Intellectual Capital Potency and Firm Value in Nigeria; Evidence from Listed Nonfinancial Firms in Nigeria

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ABSTRACT

The objective of this paper is to investigate the influence of intellectual capital potency on firm value of non-financial firms in Nigeria. This study uses analysis technique to measure ICD. Secondary data were obtained from the Audited account reports of selected non financial firms and Nigerian exchange factbook for the period 2011-2020.This study selected 76 firms out of 107 quoted firms in non-financial sector of Nigerian economy using simple purposive sampling method. The 76 firms were analyzed using regression analysis. The results shows that there is negative influence of capital employed efficiency on firm value while human capital employed efficiency have positive but no significant influence on firm value. The moderating variables of firm size (FISZ) have negative and significant influence, while firm age (FIRA) has positive and non significant influence on firm value of non-financial firms in Nigeria. The findings enhanced the knowledge base of intellectual capital in emerging economies such as Nigeria. Based on the findings this study recommended that, the human capital component of intellectual capital should be trained and educated regularly, innovated, nurture capacity, creativity, know-how and previous experience, teamwork capacity, employee flexibility, tolerance for ambiguity, motivated, satisfied, so as to enhance the usefulness of its output to total input. Also firm specific growth and sustainability policy should strongly placed using corporate governance code and other enhanced internal structural innovative processed to ensure that the firm does not extinct.

Keywords: Intellectual Capital Potency; Capital Employed Efficiency; Human Capital Efficiency; Firm Size; Firm Value

1.0 Introduction

A significant movement from traditional "product based organization" to "knowledge intensive organisation" is apparent in the 21st century. With this transition, organizations tend to interpret certain traditions, practices and concepts in different ways. Traditional product based organizations define their "capital" as cash, goods, properties, net worth of the company or other valuables. Instead, knowledge intensive organizations interpret their capital as "intangibles" or "intellectual capital" (Hendricks, 1976). Some prior studies have recognized intangibles and intellectual capital as two concepts. But, they are represent the same object but in different disciplines such as

"Intangibles" in accounting and "Intellectual capital" in management (Marr & Moustaghfir, 2005). Regardless of different discipline, all these concepts represent the "hidden value" of the company.

Human capital refers to the intrinsic productive capabilities of human beings (Eide & Showalter, 2010). It is the collective measure of the knowledge, education, skills, competencies, and other attributes personified in individuals or groups of individuals which impact their prolific capacity and earning potential to produce goods, services, or ideas in market settings. Investment in human capital is of paramount importance for the sustainable development, economic competitiveness, and growth of any nation. Therefore, every nation should have a strong investment in human capital in complementing other investments and policies to boost efficiency and economic advancement. At the micro-level, human capital not only acts as the primary facilitator in augmenting firm productivity but also serves as the critical factor in the effective execution of business strategies (Bontis et al., 2000; Yusuf, 2013). Firms with superior human capital are in a better position to build resources and capabilities (Barney, 1991). Moreover, the extent to which a firm develops and maintains human capital is positively related with the level of firm performance and the long run value creation (Ruíz et al., 2017). Therefore, it is challenging for a firm to create a competitive advantage without an efficient labor force, even though the firm has ample financial resources, advanced technologies, and sophisticated infrastructure.

The existing empirical studies which examine the relationship between human capital and firm value confirm that the investment in human capital can yield better firm performance outcomes (Almeida & Carneiro, 2009; Ballot et al., 2001; Becker & Huselid, 2006; Bowen & Ostroff, 2004; Buller & McEvoy, 2012; Heskett et al., 2003; Khan & Quaddus, 2018; Likert & Bowers, 1969; Mohapatra et al., 2019). Although, existing literature identifies a positive relationship between human capital and firm value, one of the major problems entrenched in the literature is the scarcity of a generally accepted methodological framework to establish the relationship between firm value and human capital. In order to avoid this predicament, the present study trails a positive methodological approach, which grounds research on a fundamental theory from which research hypotheses are later inferred and verified in the context under study. We develop our hypotheses by following the classical economic growth theory, the output of a country depends on two factors; labour and capital. We modify the production function given by Cobb-Douglas and argue that at the micro level, this production function equally applies to firms and hence, the firm's output depends mainly on two inputs, physical capital and human capital (labour). In this framework, the value of the firm should be a function of these two factors. Hence, we try to empirically answer the following three questions.

Despite of claims in various climes, that human capital is the most important asset of companies; the values of non-financial firms have continued to dwindle (Okpala & Omaliko, 2022). This is in the face of the daunting insecurity, health and environmental challenges in Nigeria. These firms now resort to replacement of the human capital asset with technology. This has prompted investigation into the claim of human capital being the most valuable. Again, it is startling that some firms that pride itself as having well equipped human capital have its firm value falling more than it rises. This study hopes to bridge the gap of providing empirical results and literature for the period reviewed. To achieve this purpose, the

following hypotheses were formulated:

Ho₁: Capital employed does not significantly influence firm value

Ho₂: Human capital does not impact firm value significantly

Ho₃: Structural capital does not significantly affect firm value

2.0 Conceptual Framework

2.1 Intellectual Capital Potency

Intellectual capital potency is a firm's intangible asset, it can be either knowledge, information, experience owned by human resources and firm's organization (Stewart, T. 1997). Intellectual capital of firm is a collection and synergized of the knowledge, experience, invention, innovation, market share, and communities that may affect the firm (Akpinar, 2014). Intellectual capital can also be defined as the difference between the market value of the firm and the replacement asset of the firm. The firm's market value is equal to the book value plus firm's intellectual capital.

Experts in the field of intellectual capital divide intellectual capitals into three dimensions: (1) human capital, (2) structural capital, and (3) external (customer) capital. Human capital is the intangible assets owned by the firm in the form of intellectual ability, creativity and innovation that are owned by its employees. On the industry based on knowledge, human capital is a major factor because this resource is the dominant cost in the process of production (Omaliko & Okpala, 2022).

2.1.1 Capital Employed Efficiency

Capital Employed (CE) is the tangible assets part of capital and contain both physical and financial assets. The physical part represents fixed assets and raw materials, while the financial part includes other existing assets after employees leave the company (Basso et al., 2010). According to Pulic (2004), CE refers to physical and financial capital like book value of net assets. Similarly, Chen et. al., (2005); Mosavi et al., (2012); Rehman et al., (2014); Rehman et al., (2012) are calculated CE as the sum of physical and financial assets, or by deducting intangible assets from total assets.

Capital Employed Efficiency shows how efficiently financial capital is used when creating companies value. CE (capital employed) is usually taken as the book value of net assets of the organization. CEE is defined as follows: CEE =VA/CE, where VA is the value added and CE is the capital employed (Ovechkin, Romashkina and Davydenko, 2021)

This study holds capital employed efficiency as revenue minus cost of revenue, divided by total asset minus intangible assets.

2.1.2 Human Capital Efficiency

Ting and Lean (2009) sees human capital efficiency to include innovation, capacity, creativity, know-how and previous experience, teamwork capacity, employee flexibility, tolerance for ambiguity, motivation, satisfaction, learning capacity, loyalty, formal training

and education in relation the usefulness of its output to total input.

Human capital is the components that emerged from the concept of intellectual capital (Bontis et al., 2000; Tayles et al., 2007). Human capital is the most important asset that exists within a firm. It represents the human factor in an organisation where by combination of intelligence, skills, knowledge, aptitudes and expertise that gives the organisation its distinctive character which those traits contributing to production and profitability, thus improve organizational performance (Bontis et al., 2000 Tayles et al., 2007; Gazor et al., 2013). Additionally, Yusuf (2013) argued that the ability of a corporate organization to successfully implement business strategies solely depends on efficient use of intangibles asset, particularly human capital.

Omaliko and Ajuonu (2022) stated HCE as the ratio of value added to the payments that are received by the employees such as salary, social security etc:

HCE =VA/HC where VA is the value added and HC represents total wages and salaries

Therefore, human capital efficiency can be expressed as revenue minus cost of revenue, divided by staff cost. This suggests that human capital efficiency is the ratio of staff cost to the employee output vis-a-vis her impact on the value of the firm.

2.1.3 Structural Capital Efficiency

Structural capital consists of organizational processes, trademarks, databases, information systems, cultural aspects, and other elements of the intellectual infrastructure of an organization. Structural capital is what stays at the firm after its employees go home and consists of processes, methods, brands, intellectual property structures, and other hidden intangibles. Structural capital is always divided into innovational capital and process capital. Innovational capital represents willingness of a firm to extend innovations through R&D (research and development) and process capital represents activities which are used to improve efficiency and raise the quality of business processes . SCE is the ratio of VA to the part of VA that is referred to structural capital (or SC).

Pulic argues that the less human capital participates in value creation, the more structural capital is involved. Based on this reverse relationship SC can be defined as the difference between value added and human capital:

SC = VA □ HC = OP + D + A

SCE is calculated as follows:

SCE =SC/VA where SC is the difference between VA and HC or the sum of OP, D, and A Equation (6) and VA is the value added.

Structural capital encompasses the firm's ability to reach out to the market, or hardware, software, and others supporting the firm. They are the infrastructure supporting the performance of employees; structural capital is a link of human capital becomes intellectual capital (Sveiby, et al. 1998). Structural capital consists of capital innovations, innovation of organizations to create new products and services and capital process,

namely engineering, systems, processes, and equipment owned by the firm.

2.1.4 Firm Age

The age of the firm is a standard measure of reputation in capital structure models. As a firm continues longer in business, it establishes itself as an ongoing business and therefore increases its capacity to take on more debt; hence age is positively related to debt. Company age is also considered capable of affecting the firm value. Measurement of company age can be seen from how long the company stands or how long the company operates from the date of initial public offering. Research conducted by Ilaboya & Ohiokha (2016) showed that the company age has a positive effect on the firm value. So, the longer the company stands, the higher the firm value. However, research conducted by Onasis & Robin (2016) gives results that the company age does not affect the firm value, so how old company age is not a guarantee that the company has a high value.

Age in general parlance is the length of time during which a being or thing has existed. Shumway (2001) defined firm age as the number of years of incorporation of the company; even though some believe that listing age, should define the age of the company. According to them, listing age is more economical since listing is a defining moment in the company' life. Shumway's argument is debunked from the perspective of the company as a legal personality (Waelchi & Pdferer. 2011). As a legal person, a company is born through incorporation Gitzmann, 2008; Pickering, 2011). Hence, they maintained that firm age is preferred to be year of incorporation as the definition of the age of the company.

Firm age is taken for this study as the difference between current year and year of listing in the stock exchange plus one, expressed in nominal value

2.1.5 Firm Size

El Mehdi (2014) suggested that firm size is influential in that as firm size increases, profits persist due to economies of scale and ability to handle financial risk improves thus influencing stock returns positively. For firms, Stable and wider asset base characterize higher profitability resulting to higher stock returns. Aga, et al. (2013) remarked that company size is the log of firm assets and main cause of variability on shareholder value maximization. In general, company size is measured by the number of total assets owned, because the total assets are generally substantial compared to other financial variables. Researchers calculate the company size with the value of the natural logarithm of total assets.

This current study conceptualises firm size as natural logarithm of total asset. This measure is best for comparing firm size of same currencies within the same country.

2.1.6 Firm Value

Firm value is one of the concepts that have been developed for accounting the real value of the firms more realistically considering the concept of market value. Firm value is a concept demonstrating the value of the firm purified from the cash and cash equivalents and financial debts as regards to the concept of market value (Ilgaz 2010). He expressed firm

value as:

Firm Value = Market value – Total Financial Debts - (Liquid assets + Marketable Securities)

The simple formula for firm value is: Firm value = Market Capitalization + Market Value of Debt – Cash and Equivalents. This can be extended as; the extended formula is: Firm value = Common Shares + Preferred Shares + Market Value of Debt + Minority Interest – Cash and Equivalents

According to Obiora, Omaliko and Okeke (2022), firm value is the perception of the investor to the success of a company. It is reflected in the share price of the company. The increase of the share price shows the trust of the investors to the company. They are willing to pay more with aiming for a higher return. The firm value is the total assets owned. It consists of the market value of share and liabilities (Damodaran, 2002). The ratio of market price to book value ratio can also be used to measure firm value. Firm value is the perception of investors to companies that are often associated with stocks prices. High stock prices make the firm value also high. Research by Hidayah (2014), the high firm value will increase investor confidence to invest in the company because it will be able to provide big dividends to investors. As for the creditor firm value related to the liquidity of the company, i.e., the company is considered able to repay the loan provided by the creditor.

Firm value is also referred to as the takeover value — the amount of money required for an acquirer to buy a company at current market price, inclusive of cash, debt, and other items associated with a business (Bradburd et al., 2015). Firm value is held in this study as market capitalization plus total liabilities less cash flow divided by total asset of the firm calculated in numbers and proxied by Tobin Q.

2.2 Theoretical Framework

2.2.1 Resource Based View theory

The resource- based theory of the firm was propounded by Wernerfelt, (1984) as a combination of ideas of Selznick (1957) and Penrose (1959) concerning the explanation of enterprises being system that outputs resources. It suggests that resources that are valuable, rare, difficult to imitate, and non-substitutable best position a firm for long-term success. These strategic resources can provide the basis to develop firm capabilities that can spring to superior performance and value over time. It also maintains that firms position themselves strategically based on their resources and capabilities rather than their products and services. Within resource-based theory, the key terms include **tangible** resources(physical assets), intangible resources(knowledge, skills, reputation and firm culture), and capabilities(what the firm can do). The theory again contends that the possession of strategic resources provides an organization with a golden opportunity to develop competitive advantages over its rivals which in turns yields strong profit.

RBT is a proper choice to describe research on intellectual capital, especially in the context of the relationship between intellectual capital, financial performance, and firm value. In intellectual capital's perspective, intangible assets of companies are classified into three main categories: human capital, structural capital, and customer capital (Bontis, 1998 in

Ulum, 2013). According to Pulic (2004), each company has unique knowledge, skills, values and solutions –in this case, are intangible resources– that can be transformed into a 'value' in the capital market. Intangible resources that are efficiently managed can assist companies to achieve competitive advantage, increase productivity and its market value. The theory emphasises on firms' resources and resources comprise the firms' assets from employee capabilities, procedures to financial position, data and knowledge. Barney (1991) demonstrated resources to three categories: physical capital which includes innovation, facilities, site and availability of raw materials; human capital in employees' knowledge, skills development, decision making, intellectual ability, connections and personal knowledge; and organisational capital resources in the form of formal reporting structure, formal and informal planning, control and coordination systems, and informal relationships. The resource-based theory seeks to explain how firms can adequately build and implement crucial resources to sustain competitive advantage. Barney et al. (2001) simplified the critical resource characteristics and capabilities, leading to sustained competitive advantage to four which are valuable, rare, inimitable, and non-substitutable. The theory has been greeted with criticism such being tautological. Again, different resources configurations can generate the same firm value and would not be a competitive advantage. The role of product marketing is underdeveloped in the build up of resource based theory. This study is anchored on this theory as it has established that a relationship exist between strategic resources and firm performance and value.

2.3 Empirical Review

Hasan and Hasan (2019) investigated whether intellectual capital plays a significant role in financial performance of banking sector in Iraq. We use value-added intellectual coefficient approach to measure the intellectual capital by aggregating the capital-employed efficiency, Human capital efficiency and structural capital efficiency. For financial performance, we use two proxies, return on assets and return on equity. Initially we regress two models, return on assets and return on equity, on value-added intellectual coefficient approach separately and then regress financial performance with each component of intellectual capital. Overall findings explain significant role of intellectual capital on the financial performance of banking sector in Iraq. Furthermore, intellectual capital components like capital-employed efficiency, Human capital efficiency and structural capital efficiency have a positive and significant relation with return on assets and return on equity, except structural capital efficiency which has no significant effect on return on equity. We also find impact of human capital efficiency much stronger on financial performance than the others components in the banking sector in Iraq.

Garima, Nemiraja and Anto Joseph (2021) investigated whether human capital affects firm value by following a positive methodological approach. According to the classical theory of economic growth, the output of a country depends on its human and physical capital. At the micro-level, the same theory holds true for firm output. Thus, the human capital of a firm should play a significant role in firm performance and therefore firm valuation. Our results show a positive relationship between human capital and firm value. Human capital creates value; first, by better utilization of current growth opportunities; second, by creating future growth opportunities, and lastly, by reducing the volatility associated with the firm growth rate. Also, we test the size effect on the relationship between human capital and firm value

and do not find any differential impact.

Mohammad (2021) empirically investigate if intellectual capital has an impact on profitability while considering the interaction effect of human capital efficiency. The data are drawn from LEAP market of Bursa Malaysia over the three-year period of 2017 to 2019. Modified Value Added Intellectual Coefficient (MVAIC) method is applied to measure intellectual capital and return on asset (ROA) as a proxy for profitability. The empirical findings, after controlling for firm size and leverage, indicate that intellectual capital is positive and significantly associated with profitability. However, the results show a mixed relationship between MVAIC components and profitability. The findings reveal positive and significantly association between human capital efficiency (HCE), capital employed efficiency (CEE) and ROA. Structural capital efficiency (SCE) has significant but negative relationship with ROA. While, relational capital efficiency (RCE) is proven to be statistically insignificant with ROA. However, when HCE interact with SCE and RCE, the results show that HCE moderates positively the effect of SCE and RCE on ROA. This is among the few studies that explore an empirical relationship between intellectual capital and profitability in the context of Malaysian SMEs and making a novel contribution in considering an interaction variable. However, the study examines one country and one industry, therefore, limit the generalisation of findings.

Ovechkin,Romashkina and Davydenko (2021) maintained that economic efficiency is a function of two types of resources: those that are presented in financial statements and those that are not. Non-balance sheet resources are referred as to intellectual capital (IC). The study investigated the relationship between IC, its components and the level of financial profitability. To conduct the analysis, the system generalized method of moments for a broad sample of Russian firms that operate in the agribusiness industry was adopted. They employed the Value Added Intellectual Coefficient (VAIC) and own-created approach that is supposed to respond to the criticism regarding VAIC. Comparison between VAIC and own-created approach to IC estimation revealed that the latter is more appropriate due to its advantages. Our approach unlike VAIC allows measuring both efficiency ratios and the stocks of IC. The results showed that the efficiency of structural capital usage and the stock of human capital have the biggest impact on the profitability level of the agricultural businesses among employed measures of IC.

Yusuf (2013) noted that It has become a common phrase included in banks annual reports and accounts that; "Our employee are our greatest asset", yet there have not been adequate attention given to the value and contribution of this "great asset"on the overall performance of the banks. Human capital efficiency has no significant impact on the EPS and ROE of Nigerian banks that were tested. The study found that efficient utilisation of human capital does not have any significant processes to n the return of equity of banks. Also the size of a bank has no significant impact on it return on equity, while the return on equity of banks cannot be predicted by human capital efficiency and size of the banks.

Adegbayibi (2021) observed that the prolonged neglect of intellectual capital by management of firms is a major challenge due to the paradigm shift towards knowledge economy where performance and competitive edge of firms are no longer primarily a matter of machines and tools but of brains and harnessing those brains. It is in view of this that this study investigated the effect of intellectual capital on performance measures of listed non-financial companies in

Nigeria between year 2007 and 2017. The study adopted ex-post facto research design and data were obtained from secondary sources through the audited annual reports of sampled firms and the fact books of Nigerian Stock Exchange. Data such as human capital efficiency, structural capital efficiency and capital employed efficiency were proxies for intellectual capital while return on equity and return on assets was proxies for financial performance. Sample sizes of fifty (50) out of a population of eighty (80) listed non-financial firms on Nigerian Stock Exchange as at December 2018 were purposively selected for the study. Data collected were analyzed using descriptive statistics and panel regression analysis. The results of the study revealed that human capital efficiency, capital employed efficiency, firm size had significant positive effect on return on equity while human capital efficiency, structural capital efficiency, capital employed efficiency and leverage had a significant effect on return on assets. The study concluded that intellectual capital has positive significant effect on financial performance measures. The study recommended a policy framework for the management to increase intellectual capital utilization through investment in human and customer capital to enhance their financial performance and maintain competitive edge.

Githaiga (2019) noted that the global economy has shifted from being production-based to information-knowledge based. Thus, knowledge resources, and in particular human capital, are considered key drivers of competitive advantage and superior performance. It is from this background this study sought to examine the effect of human capital on firm performance. Data was drawn from 31 commercial banks in Kenya for the period 2008-2017 and was analyzed through descriptive and inferential statistics. The study found that human capital had a positive and significant effect on firm performance (β = 0.447, ρ-value 0.000<0.05). The findings have implications for practitioners and the regulator.

Rezende and Silva (2021). The study aimed at discussing the Value Creation based on the VAIC™ method and as a research field the companies that are part of the B3 (BM&FBOVESPA) Corporate Sustainability Index (ISE) portfolio. As a first approach, we selected the year 2016 after ten years of ISE history. The VAIC components were recovered and computed from the International Financial Reporting Standards ended in December 31, 2015. The hypotheses allowed to affirm the following: (i) there is interdependence among Invested Financial Capital, Intellectual Capital, and Value Creation; (ii) there are dimensions of Value Creation capable of differentiating and clustering the observations; and (iii) the allocative efficiency of companies can vary according to clusters. The main limitation is the size of the population/final sample — 29 corporations. The implications refer to the reinforcement of the theoretical existence of Value Creation based simultaneously on tangible and intangible assets and the possibility to categorize companies to broaden the understanding of the bases for appreciation of the value and pricing of assets traded on the stock exchange platforms.

Hendra and Widya (2018) examined the effect of intellectual capital on the financial performance of the company. Independent variables consisted of structural capital efficiency (SCE), human capital efficiency (HCE), capital employed efficiency (CEE) control variables used in this research are the size and leverage. The population of this study are non-financial companies listed on the Indonesian Stock Exchange. Samples were selected using purposive sampling method and obtained 232 companies. Results showed that HCE has negative effect on the financial performance, SCE has significant positive effect on financial performance, and CEE has significant positive effect on financial performance.

The limitation in the study is sample that are used only limited to the non-financial sector companies listed on the Indonesia Stock Exchange. Future studies are expected to use other measurements to measure intellectual capital and value of the company, and further research is also expected to increase the research data and select other industrial sectors.

3.0 Methodology

Ex-post facto design pattern of research was adopted in this study. The study relied on historic accounting data obtained from financial statements of the sampled firms and intends to determined causal relationship between the independent and dependent variables with a view to establishing the influence that exist between intellectual capital potency and firm value from 2011-2020. Data for the study were collected from the annual reports and accounts of the selected non financial firms quoted on the Nigerian Exchange Group (NGX) and also from the Nigerian Exchange Group Factbook. Out of 107 nonfinancial firms, 76 firms were selected purposively. Based on this a total of 76 firms formed our sample size with 760 observations.

The data collected were analysed using regression analysis, correlational matrix with the aid of STATA V.15. Colinearity existence was also tested using Normality Test (NT) and Variance Inflation Factor (VIF) and Tolerance Value (TV).

3.1   Model Specification

This study adopted the model of Mohammad (2021) to explain the variables' interaction thus;
ROAit = β0 + β1 HCEit + β2 SCEit + β3 RCEit + β4 CEEit + β5 Sizeit + β6 Levit + εit

Then modified it to TobinQit = β0 + β₁ HCEit + β₂ SCEit + β₃ CEEit + β₄ Sizeit + β₅ Firagit + εit

Where: Tobin q= firm value; HCE= Human capital efficiency, SCE = structural capital efficiency, CEE = capital employed efficiency. SIZE = firm size, Fira = firm age, Є = is the error component for company i at time t assumed to have mean zero E [ε_{it}] = 0, β0= Constant, β= 1, 2,…5 are parameters to be estimate; i = non financial firms, i = 1. . . 6; and t = the index of time periods and t = 1. . . 6.

4.1   Data Analysis

Table 1: Descriptive Statistics

Stats	TOBQ	CEE	HCE	SCE	FIRA	FSIZ
Mean	.0766924	.236416	3.98245	.5751604	26.73947	7.111685
p50	.0017768	.201	3.00075	.7	28	7.0142
Max	3.002161	5.8538	73.3844	18.6774	56	9.3059
Min	-.9062282	-1.2159	-16.3314	-20.5332	2	5.2394
Sum	760	760	760	760	760	760

Author's Computation (2022)

The above table shows that the mean value of firm value in the sampled non financial firms was 0.0766924. The median firm value was 0.0017768. The maximum firm value was 3.002161 while the minimum value stood at -0.9062282. This therefore means that firms with higher value or equal to the median value of 0.0766924 expressed as p50≥0.0766924 has improved firm value as a result of improved efficiency, while firms with value ≤ -0.9062282 had deteriorating firm value. We also observed that the average firm age of sampled firm was 26.73 with a maximum of 56 and minimum of 2 years respectively. This suggests that firms above 26.73 years are quite old while those below are seen to be young. The average firm size was 7.111222 with a maximum firm size latching around 9.3059 and a minimum of 5.2394 for the sampled quoted non financial firms in Nigeria between 2011 to 2020.

Normality Test

Table 2: Shapiro-Wilk W Normality Test

Variable	Obs	W	V	Z	Prob>z
TOBQ	760	0.79270	101.856	11.320	0.00000
CEE	760	0.51461	238.499	13.403	0.00000
HCE	760	0.64480	174.530	12.638	0.00000
SCE	760	0.30505	341.469	14.281	0.00000
FIRA	760	0.93326	32.792	8.545	0.00000
FSIZ	760	0.98701	6.383	4.538	0.00000

The Shapiro-Wilk W test for normality holds that the data was normally distributed as the Prob>z is 0.0000 for the variables at 5%. See appendix.

Table 3: Correlation Matrix

	TOBQ	CEE	HCE	SCE	FIRA	FSIZ
TOBQ	1.0000					
CEE	0.1530	1.0000				
HCE	0.0460	0.5909	1.0000			
SCE	-0.0064	0.0395	0.0896	1.0000		
FIRA	0.1181	0.0899	-0.0124	0.0070	1.0000	
FSIZ	0.0479	-0.0074	0.2557	0.0879	0.1121	1.0000

The result of the correlation reveals that the adopted variables are not correlated. That means none of them can be substituted for the other. See appendix

Variance Inflation Factor

The VIF of the study stood at 1.32 and below the threshold of 10. This suggests that multi collinearity is ruled out amongst the variables of interest. See appendix

4.2 Test of Hypothesis

The hypotheses were tested using fixed and random effect, and a confirmatory test with hausman test to decide an efficient option to interpret the result (0.0002). Here, the study adopts fixed effect as the p-value > $\chi2$ is less than .05 (Gujarati, 2004; Ajibolade & Sankay, 2013). In table 1.3, we observed that the adjusted R-Squared values was 0.0517. This indicates that all the independent variables jointly explained 5% of what happened in the firm value dependent variable. The Prob > f= 0.0000 was also observed to confirm the fitness of the model adopted. In addition to the above, the specific findings from each explanatory are provided as follows:

HYPOTHESIS 1: **capital employed does not influence firm value of Non financial listed firms in Nigeria**

The fixed effect Panel regression presented above showed the result of the variable of capital employed efficiency as follows: (CEEE) (Coef. = -.0271526, t = -0.46 and P value = 0.644). Following the results above, it is revealed that the effect of capital employed efficiency on firm value is negative and non significant. Based on the result, the study accepts the null hypothesis.

HYPOTHESIS 2: **human capital employed efficiency does not significantly influence firm value of quoted non financial firms in Nigeria**

The result showed the variable of human capital employed efficiency (HCEE) (Coef. = .0015041, t = 0.45 and P value = 0.652). It is revealed that the effect of human capital employed on firm value of non financial firms in Nigeria is positive and non significant. Based on the result, the study accepts the null hypothesis and concludes that human capital employed has no statistical insignificant effect on firm value of quoted non financial firms in Nigeria.

HYPOTHESIS 3: **structural capital employed efficiency does not significantly influence firm value of quoted non financial firms in Nigeria**

The result showed that structural capital employed efficiency (HCEE) (Coef. = -.0026645, t = -0.42 and P value = 0.676). It is revealed that the effect of structural capital employed on firm value of non financial firms in Nigeria is positive and non significant. Based on the result, the study accepts the null hypothesis and concludes that structural capital employed has no statistical insignificant effect on firm value of quoted non financial firms in Nigeria.

5.1 Conclusion

This study explored the influence of intellectual capital on firm value of seventy six quoted firms in the Nigeria for ten years under review (2011-2020).

This result concludes that only human capital employed efficiency and firm age influenced firm value positively.

5.2 Recommendation

Based on the findings of this research, the following recommendations were made.

i.   The human capital component of intellectual capital should be trained and educated regularly, innovated, nurture capacity, creativity, know-how and previous experience, teamwork capacity, employee flexibility, tolerance for ambiguity, motivated, satisfied, so as to enhance the usefulness of its output to total input.

ii. Firm specific growth and sustainability policy should strongly placed using corporate governance code and other enhanced internal structural innovative processess to ensure that the firm does not extinct.

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Variable	VIF	1/VIF
HCE	1.75	0.572115
CEE	1.64	0.610063
FSIZ	1.15	0.872737
FIRA	1.04	0.963766
SCE	1.01	0.987440
Mean VIF	1.32	

Fixed-effects (within) regression

Number of obs = 760
Group variable: panelid
Number of groups = 76
R-sq: within = 0.0517
Obs per group: min =10
between = 0.0108
avg = 10.0
overall = 0.0017
max = 10

F(5,679) = 7.40

corr(u_i, Xb) = -0.7862
Prob > F = 0.0000

TOBQ	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
CEE	-.0271526	.0587676	-0.46	0.644	-.1425406	.0882354
HCE	.0015041	.0033350	0.45	0.652	-.0050442	.0080523
SCE	-.0026645	.0063748	-0.42	0.676	-.0151811	.0098522
FIRA	.0018506	.0035482	0.52	0.602	-.0051162	.0088173
FSIZ	-.3649584	.0644375	-5.66	0.000	-.4914792	-.2384376
_cons	2.624641	.4261035	6.16	0.000	1.788002	3.461280
sigma_u	.39972059					
sigma_e	.25166777					
rho	.71612319	(fraction of variance due to u_i)				

F test that all u_i=0:   F(75, 679) =   8.92   Prob > F = 0.0000

Random-effects GLS regression

Number of obs = 760
Group variable: panelid
Number of groups = 76
R-sq: within = 0.0230
Obs per group: min = 10
between = 0.0000
avg = 10.0
overall = 0.0008
max = 10

Wald chi2(5) = 5.23

corr(u_i, X) = 0 (assumed)
Prob > chi2 = 0.3882

TOBQ	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
CEE	.0437687	.0568475	0.77	0.441	-.0676504	.1551877
HCE	-.000868	.0032257	-0.27	0.788	-.0071902	.0054543
SCE	-.0028409	.0064935	-0.44	0.662	-.0155679	.0098861
FIRA	.0012449	.0017530	0.71	0.478	-.002191	.0046809
FSIZ	-.0569811	.0297995	-1.91	0.056	-.115387	.0014248
_cons	.443378	.2094334	2.12	0.034	.0328961	.8538599
sigma_u	.21122947					
sigma_e	.25166777					
rho	.41330252	(fraction of variance due to u_i)				

. hausman icfix icran

```
        ---- Coefficients ----
    |    (b)          (B)           (b-B)     sqrt(diag(V_b-V_B))
    |   icfix        icran        Difference         S.E.
-------------+----------------------------------------------------------------
   CEE |  -.0271526    .0437687     -.0709213         .0148992
   HCE |   .0015041   -.0008680      .0023721         .000847
   SCE |  -.0026645   -.0028409      .0001764            .
  FIRA |   .0018506    .0012449      .0006056         .0030849
  FSIZ |  -.3649584   -.0569811     -.3079773         .0571331
-------------------------------------------------------------------------------
```

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 23.71

Prob>chi2 = 0.0002   (V_b-V_B is not positive definite)