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Intellectual Capital and the Growth of Listed Commercial Banks in Nigeria

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ABSTRACT: This study examined the effect of intellectual capital on growth of listed commercial banks in Nigeria. The study employed ex-post facto design and the study population was drawn from all listed commercial banks, out of which a sample of seven (7) were selected using banks with international licenses as basis for sampling. Secondary data was the main instrument of data collection, obtained from the published annual reports and accounts of listed commercial banks from 2014-2023. Data on the dependent variable (revenue and asset growth), control variable (financial leverage – debt to equity ratio) and independent variable (intellectual capital – human capital efficiency and structural capital efficiency) were collected. Data obtained were analyzed via descriptive, regression diagnostic and inferential statistics. The fixed and random effects panel regression results revealed that intellectual capital has no significant influence on commercial banks' growth in Nigeria. On the basis of the findings, the study recommends among others that management should further engage less structural capital; this should however be cautiously implemented such that the level of structural capital is kept low as much as possible in order not to deter the growth of commercial banks. This study contributes to knowledge as it serves as a response call for further research in understanding intellectual capital and the growth of listed commercial banks in Nigeria.

KEYWORDS: Intellectual capital; Structural capital; Human capital efficiency; Firm growth; Commercial banks;
JEL Classification: M41; E24

1. INTRODUCTION

Intellectual capital is an emerging concept in accounting that is associated with the level of knowledge acquired by an organization through development of human capital, investments in marketing to improve customers' relationship with firms and improving organizational culture (Anik, Chariri & Isgiyarta, 2021). Hence, the total knowledge acquired by a company through human resources, relational capacity and structural competency is regarded as intellectual capital (Ahangar, 2020). Intellectual capital is a vital resource possessed by firms internally which could affect other accounting attributes reported on financial statements. For the purpose of growing the level of intellectual capital in an entity, adequate investments are required to be made by managers on the variables such as human capital and relational capital (Anser, 2024 Aluwong, 2022)

For the improvement in human capital, managers are required to provide funds for training and development of employees for the purpose of raising their technical know-how and making them to be acquainted with the required skills needed in organization (Majumder, Ruma & Akter, 2023)**.** Managers are expected to commit funds on marketing and distribution activities to create more relationships with customers and other companies. Business-related facilities must be acquired in line with the level of technology and essential to the various tasks in the organization. The various investments on the components of intellectual capital are meant to improve the benefits of human and relational capital (Faraji, et al, 2022). This is because the improvement in human capital is capable of affecting the productivity of an organization positively, the improvement in relational capital is capable of marketing the products or services to the various customers or markets and the growth in structural capital could elevate the operating capacity of a company where tasks are discharged diligently with higher proficiency.

According to Essien, Ofonime and Eteyen (2024), a firm with higher intellectual capacity is one that could achieve higher financial performance in an accounting period. Intellectual capital drives organizational wealth more by knowledge and information rather than the process of production. While in the past most economies depended on use of land, natural resources, equipment and capital for the creation of value, currently our information economy depends largely on application of knowledge in the creation of wealth and economic growth (Mollah, & Rouf, 2022). In addressing the relevance of intellectual capital management, Apiti, Ugwoke and Chiekezie (2017) noted that in period of national and global financial crisis, the relevance of intangible assets attracted much attention in the literature, because intellectual capital which is an aspect of intangible asset exert influence in areas of adding value to a firm and with its relational ability, can facilitate the acquisition of other resources, thus promoting the survival, growth and profitability of firms.

Furthermore, this stride has paid in promoting huge transformation within the financial sector of Nigeria in the last few years. Customers of banks now receive quick and improved services from their banks. The boost of educated workforce gives rise to high profitability, growth and productivity. Firms that makes a better disclosure of its intellectual assets, stands tall among her competitors and the greater it provides confidence to her stakeholders. Intellectual capital thus sharpens and strengthens competitive edge. Numerous researches have been conducted on intellectual capital and bank performance; however, the results remained mixed (Bellucci, Marz, Orlando & Ciampi, 2021; Faraji, et al 2022).

Some researchers argued that such inconsistency is the result of unclear measurement of intellectual capital (Githaiga, 2023), others found a positive link between intellectual capital and performance (Majumder, Ruma & Akter, 2023; Githaiga, 2022; Mollah & Rouf, 2022), others found positive link between intellectual capital and performance (Maditinos, et al 2011). Notably, there are limited empirical studies that had assessed the link between intellectual capital (human capital efficiency and structural capital efficiency) and growth (revenue and asset growth) of listed commercial banks in Nigeria. In view of the above, this study examined the effect of intellectual capital on the growth of listed commercial banks in Nigeria.

2. REVIEW OF RELATED LITERATURE

2.1 Intellectual Capital

Intellectual capital is defined as the sum of knowledge acquired by a company from their investments in different aspects of operation conducted (Xu & Zhang, 2021). According to Adegbayibi (2021), intellectual capital is regarded as the unique knowledge of business possessed by a company different from other entities in the same industry or other entities operating in an economy. Intellectual capital is seen as an interesting area among the accountants and other management scientists. This is because in modern time, it has been observed that the knowledge-based economy is one of the key drivers of organizational performance. Intellectual capital is understood to be a fundamental resource of knowledge-based economy. In accordance with the view of Gara, et al (2025), intellectual capital could exist in the operation of an entity without the knowledge of the managers. Before now, intellectual capital was not recognized in the literature of accounting because managers in those eras paid more attention to attributes that are seen and touched and not just the ones that could be perceived.

The idea of intellectual capital came as a result of the fact that knowledge has been recognized in the modern business world to help in improving upon the value of companies or financial performance indicators (Yin & Xu 2025). The critical way of developing intellectual capital is by making adequate investments to different areas of operation such as training and development of employees, advertising or marketing the products or services, developing intangible assets such as brand name, patent right, and so on. Intellectual capital is also derived from adequate investments in developing the structure of a company in line with the modern facilities brought by the level of technological advancement (Ajiboye, Bosun-Fakunle & Emuze, 2025).

For this reason, it could be said that the various areas in which intellectual capital could be developed in a firm through adequate investments include but not limited to workforce training and development, marketing of firm's products/services and installation of modern structure and facilities for efficient operation (Anser, 2024). Based on this classification, intellectual capital is associated with human capital and relational capital. However, in this study, we dissected intellectual capitals by x-raying two (2) intellectual capital dimensions - Human Capital Efficiency and Structural Capital Efficiency.

2.2 Structural Capital Efficiency

Structural capital includes non-human knowledge reservoirs in a firm facilitating innovation and performance (Rabiu, et al, 2025). It offers efficient communication and operations supporting knowledge activities contributing to value/profits (Aluwong, 2020). It is a knowledge remaining when employees leave an organization (Al-Omoush, 2022). It involves hardware, culture/practices, intellectual property, software, repositories, research and development (R&D) supporting efficiency (Luh, 2025). Structural capital comprises knowledge, culture, processes, philosophies, systems, databases explaining productivity/innovation structures (Mustafa, et al 2024). It codifies transferable bodies of knowledge and connects people to expertise/knowledge on demand. Communication networks, knowledge databases allow expertise sharing.

Structural capital is one of the three primary components of intellectual capital, and consists of the supportive infrastructure, processes, and databases of the organization that enable human capital to function (Dancaková & Glova 2024). It is owned by an organization and remains with an organization even when people leave. It includes: capabilities, routines, methods, procedures and methodologies embedded in organization (Brenner & André, 2010). Structural capital is the supportive infrastructure that enables the rest of an organization to function in a repeatable, scalable way. It is owned by an organization and remains with an organization even when people leave.

Structural capital includes processes, data, systems, designs, and knowledge. Some structural capital qualifies for special legal protection as intellectual property such as patents, trademarks, copyrights and trade secrets (Acuña-Opazo & Contreras Gonzalez, 2021). It includes all the non-human store houses of knowledge in organizations that include the databases, organizational charts, process manuals, strategies, routines, and anything whose value to the company is higher than its material value.

2.3 Human Capital Efficiency

Elenwo and Tolofari (2024). defines human capital as the knowledge that employees take with them when they leave the firm. It includes the knowledge, skills, experiences and abilities of people. Some of this knowledge is unique to the individual, some may be generic. Examples are innovation capacity, creativity, know-how and previous experience, teamwork capacity, employee flexibility, tolerance for ambiguity, motivation, satisfaction, learning capacity, loyalty, formal training and education. Kamal, et al (2012) defined human capital as employee's competence in creating both tangible and intangible assets by contributing in the continuous generation of knowledge and ideas.

Pulic (2000) looked at human capital to be the knowledge held by employees are the primary source of value creation so therefore employees' expenses should be seen as investments rather than costs. Choo and Bontis (2002) see human capital as the combined knowledge, skill, innovativeness and ability of the company's individual employees to meet the task at hand. Human capital is recognized as the largest and

the most important intangible asset in an organization which ultimately provides the goods and/or services that customers require or the solutions to their problems which entail collective knowledge, competency, experience, skills and talents of people within an organization.

2.4 Firm Growth

Firm growth, often measured by asset and revenue growth, indicates a company's increasing ability to generate value and expand its operations. These metrics provide insights into a firm's financial health, market position, and overall performance. Asset and revenue growth are distinct but related financial metrics. Asset growth measures the increase in a company's resources over time, while revenue growth reflects the increase in its sales and income (Ekwe, 2013). Analyzing both helps assess a company's overall performance and financial health. Asset growth refers to the increase in a company's total assets, which include both tangible and intangible resources like cash, inventory, and goodwill.

Furthermore, firm growth is calculated by comparing the current period's total assets to the previous period's total assets (current period total assets - previous period total assets) / previous period total assets) It indicates a company's ability to accumulate resources and potentially increase its capacity to generate revenue in the future. However, excessive asset growth without corresponding revenue growth might indicate inefficient resource utilization. Revenue growth refers to the increase in a company's sales or income generated from its operations. It is calculated by comparing the current period's revenue to the previous period's revenue (current period revenue - previous period revenue) divided by previous period revenue. Hence, it indicates a company's ability to attract customers and increase its sales over time and considered as a key indicator of a firm's market presence and turnover effectiveness.

2.5 Theoretical Framework

This study was anchored on agency theory. The theory emphasizes that performance-related payment can motivate employees to achieve organizational goals. Hariyono and Tjahjadi (2021) believed that there is a relationship between the conception of agency theory and a company's choice of performance indicators. Given its related costs and risks, a performance indicator, no matter financial or non-financial performance indicators, should be included in the performance management system as long as the indicator can add incremental information about employees' efforts (Hariyono & Tjahjadi, 2021; Hermawan, et al, 2021).

Since human resource and management accountants may have different ideas about the costs and risks of certain performance indicators and different ideas about what incremental information is, these two groups may have different perception about the explanations agency theory provides of performance management. Moers (2006) questions the validity of the assumption in agency theory that principals are honest and easy to suffer from agent's self-interest intention which may finally results to harm the interest of the principal. Moers (2006) argues that this assumption has lent so much discretion to principles in reality that performance management systems established by principals tends to become diverse and subjective.

Furthermore, it may be hard to achieve fairness within such performance management systems and some problems, such as undue tolerance of poor performance may thus arise (Moers, 2006). It may be interesting to see how human resource staff and management accountants add diversity and subjectivity do performance management and whether they are aware of their contribution. It will be meaningful to check whether the problems predicted by Moers (2006) do happen in practice.

3. METHODOLOGY

The research design used in this study is the *ex-post facto* because the study used already existing data where the researcher has no means of control of the events/variables. The study population comprised twenty-three listed commercial banks on the Nigerian Exchange Group (NGX) as at 31st December, 2024. Given the population, seven (7) listed commercial banks were selected out of the 23 using stratified sampling technique by selecting listed commercial banks with international categorization.

The study employed secondary data comprising proxies of intellectual capital (human capital efficiency and structural capital efficiency), firm growth (asset growth and revenue growth) and a control variable (financial leverage - debt to equity ratio). Data were obtained for 7 listed commercial banks from 2014-2023; thus, dependent variable is firm growth, control variable is financial leverage while the independent variable is intellectual capital. Given the independent, dependent and control variables and goal of the empirical investigation, the following econometric model were estimated:

$$Assgrow = f(Hce, Sce, Dte) \quad - \quad Eq.\ 1$$

$$Revgrow = f(Hce, Sce, Dte) \quad - \quad Eq.\ 2$$

Equations 1-2 were re-estimated to capture the explicit form of the regression models:

$$Assgrow_{it} = B_0 + B_1Hce_{it} + B_2Sce_{it} + B_3Dte_{it} + \mu_{it} \quad - \quad Eq.\ 3$$

$$Revgrow_{it} = B_0 + B_1Hce_{it} + B_2Sce_{it} + B_3Dte_{it} + \mu_{it} \quad - \quad Eq.\ 4$$

Where: Assgrow represents asset growth; Revgrow is revenue growth; Dte is debt to equity ratio; Hce is human capital efficiency; Sce is structural capital efficiency; μ_{it} is error term; í is individual commercial banks of the study while t is time-frame:

Table 1: Measurement of Variables

Variables	Measurement	A-priori Sign	Author(s)
Asset Growth	Current year total assets minus previous year total assets divided by previous year total assets	N/A	Xu and Liu (2019)

Revenue growth	Current year revenue minus previous year revenue divided by previous year revenue	N/A	Sylvanus, et al (2024)
Human capital efficiency	Revenue minus cost of revenue divided by staff cost	+	Sylvanus, et al (2024)
Structural capital efficiency	Revenue minus cost of revenue divided and staff cost divided by revenue minus cost of revenue	+	Sumedrea (2013); Ekwe (2013)
Debt to equity ratio	Debt divided by equity	+	Xu and Liu (2019)

Source: Compiled by the Researcher (2025)

The analyses were carried out as follows: descriptive statistics (mean, standard deviation, minimum, maximum, kurtosis, skewness and Pearson correlation); diagnostic statistics (variance inflation factor, and Hausman specification tests) and inferential statistics (fixed and random effects regression).

4. RESULTS

Table 2: Summary of Descriptive Statistics

Variables	Mean	Std. Dev.	Max. Val.	Min. Val.	Skewness	Kurtosis
Assegrow	16.5505	11.2989	50.9800	-4.0600	0.6922	3.4621
Revgrow	12.0118	16.4310	64.9300	-22.500	0.7474	4.1432
Hce	3.9212	4.32019	37.8100	1.2000	7.0462	55.695
Sce	0.6715	0.12722	0.9700	0.1700	-0.9232	5.5708
Dte	87.343	3.37116	100	81.690	1.3650	6.6037

Source: Compiled by the Researchers (2025)

The summary of descriptive statistics (Table 2) show that the average performance measures (asset growth– Assegrow and revenue growth - Revgrow) of the listed commercial banks revolved around 16.5505 and 12.0118. The average values for intellectual capital (measured by human capital efficiency – Hce and structural capital efficiency - Sce) and control variable (measured by debt to equity ratio – Dte) were 3.9212, 0.6715, and 87.343respectively; the significant variation of Dtefrom the other variables is expected because Dteis measured as total debts to total equity.

The minimum and maximum values for Assegrow were -4.0600, and 50.9800 while and Revgro wwere -22.500 and 64.9300 respectively. On the other hand, minimum and maximum scores for Hce were 1.2000 and 37.8100, Scewere 0.1700 and 0.9700 while Dte were 81.690 and 100 respectively. Also, all the variables skewed toward same direction (positively skewed), except Sce; suggesting that variables of Assegrow, Revgrow, Hce, and Dte moved in same direction except Sce that moved in the opposite direction. In addition, the variables have normal distribution as indicated by kurtosis values except Hce.

Table 3a: Pearson Correlation - Intellectual Capital and Asset Growth

	Assegrow	Hce	Sce	Dte
Assegrow	1.0000			
Hce	0.1281	1.0000		
Sce	-0.0780	0.5289	1.0000	
Dte	0.2376	-0.1473	-0.2158	1.0000

Source: Compiled by the Researchers (2025)

Table 3b: Pearson Correlation – Intellectual Capital and Revenue Growth

	Revgrow	Hce	Sce	Dte
Revgrow	1.0000			
Hce	-0.0980	1.0000		
Sce	-0.1165	0.5289	1.0000	
Dte	-0.0098	-0.1473	-0.2158	1.0000

Source: Compiled by the Researchers (2025)

Table 3a-3b is the results of the Pearson correlation for the independent, control and dependent variables. The results revealed that the correlation between the variables is negative between the intellectual capital variables (Hce, Sce), control variable (Dte), and firm growth variable (Revgrow). On the other hand, the correlation between Assegrow, Hce and Dte were positive except Sce that exhibited a negative correlation.

Table 4: Variance Inflation Factor

Variables	VIF	1/VIF
Sce	1.43	0.7007
Hce	1.39	0.7190
Dte	1.05	0.9519
Mean VIF	**1.29**	

Source: Compiled by the Researchers (2025)

Table 4 revealed that the mean VIF is 1.29 and is less than the accepted mean VIF of 10; this indicates the absence of multicollinearity in the model of intellectual capital and the growth of listed commercial banks.

Table 5: Fixed/Random Effects Regression for Intellectual Capital and Revenue Growth

Estimator(s)	Fixed Effect (FE)		Random Effect (RE)	
Variable(s)	Coefficient	Probability	Coefficient	Probability
Hce	0.1850	0.661	0.1265	0.760
	(0.44)		(0.30)	
Sce	-4.9028	0.736	-5.9358	0.678
	(-0.34)		(-0.42)	
Dte	0.6257		0.5108	0.278
	(1.31)	0.195	(1.08)	
_cons.	-40.078		-29.121	0.506
	(-0.91)	0.368	(-0.67)	
F-value	0.67			
F-Probability	0.5769			
R-Squared (overall)	0.0001		0.001	
Wald Ch2			1.52	
Prob. Ch2			0.6773	
Hausman Test	Chi2 = 2.07		Prob>Chi2= 0.938	

Source: Compiled by the Researchers (2025)

In Table 5, the RE coefficient is 0.1265(Hce), -5.9358(Sce), and 0.5108(Dte), suggesting that the commercial banks' intellectual capital and financial leverage will lead to approximately 12.7%, 59.4% and 51.1% changes in revenue growth. Besides, Hce, Sce and Dte were insignificant for both FE and RE at 5% significance level. The t-test result indicated that the variable of Hce, Sce, and Dte were statistically insignificant in explaining the influence on revenue growth.

The overall R^2 is 0.0001 for RE and FE; this implies that the variables of Hce, Sce, and Dte explained about 0.01% variation in revenue growth. Hausman test (Prob> Chi2 = 0.938 > 0.05) suggests that RE is more efficient than FE The Wald Ch2 is 1.52 (p-value = 0.6773 > 0.05) and is insignificant, providing evidence that intellectual capital (human capital and structural capital) has no significant effects on revenue growth of listed commercial banks in Nigeria.

Table 6: Fixed/Random Effects Regression for Intellectual Capital and Asset Growth

Estimator(s)	Fixed Effect (FE)		Random Effect (RE)	
Variable(s)	Coefficient	Probability	Coefficient	Probability
Hce	0.2767	0.454	0.6321	0.079
	(0.75)		(1.76)	
Sce	-15.302	0.231	-13.930	0.260
	(-1.21)		(-1.13)	
Dte	0.3535		0.7904	0.049
	(0.85)	0.401	(1.97)	
_cons.	-5.1400		-45.608	0.220
	(-0.13)	0.895	(-1.23)	
F-value	0.84			
F-Probability	0.4784			
R-Squared (overall)	0.0727		0.1008	
Wald Ch2			7.17	
Prob. Ch2			0.0667	
Hausman Test	Chi2 = 2.77		Prob>Chi2= 0.920	

Source: Compiled by the Researchers (2025)

In Table 6, the RE coefficient is 0.6321(Hce), -13.930 (Sce), and 0.7904 (Dte), suggesting that the commercial banks' intellectual capital and financial leverage will lead to approximately 63%,139% and 79% changes in asset growth. Besides, Hce, Sce and Dte were insignificant for both FE and RE at 5% significance level. The t-test result indicated that the variable of Hce, Sce, and Dte were statistically insignificant in explaining the influence on asset growth.

Nevertheless, overall R^2 is 0.1008 for RE, which is higher than overall R^2 for FE; this implies that the variable of Hce, Sce, and Dte explained about 10.1% variation in asset growth. Also, the Hausman test (Prob> Chi2 = 0.920 > 0.05) suggests that RE is more efficient than FE The Wald Ch2 is 7.17 (p-value = 0.0667 >0.05) and is insignificant, providing evidence that intellectual capital (structural and human capital) has no significant effect on asset growth of listed commercial banks in Nigeria.

5. CONCLUSION AND RECOMMENDATIONS

The aim of this study was to examine the effect of intellectual capital on firm growth using a sample of seven (7) listed commercial banks in Nigeria. The study period was from 2014-2023 (a period of 10years) and secondary data comprising the dependent variable (firm growth – revenue growth and asset growth), control variable (financial leverage – debt to equity ratio) and the independent variable (intellectual capital – human capital efficiency and structural capital efficiency) were obtained from the annual reports and accounts of the listed commercial banks. Data obtained were analyzed using descriptive, regression diagnostic and inferential statistical techniques.

The study concludes that intellectual capital measures (human capital efficiency and structural capital efficiency) insignificantly affect firm growth (revenue growth and asset growth). On the basis of the findings, the study recommends the following:

(i) That ,management of firms should further engage less structural capital; however, this recommendation should be cautiously implemented such that the level of structural capital should be kept low as much as possible in order to further deter the growth of commercial banks.

(ii) There is need for management to discourage the abusive use of human capital due to its negative effect on firm growth; to achieve this, management should engage in measures that can discourage abusive use of human capital.

(iii) That management of firms should rather use more of human capital; the human capital should be of quality needed to enhance the growth of firms.

(iv) That management of firms should use less of structural capital; the structural capital should be those that can improve firms' growth.

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