise value [8, 9] other studies have demonstrated that the effect is weak or even negative [10, 11]. Studies have shown that current green accounting methodology models could benefit from improved deterministic input-output analysis model refinement. Furthermore, while sustainable investments yield long-term advantages, their perceived high costs discourage companies from undertaking them, as immediate economic paybacks are often perceived to be rare [12]. Hence, one important question arises: how can the practice of green accounting improve financial viability and, at the same time, firm value under Indonesia's existing regulatory and market environment? Filling the gap is critical for corporate sustainability to be mutually aligned with economic performance.

Signaling Theory Spence [13], Stakeholder theory Parmar et al. [14] and Freeman [15], and agency theory Noreen [16]. According to signaling theory, a firm signals to the market its financial health by taking actions like adopting green accounting, which can significantly enhance credibility and attract investors, with consequent effects on stock prices [17, 18]. According to stakeholder theory, the integration of environmental costs builds trust between these stakeholders, including investors, customers, and regulators, and fosters stronger stakeholder relationships [19]. Agency theory proposes that green accounting is implemented to meet the demands of investors who are seeking socially responsible investments, which ultimately results in improved firm value [20]. Together, these frameworks elaborate on the relationships between green accounting, financial performance, audit opinions, and firm value.

The current study provides answers to contradictory findings on green accounting and firm value in previous studies. Studies have shown a positive relation [21], but some studies did not find a significant relationship [22]. While the effects of audit opinions, financial performance, firm size, financial distress, and CSR practices on firm value are uncertain, financial performance has been proven to improve investor perception and firm valuation [23], but low environmental performance can exert detrimental effects on short-term [24] market performance. Just as qualified audit opinions may prompt stock price adjustments [25], they appear to be less effective in an emerging market [17]. To fill these gaps, this study examines the relationship between financial performance, CSR, and firm size with audit opinions in Indonesia. Including these elements in one model gives new insight into their overall impact on firm value.

It examines how financial performance, financial distress, size, corporate social responsibility, and audit opinion affect company value. Specifically, the paper examines the extent to which these factors, independently and together, influence relative firm value. In this paper, we will look at the audit report as a content mediator between financial and non-financial performance measures. We will discuss how the audit impacts investor perceptions and, therefore, the value of the firm. In doing so, this study seeks to offer practical guidance to managers, auditors, and investors on how corporate governance mechanisms impact financial decisions in a dynamic environment.

2. Literature Review

2.1. Theoretical Research

The relationship between ESG factors and financial performance has been increasingly studied. Stakeholder theory posits that companies adopting ESG principles can achieve long-term financial performance by incorporating stakeholder management to create established and lasting relationships with stakeholders, which can improve regulatory frameworks and reduce risks to regulation and corporate performance [26, 27]. Similarly, the resource-based view (RBV) states that ESG efforts generate unique intangible resources, including brand equity and employee loyalty, which indicate a competitive advantage [28]. Moreover, signaling theory suggests that high ESG companies signal credibility and long-term sustainability to investors, reducing information asymmetries and lowering capital costs [13].

Chen et al. [29] find that firms with strong ESG practices outperform in highly visible stock returns and experience lower volatility, especially in industries more exposed to regulation. Zhang and Shailer [30] show that firms with ESG disclosures tend to increase investor confidence, thereby decreasing firms' cost of equity. Linking ESG to financial performance is not straightforward, with some studies like those of Renneboog et al. [31] showing that the effect is heterogeneous across firm size, industry characteristics, and geographical context. For instance, in the mining sector, sustainability efforts could create significant cost savings over the long term but also require substantial short-term investments that negatively impact short-term profitability [32, 33].

Also, recent innovations in financial modeling have enabled a more granular analysis of ESG's effect on corporate valuation. AI and ML applications are better than ever at predicting financial outcomes driven by ESG initiatives, as the World Benchmarking Alliance [34]. The models combine ESG scores, EPS, and stock pricing data to evaluate the moderating influence of ESG on financial viability [35]. The findings of Khalil et al. [36] highlight that ESG factors, when paired with strong financial fundamentals, provide an added boost in both firm value and resilience during economic downturns.

While these findings offer valuable insights, there are still gaps in understanding the long-term causal relationship between ESG performance and financial outcomes. Although some empirical works identify a straightforward positive nexus, other studies observe a non-linear connection where higher investment in ESG generates less and less improvement. Future research should address these dynamics using longitudinal data and sector-specific analyses. We also need to identify causality between policy changes, ESG adoption, and financial performance over time. This gap must be filled in order to provide a more actionable understanding of how businesses can leverage ESG metrics to engage with investors and others to survive and thrive in this increasingly ESG-driven financial context.

2.2. Hypothesis Development

An audit opinion is an important appraisal of a corporation's financial health, credibility, financial performance, financial distress, firm size, and creditors' reporting of corporate social responsibility (CSR) [37-40]. Previous research has found that good financial performance increases the chances of obtaining an unqualified audit opinion, with stable earnings and liquidity firms seen as less risky [41]. On the other hand, financial distress comes with greater risk factors such as insolvency and going concern that lead to a higher likelihood of obtaining a qualified audit opinion [42]. In fact, larger firms tend to receive favorable audit opinions due to the higher allocated resources for compliance with financial reporting standards [43, 44]. In addition, CSR engagement enhances transparency and governance, which can also contribute to favorable audit opinions [45, 46]. Profitability and earnings growth can contribute to firm value as they attract investors and increase market value [47]. Still, distress in financials tends to impair the worth of a firm by raising the prospect of bankruptcy or investor anxiety [48, 49]. The larger companies may display more firm value due to the advantages of economies of scale and greater confidence in the market [50, 51]. CSR practices also help to create firm value by building trust among stakeholders and improving reputation [52, 53]. First, a positive audit opinion indicates financial stability, which enhances investor confidence and leads to an increase in firm value [54-56]. These findings are in line with previous studies arguing that financials, governance, and audit can all work together toward enhancing firm value.

$H_{1:}$ Financial performance has a significant positive effect on audit opinion
$H_{2:}$ Financial distress has a positive effect on audit opinion
$H_{3:}$ Firm size has a significant positive effect on audit opinion.
$H_{4:}$ Corporate social responsibility has a significant positive effect on audit opinion
$H_{5:}$ Financial performance has a significant positive effect on firm value
$H_{6:}$ Financial distress has a negative effect on firm value.
$H_{7:}$ Firm size has a significant positive effect on firm value
$H_{8:}$ Corporate social responsibility has a significant positive effect on firm value
$H_{9:}$ Audit opinion has a significant positive effect on firm value

2.3. Research Framework Model

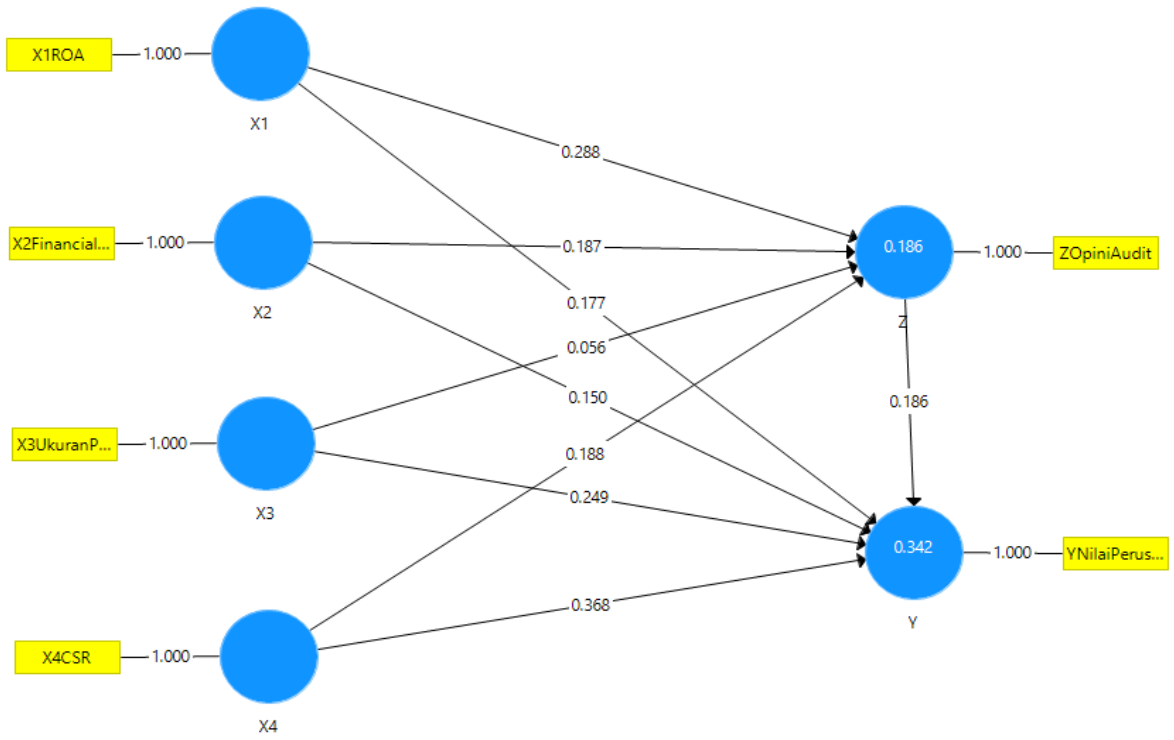

Figure 1.
Research Framework Model.

3. Method

3.1. Research Design

In this context, empirical studies emphasize the critical role played by financial and governance factors in shaping audit opinions and firm value. The robustness of financial performance solidifies the credibility of the expenses incurred, making the chances of receiving a modified audit opinion lower than those of companies with weaker performances [29]. On the other hand, financial distress elevates the risk of audits, resulting in unfavorable opinions [57]. Governance typically changes with firm size, as it is more secure and protected [31], giving larger firms more accurate reporting and better audits. Furthermore, CSR efforts enhance corporate responsibility, positively impacting audit opinions and corporate value [58]. Positive audit opinions boost investor confidence and increase firm value [59].

3.2. Research Sample

This study uses a purposive sampling technique, resulting in the selection of manufacturing companies that consecutively publish annual reports, disclose CSR information, and are profitable from 2018 to 2023. This more focused selection enhances the relevance and reliability of the data, paralleling common research practices in the field [60]. Examples of such works include [61], which shows that purposive sampling aids in targeting firms that offer meaningful insights on the connection between financial performance, CSR, and firm value [21]. Hence, by focusing on firms with strong financial reporting and CSR, the quality of the sample is enhanced for the purpose of examining the audit opinion, financial distress, and firm value hypotheses. This methodology also guarantees that any included data remains representative of the sector, which contributes to credible results that truly reflect corporate practices in reality [62, 63].

3.3. Variable Instrument

Finally, in the current research, some variables were used to analyze the relationship between financial performance, financial distress, firm size, firm value, CSR efforts, and audit opinion. Those variables can be either exogenous, intervening, or endogenous. Company size is measured by the natural logarithm of total assets, and CSR is represented by CSR indices according to GRI G4 [64]. ROA, a common measure of financial performance, shows how efficiently the company generates dollars from its assets [65]. The Altman Z-Score, which is an indicator of financial distress, plays an essential role in predicting a firm going bankrupt [66]. Total assets, as a measure of firm size, affect organizational performance in terms of access to capital and liquidity [67]. CSR practices impact overall firm performance because reputation and long-term stakeholder confidence depend upon CSR practices, which are evaluated through standardized indexes [68, 69]. The intervening variable audit opinion is a dummy variable, where an unqualified opinion indicates good financial health and credibility to the market [29, 70]. Finally, firm value (Tobin's Q) is an endogenous variable that indicates the market's perception of how valuable a firm's assets are and how well it is doing (the higher the value, the more confidence investors have in its prospects) [70, 71]. The concise alluding proven would at least comprise the above variables that would review simultaneously the potency of firm value from the manufacturing firm manufacturers toward which stock took, for example, a listing firm would occupy the Indonesia Stock Exchange. It also highlights the necessary link between financial and non-financial indicators in order to provide a better picture of firm behavior and market appraisal.

3.4. Data Analysis Methods

They are analyzed by means of partial least squares (PLS-SEM). In particular, this technique is effective in addressing complicated hypotheses and interaction terms, and is well suited for small sample sizes and violations of normality and multicollinearity assumptions [72]. As PLS-SEM can be applied in constructing both reflective and formative measurement models for a comprehensive understanding of the relationships between multiple dimensions/assets to improve financial performance, anticipate financial distress, consider firm size, CSR, the impact of audit opinion on the academics of the firm, and its overall value, we decided to use this general-purpose method in our modified MMOs. Outer model evaluation, hypothesis testing, and overall model evaluation [73].

4. Results

4.1. Descriptive Statistics Data

Table 1: Description statistics of variables. ROA has a mean of 0.1923, indicating moderate efficiency in the use of funds, with a very high standard deviation (0.23683). The mean is 18,1750 and the standard deviation is 131,738, suggesting that the financial health of companies varies widely. Firm Size has a minimum value of 15.32 and a maximum value of 314.45, but with a mean of 474.7030, which could either mean we have some outliers or errors. CSR has relatively higher engagement with a mean of 0.3837 and less standard deviation (0.13952). Audit Opinion: the mean is 0.6571, which can be interpreted as most (61.80%) of the audit opinions are favorable. The third part of Y2, Firm Value, also has high variation with a mean of 45.1360 and a massive 541.144 standard deviation, indicating that there are outliers. There is considerable variability in some of these variables that merits further analysis.

Table 1.
Descriptive statistics for the variables.

Variable	N	Minimum	Maximum	Mean	Std. Deviation
ROA (X1)	105	0.01	1.28	0.1923	0.23683
Financial Distress (X2)	105	0.48	12.84	18.1750	131.73800
Firm Size (X3)	105	15.32	314.45	474.7030	7.28636
CSR (X4)	105	0.16	0.67	0.3837	0.13952
Audit Opinion (Y1)	105	0.00	1.00	0.6571	0.47694
Firm Value (Y2)	105	0.34	29.74	45.1360	541.14400

4.2. Measurement model (Outer Model)

Convergent validity is determined to confirm that reflective indicators function as yields for the latent variables. Outer loading of an indicator is valid when it is greater than 0.70, yet a 0.50 value is still acceptable [74]. Table 2 shows the results of the outer loading; all indicators (ROA, Financial Distress, Firm Size, CSR, Firm Value, and Audit Opinion) have an outer loading of 1.000, which is below 0.50. This establishes that all of the items are valid measures of their respective latent variables. The measurement model is therefore good in convergent validity, thus, the respective variables may have further analysis.

Composite Reliability is a test used to measure the level of reliability of the measurement instrument used in this research. Reliability is established when the correlation value is greater than 0.70, with the Cronbach's Alpha method through Smart PLS confirmed [74]. The composite reliability values of all variables (ROA, Financial Distress, Firm Size, CSR, Firm Value, and Audit Opinion) are presented in Table 3, with a value of 1.000 well exceeding the threshold of 0.70. This means indicators for each construct are reliable and produce consistent results when measured on different occasions. Additionally, the variables utilized in this research are credible and appropriate for further analysis.

Table 2.
Outer Loadings (OL).

Indicators	Variable Score	*Loading Limit*	Result
ROA (X1)	1.000	≥ 0.5	Valid OL
Financial Distress (X2)	1.000	≥ 0.5	Valid OL
Firm Size (X3)	1.000	≥ 0.5	Valid OL
CSR (X4)	1.000	≥ 0.5	Valid OL
Firm Value (Y2)	1.000	≥ 0.5	Valid OL
Audit Opinion (Y1)	1.000	≥ 0.5	Valid OL

Source; Author research 2025

Table 3.
Composite Reliability (CR).

Variable	*Composite Reliability*	Criteria
ROA (X1)	1.000	0.7
Financial Distress (X2)	1.000	0.7
Firm Size (X3)	1.000	0.7
CSR (X4)	1.000	0.7
Firm Value (Y2)	1.000	0.7
Audit Opinion (Y1)	1.000	0.7

4.3. Discriminant Validity

It is one of the critical points of validating a model, as it shows how distinct each construct in research is measured against other constructs. In this study, the discriminant validity test was performed based on Average Variance Extracted (AVE), which states that a construct has sufficient discriminant validity if it has an AVE value greater than the value of correlation with other constructs. The outcomes in Table 4 reveal that the constructs provide an AVE higher than 0.5, thus recommending that they show reasonable discriminative validity. As such, there are no overlaps among each latent variable in the study with those of the other variables; each measures its latent construct uniquely. Discriminant validity measures are to determine that the measuring instruments do not need to measure different constructs [75].

These results are also supported by the Fornell-Larcker criterion: The root of the AVE for each construct marked with an asterisk in the table is greater than its calculated correlation with the other latent variables (Table 5). This further confirms that the constructs are distinct enough from one another, which is important to verify that the study's variables are not overlapping. Therefore, the research variables reflect good discriminant validity, making the measurement model reliable and allowing it to be considered as a basis for further analysis.

Table 4.
Average variance extracted (AVE).

Variable	*Average Variance Extracted* (AVE)
ROA	1.000
Financial Distress	1.000
Firm Size	1.000
CSR	1.000
Firm Value	1.000
Audit Opinion	1.000

Table 5.
Discriminant validity analysis (DVA).

	X1	X2	X3	X4	Y	Z
ROA	1.000*					
FinancialDistress	0.202	1.000*				
Firm Size	-0.058	0.236	1.000*			
CSR	-0.008	0.102	-0.195	1.000*		
Audit Opinion	0.251	0.329	0.190	0.373	1.000*	
Firm Value	0.328	0.251	-0.065	0.216	0.345	1.000*

This is an important measure in partial least squares (PLS) to assess the validity of relationships between constructs. It is calculated by dividing the geometric mean of the heterotrait correlations by the monotrait correlations between similar constructs. HTMT values range from 0 to 1, where values closer to 0 indicate no relationship between constructs, and values closer to 1 indicate a high relationship, potentially causing multicollinearity. In this study, no HTMT values exceeded 0.9, suggesting no multicollinearity issues and confirming that constructs are appropriately distinct and interrelated.

4.4. Variance of the Inflation Factor (VIF)

The VIF is an important measure in assessing whether multicollinearity may occur between the research objects before performing the structural model analysis in PLS. If the VIF is less than Table 6, it indicates that the multicollinearity problem does not exist for the variables [75]. The VIF values are all equal to 1 for the variables (ROA, Financial Distress, Firm Size, CSR, Firm Value, and Audit Opinion), confirming that multicollinearity is not a major issue in this study. This guarantees that the assumptions for their non-multicollinearity are satisfied and the model can proceed with structural analysis without worrying about inflated standard errors or biased estimates. The following process is bootstrapping analysis, followed by the development of the structural model equations to enable us to test the significance of direct and indirect effects on the endogenous latent constructs. Bootstrapping provides an opportunity to estimate sampling distributions of coefficient values, so we know something about their significance [75]. Consequently, this process is a prerequisite for the estimation of model reliability, validity, hypothesis evaluation, and direction of the theoretical variables in the model [75].

Table 6.
Variance Inflation Factor (VIF).

Variable data	VIF
ROA	1.000
Financial Distress	1.000
Firm Size	1.000
CSR	1.000
Firm Value	1.000
Audit Opinion	1.000

4.5. Direct Effect Test Results

The results of the direct effect tests in Table 7 the results show that ROA, financial distress, company size, CSR, and audit opinion significantly influence company value and audit opinion. For instance, ROA plays a crucial role concerning both Firm Value (β = 0.177, p = 0.031) and Audit Opinion (β = 0.288, p = 0.000). Likewise, Financial Distress shows a positive influence on Firm Value (β = 0.150, p = 0.029) and Audit Opinion (β = 0.187, p = 0.017), while Firm Size significantly contributes to Firm Value (β = 0.249, p = 0.003) but not to Audit Opinion (β = 0.056, p = 0.578). CSR significantly and positively affects both Firm Value (β = 0.368, p = 0.000) and Audit Opinion (β = 0.188, p = 0.028). Additionally, Audit Opinion has a substantial effect on Firm Value (β = 0.186, p = 0.011). This implies that CSR has the strongest influence in the model, especially on Firm Value. These results support the notion that while all of these variables have different degrees of impact on the studies carried out, both Firm Value and Audit Opinion are significantly affected by these variables, which will inform future research decisions.

Table 7.
Direct Effect Test Results (DE).

Variable research	Original Sample (O)	T Statistics (STDEV)	P Values
ROA →Firm Value	0.177	2.023	0.031
ROA → Audit Opinion	0.288	5.460	0.000
Financial Distress→Firm Value	0.150	2.066	0.029
Financial Distress→ Audit Opinion	0.187	2.391	0.017
Firm Size→Firm Value	0.249	2.955	0.003
Firm Size→Audit Opinion	0.056	0.556	0.578
CSR→Firm Value	0.368	5.590	0.000
CSR→Audit Opinion	0.188	2.204	0.028

4.6. Discussions

The analysis presented in the previous section reveals important findings related to the association of the independent variables, which are Return on Assets (ROA), Financial Distress, Firm Size, Corporate Social Responsibility (CSR), and Audit Opinion, with the dependent variables, namely, Firm Value and Audit Opinion. These findings have significant implications for researchers studying the finance/corporate governance relationship and provide practical insights for companies and regulators.

The impact of ROA on firm value and audit opinion strongly influences the notion that financial performance acts as the heart of a business's success and reputation. ROA is a common measure of the returns a company earns on its assets, and its positive association with firm value is consistent with previous studies that have shown a direct relationship between a company's financial performance and its valuation. Moreover, the correlation between ROA and audit opinion is also indicative of the relationship between a firm's financial performance and its audit outcome, demonstrating that companies with stronger financial results are likely to receive favorable audit opinions [39]. Such findings are in line with previous studies that point out that profitability is important when it comes to the assessment of a firm in market or regulatory contexts [76].

Another important issue is the relevance of financial distress to firm value and audit opinion. The impact of financial distress on a company has been acknowledged for many years and represents an important consideration that can influence recipient responses both within the firm and externally, such as by auditors and investors. For example, an organization in financial distress may be subject to heightened questioning from auditors, who may voice concerns about the organization's ability to continue as a going concern. In the same manner, the negative effect of financial distress on firm value indicates that investors consider firms that are distressed to be risky, and hence it reduces the value of the firm in the market. These results confirm prior studies, Andreou et al. [77] demonstrating a strong association between financial distress, the cost of capital and stock return, and market demand for equilibrium manipulation, i.e., the perception of underlying value by firms in distress leads to a decrease in their market value and audit quality.

Evidence regarding firm size and value shows a positive impact of value on larger firms. Larger firms may possess more stability, resources, and market presence, contributing to higher firm valuation. This result is consistent with the literature, which generally finds that larger firms are valued higher, as they generate more stable cash flows and experience diversified risks. Surprisingly, however, there is no significant relationship between firm size and audit opinion. This might imply that auditors are becoming less indifferent to firm size as an independent variable in evaluating entity solvency. Rather, auditors focus on particular financial indicators such as profitability or liquidity rather than just size. Such observation aligns with the

findings of the study conducted [78, 79] that suggested although the size of the firm could influence a company's audit costs, it is not always the case that it is directly proportional to the quality of the audit opinion.

CSR has been shown to be one of the most important components in the study, with a positive and significant impact on Firm Value and Audit Opinion. The positive relation between CSR and Firm Value highlights the increasing significance of non-financial performance metrics (e.g., ESG criteria) in pricing firms. Investors are progressively perceiving CSR as a firm's long-term sustainability and ethical behavior [80], which has positive effects on the market value of firms. Furthermore, the significant impact of CSR on Audit Opinion indicates that auditors might take into account a firm's CSR initiatives in arriving at their opinion, knowing that companies engaged in strong CSR efforts are less likely to encounter regulatory or reputational risks. These results are consistent with the existing literature that highlights the importance of CSR as a way to strengthen a firm's reputation and meet ethical investors' needs [33, 81].

Lastly, the finding regarding Audit Opinion and Firm Value aligns with the established view that the credibility of a firm's financial statements, as signified by the audit opinion, is a key factor influencing the market's assessment of its value. A good audit opinion indicates to investors that the information provided is transparent, reliable, and trustworthy, leading to a higher valuation. On the contrary, an adverse opinion may increase anxiety regarding firm viability and governance practices that could adversely impact firm value. This result is consistent with the findings [82] in which firms that received a qualified or adverse audit opinion suffered negative reactions in the market that followed with a fall in their respective shares.

5. Conclusions

The focus of this research has been the critical linkages between financial performance, corporate governance, and firm valuation, particularly concerning indicators including Return on Assets (ROA), Financial Distress, Firm Size, Corporate Social Responsibility (CSR), as well as Audit Opinion. These results provide a clear way of how these factors affect Firm Value and quality Audit Opinion. ROA and CSR also became major drivers of both Firm Value and positive Audit Opinions, highlighting the impact of financial performance and non-financial metrics on business success. Specifically, it was revealed that Financial Distress has adverse effects on both Firm Value and Audit Opinion, indicating the struggles that companies in distress are going through. The results contribute to the literature and provide useful insights to managers, auditors, and investors to evaluate and improve firm performance. More studies might investigate how these variables function together in various sectors and regions to gain a fuller picture of their broader consequences.

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