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Dynamic Relationship between Stakeholders' Demands, Environmental Accounting Disclosure and Financial Performance of Manufacturing Firms in Nigeria

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ABSTRACT

Despite growing stakeholder pressure and regulatory attention, manufacturing firms in Nigeria still exhibit inadequate environmental disclosure practices, raising concerns about its implications for financial performance and commitment to sustainability. Hence, the study aimed the examine the dynamic relationship between stakeholders' demands, environmental accounting disclosure and the financial performance of manufacturing firms in Nigeria. The study explored both primary and secondary data. The study employed a longitudinal research design combining primary data from 280 stakeholders. The secondary data were obtained from the annual reports and accounts of 30 sampled firms listed on the Nigerian Exchange Group from 2008 to 2023. A vector autoregressive (VAR) model was applied to analyse the short- and long-term interaction among the variables. The findings revealed that environmental accounting practices are relatively autonomous but increasingly influenced by stakeholder demands over time and both factors significantly enhance financial performance. The results underscore the growing interdependence between corporate environmental accountability and stakeholder expectations, highlighting that firms prioritizing transparency and engagement experience improved financial outcomes. Based on the findings, the study recommends stricter enforcement of environmental regulations, the introduction of incentive schemes for sustainable practices, adoption of standardized reporting frameworks, active stakeholder engagement and integration of environmental accounting strategic planning. The study contributes to empirical evidence on the relevance of aligning environmental practices with stakeholder expectations to achieve sustainable business outcomes in Nigeria's manufacturing sector.

Keywords: Environmental Accounting Disclosure, Financial Performance, Manufacturing Firm, Stakeholders' Demand, Vector Autoregressive
JEL Classifications: M41, Q56

1. INTRODUCTION

The manufacturing sector plays an important role in Nigeria's economic growth, contributing to employment, Gross Domestic Product, and industrial development. However, it is also a major contributor to environmental degradation, evidenced by resource depletion, pollution, and inadequate waste management practices (Elenwo and Akankali, 2014; Ogunkan, 2022). While global emphasis on sustainability has heightened, many Nigerian manufacturing firms continue to neglect environmental considerations, lagging in the adoption of environmental accounting practices. In the contemporary business landscape, the Nigerian manufacturing industry faces increasing pressure from several stakeholders to adopt environmentally responsible practices. Stakeholders, which include investors, consumers, regulators, and local communities, demand greater transparency

and accountability in environmental performance, which has significant implications for corporate strategies and financial outcomes (Wagner, 2015; Shahzad et al., 2020). Environmental accounting, which involves the systematic tracking and reporting of environmental benefits and costs, has emerged as a vital tool for firms to meet these demands and enhance their sustainability profiles (Amir et al., 2024).

Stakeholder pressures, including regulatory, customer, and competitor pressures, significantly influence the adoption of environmental management accounting (EMA) and environmental management initiatives (Xie et al., 2024; Cao et al., 2025). These pressures drive organizations to implement EMA practices to meet stakeholder expectations and improve environmental performance (Amir et al., 2024). The interaction and adaptation behaviors of stakeholders play a crucial role in enhancing the effectiveness of EMA in achieving organizational sustainability. EMA implementation has been shown to significantly improve economic, environmental, and social aspects of sustainability in manufacturing firms (Amir et al., 2024; Fuzi et al., 2019; Fuzi et al., 2022).

The performance of companies is essential to investors, stakeholders, and the economy. Financial performance is a wide phrase that refers to a overall health and the returns on pooled resources employed for operational operations (Akinadewo et al., 2023). Investors primarily focus on their returns on investments, while other stakeholders have different priorities. These include the firm's capability to deliver enhanced services, improved working environment, eco-friendly products, increased employee compensation, and the contribution to the growth of the country. Most managers are constantly challenged to pursue goals and objectives that will improve their organizations' performance. They operate on a global scale, such that it is envisaged they look for chances to do business through various opportunities, to improve the organization's overall performance regarding shareholder value while being challenged by real-life and environmental constraints (Muhammad et al., 2015). Hence, business organizations and countries are tasked with ensuring that environmental concerns are considered when making decisions (Epstein, 2018). Accordingly, organisations in advanced countries have begun to enhance their environmental performance in response to natural resource depletion (Amosun et al., 2022; Aftab et al., 2023). Similarly, some companies in Nigeria have taken similar steps by yielding to various environmental laws, rules, and government enactments in response to campaigns aimed at protecting the environment by various stakeholders (Ogunkan, 2022).

Industrial activities are conducted by many countries worldwide, involving various sectors such as assembling, mining, refining, and others. However, these activities generate waste that contains substances that can cause pollution, leading to environmental problems within various regions of the world. Environmental contamination has reached alarming levels, as reported in studies conducted by Srinivasa (2014). These environmental degradations caused by the actions of most manufacturing firms affect the interest of majority of stakeholders. The government as a stakeholder, will implement its interest in the society when the significant sectors (especially the manufacturing sector) of the economy create and encourage an enabling environment. Also, the customers and public will relax in their interactions with one and another only if they have the trust that there is no compromise to the environment that determine their existence. So, firms must endeavour to consider the environmental footprint of their businesses, goods or services and the complexity of its environment because they can determine their success or failure.

Adopting good environmental accounting practices can help to ensure good environmental behaviours, manage environmental risks and opportunities, achieve environmental performance, and the ultimate goal of meeting the basic interests of variety of stakeholders before the powerful stakeholders utilises such power over the company. Despite the growing emphasis on environmental sustainability. Many manufacturing firms in Nigeria struggle to effectively integrate environmental accounting into their operations. This challenge is heightened by limited stakeholder engagement, inconsistent regulatory framework and varying levels of environmental awareness among firms (Abaa et al., 2024). The lack of robust environmental accounting practices can lead to suboptimal financial performance and missed opportunities for value creation through sustainable practices (Soetan et al., 2024). Additionally, the failure to adequately respond to stakeholder demands can result in reputational risks and diminished competitive advantage (Oluseyi-Sowunmi et al., 2020; Danso et al., 2020). Therefore, understanding the interplay between stakeholder pressures, environmental accounting, and firm performance is crucial for developing strategies that enhance both environmental and economic outcomes in the Nigerian manufacturing sector.

The dynamic relationship between stakeholder demands, environmental accounting, and the performance of Nigerian manufacturing firms has been insufficiently explored. This gap hampers efforts to align environmental and financial performance, which is critical for fostering sustainability. Nigerian firms often lack the systems and standards needed to track and report environmental costs accurately, resulting in inconsistent and unreliable data. Therefore, understanding the interplay between stakeholder pressures, environmental accounting, and firm performance is crucial for developing strategies that enhance both environmental and economic outcomes in the Nigerian manufacturing sector.

2. LITERATURE REVIEW

Stakeholder theory is relevant as it emphasizes that firms must consider the interest of all parties affected by their activities, and not just the shareholders. The proponent of the theory is Freeman (Freeman, 1984). In Nigeria's manufacturing sector, where environmental degradation has been a major concern, the theory provides a strong framework for analysing how firms respond to growing external pressures in adopting environmental accounting practices. This theory is essential in understanding how stakeholder pressures influence environmental and social activities within firms, which in turn affects environmental and economic performance (Wagner, 2015). It also supports the opinion that

environmental accounting serves as a mechanism through which firms balance profitability with ecological and social responsibility, which ensures long-term sustainability and stakeholder trust.

Complementing this, legitimacy theory was first developed by Dowling and Pfeffer in 1975, as a framework to understand how organizations maintain their social license to operate by aligning their activities with societal values and expectations (Dowling and Pfeffer, 1975; Suchman, 1995). In Nigeria, where manufacturing firms face increasing scrutiny from regulators, the media and local communities, environmental disclosure becomes a tool to demonstrate compliance and enhance reputation. Finally, the theory of eco-efficiency brideges economic and environmental performance of advocating resource-efficient production that minimizes waste and emission while enhancing profitability. Stephen schmidheiny is recognized as the individual who introduced the concept of eco-efficiency and has made perhaps the most significant contribution to its development and widespread adoption (Zhelyazkova, 2016).This theory is suitable in the Nigerian context, where manufacturing firms must reconcile sustainability with cost efficiency. This theory is reflected in the practices of green product and process innovations, which are positively influenced by stakeholder pressures and contribute to improved environmental performance (Xie et al., 2024).

3. METHODOLOGY

3.1. Research Design

The study utilized a longitudinal research design, which was deemed suitable for establishing cause-and-effect relationships between the independent and dependent variables based on past events. The ex-post facto research approach was employed as it dealt with factual data that could not be manipulated. This research design allowed for a quantitative review of data extracted from the published financial statements of the Nigeria Exchange Group and sustainability reports of the firms, as well as primary research instruments across stakeholders. Variables identified from existing literature were used to analyze changes in the dataset. The design involved understanding past events to make predictions about future events. Descriptive and inferential statistics were applied to the data for analysis.

3.2. Area of Study

The study area covered South-West Nigeria, which comprised six states: Lagos State, Ogun State, Oyo State, Osun State, Ondo State, and Ekiti State. These states were considered due to their proximity for data collection and the availability of manufacturing firms listed on the Nigeria Exchange Group. Additionally, these firms were more likely to comply with global environmental standards on sustainability reporting. The focus was narrowed to the South-West states to obtain responses from the stakeholders of the firms sampled.

3.3. Population, Sample Size, and Sampling Technique

The population of the study encompassed listed Nigerian manufacturing firms that were quoted on the Nigeria Exchange Group as of December 31st, 2023. According to the classification by the Nigeria Exchange Group, there were five sub-sectors within the manufacturing industry. The dataset covered a time frame from 2008 to 2023, representing 16 years of data. The population of the study was 500 in total with a sample size of 280 respondents randomly selected which comprise of 250 senior members of staff of the firms, 15 top officials of regulatory agencies and 15 chiefs of the communities. Secondary data was sourced from the annual reports and accounts of the firms between 2008 and 2023. Primary research instruments were also distributed to various stakeholders of these firms to determine how they influenced the demand for firms' environmental performance.

3.4. Data and Sources of Data

The study utilized both primary and secondary sources of data. The primary data were obtained through electronic structured questionnaires, which comprised lists of appropriate responses from the stakeholders of the sampled firms. Electronic structured questionnaires were employed because they were less expensive, ensured accurate questionnaire administration and data cleaning, and provided greater accessibility to a wide range of stakeholders, including employees, top-level management, shareholders, customers, the government, and the general public. The responses of these stakeholders assisted in determining key factors driving their demands for sustainability and the reporting of environmental information.

3.5. Research Instruments

The study employed structured questionnaires as a research instrument. The questionnaires were distributed to external stakeholders of the sampled firms to gather their responses (e.g., suppliers, shareholders, creditors, the environment the firms are domiciled etc.). They were organized, designed, and administered in a way that ensured the accurate retrieval of information by the researcher. For instance, the design of the questionnaire was structured in alignment with the objective to be achieved and the nature of the respondents, with scaling attached to each response. The purpose of scaling was to help achieve the necessary construct of ideas and metrics required to test the hypothesis.

3.6. Data Analysis Technique

The study employed a comprehensive set of analytical techniques aligned with the research objectives, each requiring distinct methodological approaches. The objective examined the dynamic relationship between stakeholder demands, environmental accounting practices, and performance through vector auto regression modelling. This analysis began with stationarity testing using the Augmented Dickey-Fuller test, followed by optimal lag length selection using information criteria. The researchers conducted a variance decomposition to understand the relative influence of different variables. This comprehensive approach provided insights into the interconnected nature of stakeholder demands, environmental practices, and financial outcomes.

3.7. Vector Autoregressive (VAR) Model

The VAR model is specified to examine the dynamic relationship among Stakeholders' demands (SD), environmental accounting practices (EAP), and financial performance (FP) in the manufacturing sector. Each variable is modelled as a function of its own lags and the lags of the other two variables.

Equation for Stakeholders' Demands (SD):

$$SD_t = \propto_1 + \sum_{k=1}^{p} \left(\varnothing_{11k} SD_{t-k} + \varnothing_{12k} EAP_{t-k} + \varnothing_{13k} FP_{t-k} \right) + \in$$

Equation for environmental accounting practices (EAP):

$$EAP_t = \propto_2 + \sum_{k=1}^{p} \left(\varnothing_{21k} SD_{t-k} + \varnothing_{22k} EAP_{t-k} + \varnothing_{23k} FP_{t-k} \right) + \in_{2t}$$

Equation for financial performance (FP):

$$FP_t = \propto_3 + \sum_{k=1}^{p} \left(\varnothing_{31k} SD_{t-k} + \varnothing_{32k} EAP_{t-k} + \varnothing_{33k} FP_{t-k} \right) + \in_{3t}$$

Where:
SD_t = Stakeholders' Demands at time t
EAP_t = Environmental Accounting Practices at time t
FP_t = Financial Performance at time t
$\propto_1, \propto_2, \propto_3$ = Intercepts for each equation.
$\varnothing_{ijk}$ = Coefficients representing the effect of the k^{th} lag of variable j on variable i
I,j = SD, EAP, FP
$\in_{1t}, \in_{2t}, \in_{3t}$: Error terms for each equation.

3.8. Contemporaneous Effects Matrix

The contemporaneous relationships among variables at time t are captured as follows:

$$\begin{pmatrix} SD_t \\ EAP_t \\ FP_t \end{pmatrix} = \begin{pmatrix} \propto_1 \\ \propto_2 \\ \propto_3 \end{pmatrix} + \begin{bmatrix} \varnothing_{11} & \varnothing_{12} & \varnothing_{13} \\ \varnothing_{21} & \varnothing_{22} & \varnothing_{23} \\ \varnothing_{31} & \varnothing_{32} & \varnothing_{33} \end{bmatrix} \begin{pmatrix} SD_t \\ EAP_t \\ FP_t \end{pmatrix} + \begin{pmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \end{pmatrix}$$

$\varnothing_{1j}$: Coefficients representing the contemporaneous effect of variable j on variable i at time t.

3.9. Final VAR System

Combining the lagged and contemporaneous effects, the VAR system is specified as:

$$\begin{pmatrix} SD_t \\ EAP_t \\ FP_t \end{pmatrix} = \begin{pmatrix} \propto_1 \\ \propto_2 \\ \propto_3 \end{pmatrix} + \sum_{k=1}^{p} \begin{bmatrix} \varnothing_{11k} & \varnothing_{12k} & \varnothing_{13k} \\ \varnothing_{21k} & \varnothing_{22k} & \varnothing_{23k} \\ \varnothing_{31k} & \varnothing_{32k} & \varnothing_{33k} \end{bmatrix} \begin{pmatrix} SD_{t-k} \\ EAP_{t-k} \\ FP_{t-k} \end{pmatrix} + \begin{bmatrix} \varnothing_{11} & \varnothing_{12} & \varnothing_{13} \\ \varnothing_{21} & \varnothing_{22} & \varnothing_{23} \\ \varnothing_{31} & \varnothing_{32} & \varnothing_{33} \end{bmatrix} \begin{pmatrix} SD_t \\ EAP_t \\ FP_t \end{pmatrix} + \begin{pmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \end{pmatrix}$$

This model accounts for both the lagged and contemporaneous effects, providing a comprehensive framework to analyze the dynamic interactions between stakeholders' demands, environmental accounting practices, and financial performance in the manufacturing sector.

3.10. Determination of Lag Length

The optimal lag length (ppp) is determined using information criteria such as the Akaike information criterion (AIC) and the Schwarz Bayesian criterion (SBC). These criteria ensure the model captures the relevant dynamics without overfitting.

This VAR specification captures the short-term and long-term effects of stakeholders' demands on environmental accounting practices and financial performance, along with the reciprocal influences among the variables.

3.11. Measurement of Variables

Variable	Measurement	Sources
Stakeholders' demand (SD)	Measured as the total number of stakeholder-related transactions or engagements within a specific time period.	Dechow et al. (2010); Holthausen and Verrecchia (1988)
Environmental disclosure percentage ($ED\%_{it}$)	This is computed as the proportion of environmental information disclosed	Researcher's compilation
Return on capital employed ($ROCE_{it}$)	Measured as the efficiency of capital utilization, calculated by dividing earnings before interest and tax (EBIT) by capital employed	Lucato et al. (2013), Lucato (2017)

4. RESULTS AND DISCUSSION

Table 1 presents the variance decomposition of environmental accounting over ten periods, showing how variations in environmental accounting are explained by itself and other variables in the system, including stakeholder environmental demands (SED) and return on capital employed (ROCE). The results show that environmental accounting exhibits strong self-influence, starting at 100% in period 1 and gradually declining to 77.324% by period 10. Stakeholder environmental demands' influence grows from 0% to 16.384% over the ten periods, while ROCE's contribution increases from 0% to 6.292%. The gradual increase in the influence of other variables suggests a growing interconnectedness of these factors over time.

Table 1: Variance decomposition of environmental accounting (EA)

Period	S.E.	EAP	SED	ROCE
1	0.286	100.000	0.000	0.000
2	0.384	92.847	4.562	2.591
3	0.445	88.563	7.324	4.113
4	0.486	85.847	9.156	4.997
5	0.524	83.624	10.847	5.529
6	0.563	81.956	12.324	5.720
7	0.598	80.563	13.567	5.870
8	0.632	79.324	14.624	6.052
9	0.665	78.256	15.563	6.181
10	0.698	77.324	16.384	6.292

Source: Author's Computation (2025)

These findings have important implications for understanding the dynamics of environmental accounting in Nigeria's manufacturing sector. The strong persistence of environmental accounting's own shocks suggests that environmental accounting practices are relatively autonomous and stable over time. However, the growing influence of stakeholder demands indicates that manufacturers must increasingly consider stakeholder perspectives in their environmental accounting practices, highlighting the evolving nature of corporate environmental responsibility in Nigeria.

Table 2 presents the variance decomposition of stakeholder environmental demands over ten periods, illustrating how variations in stakeholder demands are explained by environmental accounting (EA), stakeholder environmental demands (SED), and return on capital employed (ROCE). The analysis reveals that stakeholder environmental demands exhibit a strong but declining self-influence, starting at 76.376% in period 1 and decreasing to 53.124% by period 10. Conversely, environmental accounting's influence increases substantially from 23.624% to 40.584% over the ten periods. ROCE shows a modest but steady increase in influence, rising from 0% to 6.292%. This pattern indicates a growing interdependence between stakeholder demands and environmental accounting practices over time.

These findings demonstrate the dynamic relationship between stakeholder demands and environmental accounting in Nigeria's manufacturing sector. The substantial and increasing influence of environmental accounting on stakeholder demands suggests that as companies improve their environmental accounting practices, they better align with and potentially shape stakeholder expectations. This has important implications for manufacturing companies' strategic approach to environmental management and stakeholder engagement.

Table 3 examines the variance decomposition of return on capital employed over ten periods, showing how variations in ROCE are explained by environmental accounting (EA), stakeholder environmental demands (SED), and its own innovations. The results show that ROCE's self-influence decreases substantially from 80.629% in period 1 to 50.732% by period 10. Environmental accounting's influence grows from 10.524% to 26.584%, while stakeholder demands' influence increases from 8.847% to 22.684%. This indicates that both environmental accounting practices and stakeholder demands have increasingly significant effects on financial performance over time.

These findings have crucial implications for understanding how environmental practices and stakeholder demands affect financial performance in Nigeria's manufacturing sector. The growing influence of both environmental accounting and stakeholder demands on ROCE suggests that companies that effectively manage their environmental responsibilities and stakeholder relationships are likely to see improved financial performance. This supports the business case for environmental sustainability and stakeholder engagement in the manufacturing sector.

4.1. Post-Estimation Tests and Stability Analysis

These tables present a comprehensive set of diagnostic and stability tests for the analysis, including residual diagnostics, stability tests, additional variance decomposition, Granger causality tests, and VAR stability checks. Table 4 presents three essential diagnostic tests for evaluating the model's statistical validity: the Serial Correlation LM Test, Heteroskedasticity White Test, and Normality Jarque-Bera Test. These tests are crucial for ensuring the reliability and robustness of the research findings.

The serial correlation LM Test yielded a statistic of 12.45 with a P = 0.187, indicating no significant serial correlation in the residuals. The heteroskedasticity white test produced a statistic of 14.32 with a P = 0.246, confirming that the residuals are homoscedastic. The Normality Jarque-Bera Test resulted in a statistic of 5.78 with a P = 0.454, supporting the normal distribution of residuals. These diagnostic results significantly strengthen the credibility of the research findings on environmental accounting and stakeholder demands in Nigeria's manufacturing sector. The absence of serial correlation suggests that the model accurately captures the relationship between variables over time. The homoscedastic residuals indicate consistent variance in the error terms, while the normal distribution of residuals supports the validity of statistical inferences made from the model.

Table 2: Variance decomposition of stakeholder environmental demands (SED)

Period	S.E.	EA	SED	ROCE
1	0.824	23.624	76.376	0.000
2	1.156	27.847	69.562	2.591
3	1.384	30.563	65.324	4.113
4	1.563	32.847	62.156	4.997
5	1.724	34.624	59.847	5.529
6	1.868	36.156	58.124	5.720
7	1.998	37.463	56.667	5.870
8	2.124	38.624	55.324	6.052
9	2.245	39.656	54.163	6.181
10	2.362	40.584	53.124	6.292

Source: Author's computation (2025)

Table 3: Variance decomposition of return on capital employed (ROCE)

Period	S.E.	EA	SED	ROCE
1	3.558	10.524	8.847	80.629
2	4.862	13.847	11.562	74.591
3	5.724	16.563	13.824	69.613
4	6.386	18.847	15.656	65.497
5	6.924	20.624	17.247	62.129
6	7.386	22.156	18.624	59.220
7	7.798	23.463	19.867	56.670
8	8.172	24.624	20.924	54.452
9	8.516	25.656	21.863	52.481
10	8.836	26.584	22.684	50.732

Source: Author's Computation (2025)

Table 4: Residual diagnostics

Test	Statistic	P-value	Decision
Serial correlation (LM test)	12.45	0.187	No evidence of serial correlation
Heteroskedasticity (White test)	14.32	0.246	Residuals are homoscedastic
Normality (Jarque-Bera test)	5.78	0.454	Residuals are normally distributed

Source: Author's computation (2025)

Table 5 focuses on the eigenvalue stability condition, which is crucial for determining whether the estimated model is dynamically stable and suitable for long-term analysis of environmental accounting and stakeholder demands. The maximum modulus of eigenvalues is reported at 0.893, which falls below the critical threshold of 1.0. This finding is definitive in establishing the model's stability, as all eigenvalues lie within the unit circle. The criterion value confirms that the model meets the stability requirements for valid statistical inference.

The stability of the model has important implications for the research on environmental accounting in Nigeria's manufacturing sector. It confirms that the relationships identified between environmental accounting, stakeholder demands, and performance are not spurious but represent genuine long-term associations that can be relied upon for policy formulation and strategic decision-making.

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Table 6 presents a condensed variance decomposition analysis over three key periods (1, 3, and 5), showing how variations in financial performance are explained by environmental accounting, stakeholders' demands, and its own innovations.

Table 7 presents a detailed examination of the VAR model's stability through the analysis of eigenvalue roots and their corresponding moduli. The table shows eight distinct roots, with the largest modulus being 0.899 (corresponding to the root 0.893 + 0.112i). All other roots have smaller moduli, ranging from 0.823 to 0.096. The fact that all moduli are less than unity confirms the stability of the VAR system.

The comprehensive stability analysis reinforces the reliability of the VAR model in analyzing the relationships between environmental accounting, stakeholder demands, and performance in Nigeria's manufacturing sector. The stable nature of the system suggests that shocks to the system will have diminishing effects over time, making the model suitable for both short-term and long-term analysis of environmental accounting practices and their impacts. The residual diagnostics (Table 4) show no evidence of serial correlation (P = 0.187), homoscedastic residuals (P = 0.246), and normal distribution (P = 0.454). The stability tests (Tables 5 and 7) confirm the model's stability with maximum eigenvalue modulus of 0.893, well below the critical value of 1.0.

The robust diagnostic results validate the reliability of the analysis and its findings for policy and practice in Nigeria's

Table 5: Stability test

Eigenvalue stability condition	Criterion	Value	Conclusion
Maximum modulus of eigenvalues	<1.0	0.893	Model is stable

Source: Author's computation (2025)

Table 6: Variance decomposition

Period	Environmental accounting (%)	Stakeholders' demands (%)	Financial performance (%)
1	5.2	10.3	84.5
3	18.4	20.5	61.1
5	25.7	30.4	43.9

Source: Author's computation (2025)

Table 7: VAR stability check condition

Root	Modulus
0.893+0.112i	0.899
−0.823+0.014i	0.823
0.451	0.451
−0.312+0.073i	0.319
0.215	0.215
−0.098+0.215i	0.236
−0.154+0.072i	0.170
−0.096	0.096

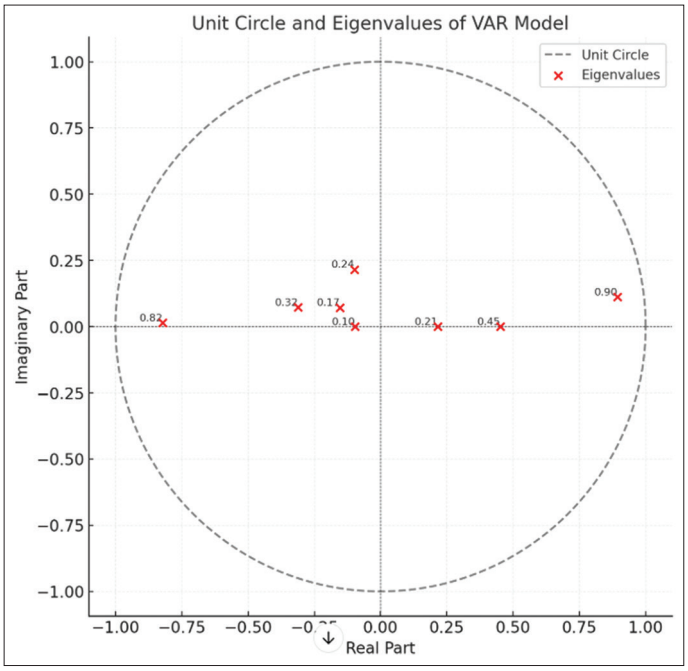
Source: Author's computation (2025)

manufacturing sector. The confirmed stability of the model and the established causal relationships provide strong evidence that environmental accounting practices and stakeholder demands significantly influence financial performance. This suggests that manufacturing companies in Nigeria should prioritize both environmental accountability and stakeholder engagement as key drivers of sustainable financial performance. The findings provide a solid empirical foundation for policy recommendations aimed at promoting environmental sustainability in the manufacturing sector while maintaining financial viability.

The graph provided in Figure 1 illustrates a unit circle plot that serves as a crucial diagnostic tool for assessing VAR model stability. The plot features a dashed circular boundary representing the unit circle with a modulus of 1.0, which acts as the critical threshold for stability assessment. Within this space, we can observe several red points marking the eigenvalues of the VAR model.

What's particularly noteworthy about this visualization is the positioning of all eigenvalues, which fall comfortably within the confines of the unit circle. The largest modulus value of 0.899 is especially significant, as it demonstrates a clear margin between the most extreme eigenvalue and the unit circle boundary. This positioning is not merely a technical detail but has profound implications for the model's behavior and reliability. The internal placement of these eigenvalues confirms the VAR model's stability, which is fundamental for its practical applications. This stability characteristic ensures that any perturbations or shocks introduced to the system will gradually fade away rather than amplify over time. Such behavior is essential for the model's predictive capabilities and its ability to generate meaningful

Figure 1: Unit circle plot



insights. Given these stability characteristics, we can confidently proceed with more advanced analytical techniques using this VAR model. The confirmed stability makes it particularly suitable for conducting impulse response analysis and variance decomposition studies, both of which require a stable underlying system to produce reliable and interpretable results. This stability validation essentially green lights the model for more sophisticated economic or financial analysis, depending on its intended application.

The findings reveal a complex interplay among these variables. Over time, the influence of stakeholders' demands on environmental accounting practices increased, reflecting the growing power of external pressures in shaping corporate behavior. Simultaneously, companies that prioritized stakeholder engagement and transparency in environmental reporting experienced positive shifts in financial performance. This dynamic relationship underscores the importance of aligning environmental practices with stakeholder expectations to achieve sustainable business outcomes. Moreover, the analysis highlights that the benefits of environmental accountability extend beyond immediate financial gains, fostering long-term resilience and reputation enhancement in the face of evolving market and regulatory conditions.

5. CONCLUSION AND RECOMMENDATIONS

The findings revealed that environmental accounting practices are relatively autonomous but increasingly influenced by stakeholder demands over time and both factors significantly enhance financial performance. The results underscore the growing interdependence between corporate environmental accountability and stakeholder expectations, highlighting that firms prioritizing transparency and engagement experience improved financial outcomes. The following are recommendations:

i. The government should enforce stricter environmental regulations and ensure their consistent implementation. Regulatory agencies must be adequately resourced to monitor compliance effectively, impose penalties for violations, and reward firms that adhere to sustainability standards.
ii. Incentive schemes such as tax rebates, grants, or subsidies should be introduced to encourage manufacturing firms to adopt environmental accounting practices. These measures can alleviate the financial burden on firms, particularly small and medium-sized enterprises, enabling them to invest in sustainable technologies and reporting systems.
iii. Firms should actively engage with stakeholders, including employees, regulators, investors, and local communities, to align their environmental practices with stakeholder expectations. Transparent communication about environmental impacts and actions can foster trust and collaboration
iv. The adoption of standardized frameworks for environmental accounting and sustainability reporting should be encouraged. These frameworks, such as the global reporting initiative (GRI) and integrated reporting (IR), can help firms disclose their environmental impacts consistently and comparably.
v. Firms should integrate environmental accounting into their long-term strategic planning processes. This involves setting measurable sustainability goals and regularly reviewing their progress to ensure alignment with both financial objectives and stakeholder expectations.

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