

## Cloud-Based Accounting Information Systems and Financial Reporting Quality of Listed Information and Communication Technology Firms in Nigeria



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**ABSTRACT:** The confluence of cloud-based Accounting Information Systems (AIS) adoption and financial reporting quality within Nigeria's Information and Communication Technology (ICT) sector is explored in this study. Given the dynamic landscape of the ICT industry characterized by technological advancements, evolving market dynamics, and regulatory shifts, ICT firms are increasingly turning to cloud-based AIS to streamline their accounting processes and adapt to changing business requirements. The population of the study consists of all eight (8) Information and Communication Technology (ICT) enterprises that are listed on the Nigerian Exchange Group as of 31st December 2022. As a result, this study delves into the impact of Cloud-Based AIS adoption on the Financial Reporting Quality of Listed ICT Firms in Nigeria over a decade-long period from 2013 to 2022. Utilizing a Panel Regression Technique (Random Effect Model), the study identifies a significant overall effect of Cloud-Based AIS on the Financial Reporting Quality of Listed ICT Firms in Nigeria. Moreover, it highlights the significant influence of Cloud Security Investment on financial reporting quality among ICT firms in Nigeria, while Cloud Expenditure Growth is found to have no statistically significant effect. The study emphasizes the need for strategic resource allocation and exploration of cost optimization opportunities, given that cloud expenditure growth may not directly impact financial reporting quality. However, the study recommends for prioritizing cloud security investments to safeguard financial data integrity, mitigate cybersecurity risks, and enhance trust in financial reporting practices, thereby bolstering investor confidence.

**KEYWORD:** Cloud-Based Accounting Information Systems, Cloud Expenditure Growth, Cloud Security Investment, Discretionary Accrual and Firm Age.

### 1. INTRODUCTION

Digital technology relies heavily on high-quality financial reporting to convey organizational performance to stakeholders, influencing investment decisions and regulatory oversight. However, the sector's rapid technological advancements and globalized operations pose unique challenges to maintaining reporting quality. Evolving business models and revenue recognition practices underscore the need for tailored reporting frameworks, while varying regulatory requirements across jurisdictions complicate efforts to ensure transparency and consistency (Mu, 2024).

Handoko *et al.* (2023) highlight various dimensions for measuring financial reporting quality, including Earnings Quality, Transparency and Disclosure Quality, Accounting Conservatism, Timeliness of Financial Reporting, Enhancing the Standard of Audit and Ensuring Objectivity, Financial Restatements, and Comparability of Financial Statements. However, this study specifically delves into Earnings Quality, recognizing its significance in gauging the reliability, relevance, and sustainability of reported earnings, particularly within the quoted digital technology firms in Nigeria. Given the sector's volatility, rapid technological advancements, and dynamic market conditions, the quality of earnings becomes crucial for stakeholders, impacting investment decisions, capital allocation, and market perceptions. Despite its importance, ensuring high earnings quality in the ICT sector presents challenges due to complex revenue recognition practices, intangible assets valuation, and reliance on intellectual property rights.

Cloud-based Accounting Information Systems (AIS) mark a significant departure from traditional on-premise systems, offering dynamic and scalable solutions for managing financial data in organizations (Hiran & Dadhich, 2024). Particularly in the context of listed Information and Communication Technology (ICT) firms in Nigeria, where technological innovation is paramount, the

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adoption of cloud-based AIS brings substantial implications for financial reporting practices. By leveraging remote servers, advanced analytics, and automation, cloud-based AIS enhances data accessibility and facilitates real-time reporting, enabling ICT firms to navigate the fast-paced business environment effectively. Moreover, it centralizes financial data, integrates systems, and enhances adaptability to regulatory changes, thereby improving reporting efficiency, accuracy, and transparency. However, this adoption also introduces risks such as data security and compliance concerns, necessitating robust governance mechanisms and risk management practices. This study aims to investigate the relationship between cloud-based AIS adoption and financial reporting quality among listed ICT firms in Nigeria, shedding light on the impact of cloud technology on reporting reliability, transparency, and relevance. Through an in-depth analysis of financial statements and disclosures, the research seeks to contribute insights to policymakers and stakeholders about the evolving financial reporting landscape in the Nigerian ICT sector. Cloud-based Accounting Information Systems (AIS) in the Information and Communication Technology (ICT) sector of Nigeria can be evaluated through several dimensions, including Cloud Adoption Rate, Cloud Expenditure Growth, and Cloud Security Investment (Chen *et al.*, 2024). These metrics are pivotal in understanding the integration and impact of cloud-based AIS within the sector. As ICT firms increasingly adopt cloud technology to modernize their accounting processes, assessing the rate of cloud adoption becomes crucial for gauging their utilization of cloud-based AIS. Cloud Adoption Rate indicates the proportion of total IT expenditure allocated to cloud solutions, reflecting the pace and scale of adoption. Moreover, Cloud Expenditure Growth tracks investment trends in cloud technology over time, indicating firms' commitment to leveraging cloud-based AIS benefits. Additionally, Cloud Security Investment measures firms' investments in safeguarding financial data and ensuring regulatory compliance, addressing concerns around data security and privacy. By examining these dimensions, this study aims to elucidate the relationship between cloud-based AIS adoption and financial reporting quality among listed ICT firms in Nigeria, providing insights into the factors shaping cloud technology integration and its implications for financial reporting practices and performance in the sector. Through comprehensive analysis, this research contributes to understanding cloud-based AIS adoption's influence on financial reporting quality, informing stakeholders about the dynamics and challenges associated with cloud technology adoption in the Nigerian ICT industry.

The motivation behind this study stems from the relationship between cloud-based Accounting Information Systems (AIS) adoption and financial reporting quality in Nigeria's Information and Communication Technology (ICT) sector, driven by the sector's rapid transformation and increasing adoption of cloud technology to enhance operational efficiency. Despite the potential benefits, the impact of cloud technology on financial reporting quality remains understudied. Thus, this research aims to investigate this relationship among listed ICT firms in Nigeria, examining proxies such as Earnings Quality, Cloud Adoption Rate, Cloud Expenditure Growth, and Cloud Security Investment. By analyzing how cloud technology integration affects the accuracy, timeliness, and completeness of financial reporting, the study contributes to understanding technology's influence on financial practices in emerging economies like Nigeria. Through comprehensive analysis and insights, this research informs stakeholders and policymakers about the implications, challenges, and best practices associated with cloud technology adoption in the Nigerian ICT industry, fostering sustainable growth within the sector.

## 1.1 Statement of the Problem

The Nigerian Information and Communication Technology (ICT) sector, marked by rapid growth and innovation, grapples with a persistent challenge concerning the quality of reported earnings by listed firms, impacting stakeholders' decision-making processes, investor confidence, and market integrity. Previous studies by Oguntala *et al.* (2017), Egiyi and Udeh (2020); Obasan and Kuola (2022); Imeokparia *et al.* (2023) and Akpan *et al.* (2023) have attributed this issue to the inefficiencies of existing Accounting Information Systems (AIS) in ICT firms, often outdated or inadequate to handle industry complexities, leading to inaccuracies and delays in financial reporting. Consequently, stakeholders are presented with unreliable financial information, hindering their ability to assess ICT firms' true financial health and performance accurately. Additionally, the rising adoption of cloud-based AIS in the Nigerian ICT sector brings both opportunities and challenges, with cloud technology offering benefits like enhanced data accessibility and real-time reporting capabilities, yet its impact on earnings quality remains uncertain. Hence, there is a critical need to explore the relationship between cloud-based AIS adoption and earnings quality among listed ICT firms in Nigeria, particularly understanding how factors such as Cloud Adoption Rate, Cloud Expenditure Growth, and Cloud Security Investment influence earnings quality. Through this investigation, valuable insights can be gleaned for policymakers, regulators, investors, and practitioners, aiming to enhance financial reporting practices and performance within the Nigerian ICT industry. Consequently, this study aims to address significant gaps in the existing literature regarding the relationship between cloud-based Accounting Information Systems (AIS) and financial reporting quality among Information and Communication Technology (ICT) firms in Nigeria. Existing research has primarily focused on cloud technology adoption across industries, overlooking the specific

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nuances of the Nigerian ICT sector, such as its rapid growth, technological innovation, and regulatory environment. Moreover, while some studies have examined the impact of cloud technology on financial reporting quality, there is a lack of consensus on the mechanisms involved, especially within the Nigerian context. Additionally, many studies use limited cross-sectional data, failing to capture longitudinal trends. Hence, this study proposes a ten-year longitudinal analysis to offer a comprehensive understanding of cloud technology adoption's evolution and its implications for earnings quality in the Nigerian ICT sector. Furthermore, while some research has used econometric models, few have employed panel data methods, limiting the robustness of findings. Therefore, this study aims to employ panel data methods, including pooled ordinary least squares, fixed-effect, and random-effect models, alongside rigorous testing, to provide reliable insights into the relationship between cloud-based AIS adoption and financial reporting quality among listed ICT firms in Nigeria.

## 1.2 Objective of the Study

The main objective of the study is to assess the effect of Cloud-Based Accounting Information Systems and Financial Reporting Quality of Listed Information and Communication Technology (ICT) Firms in Nigeria. However, the specific objectives are to:

- i. Evaluate how Cloud Expenditure Growth affects the discretionary accrual of quoted ICT Firms in Nigeria.
- ii. Investigate ways in which Cloud Security Investment affects the discretionary accrual of Listed digital technology enterprises in Nigeria.

## 2. LITERATURE REVIEW

### 2.1.1 Cloud-Based Accounting Information Systems

These are digital platforms utilized by organizations, including Information and Communication Technology (ICT) firms, to streamline accounting and financial processes through cloud computing infrastructure (Weathers *et al.*, 2024). These systems leverage remote servers, advanced software, and internet connectivity to store, process, and analyze financial data without on-premise installations. Offering features like general ledger management, accounts receivable and payable, financial reporting, and budgeting accessible via web browsers or mobile apps, cloud-based AIS provide scalability, enabling organizations to adjust resources according to needs, reducing infrastructure costs (Karanikola *et al.*, 2023). They offer real-time access and collaboration, enhancing productivity, and incorporate advanced security measures like encryption and access controls to protect sensitive data and ensure compliance. As a modern and cost-effective solution, cloud-based AIS contribute to improving financial reporting quality in Nigeria's dynamic ICT industry landscape.

### 2.1.2 Cloud Expenditure Growth

Cloud Expenditure Growth refers to the pace at which organizations, particularly those in the Information and Communication Technology (ICT) sector, increase their spending on cloud-based technologies and services over a defined timeframe (Wang *et al.*, 2019). This metric measures the change in financial resources allocated to acquiring, implementing, and maintaining cloud computing infrastructure, platforms, and software applications. It encompasses various expenses associated with cloud technology adoption, including subscription fees for cloud services, investments in infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS) solutions, as well as costs related to cloud migration, training, and support services (Li *et al.*, 2020). Cloud Expenditure Growth reflects the organization's commitment to using cloud computing strategically to achieve business objectives such as enhancing operational efficiency, scalability, and agility, potentially while reducing upfront capital expenditures and total cost of ownership compared to traditional on-premise IT infrastructure. A high Cloud Expenditure Growth rate indicates substantial investment in cloud-based technologies and a proactive stance toward digital transformation, fostering competitiveness in the evolving ICT landscape. Conversely, a low or stagnant rate may signal cautious adoption due to budget constraints, organizational inertia, or concerns about return on investment and cost-effectiveness. Overall, Cloud Expenditure Growth serves as a vital indicator of an organization's progress in adopting cloud-based accounting information systems and leveraging cloud technology to enhance financial reporting quality within Nigeria's ICT industry.

Wang *et al.* (2019) posited that this can be calculated using the formula:

$$CER = \frac{CE_t - CE_{t-1}}{CE_{t-1}} \times 100\%$$

Where:

CER = Cloud Expenditure Growth

$CE_t$  = Cloud Expenditure in Current Year

$CE_{t-1}$  = Cloud Expenditure in Previous Year

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### 2.1.3 Cloud Security Investment

Cloud Security Investment refers to the financial resources allocated by organizations, particularly Information and Communication Technology (ICT) firms, towards implementing and maintaining security measures tailored for protecting cloud-based computing environments and data assets (Alshammari *et al.*, 2021). This investment encompasses various initiatives and expenditures aimed at mitigating cybersecurity risks, safeguarding sensitive information, and ensuring compliance with regulatory requirements within cloud computing infrastructures (Zhang *et al.*, 2020). It includes funding for deploying security controls like encryption, access controls, authentication mechanisms, and intrusion detection systems to uphold data confidentiality, integrity, and availability in cloud environments. Additionally, Cloud Security Investment covers expenses related to security audits, assessments, and certifications to evaluate and validate the effectiveness of cloud security measures, ensuring adherence to industry standards and regulatory guidelines.

Zhang *et al.* (2020) reported that Cloud Security Investment is determined by the formula:

CSI =  $\frac{\text{Total investment in cloud security measures}}{\text{Total assets}}$

### 2.1.4 Financial Reporting Quality

Financial reporting quality pertains to the precision, dependability, openness, and significance of financial data revealed by an organisation in its financial statements and reports. The objective is to offer stakeholders a comprehensive comprehension of the organization's financial well-being and performance, enabling them to make informed decisions (Masa'Deh *et al.*, 2024). High-quality financial reporting involves presenting timely, complete, and understandable financial information that adheres to accounting standards, regulatory requirements, and disclosure guidelines, with key attributes including the absence of material errors, adherence to accounting principles, consistency in practices, and transparent disclosure of policies and judgments (Handoko *et al.*, 2023). It also encompasses comparability across periods and peers, fostering trust, transparency, and accountability, which are essential for investor confidence, efficient capital allocation, and market integrity within the Nigerian ICT industry. Conversely, poor financial reporting quality can erode trust, impair decision-making, and undermine market confidence, highlighting the significance of ensuring transparency and accountability in financial reporting to promote industry stability and growth.

### 2.1.5 Discretionary Accrual

#### Discretionary Accrual (Dechow *et al.*, 1995) Model

Discretionary accruals refer to accounting adjustments made by management that are not directly tied to underlying business transactions but rather involve managerial judgment or discretion. These accruals are used to smooth out earnings or manipulate reported financial results to meet certain targets or objectives (Hayes (2014). In essence, discretionary accruals represent the portion of accruals that are subject to management's discretion rather than being dictated solely by the timing of cash flows or the recognition of revenues and expenses based on generally accepted accounting principles (GAAP).

Management may employ discretionary accruals to influence reported profits, either to meet internal performance goals, present a more favorable financial picture to investors and stakeholders, or to smooth out earnings over time. However, excessive use of discretionary accruals can raise concerns about earnings management and transparency. Discretionary accruals can be identified and quantified through various statistical and analytical techniques, such as the Jones model or the modified Jones model. These models help analysts and investors assess the quality of reported earnings and evaluate the extent to which earnings management may be influencing financial statements ((Bello & Yero, 2011).

### 2.1.6 Firm Age

Firm age refers to the duration a company has been in operation since its establishment. It is a crucial metric in understanding a company's developmental stage, maturity, and potential growth trajectory (Al-Emran, *et al.*, 2020). There are various definitions of firm age, often categorized into three main stages: young or nascent firms, mature firms, and declining or exiting firms. Young firms are typically characterized by innovation, high growth potential, and a focus on establishing themselves in the market. They often face challenges such as securing funding, building brand recognition, and developing sustainable business models.

Mature firms have passed the initial growth phase and have established themselves in the market. They tend to focus on optimizing operations, expanding market share, and diversifying products or services. However, they may also encounter challenges related to market saturation, competition, and adapting to changing consumer preferences. Declining or exiting firms are those that are facing challenges such as declining revenue, market obsolescence, or operational inefficiencies (Oguntala *et al.*, 2017). They may undergo restructuring, downsizing, or ultimately exit the market through mergers, acquisitions, or bankruptcy. Understanding firm age is essential for investors, policymakers, and managers to make informed decisions regarding investment,

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resource allocation, and strategic planning. It provides insights into the company's stage of development and helps anticipate future opportunities and challenges.

### 2.2 Empirical Review

#### Empirical Review on Cloud-Based Accounting Information Systems

Weathers *et al.* (2024) conducted a study investigating the utilization of ABLE (Achieving a Better Life Experience) accounts among Supplemental Security Income (SSI) recipients eligible for such accounts, aiming to identify strategies for enhancing participation rates. The ABLE Act of 2014 established tax-preferred savings programs for individuals with disabilities. Through descriptive analysis of Social Security program data, the research quantified aspects including ABLE account prevalence, participation rates among eligible SSI recipients based on demographic and socio-economic characteristics, state-level variations, and the impact of tax incentives. Findings revealed that, as of December 2021, 36,610 SSI recipients possessed ABLE accounts, with a median value of \$3,222. However, participation rates were modest at 1.1 percent among SSI recipients with disabilities before age 26, with significant disparities across demographic and socio-economic groups and among states. The study concludes that evidence-based strategies are necessary to bolster ABLE account participation, highlighting the importance of targeted interventions to promote greater access to financial resources for individuals with disabilities. The study's methodology may lack depth in addressing potential confounding variables or controlling for external factors that could influence ABLE account participation rates among Supplemental Security Income (SSI) recipients.

Sahayaraj and Muthurajkumar (2023) discussed the crucial issue of preserving log data integrity in cloud-oriented applications, focusing on challenges related to confidentiality, privacy, and forensic analysis. They highlight limitations in existing models that involve third-party entities or cloud service providers (CSPs), which may compromise security. To overcome these challenges, the authors propose a novel mechanism leveraging machine learning classification techniques to classify log data efficiently and introduce innovative structures to ensure log data integrity progressively. Implemented systems demonstrate efficiency and tamper-proof characteristics, suggesting applicability in both private and public cloud deployments. The article presents a promising approach to addressing log data integrity concerns in cloud environments, offering novel solutions to enhance security and efficiency in cloud-based applications. While the study proposes innovative mechanisms to address log data integrity in cloud-oriented applications, the practical applicability and scalability of these solutions in real-world scenarios warrant further validation and testing.

Akpan *et al.* (2023) did a study to examine how cloud accounting affects the accuracy of financial information in certain Nigerian organisations. The study utilises a cross-sectional survey research design to examine a diverse population comprising professional accountants, auditors, and information technology professionals from different domains. Based on Taro Yamane's (1967) assumptions, the authors opted for a sample size of 400 respondents. The data was collected by administering a carefully designed questionnaire, and the reliability and validity of the instrument were evaluated using Cronbach's Alpha test and content validity test, respectively. The data analysis encompassed the utilisation of descriptive statistics and Ordinary Least Square (OLS) regression. All of the study's hypotheses, which examined the impact of cloud accounting on data storage, efficiency, and mining, were confirmed, indicating substantial positive correlations. The results indicate that the use of cloud accounting methods improves the effectiveness of financial information accuracy. The study suggests that companies should allocate greater resources to automated accounting systems and offer comprehensive training programmes to accounting personnel in order to enhance efficiency in financial and other accounting functional reporting. The previous study utilised primary data sources, while the current study utilised secondary data sources.

A recent study by Huang *et al.* (2021) titled "The Impact of Cloud-Based Accounting Information Systems on Financial Reporting Quality: Evidence from Chinese Listed Firms" examined the relationship between cloud-based accounting information systems (AIS) adoption and financial reporting quality among Chinese listed firms. The study utilized financial data analysis and regression models to assess the impact of cloud-based AIS adoption on financial reporting accuracy, timeliness, and transparency. The findings revealed that firms that adopted cloud-based AIS demonstrated higher financial reporting quality metrics, including lower error rates, faster reporting cycles, and enhanced disclosure transparency compared to firms using traditional on-premise AIS. The study concluded that cloud-based AIS adoption positively influenced financial reporting quality, highlighting the strategic importance of cloud technology for enhancing transparency and reliability in financial reporting processes. The analysis conducted by Huang *et al.* (2021) may lack consideration of potential confounding variables or alternative explanations that could influence the observed relationship between cloud-based accounting information systems adoption and financial reporting quality among Chinese listed firms.

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## Empirical Review on Cloud Expenditure Growth

One recent study by Li *et al.* (2020) titled "The Impact of Cloud Computing on Firms' Financial Performance: An Empirical Study" investigated the relationship between cloud computing adoption and financial performance among Chinese firms. The study utilized panel data analysis to examine the impact of cloud expenditure growth on firms' profitability, operational efficiency, and market valuation. The findings revealed that firms with higher cloud expenditure growth levels of cloud expenditure growth tended to achieve higher profitability, operational efficiency, and market valuation compared to their counterparts with lower levels of cloud investment. The study concluded that cloud expenditure growth positively influenced firms' financial performance, highlighting the strategic importance of cloud technology adoption for enhancing business outcomes. The study by Li *et al.* (2020) may face criticism regarding potential region gaps as it focuses solely on Chinese firms, thus limiting the generalizability of findings to firms operating in other regions or countries with different market dynamics, regulatory environments, and levels of technological infrastructure and adoption.

Another relevant study by Wang *et al.* (2019) explored the determinants and implications of cloud computing adoption among SMEs in China. Using survey data and regression analysis, the study examined factors influencing SMEs' decisions to invest in cloud technologies and the impact of cloud expenditure growth on firms' competitiveness and growth prospects. The findings indicated that factors such as perceived benefits, cost savings, and scalability were significant drivers of cloud adoption among SMEs. Furthermore, the study found that higher levels of cloud expenditure growth were associated with increased business agility, innovation capabilities, and market competitiveness among SMEs. The study by Wang *et al.* (2019) may face criticism due to its reliance on survey data, potentially limiting the depth of analysis and overlooking nuanced factors influencing cloud computing adoption among SMEs in China, thereby representing a gap in capitalizing on survey data's potential insights.

## Empirical Review on Cloud Security Investment

In their recent study titled "Cloud Computing Adoption Factors and Security Concerns: A Meta-Analysis," Alshammari *et al.* (2021) examined the factors influencing cloud computing adoption and associated security concerns across organizations globally. Through a meta-analysis of existing empirical research, the study identified key determinants of cloud adoption and security investment. Their findings underscored the significance of perceived security risks, data privacy concerns, regulatory compliance requirements, and organizational trust in shaping organizations' decisions to invest in cloud security measures. Additionally, the study emphasized the role of organizational culture, management support, and industry norms in influencing cloud security investment decisions. Ultimately, the study concluded that addressing security concerns and implementing robust security measures are essential for successful cloud adoption and safeguarding the integrity and confidentiality of organizational data. The study by Alshammari *et al.* (2021) may face scrutiny for potentially overlooking contextual nuances and variations in cloud adoption and security concerns across different industries and organizational contexts, thus representing a gap in the comprehensive understanding of factors influencing cloud computing adoption and security measures.

Another relevant study by Zhang *et al.* (2020) examined the impact of cloud security investment on firms' financial performance and risk management practices. Using financial data analysis and regression models, the study assessed the relationship between firms' investment in cloud security technologies and their profitability, stock market performance, and risk exposure. The findings indicated that firms with higher levels of cloud security investment tended to achieve better financial performance metrics, including higher profitability ratios and stock returns, while also mitigating operational and cybersecurity risks. The study concluded that cloud security investment is essential for enhancing firms' financial resilience, protecting shareholder value, and maintaining trust and confidence among stakeholders. The study by Zhang *et al.* (2020) may face criticism for potentially overlooking potential endogeneity issues and alternative explanations that could influence the observed relationship between cloud security investment and firms' financial performance and risk management practices.

## 2.3 Theoretical Framework

### 2.3.1 The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), introduced by Fred Davis in 1989, is a theoretical framework designed to elucidate and predict individuals' acceptance and adoption of new information technologies. The theory suggests that consumers' intentions to utilise a technology are impacted by two primary factors: perceived usefulness (PU) and perceived ease of use (PEOU). Perceived usefulness is the perception that using a technology would improve performance, whereas perceived ease of use is the belief that using the technology involves little effort. TAM suggests that users are more inclined to adopt a technology if they perceive it as useful and easy to use, with external variables like subjective norms and facilitating conditions also impacting adoption. In the context of this study, TAM provides insights into the factors influencing the adoption of cloud-based Accounting Information Systems (AIS) by Information and Communication Technology (ICT) firms in Nigeria. It suggests that these firms are more likely to

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adopt cloud-based AIS if they perceive them as beneficial for improving financial reporting quality and if they find them easy to implement and use. Examining perceptions of ICT firm managers and employees regarding the usefulness and ease of use of cloud-based AIS can offer valuable insights into technology adoption determinants within the Nigerian ICT sector.

### **2.3.2 The Institutional Theory**

Institutional Theory, developed by Meyer and Rowan in 1977, is a sociological framework that explores how institutions, including regulatory bodies, norms, and cultural values, influence organizational behavior and decision-making processes. It posits that organizations are subject to external pressures to conform to established norms, rules, and practices within their environment. These pressures are categorized into coercive, normative, and mimetic. Coercive pressures stem from formal regulations and laws enforced by governmental bodies, while normative pressures arise from social norms and values within a society or industry. Mimetic pressures result from organizations imitating successful peers or industry leaders in response to uncertainty. In the context of this study, Institutional Theory provides insights into the factors influencing the adoption of cloud-based Accounting Information Systems (AIS) and financial reporting practices within Nigerian ICT firms. It suggests that these firms may adopt cloud-based AIS and financial reporting practices in response to institutional pressures from regulatory bodies, industry norms, and cultural values. For instance, regulatory mandates or industry standards promoting transparency may drive the adoption of cloud-based AIS as a means of achieving legitimacy and compliance. Additionally, normative pressures from stakeholders may shape perceptions of acceptable financial reporting practices, further influencing ICT firms' adoption decisions.

### **2.3.3 The Resource-Based View (RBV) Theory**

The Resource-Based View (RBV) Theory, introduced by Wernerfelt in 1984, is a strategic management framework that underscores the significance of firm-specific resources and capabilities in achieving competitive advantage and superior performance. RBV posits that a firm's competitive edge arises from its unique bundle of resources and capabilities that are valuable, rare, difficult to imitate, and non-substitutable (VRIN). Resources encompass tangible and intangible assets owned or controlled by the firm, while capabilities represent the firm's ability to deploy these resources effectively to achieve strategic goals. Firms are advised to focus on developing and leveraging internal resources and capabilities to create sustainable advantages that competitors cannot easily replicate. RBV also stresses the importance of dynamic capabilities, enabling firms to adapt and innovate in response to evolving market conditions. In relation to this study, RBV offers insights into the internal factors shaping the adoption of cloud-based Accounting Information Systems (AIS) and financial reporting practices within Nigerian ICT firms. It suggests that firms' adoption of cloud-based AIS is influenced by their unique set of resources and capabilities, including technological infrastructure, human capital, and organizational culture. Firms with superior resources and capabilities are better positioned to leverage cloud technologies effectively, enhancing financial reporting quality and gaining competitive advantage. Additionally, RBV underscores the role of dynamic capabilities in driving successful adoption and implementation of cloud-based AIS, emphasizing firms' ability to adapt and innovate amidst technological changes and market dynamics.

This is the underpinning theory. This is because, the RBV provides a theoretical framework for understanding how ICT firms' internal resources and capabilities influence their adoption and utilization of cloud-based AIS to enhance financial reporting quality. In the Nigerian ICT sector, where firms operate in a highly competitive and rapidly evolving environment, the RBV suggests that firms with superior technological infrastructure, skilled workforce, and organizational capabilities are more likely to effectively integrate cloud technologies into their accounting systems and leverage them to improve financial reporting quality. By focusing on the firm-specific resources and capabilities that enable effective cloud-based AIS adoption, this study aims to uncover the mechanisms through which ICT firms in Nigeria can enhance their financial reporting quality and attain a superior position in the market. Thus, the RBV serves as a foundational theory that informs the study's exploration of the relationship between cloud-based AIS adoption and financial reporting quality within the Nigerian ICT industry landscape.

## **3. METHODOLOGY**

This study adopts ex-post facto research design, and this research design was adopted on the basis that the event has already occurred, and the past data were used for analysis by the researcher. The ex-post facto design helps in investigating possible causes and relationships by first identifying some existing consequences and then analyzing data to establish possible causal factors. In designing this study, the type of data collected, nature of variables and technique of analyses were considered. The research design adopted benefit from extant approaches of previous empirical studies in terms of methods of research used. The population of the study comprises of the entire eight (8) ICT firms quoted on the Nigerian Exchange Group as at 31<sup>st</sup> December 2022. However, for the purpose of this study, all the entire ICT firms were used as the sample size for the study. This study utilised

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the data from all ICT enterprises over a ten-year period (2013-2022), which was obtained from secondary sources such as published annual reports. This is because the study is ex-post facto in nature.

The research paradigm that underpins this study is quantitative in nature and for it to be consistent with the objectives of this study. Panel Ordinary Least Square (OLS), regression technique of data analysis will be employed. Pooled Ordinary Least Square Model, Fixed effects Model, and Random effects Model will be conducted. Besides, Likelihood Ratio, LM Test, and Hausman specification test was carried out to determine the most appropriate model among the models with the help of E-Views statistical package, version 12.0. The rationale for using regression as the analytical method in this study is because it is proficient in assessing the impact of one variable on another. The study was modeled according to the studies of Handoko *et al.* (2023) but used different variables.

$$DAC = \beta_0 + \beta_1CEG + \beta_2CSI + \beta_3FA + \varepsilon \dots\dots\dots(i)$$

Where:

DAC = Discretionary Accrual

CEG= Cloud Expenditure Growth

CSI = Cloud Security Investment

FA = Firm Age

$\beta_0$  is the slope of the statistical model of regression of Earnings Quality

$\beta_1, \beta_2,$  and  $\beta_3$  are rates of change of the explanatory variables with respect to Financial Reporting Quality variable.

$\varepsilon$  = is the error component

## A Prior Expectation

Based on extant literature, a prior expectation for this model is that there will be a significant relationship between discretionary accruals (DAC) and cloud-based accounting information systems variables, namely cloud expenditure growth (CEG) and cloud security investment (CSI), as these technological advancements are believed to impact financial reporting quality. Additionally, the influence of firm age (FA) is expected to be considered, reflecting the organizational maturity and experience in utilizing these systems. It is anticipated that higher levels of cloud expenditure growth and cloud security investment will be associated with lower discretionary accruals, indicating improved financial reporting quality, while firm age may moderate these relationships, reflecting the evolving nature of technology adoption and organizational learning curves.

**Table 1: Definitions of Variables in the Model**

Variable	Type	Measurement	Source
Discretionary Accrual (DAC)	Dependent	$DAC = \Delta NRI - \Delta CF - \Delta WC - \Delta IV$	Dechow, <i>et al.</i> (1995)
Cloud Expenditure Growth (CEG)	Independent	$CER = \frac{CE_t - CE_{t-1}}{CE_{t-1}} \times 100\%$	Wang <i>et al.</i> 2019
Cloud Security Investment (CSI)	Independent	$CSI = \frac{\text{Total investment in cloud security measures}}{\text{Total assets}}$	Zhang <i>et al.</i> (2020)
Firm Age	Control	$FA = \frac{\text{Current Date} - \text{Date of Establishment}}{365 \text{ days}}$	Oguntala <i>et al.</i> (2017)

Source: Researcher Computation (2024)

## 4. RESULTS AND DISCUSSION

### 4.1 Data Presentation

This section established results of regression analysis on the subject matter, using the panel regression analysis technique.

#### 4.1.1 Descriptive Statistics

**Table 4.1 Descriptive Statistics**

	DAC	CEG	CSI	FA
Mean	0.163500	0.625750	2.858625	0.081250
Median	0.155000	0.665000	2.705000	0.070000
Maximum	0.370000	4.780000	9.810000	0.210000
Minimum	-0.040000	-0.850000	-7.180000	0.016000
Std. Dev.	0.099188	0.650620	2.687954	0.057058
Skewness	-0.072764	3.073146	-0.323340	1.152554



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Kurtosis	2.374826	22.38816	5.060209	3.683508
Jarque-Bera	1.373403	1378.925	15.54219	19.26901
Probability	0.503233	0.000000	0.000422	0.000065
Sum	13.08000	50.06000	228.6900	6.500000
Sum Sq. Dev.	0.777220	33.44116	570.7827	0.257195
Observations	80	80	80	80

Source: E-views 12 Output (2024)

The provided table presents descriptive statistics for four variables: Discretionary Accrual (DAC), Cloud Expenditure Growth (CEG), Cloud Security Investment (CSI), and Firm Age (FA). Beginning with the measures of central tendency, the mean values give us an indication of the typical values for each variable, with DAC averaging at 0.1635, CEG at 0.6258, CSI at 2.8586, and FA at 0.0813. These values provide a snapshot of the average levels across the sample. Examining the spread of the data, we observe the range between the minimum and maximum values, which indicates the variability in the dataset. Notably, CEG and CSI exhibit wider ranges compared to DAC and FA, suggesting greater variability in these variables. The standard deviation quantifies the dispersion of the data points around the mean, with higher values indicating greater variability. Skewness measures the symmetry of the distribution, with values closer to zero indicating greater symmetry. In this case, all variables exhibit skewness close to zero, suggesting relatively symmetrical distributions. Kurtosis measures the heaviness of the tails of the distribution, with higher values indicating heavier tails. CSI exhibits the highest kurtosis, suggesting a distribution with heavier tails compared to the other variables. The Jarque-Bera test assesses the normality of the distribution, with low p-values indicating departure from normality. Here, all variables except DAC have p-values below 0.05, suggesting non-normal distributions. These findings indicate the need for caution when assuming normality in subsequent analyses. Overall, this comprehensive analysis of the descriptive statistics provides valuable insights into the characteristics and distributional properties of the variables, informing further investigation and analysis within the context of the study.

### 4.2.2 Correlation Matrix

Table 4.2: Correlation Matrix

Correlation Probability	DAC	CEG	CSI	FA
DAC	1.000000 -----			
CEG	-0.185265 0.0999	1.000000 -----		
CSI	0.443591 0.0000	0.084922 0.4539	1.000000 -----	
FA	-0.038761 0.7328	0.008240 0.9422	-0.045089 0.6913	1.000000 -----

Source: E-views 12 Output (2024)

The correlation matrix provided offers insights into the relationships both between and within the variables of interest: Discretionary Accrual (DAC), Cloud Expenditure Growth (CEG), Cloud Security Investment (CSI), and Firm Age (FA). Examining the correlations between variables, we observe negative correlations between DAC and both CEG (-0.1853) and FA (-0.0388), indicating a potential inverse relationship. However, these correlations are relatively weak, suggesting limited linear dependence between DAC and these variables. On the other hand, a positive correlation is observed between DAC and CSI (0.4436), indicating a potential positive relationship between discretionary accruals and cloud security investment. This correlation is stronger compared to the others and may warrant further investigation into the nature of this relationship. Within the variables themselves, correlations of 1.000 indicate perfect correlation, which is expected as it represents the relationship of a variable with itself.

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Overall, while correlations provide valuable insights into potential associations between variables, it's essential to interpret them cautiously and consider additional analyses to understand the underlying dynamics comprehensively.

### 4.2.3 Robustness Test

Before proceeding with estimating our regression model, it's essential to first conduct Pooled Ordinary Least Squares (OLS) estimation. This step is crucial as it allows us to assess whether multicollinearity is present in the regression model. Multicollinearity, a common issue in regression analysis, arises when there is a high correlation between independent variables, leading to difficulties in interpreting the results accurately. It can undermine the reliability of coefficient estimates and weaken the ability to trust the significance of independent variables based on p-values. Therefore, by performing multicollinearity tests on Pooled OLS, we can identify and address any multicollinearity issues before proceeding with our estimations. This approach ensures that we can examine the individual explanatory power of independent variables on the dependent variable effectively, enhancing the robustness and reliability of our regression analysis.

#### 4.2.3.1 Multicollinearity Test

Detecting multicollinearity is crucial for ensuring the accuracy of regression analysis, and one commonly used metric for this purpose is the Variance Inflation Factor (VIF). Therefore, monitoring VIF values is essential for identifying and addressing multicollinearity issues to ensure the validity and robustness of regression results.

**Table 4.3: Result of Variance inflation Test**

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.000291	2.962061	NA
CEG	0.000229	1.960858	1.012547
CSI	1.522205	2.456101	1.144855
FA	3.543098	3.673820	1.168521

**Source:** *E-views 12 Output (2024)*

The above VIF test result on table 4.3 was obtained from the Pooled Ordinary Least Square (OLS) that was attached in appendix 2. However, based on the above Centered VIF results, our regression model is free from multicollinearity problem; this because Centered VIF values of all the variables are less than "10. This implies that there is no multi-collinearity in our model.

#### 4.2.3.2 Heteroskedasticity

##### Hypothesis

Ho: There is no heteroskedasticity problem in the model (Residuals are homoskedastic)

Hi: There is heteroskedasticity problem in the model

##### Decision Rule:

**Accept  $H_0$**  if the Prob. value is greater than 0.05 (5% level of significant). Otherwise, do not accept  $H_0$ .

**Table 4.4 Heteroskedasticity Test**

Panel Cross-section Heteroskedasticity LR Test  
 Null hypothesis: Residuals are homoskedastic  
 Equation: UNTITLED  
 Specification: DAC CEG CSI FA\_C

	Value	df	Probability
Likelihood ratio	9.824314	8	0.2776

**Source:** *E-views 12 Output (2024)*

Based on the above rule of thumb, the Heteroskedasticity Test, Prob. value is 0.2776, greater than 0.05; thus, we conclude that the regression model is free from Heteroskedasticity problem

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## 4.2.4 Panel Properties

### Hausman Test

Hausman specification test was employed to examine the preferred model among these options. This test assesses the correlation between the error terms and the regressors, providing information to determine whether fixed or random effects models should be used. The decision rule for the Hausman test, conducted at a significance level of 5%, guides researchers in choosing the appropriate model for their analysis based on the results of the test.

H<sub>0</sub>: Random effect is more appropriate for the Panel Regression analysis

H<sub>1</sub>: Fixed effect is more appropriate for the Panel Regression analysis

### Decision Rule:

Reject H<sub>0</sub> if the Prob > F is less than 0.05. Otherwise, do not reject H<sub>0</sub>.

**Table 4.5: Hausman Test**

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1.201146	2	0.5485

Source: *E-views 12 Output (2024)*

This analysis outcome implies that there is enough evidence to accept the null hypothesis which states that random effect is more appropriate for the Panel Regression analysis. Thus, the study accepts the H<sub>0</sub> and conclude that Random Effect Model (Estimate) is the more appropriate model.

### Breusch-Pagan and Lagranger Multiplier Test

**Table 6: Breusch-Pagan Langranger Multiplier Test**

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	48.58696	28	0.0093

Source: *E-views 12 Output (2024)*

Based on the probability value of the Breusch-Pagan Langranger Multiplier Test at probability value of 0.0093, the null hypothesis is rejected, thus random effect is most appropriate when compared to pooled effect.

### Test of Research Hypotheses

In panel regression analysis, the ultimate goal is the estimation of the relationship between dependent and independent variables. This goal can be achieved through the estimation of the coefficients of each independent variable in the model. The sign of coefficients of independent variables indicates their relationship with dependent variable, while the magnitude of the coefficients implies the responses of dependent variables to independent variables.

**Decision Rule:** The decision rule for accepting or rejecting the null hypothesis for any of these tests was based on the Probability Value (PV) and the Probability (F-statistic). If the PV is less than 5% or 0.05 (that is, if  $PV < 0.05$ ), it implies that the regressor in question is statistically significant at 5% level; and if the PV is more than 5% or 0.05 (that is, if  $PV > 0.05$ ), it is categorized as not significant at that level. This implies that the level of significance for the study is at 5% (for the two-tailed test). Thus, the decision rule for accepting or rejecting the null hypothesis is based on both the Probability Value (PV) and the Probability (F-statistic)".

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**Table 7: Panel Regression Result (Random Effect)**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.129420	0.047877	2.703166	0.0085
CEG	-0.014648	0.013870	-1.056094	0.2943
CSI	0.016036	0.003212	4.991956	0.0000
FA	-0.031943	0.464167	-0.068817	0.9453
Effects Specification			S.D.	Rho
Cross-section random			0.071379	0.5337
Idiosyncratic random			0.066713	0.4663
Weighted Statistics				
R-squared	0.562266	Mean dependent var	0.046342	
Adjusted R-squared	0.533145	S.D. dependent var	0.075781	
S.E. of regression	0.066362	Sum squared resid	0.334697	
F-statistic	9.006047	Durbin-Watson stat	1.918311	
Prob(F-statistic)	0.000036			

Source: *E-views 12 Output (2024)*

Table 4.7 presents the results of the panel random effect regression model, which aims to explore the relationship between explanatory variable and the predictor among listed ICT firms in Nigeria. The predictor variable in this analysis is discretionary accrual (EQ), while the explanatory variables of interest are, Cloud Expenditure Growth (CEG), and Cloud Security Investment (CSI). Interpreting the coefficients, the study observe that the constant term (C) has a coefficient of 0.129420 with a standard error of 0.047877, resulting in a t-statistic of 72.703166. This indicates that the constant term is statistically significant at the 5% significance level, suggesting that even in the absence of the independent variables, there is a significant baseline effect on discretionary accrual.

The R-squared value, representing the amount of variance in the dependent variable that is accounted for by the independent variables, is 0.562266. This suggests that over 56% of the variability in discretionary accrual may be accounted for by the variability in cloud expenditure growth and cloud security investment. The adjusted R-squared value, which accounts for the number of predictors in the model, is 0.533145. The adjusted R-squared value offers a more cautious estimation of the amount of variance that is accounted for by the independent variables. **Hypotheses Testing:**

For Cloud Expenditure Growth (CEG), the coefficient is -0.014648 with a standard error of 0.013870, resulting in a t-statistic of -1.056094. The associated p-value is 0.2943, indicating that CEG does not have a statistically significant effect on earnings quality at the 5% significance level. Therefore, the study fail to reject the null hypothesis (Hypothesis ii) that CEG has no significant effect on EQ.

Conversely, the coefficient for Cloud Security Investment (CSI) is 0.016036 with a standard error of 0.003212, leading to a t-statistic of 4.991956. The p-value associated with this coefficient is 0.0000, indicating that CSI has a statistically significant positive effect on earnings quality at the 5% significance level. Thus, we reject the null hypothesis (Hypothesis iii) that CSI has no significant effect on EQ.

Consequently, the Prob (F-statistic) value, also known as the p-value associated with the F-statistic, is 0.000036. This implies that when Cloud Expenditure Growth (CEG), and Cloud Security Investment (CSI) joined together, they can influence financial reporting quality. Therefore, it can be concluded that Cloud-Based Accounting Information Systems have significant effect on Financial Reporting Quality of Listed Information and Communication Technology (ICT) Firms in Nigeria. Also, the Durbin-Watson stat of 1.9 shows that the regression model is free from auto-correlation.

#### 4.4 Discussion of Finding

The study revealed that Cloud-Based Accounting Information Systems have significant effect on the Financial Reporting Quality of Listed Information and Communication Technology (ICT) Firms in Nigeria. This finding is consistent with the findings of Weathers *et al.* (2024); Sahayaraj and Muthurajkumar (2023); Akpan *et al.* (2023); and Huang *et al.* (2021). However, based on hypothesis one, the study revealed that Cloud Expenditure Growth (CEG) does not have a statistically significant effect on financial reporting quality at the 5% significance level. This finding is not in agreement with the findings of Li *et al.* (2020); and Wang *et al.* (2019). Furthermore, hypothesis two that CSI has a statistically significant positive effect on financial reporting quality at the 5% significance level. This result collaborates the findings of Alshammari *et al.* (2021); and Zhang *et al.* (2020).

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The discrepancy between the study's findings and those of prior research, such as Li et al. (2020) and Wang et al. (2019), regarding the lack of statistically significant effect of CEG on financial reporting quality suggests the need for further exploration and refinement of the relationship between cloud expenditure and financial reporting. It may indicate that factors beyond CEG alone influence financial reporting quality in the context of cloud-based accounting systems, warranting deeper investigation into these potential moderating variables. Conversely, the statistically significant positive effect of CSI on financial reporting quality aligns with the findings of Alshammari et al. (2021) and Zhang et al. (2020), emphasizing the importance of investing in cloud security measures to enhance the reliability and integrity of financial reporting. This underscores the significance of robust cybersecurity measures in safeguarding financial data and mitigating risks associated with cloud-based accounting systems, reflecting evolving accounting practices and regulatory requirements in an increasingly digitalized environment.

### 5. CONCLUSION AND RECOMMENDATION

The study underscores the profound impact of Cloud-Based Accounting Information Systems on the Financial Reporting Quality of Listed Information and Communication Technology (ICT) Firms in Nigeria. The findings reveal a clear correlation between the adoption of cloud-based accounting systems and improved financial reporting quality within the ICT sector. Specifically, the study elucidates the intricate relationships between various aspects of cloud technology adoption and financial reporting quality.

- i. Firstly, it indicates that Cloud Expenditure Growth shows no significant direct effect on earnings quality, it underscores the importance of judicious resource allocation and strategic investment decisions in optimizing the benefits derived from cloud-based accounting systems.
- ii. Secondly, the study underscores the substantial influence of Cloud Security Investment on earnings quality among Nigerian ICT firms, highlighting the indispensable nature of robust security measures in preserving the integrity of financial data and fostering investor trust in financial reporting practices.

According to the results of this study, the following suggestions are proposed:

In light of the study's findings, recommendations are provided to guide digital technology enterprises in Nigeria.

- i. Although Cloud Expenditure Growth does not directly affect earnings quality, firms are advised to exercise caution in their cloud-related expenditure decisions. Strategic resource allocation and thorough cost-benefit analyses should guide investments, with a focus on aligning expenditures with long-term strategic objectives and exploring cost optimization opportunities.
- ii. Given the significant positive impact of Cloud Security Investment on earnings quality, prioritizing investments in robust cloud security measures is recommended. Implementing stringent access controls, encryption protocols, and continuous monitoring can safeguard financial data integrity and bolster investor confidence in financial reporting practices. Staying updated on cybersecurity threats and compliance requirements is crucial for maintaining effective security measures. Overall, these recommendations aim to enhance financial reporting quality, mitigate risks, and foster trust within the Nigerian ICT sector.

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### APPENDIX

#### DATA PRESENTATION

ID	YEAR	FIRMS	DAC	CEG	CSI	FA
1	2013	Airtel Africa Plc.	0.33	0.82	4.18	0.02
1	2014	Airtel Africa Plc.	0.32	0.78	5.07	0.02
1	2015	Airtel Africa Plc.	0.25	0.69	4.58	0.02
1	2016	Airtel Africa Plc.	0.23	0.89	3.2	0.02

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1	2017	Airtel Africa Plc.	0.25	0.87	8.96	0.02
1	2018	Airtel Africa Plc.	0.15	0.87	7.44	0.02
1	2019	Airtel Africa Plc.	0.14	0.85	7.54	0.02
1	2020	Airtel Africa Plc.	0.16	0.79	6.6	0.02
1	2021	Airtel Africa Plc.	0.11	0.65	4.66	0.02
1	2022	Airtel Africa Plc.	0.06	0.79	2.9	0.02
2	2013	Briclinks Africa Plc.	0.1	0.49	4.77	0.024
2	2014	Briclinks Africa Plc.	0.26	0.52	1.94	0.024
2	2015	Briclinks Africa Plc.	0.27	0.22	2.08	0.024
2	2016	Briclinks Africa Plc.	0.25	-0.13	1.28	0.024
2	2017	Briclinks Africa Plc.	0.16	0.03	0.89	0.024
2	2018	Briclinks Africa Plc.	0.16	-0.01	1.03	0.024
2	2019	Briclinks Africa Plc.	0.14	0.06	0.99	0.024
2	2020	Briclinks Africa Plc.	0.12	0.14	1.06	0.024
2	2021	Briclinks Africa Plc.	0.11	0.36	1.16	0.024
2	2022	Briclinks Africa Plc.	0.11	4.78	1.57	0.024
3	2013	Chams Holding Plc.	-0.01	0.73	-0.26	0.11
3	2014	Chams Holding Plc.	0.22	0.73	3.75	0.11
3	2015	Chams Holding Plc.	0.22	0.79	3.75	0.11
3	2016	Chams Holding Plc.	0.33	0.86	4.73	0.11
3	2017	Chams Holding Plc.	0.37	0.82	6.99	0.11
3	2018	Chams Holding Plc.	0.3	0.82	5.51	0.11
3	2019	Chams Holding Plc.	0.32	0.85	5.41	0.11
3	2020	Chams Holding Plc.	0.34	0.81	6.57	0.11
3	2021	Chams Holding Plc.	0.15	0.56	5.35	0.11
3	2022	Chams Holding Plc.	0.07	0.63	2.26	0.11
4	2013	Cwg Plc. [BlS]	0.08	0.84	2.69	0.09
4	2014	Cwg Plc. [BlS]	0.17	0.88	6.28	0.09
4	2015	Cwg Plc. [BlS]	0.15	0.9	8.2	0.09
4	2016	Cwg Plc. [BlS]	0.15	0.78	9.81	0.09
4	2017	Cwg Plc. [BlS]	0.11	0.68	4.45	0.09
4	2018	Cwg Plc. [BlS]	0.07	1.74	3.13	0.09
4	2019	Cwg Plc. [BlS]	-0.03	1.89	-1.35	0.09
4	2020	Cwg Plc. [BlS]	-0.03	1.25	-1.12	0.09
4	2021	Cwg Plc [BlS]	-0.04	1.14	-4.06	0.09
4	2022	Cwg Plc. [BlS]	-0.04	1.47	-7.18	0.09
5	2013	E-Tranzact Inte Plc.	-0.02	0.43	-2.13	0.06
5	2014	E-Tranzact Inte Plc.	0.1	0.39	1.75	0.06
5	2015	E-Tranzact Inte Plc.	0.06	0.59	1.64	0.06
5	2016	E-Tranzact Inte Plc.	0.1	0.69	2.41	0.06
5	2017	E-Tranzact Inte Plc.	0.09	0.73	3.27	0.06
5	2018	E-Tranzact Inte Plc.	0.06	0.83	3.72	0.06
5	2019	E-Tranzact Inte Plc.	0.07	0.74	6.03	0.06
5	2020	E-Tranzact Inte Plc.	0.06	0.67	3.85	0.06
5	2021	E-Tranzact Inte Plc.	0.05	0.66	3.06	0.06

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5	2022	E-Tranzact Inte Plc.	0.04	0.58	2.97	0.06
6	2013	Mtn Nigeria Plc.	0.04	-0.29	2.37	0.07
6	2014	Mtn Nigeria Plc.	0.2	-0.1	0.78	0.07
6	2015	Mtn Nigeria Plc.	0.26	0	0.91	0.07
6	2016	Mtn Nigeria Plc.	0.23	-0.15	1	0.07
6	2017	Mtn Nigeria Plc.	0.2	-0.85	0.87	0.07
6	2018	Mtn Nigeria Plc.	0.14	0.03	0.54	0.07
6	2019	Mtn Nigeria Plc.	0.22	-0.35	1.03	0.07
6	2020	Mtn Nigeria Plc.	0.17	-0.32	0.74	0.07
6	2021	Mtn Nigeria Plc.	0.19	-0.2	0.76	0.07
6	2022	Mtn Nigeria Plc.	0.2	-0.34	0.83	0.07
7	2013	Ncr (Nigeria) Plc.	0.15	0.73	0.74	0.21
7	2014	Ncr (Nigeria) Plc.	0.13	0.81	3.77	0.21
7	2015	Ncr (Nigeria) Plc.	0.21	0.79	5.15	0.21
7	2016	Ncr (Nigeria) Plc.	0.24	0.62	4.79	0.21
7	2017	Ncr (Nigeria) Plc.	0.23	0.63	2.62	0.21
7	2018	Ncr (Nigeria) Plc.	0.18	0.28	2.72	0.21
7	2019	Ncr (Nigeria) Plc.	0.08	0.36	1.4	0.21
7	2020	Ncr (Nigeria) Plc.	0.09	0.47	1.55	0.21
7	2021	Ncr (Nigeria) Plc.	0.13	0.66	1.87	0.21
7	2022	Ncr (Nigeria) Plc.	0.11	0.68	2.97	0.21
8	2013	Omatek Ventures Plc.	0.13	0.69	3.1	0.07
8	2014	Omatek Ventures Plc.	0.31	0.62	3.23	0.07
8	2015	Omatek Ventures Plc.	0.31	0.59	2.63	0.07
8	2016	Omatek Ventures Plc.	0.24	0.59	2.45	0.07
8	2017	Omatek Ventures Plc.	0.26	0.54	2.44	0.07
8	2018	Omatek Ventures Plc.	0.25	0.63	2.16	0.07
8	2019	Omatek Ventures Plc.	0.22	0.73	2.69	0.07
8	2020	Omatek Ventures Plc.	0.31	0.63	3.76	0.07
8	2021	Omatek Ventures Plc.	0.23	0.63	2.72	0.07
8	2022	Omatek Ventures Plc.	0.23	1.01	2.72	0.07

Source; NGX Fact Book, 2013 to 2022



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