



Artificial Intelligent Potency and Firms' Value in Nigeria

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Abstract

With the separation of ownership from control, shareholders are fast losing the firms' value. Thus, the search for a computer technique that both generate and interpret information in relation to accounting reporting led to the invention of Artificial Intelligent. In light of this, this study investigated the value of Nigerian enterprises and the potential of artificial intelligence. Panel Autoregressive Distributed Lag (ARDL) model with related Pooled Mean Group (PMG) and Mean Group (MG) were used to accomplish this goal. Artificial intelligent awareness (AIAW), artificial intelligent frequency (AIFQ), and artificial intelligent application (AIAP) are substantial and positively correlated with enterprises' value as measured by return on asset (ROA), according to the panel ARDL's long- and short-term estimates. Based on this discovery, the study suggests that artificial intelligence's capacity to increase return on assets and hence boost business value should be promoted./+96*/8*

Keywords: Artificial Intelligent, Firm Ownership, Accounting Reporting, Firms' Value, Value Maximization.

Introduction

With the separation of ownership from control, shareholders of firms become far and detached from daily firms' operations with a likely tendency of losing firms value. This usually generates conflict of interest between managers and shareholders as managers are motivated towards profitability while shareholders interest is on value maximization. Thus, the urge for increased value maximization has necessitated the commitments by many shareholders to invest in business. However, to maximize the firms' value, effective and efficient financial reporting becomes imperative (Mishra, 2023). Consequently, the actualization of firms' value via transparent financial accounting reporting has remained one of the most essential criteria to measure firms' performance.

Although, financial accounting reporting is seen as an essential means of ensuring firms value most of the existing financial accounting reporting techniques in business activities are traditional - human – knowledge based with several limitations (Kwarbai & Omojoye, 2021). These limitations ranging from accounting errors, fraud as well as over reliance on human expertise makes it imperative for a technique that stimulate the process of thinking and obtaining information. Therefore, while the traditional accounting system employs a computerized path

analysis tools to analyze accounting information generated by human experts, the search for a computer technique that both generate and interpret information in relation to accounting reporting led to the invention of Artificial Intelligent (Akinbowale, Mashigo & Zerihum, 2023). Consequently, Artificial intelligent which has the capacity to generate and interpret large data is wide spreading and its impact on every business ecosystem is virtually spread. Thus, accounting being a vital constituent of business environment is not insulated from this spread (Santos, Pires, & Alves, 2023). It is against this backdrop that this paper investigated the effect of artificial intelligent potency and firms value in Nigeria.

Statement of the problem

In most developing nations, accounting system has witnessed various and substantial changes recently. These changes are mainly ascribed to developments in information and communication technology, principally the speedy incorporation of Artificial Intelligence (AI) in almost all sectors (Guse & Mangiuc, 2022). The incorporation of AI into accounting system is a worldwide spectacle driven by the acknowledgement of its potency in reforming how financial data is managed, analyzed, and utilized (Bako & Tanko, 2022). Nigeria, as a major player in the African economy, is no exception to this drift especially the potency of artificial intelligent in

actualizing firms value. Hence, the predictability ability of artificial intelligent especially in accounting for errors in financial reporting has made its applications in all accounting practices as a matter of routine. It is to add value to existing studies that this paper investigated artificial intelligent potency and firms' value in Nigeria. The remainder of this work is structured as follows, in keeping with the introduction: The methodology is described in Section 3, the results are discussed in Section 4, the conclusion and policy implications are covered in Section 5, and Section 2 reviews pertinent existing studies.

Objectives of the study

- i. To investigate the effect of artificial intelligent potency on firms' value in Nigeria.
- ii. To examine the degree of correlation between artificial intelligent potency and firms' value in Nigeria.

Research Hypotheses

H0₁: Artificial intelligent potency has no impact on firms' value in Nigeria.

H0₂: There is no correlation between artificial intelligent potency and firms' value in Nigeria.

Literature Review

heoretical Literature

This paper is anchored on social learning theory, expert system artificial intelligent, Chaos System and cuckoo search model of artificial intelligent. The social learning theory as formulated by Albert Bandura in 1973, have it that individual acquire knowledge from one another mainly through reflection, mimicking and demonstrating. Because it integrates motivation, memory, and attention into learning processes, this theory is frequently referred to as a bridge between behaviourist and cognitive learning theories. People mostly learn by observing the actions, demeanours, and outcomes of others. According to Bandura (1986), the majority of behaviour is learnt through reflection and demonstration. One develops a notion of how new behaviours are achieved by reflecting on others, and this suggested contemplation serves as a guide for action in the future. Through a constant interaction between behavioural, cognitive, and environmental factors, social learning theory explains how people behave. The theory combined behavioural and cognitive theories of learning to offer an all-inclusive model that accounts for the wide choice of learning practices that take place in the real world. As posited by Bandura and Walters (1977), vital doctrines of social learning theory are thus: Learning is not merely behavioural but a cognitive progression that takes place in a social setting; Learning can take place by observing a behaviour and associated consequences of

such behaviour (reinforcement); Learning encompasses reflection, extraction of information from those reflections, and making informed decisions about the performance of the reflections. Thus, learning can take place without a noticeable change in behaviour; Reinforcement has a fundamental role to play in learning but is not completely accountable for learning; The learner is not an inactive beneficiary of information. Cognition, environment, and behaviour all jointly affect one another in the learning process.

The application of this theory to this paper is that artificial intelligent that mimics human reasoning is an evolutionary process in the form of invented technology that imitates human behaviour which is the central idea of this theory.

Similarly, expert system theory of artificial intelligent developed by Golro and Tighe in 2012 is one of the most efficient and effective theory of artificial intelligent that depends on human expertise as a set-up of knowledge system. This kind of artificial intelligent model imitates human expertise in resolving thoughtful problem procedures. The Expert System Theory is a sprout from Markvo chain method that combines human expert knowledge in resolving accounting issues. The theory or model is a combination of deterministic and stochastic procedure using value stimulation tool (Neshat & Adeli,2011). The Expert System Theory has the capacity of addressing questions relating to cost accounting and financial reporting that is most appropriate in influencing favorable firms' value in Nigeria.

The use of artificial intelligence in accounting, however, is approached in a particular way that implies the existence of disorder by the chaos system theory, which was developed by Lux, Clements, Croome, and Viljjanen in 2010. That is when there is a dispute between corporate managers and stockholders due to different goals (Kardasho, Einar & Okrent, 2006). Therefore, chaos theory is a dynamic and critical model that uses available signal processing to determine self-organization and the degree of disorder in corporate structures. Thus, the key components of corporate structure and how they interact to increase a company's value are captured by the chaos system theory. This is due to the fact that the financial reporting chaos system theory grows more intricate as the dispute between managers and shareholders intensifies over time. However, the theory has faced harsh criticism, highlighting the fact that the theory's creator did not adequately address the dynamics' complexity. The cuckoo search paradigm was created in an attempt to address this issue. As a result of the chaos system theory's limitations, Durgun and Yildiz developed the cuckoo search model in 2012. Because it can combine the stochastic exploration and exploitation capabilities of the orthogonal learning method, the Cuckoo Search

Model is mostly used to solve value optimisation problems in accounting systems.

Empirical Literature

Extant empirical literatures on adoption of artificial intelligent in accounting profession are basically divided into two strands. One strand concentrates mainly on the transformative potency of artificial intelligent as it boosts financial reporting, advance decision-making procedures, and grows the efficacy of accounting practices (Sani, 2022, Haasan, 2022, Ukpog, 2022, Das, 2021, Ukpog, Udoh, & Essien, 2019). The other strand focuses on the application of artificial intelligent and risk of unemployment by accounting professionals as artificial intelligent handle more accounting jobs than human accounting professional at lower operational costs and maximize profits (Nguyen,2021, Eren,2021, Kute,2021).

Sani (2022) examined the transformative potential of artificial intelligent in revenue generation and trials brought by the COVID-19 pandemic in Nigeria. The study by adopting qualitative research approach, found that the implementation of artificial intelligent in accounting systems is a serious cause of change that changes conventional methods and resolving long standing issues relating to incomplete taxpayer data and multiple taxation. The study by Ukpog, Udoh, and Essien (2019) used both qualitative and quantitative research approaches to examine the fundamental role of artificial intelligence in reforming proficient services and its potential implications for the banking, accounting, and auditing sectors in Nigeria. Based on this finding, the paper recommended removing all forms of barriers limiting the adoption of artificial intelligence in Nigeria's revenue generation practices. The study concluded that the transformational potential of artificial intelligence in Nigeria's banking, accounting, and auditing sectors should be enhanced by increasing awareness of the obstacles linked to its adoption in the nation. Das (2021) examined the effect of Artificial intelligent on accounting profession with emphasize on its possible implications and transformative power. By utilizing quantitative research approach, the study found that the application of artificial intelligent can boost accounting efficacy and provide greater business value. Based on this finding, the study recommended active partnership among accounting professionals, auditing professionals, and artificial intelligent specialists to adapt to the growing trend and protect the sustained importance of the accounting profession.

Hasan (2022) investigated the utilization of Artificial Intelligence in accounting and auditing professions. The paper by applying semi – systematic or narrative review method acknowledged the shortcomings posed by unsettling technologies associated with Industry.

Also, that in the period of swift technological developments, the accounting and auditing professions are expected to undertake a substantial change to catch up with the changing world efficiently. However, the paper found that while artificial intelligent offers considerable rewards, it also come with worries and accompanying reservations... Based on these findings, the paper recommended the need for multiple collaboration among disciplines about the applications of artificial intelligent in accounting and auditing professions.

Ukpog (2022) looked into how Nigerian banks were using artificial intelligence in their financial operations. The study included 143 accounting professors from public colleges and prominent bankers in Akwa Ibom State. Using descriptive statistics, the study discovered that Nigerian commercial banks can use artificial intelligence to manage credit risk.

Nigerian researchers Kwarbai and Omojoye (2021) looked at the fields of artificial intelligence and accounting. Artificial intelligence has had a significant impact on Nigerian accounting practice, according to the study, which employed a survey research design and recruited participants from the Big Four audit firms: KPMG, Deloitte, PricewaterhouseCoopers, and Ernst & Young. On the basis of this, the report suggested that professional auditing should include artificial intelligence.

Gheorghe (2012) conducted research on artificial intelligence with the primary goal of chronicling the development of AI across time. The study discovered that the primary objective of artificial intelligence is to create computational agents that replicate the potentials associated with human intelligence through the use of a themed experimental technique that documents several stages of the development of artificial intelligence. Based on its reasoning aspects, this imitated intelligent duplicates' internal representation of their outward surroundings.

According to the studied literature, while artificial intelligence has made significant strides, most of its applications focus on banking operations and auditing issues, with little to no research on how AI may improve the value of Nigerian businesses. Furthermore, there is a dearth of research on the existence or absence of the observed covariate between traditional human-based financial accounting reporting and artificial intelligence, which raises both theoretical and empirical concerns. Through an investigation of artificial intelligence and company value in Nigeria, this article aims to close all of these gaps in the field.

Methodology Research Design

Ex post facto research design, which makes use of secondary time series data, was used in this work. Because the study's scenario already exists or has already occurred, the researcher does not control or change independent variables in this methodical empirical investigation, which is why this research design was chosen. Since the data on the variables for intangible assets and the listed manufacturing businesses' value are clearly established in yearly

reports, the researcher is unable to change the independent variables. However, the researcher can design or fabricate an environment that will generate the data needed for analysis. The main reason ex post facto research is important is because it is a useful approach to behavioural science research. This is due to the fact that experiments frequently do not occur in real-world settings and may require some kind of study scenario contrivance.

Nature and source of Data

Variable	Definition / Measurement	Source
Return on Asset as proxy for firms' value	This is defined as the value/ earnings from invested capital. It is measured as the ratio of earnings to total assets.	Annual report for various years
Artificial intelligent digital awareness	This is defined as degree of awareness of artificial intelligent in the quoted firms. It is measured dichotomously as 1 for being aware and 0 for not	Author's computation
Artificial intelligent application	This is defined as the extent of the applicability of artificial intelligent. It is also measured dichotomously as 1 for applying artificial intelligent and 0 for otherwise.	Author's computation
Artificial intelligent frequency	The number of artificial intelligence-related terms that are referenced in each yearly report serves as a gauge for this.	Annual report for various years

Source: Author's computation, 2025

Technique of Data Analysis and model specifications

The paper's main credibility was established using the Panel Autoregressive Distributed Lag (ARDL) model's dynamic effect, Mean Group (MG), and Pooled Mean Group (PMG). This method is supported by the fact that the Mean Group (MG) and Poole Mean Group (PMG) of the Panel Autoregressive Distributed Lag (ARDL) model estimate independent regression for the value of each firm and estimate the coefficients as the unweighted mean of the estimated coefficients for the individual businesses. Although this allows all

coefficients to vary and be heterogeneous in the short and long run, the validity and consistency of this technique rely on having a large enough amount of data. Therefore, this study employed the pooled Mean Group to ascertain the short- and long-term relationship between artificial intelligence and the value of Nigerian businesses. Descriptive statistics were employed to ascertain the behaviour of the variables used in the estimation, panel unit root was carried out using Pesaran and Shin, Breitung, and Levin Linchu (1995), and correlation coefficients were employed to test for multicollnearity among the variables of interest in the study. The panel ARDL (pq) model in error correction is specified thus:

$$Y_{it} = \alpha_1 + \beta_i C_{it-1} + \lambda_i X_{it-1} + \varepsilon_{it} \dots\dots\dots(1)$$

Where Y_{it} = individual firm value and $i=1,2,3,\dots,n$. Then the long run parameter U_{it} becomes

$$\varepsilon_i = \frac{\lambda_i}{1 - \beta_i} \dots\dots\dots(2)$$

Given equation (2), the MG estimator for the panel ARDL becomes.

$$\varepsilon_i = \frac{1}{\beta} \sum_{i=1}^n \varepsilon_i \dots\dots\dots(3)$$

Equation (3) shows how the Mean Group (MG) formulated by Pesaran and Smith (1996) and Pooled Mean Group (PMG) model propounded by Pesaran (1999) is further, specified thus.

$$\Delta ROA_{it} = \alpha^{ROA} + \sum_{i=1}^K \beta_i^{ROA} \Delta ROA_{it-i} + \sum_{i=1}^K \gamma_i^{ROA} \Delta AIAW_{it-i} + \sum_{i=1}^K \delta_i^{ROA} \Delta AIAP_{it-i} + \sum_{i=1}^K \delta_i^{ROA} \Delta AIFQ_{it-i} + \varepsilon_t^{ROA}$$

..... (4)

Where ROA = Return on Asset, AIAW = Artificial intelligent awareness, AIAP = Artificial intelligent application, AIFQ = Artificial intelligent frequency and ε_t = Error term

Presentation and Discussions of Results

Correlation Matrix

To ascertain the degree of relationship between the firms' value proxied by return on asset and indicators

of artificial intelligent potency, the study conducted correlation coefficient matrix and the result is presented on table 1

Table 1. Correlation Matrix Result

Variable	ROA	AIFQ	AIAP	AIAW
ROA	1.00			
AIFQ	0.724*	1.00		
AIAP	0.621**	0.381*	1.00	
AIAW	0.472**	0.411*	0.541**	1.00

Source: Author's Computation, 2025 Note * =1% and ** = 5% level of significance

To determine whether there is a significant association between the variables of interest in the study at the 1% and 5% levels of significance, respectively, the correlation coefficient matrix was utilised. The findings showed that all artificial intelligence variables or indicators are significant and positively correlated with firms' value as measured by return on asset (ROA), with the strongest correlation being found between firms' value and artificial intelligence frequency (AIFQ). Furthermore, none of the inter-relationships

between the variables utilised in the estimation are greater than 0.7, according to the correlation coefficient matrix result. This suggests that the variables used in the estimation do not have a multicollinearity issue.

Panel Unit root test.

To determine the order of integration of the variables of interest and the suitability of the chosen panel ARDL technique, the study conducted panel unit root test and the result is presented on table 2.

Table 2 Panel data unit test Result

Level				First difference			
Pesaran and Shin	Biretung	Levin, Liu and Chu		Pesaran and Shin	Biretung	Levin, Liu and Chu	Order of Integration
ROA 3.81	-	-3.79**	-4.93**	-15.71**	-9.61**	-14.63**	1(0)
AIFQ 1.18	-	-1.02	-1.32	-3.60**	-2.01	21.07**	1(1)
AIAP 0.72	-	-5.02	-0.03	-22.30**	-17.50**	22.10**	1(1)
AIAW 6.71**	-	-3.01**	-6.03**	-28.01**	-18.60**	-26.01**	1(0)

Source: Author's Computation, 2025 Note * =1% and ** = 5% level of significance

The results of the panel root test revealed that while return on assets (ROA) and artificial intelligent awareness (AIAW) were stationary at levels, artificial intelligent frequency (AIFQ) and artificial intelligent application (AIAP) became stationary after first difference at 5% level of significance. This result gives a mix order of integration of purely 1(O) and 1(I). There are two statistical implications to the result's finding. First, it suggests that the variables of interest in the study may have long-term correlations. Second, it demonstrates that the panel Autoregressive Distributed Lag (ARDL) model is the best suitable estimation method for the study because the order of

integration of the variables permits the estimation of the error correction coefficient as well as the short- and long-term relationships.

Panel ARDL Results

To ascertain the effect of artificial intelligent potency proxied by tangible assets innovation proxied by artificial intelligent awareness (AIAW), artificial intelligent frequency (AIFQ) and artificial intelligent application (AIAP) on firms' value proxied by return on asset (ROA), the panel ARDL technique was utilized and the result of the long run and short run panel ARDL is presented on table 3 and 4

Table 3 Result of Long run Panel ARDL

ROA (Dependent Variable)	Poole Mean Group	Mean Group	Dynamic fixed effect
Independent Variables	Long run	Long run	Long run
AIFQ	0.085** (4.11)	0.018*** (1.97)	0.09** (4.22)
AIAW	0.041** (4.03)	0.050** (2.87)	0.03** (4.02)
AIAP	0.062** (5.82)	0.054* (4.96)	0.02** (4.53)
Constant	225** (2.56)	241** (2.66)	127** (2.61)
Observations	154	154	154
Hausmann test ¹			2.89(0.74)
Hausmann test ²			0.17(0.99)

Source: Author's Computation, 2025 Note * =1%, ** = 5% and * =10% level of significance**

Table 3 contains the result of the long run panel ARDL coefficients. The findings from the result of the long-run estimates of the panel ARDL shows that the coefficients of all variables of interest such as artificial intelligent awareness (AIAW), artificial intelligent frequency (AIFQ) and artificial intelligent application (AIAP) are correctly signed and confirmed to the anticipated expectations. This is because all the variables are significant and positively related to firms' value proxied by return on asset (ROA). That is a 1% increase in artificial intelligent frequency (AIFQ), artificial intelligent awareness (AIAW) as well as artificial intelligent application (AIAP brings about 9%,

3%, and 2% increase in firms' value proxied by return on asset in Nigeria. This study implies that in contemporary financial accounting operational contexts, artificial intelligence offers an extra signal for specialised technological knowledge and experience, enabling increased business value by reducing accounting expenses.

These results supported those of Ukpong, Udoh, and Essien (2019) and Sane (2022), who discovered that the use of artificial intelligence had a major impact on auditing systems. Additionally, the efficiency and consistency of the Mean Group and Pooled Mean Group in estimating the panel dynamic effect are confirmed by the Hausmann test.

Table 4. Result of Short run Panel ARDL

ROA (Dependent Variable)	Poole Mean Group	Mean Group	Dynamic fixed effect
Independent Variables	Short run	Short run	Short run
ECM	-0.86** (0.02)	-0.078** (0.051)	-0.084 (0.011)
AIFQ	0.035** (8.62)	0.042* (6.86)	0.006** (2.43)
AIAP	0.036** (2.16)	0.083** (2.81)	0.041** (3.42)
AIAW	0.083** (3.61)	0.032*** (2.02)	0.041** (6.02)
Constant	352** (2.24)	241** (2.34)	127** (2.61)
Observations	122	122	122
Hausmann test ¹			2.69(0.74)
Hausmann test ²			0.15(0.99)

Source: Author's Computation, 2025 Note * =1%, ** = 5% and *** =10% level of significance

Artificial intelligent awareness (AIAW), artificial intelligent frequency (AIFQ), and artificial intelligent application (AIAP) have short-term significant contributory influences on increasing the value of firms in Nigeria, according to the results of the Pooled Mean Group (PMG), Mean Group (MG), and short-term dynamic fixed effect. The error correction coefficient, which is negative and significant under all three short run models, supported the validity of these findings.

Conclusion and Policy recommendations

Relying on the findings, it can be concluded that artificial intelligent positively impacts on firms' value as evidenced by improved return on asset (ROA) as application of artificial intelligent caused a decreased total expense, suggesting that artificial intelligent is streamlining operational processes and reducing costs. Hence, the paper recommends that the artificial intelligent potential to drive firms' value by enhancing return on asset should be encouraged.

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