An Open Access Journal
• ISSN: 2814-1105

Nigerian Journal of Social Development

Research Article | Homepage: www.arabianjbmr.com | AGJ

AN EVALUATION OF HUMAN CAPITAL EFFICIENCY ON PERFORMANCE OF LISTED SERVICE FIRMS IN NIGERIA

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ABSTRACT

This study evaluates the effect of human capital efficiency on financial performance of listed service firms in Nigeria, ranging from 2010 to 2019. The independent variable is human capital efficiency, while the dependent variables are, net profit after tax margin, gross profit margin and profit before tax margin. The researcher employed earnings before interest and tax margin to control the model which is in line with related extant literature. Ex-post facto research design was along with sample size of sixteen (16) out of twenty-five (25) quoted service firms in Nigeria Stock Exchange. The data for the study was sourced from the Nigerian Stock Exchange Fact Books and related companies' Annual Financial Reports for the periods covered. Specifically, the author conducts pre regression analysis which includes descriptive statistics, correlation matrix, and normality of residua analysis. Basically, the Panel Ordinary Least Square Regression analysis was first conducted, and several diagnostic tests were carried out to check if it violates the basic Gauss Markov Theorem and assumptions. These post regression test include homoscedasticity and multicollinearity tests. A critical examination of all the diagnostic test revealed that the models failed the homoskedasticity assumption of the OLS estimates and thus, the researcher adopted the Robust Standard Error technique to correct for this problem. Findings from the robust standard error estimator reveals that: Human capital efficiency has a negative insignificant effect on net profit after tax margin and positive significant effect on gross profit margin. On profit before interest and tax margin, human capital efficiency has a positive insignificant effect. It was therefore, recommended that service firms will achieve high performance relating to gross profit margin if they continuously train and retrain their staff to acquire cognate and state-of-art skills to deliver services.

ARTICLE INFO

Keywords:
Net profit After Tax, Gross Profit Margin, Profit Before Tax, Human Capital Efficiency, Earnings Before Interest and Tax.

Article History:
Received: 21 Jun 2021
Revised: 10 Jul 2021
Accepted: 12 Nov 2021
Available Online: 22 Dec 2021

1. INTRODUCTION

Human capital is one component of intellectual capital and the most innovative feature for firms to act on according to the environmental changes through their knowledge, experience, and capabilities, which is applied to improve the organizational efficiency. Human capital has been coherently recognized in both old and recent literature on finance, accounting, economics and management because of its relevance to the success of any economic organization. According to Ovechkin, Romashkina, & Davydenko (2021), human capital efficiency is generally seen as one of the most essential drivers that contribute to the improvement of firm competitiveness and value generation in the knowledge economy. It is in view of this that the researcher argues that efficiency of human capital is a boost to firm productivity which translates visibly into increase in sales revenue, increase in assets base and increase in share value. Listed service firms, which is often said to be the backbone of the Nigerian economy, have been under increasing pressure which is posed by changes in the business environment, such as change in customer tastes, change in market demand and requirements, changes in marketing methods and production process. It is in a bid to remain competitive and respond to the above dynamism that listed service firms are pressured to improve the human capital asset of their firm, which are essentially drivers of and indispensable for competitive edge and value creation (Xu & Liu, 2020; Olaoye & Afolalu, 2020; Abubakar, Ayuba, Ishaya & Olanrewaju, 2020). Human capital efficiency is the measure of how well the human resources of a firm contribute to the process of adding value to the firm. Human capital efficiency is more emphasized in corporate literature because it is often believed to bring about innovations, creativity, work efficiency, work accuracy and strategic renewal in firm

performance (Ovechkin, Romashkina, & Davydenko, 2021). The human resource or employees of the firm are managed via human capital accounting so that they contribute significantly to the overall productivity of the firm (Olaoye & Afolalu, 2020). However, most listed service firms in Nigeria are yet to develop a good structure that values, measures and harnesses the human capital assets of the firm. It is presumed that efficient human capital management has the potentiality of increasing net profit after tax margin, gross profit after tax and profit before tax due to optimal utilization of the knowledge base, skills, and the intellect of the work force. Recently, firms that stand the competitive business environment are only those that are able to optimize their human capital base due to dynamic global market economy which used to be characterized by industry-based; has currently moved from resource-based to knowledge-based economy (Abubakar, Ayuba, Ishaya & Olanrewaju, 2020).

However, the economic downturn in the Nigerian listed service firms coupled with the business disruption which COVID-19 brought about, has led to down-sizing of the staff strength of some of the firms who could not keep up with the increasing staff costs and personnel expenses. Listed service firms find it hard sending staff on off-job training as a result of tight working schedule. In a rare situation whereby listed service firms commit enormous financial resources to the development and training of staff, other necessities such as staff health care and other personnel benefits, thwart this noble effort, thereby leading to human capital inefficiencies and decline in corporate growth. More so, the cost of staff development is often expensed under the traditional corporate reporting notwithstanding that such capital costs are meant to be recognized as assets.

As a consequence, inefficiency in human capital has led to a number of challenges that have thwarted the growth potentials of firms in Nigeria. Such inadequacies have resulted in loss of customers' loyalty, increased cost of production, loss of market competitive edge, un-sustained profitability and decline in the rate of turnover. Human capital inefficiency is an indicator of a thwarted corporate productivity, which signifies that the firm has failed to efficiently utilize the resources available to the firm in order to create more value for the shareholders. Ultimately, shareholders' wealth is often not maximized, and share price depreciates coupled with low financial performance.

Furthermore, there are a number of literatures that examined the effect of human capital efficiency on the corporate performance of firms, both in Nigeria and in abroad. Those studies that were conducted abroad such as Alfiero, Brescia and Bert (2021); Ovechkin, Romashkina and Davydenko (2021); Ngoc and Duc (2020); Nguyen and Doan (2020); Nassar (2020); Aleem (2020); Aleksandra and Ognjanović (2019); though, their findings are not entirely invalid but they cannot be suitably represent the peculiarities of the Nigerian business environment. On the other hand, there are a cup full of local researches that have tilted towards the direction of the present study. Such studies conducted in Nigeria include; Okeke and Udeh (2020); Ayuba, Chechet, Ahmed and Olanrewaju (2020); Olaoye and Afolalu (2020); Nwaiwu and Aliyu (2018); Ofurum, Onuoha and Nwaekpe (2018); Vitalis (2018); Kurfi, Noraza and Saleh (2017); Ajike and Danjuma (2016); and others. and others. However, to the best knowledge of the researcher, none of the local studies derived its evidence from the Nigerian listed service industry. It is against this backdrop that this present study examines the extent to which human capital efficiency affects the corporate performance of listed service firms in Nigeria.

1.1 Objectives of study

The main objective of this study is to examine the effect of human capital efficiency on firm performance of listed service firms in Nigeria. However, the specific objectives of this study are to:

a. Investigate the effect of human capital efficiency on net profit after tax margin of listed service firms in Nigeria.
b. Examine the effect of human capital efficiency on gross profit after tax margin of listed service firms in Nigeria
c. Determine the effect of human capital efficiency on profit before tax of listed service firms in Nigeria

2. LITERATURE REVIEW

2.1 Concept of Human Capital

Abubakar, Ayuba, Ishaya and Olanrewaju (2020) submitted that human capital comprises the knowledge, ability, attitude, expertise and professional qualities which an employee possesses. Human capital can as well be seen as the competence of an employee to create both tangible and intangible assets through contributing towards the continuous generation of ideas and knowledge. Human capital comprises the knowledge, experiences, skills, and abilities of staff. Udeh & Okeke (2020) argued that some of this knowledge is unique to the individual staff while some may be generic to all the workforce. Unarguably, human capital is the largest and the most relevant intangible asset of a firm which ultimately provides the goods or renders the services which customers require. Human capital are the core resource that provides the solutions to customer problems using their (personnel's') collective knowledge, experience, competency, skills and talents.

Furthermore, Emerole, Ibeh and Sampson (2016) conceptualized human capital as the stock of knowledge, habits, social and personality attributes which comprise the creativities that are embodied in the ability to perform labour in order to produce some economic values. Through human capital development, firms are able to train and develop these potential

capabilities of the human capital for an improved corporate productivity and possibly, growth. The relevance of human capital development is to help maximize the firm's manpower for the benefit of both the workforce and the firm.

2.2 Concept of Human Capital Efficiency

Human capital efficiency is the measure of how well the human resource of a firm contribute to the process of adding value in the firm. That is to say, human capital become efficient when it is upgraded via training and development which harnesses the existing skills and expertise of the employees in order to extract the best from them (Olaoye & Afolalu, 2020). According to Udeh and Okeke (2020), human capital efficiency is a measure of the value that was added to the firm by the human resources of the firm. This value is measured by a model which is termed Value Added Intellectual Coefficient (VAIC). Human Capital Efficiency is the Value Added (specifically by the human assets) divided by staff costs, which are made up of personnel expenses salaries and benefits from the firm. Human capital efficiency is achieved through human capital accounting whereby the firm engages in the process of acquiring, training, developing and retraining of its workforce so that the staff in question can contribute more efficiently and effectively to the performance of the firm.

2.3 Concept of Corporate Financial Performance

Corporate financial performance can be referred to as the level of productivity that the organization can accomplish towards attaining its goals, increasing organizational resources, meeting customer's needs and improving internal processes. The available resources could be human, material or financial resource. It is said that the organization has grown if it maximizes the resources at its disposal and increases the value of such resources. Organizational performance is the ability of a firm to add more value to the corporate worth by satisfying its employees, gaining competitive advantage, retaining employees, boosting productivity and minimize costs. Corporate performance is usually evaluated by estimating the values of qualitative and quantitative performance such as, net profit after tax, return on investment (ROI), return on equity (ROE), growth of net assets, capital structure or leverage, gross profit margin and profit before tax, number of clients and costs. Having noted that, one can argue that organizational performance entails the outcome of work done in an organization, it is often as a result of increase in organizational profitability, organizational efficiency, and organizational effectiveness (Olaoye & Afolalu, 2020). In this study, corporate financial performance is measured by Net Profit After Tax, Gross Profit After Tax and Profit Before Tax.

3. THEORETICAL FRAMEWORK

3.1 Theory of Human Capital

According to Ofurum, Onuoha and Nwaekpe (2018), human Capital theory originated from the emergence of classical economics in 1776 and thereafter developed as a scientific theory. In the same year, Adam Smith developed the idea of investing in human capital. Adam Smith theorized that in the Wealth of Nations, the apparent differences between the ways of individual working which is as a result of different levels of training and education are reflected differences in the returns that are necessary to defray the costs of acquiring those training and skills. The Theory of Human Capital is basically focused on the quality, not quantity, of the labour supply. One of the fundamental postulations of the theory is that employee formal education, training and skills are all what that determine their earning power. The theory further emphasizes that competences, skills, knowledge and abilities of the employees contribute to firm competitive advantage. Human Capital Theory is an approach that values resourcing, human resource development, and reward practices and reward system since the theory believes that staff costs, employee training and development are investment that may bring about future economic benefits and financial returns to the firm. The theory of Human Capital believes that a workforce that is more experienced, educated and possesses the relevant skills have the tendency to make it easier for a business organization to attain its objectives such as increased corporate performance, sustainability and firm growth. According to Emerole, Ibeh and Sampson (2016), Human Capital Theory believes that the ability and competence of human capital in a firm influence how well the organization performs and of course determines the extent of financial growth the firm attains. Human Capital, in line with the theory, effectively optimizes other resources in the firm with the view to achieving the corporate objectives of the firm. For this reason, the present study is theoretically anchored on the Human Capital Theory.

3.2 Empirical Review

Davydenko, Gulnara and Ovechikin (2021), determined the relationship between human capital efficiency and the level of financial profitability. To conduct the analysis, the researchers used the system generalized method of moments for a broad sample of Russian firms that operate in the agribusiness industry. The study employed two financial approaches to human capital estimation. The first one was the Value Added Intellectual Coefficient (VAIC). The second one was own-created approach that was supposed to respond 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. General method of

moments and Ordinary Least Square Regression were used as estimators in the study. The results showed that the efficiency of human capital significantly affect the profitability level of the selected agricultural businesses in Russia.

Xu and Liu (2020) examined the impact of human capital efficiency on the performance of Korean manufacturing firms. The study covered a period of 5 years that spanned through 2013-2018. The modified and extended Value Added Intellectual Coefficient (VAIC) model was adopted to more accurately measure human capital efficiency, and firm performance was systematically and comprehensively measured in three distinct parameters: profitability, productivity and market value. Regression analysis was used to analyze the data that were gathered. The regression results show that physical capital was the most influential factor to firm performance; human capital was viewed as a performance enhancing measure; structural capital had no significant impact on firm performance; and innovation capital and relational capital hurt a firm's profitability. It was also evident that the modified and extended VAIC model performs better than the original VAIC model proposed by Pulic (1998). This study extended the understanding of intellectual capital in achieving a competitive edge in the manufacturing sector, with intellectual capital representing a valuable platform for the sustainable development of the manufacturing sector in emerging Asian markets.

Olaoye and Afolalu (2020), examined the effect of human capital accounting on Earning per Share (EPS) of deposit money banks in Nigeria. Secondary data were collated from annual reports of the sixteen deposit money banks listed on the Nigerian Stock Exchange between 2006 and 2017. The study employed static panel data of fixed and random effect to explore the relationship between human capital accounting and EPS of deposit money banks in Nigeria. Post estimation test (Hausman Test) was also conducted to select the best and most consistent estimator. Random effect was selected to achieve the stated objective. The results of the random effect revealed that the pension and training and development have significant positive relationship with EPS while other salaries and wages have insignificant positive relationship except director's remuneration (RENMR) that has insignificant negative relationship with EPS. This also implies that training and development, and pension are critical factors that are germane to human capital accounting to boost the earning per share so as to enhance the performance of the banks. The reported adjusted R-Square of value of 0.3876 which is 39% of the systematic variation of the EPS of the firms could be jointly explained by the salaries and wages, training and development, director's remuneration and pension. Based on these finding, the management of banks were advised to give priority to payment of pension and also engage in continuous training and development of their employees to enjoying better EPS.

Abubakar, Ayuba, Ishaya and Olanrewaju (2020), examined the effect of Intellectual Capital (IC) on financial performance (FP) of all listed Nigeria's deposit money banks (NDMBs) for the period 2013-2017. Audited financial reports of the financial institutions were used as a source of secondary data. Value Added Intellectual Coefficient (VAIC^{TM}) model of Pulic (1998) was adopted to measure the various IC components which are: capital employed efficiency (CEE), human capital efficiency (HCE) and structural capital efficiency (SCE) while return on asset (ROA) served as a measure to financial performance. Multiple regression analysis was employed to test the four hypotheses at 5% level of significance. Results of the study show that IC in aggregation (VAIC) has significant positive effect on ROA of NDMBs. However, the individual analysis of IC components shows a diverse result. SCE reveals a significant negative relationship with ROA while CEE and HCE show a positive significant effect on ROA of NDMBs. The study therefore concluded that personnel and capital plays a big role in the profitability and competitiveness of NDMBs. Thus, the study recommended among other things that NDMBs intending to further improve their financial performance should focus more on improving their IC.

Nguyen and Doan (2020), investigated the impact of intellectual capital on firm value in the context of Vietnam. The research sample includes 61 manufacturing companies listed on Vietnam stock market for the period from 2013 to 2018. Three statistical methods approaches are employed to address econometric issues and to improve the accuracy of the regression coefficients include Ordinary Least Square (OLS), Random Effects Model (REM) and Fixed Effects Model (FEM). This research uses value-added intellectual capital (VAIC) to measure the intellectual capital of a firm. Value-added intellectual capital (VAIC) is considered as an effective measure by which a company uses material, financial, and intellectual capital to increase. The VAIC includes the sum of three components: Human Capital Efficiency (HCE), Structure Capital Efficiency (SCE) and Capital Employed Efficiency (CEE, including physical and financial capital). The study measured firm value using Tobin's Q ratio. Some control variables such as leverage, firm size, growth rate, and state capital are used in the regression model that pointed out the impact of intellectual capital on a firm value. The empirical results show a statistically significant positive impact of value-added intellectual capital (VAIC) on a firm's profitability. This evidence provides a new insight to managers on how to improve the value of manufacturing companies listed on Vietnam stock market.

Muhammad (2020), determined the relationship between intellectual-capital and firms' financial performance in the emerging market of Pakistan. The study deployed the use of an ex-post facto research design. This study employed unbalanced panel data of 152 non-financial publicly firms that are quoted on Pakistan Stock Exchange for the period of seven years (2012-2018). Value added intellectual coefficient model initiated by Pulic (1998) was incorporated for measuring and computing intellectual capital. Pooled Ordinary Least square regression was used to test the hypotheses of

the study. The pooled OLS results revealed that VAIC is highly significant and positively related with FFP in terms of ROA, ROE, and ATO whereas the individual constituents of VAIC such as Human Capital Efficiency, Structural Capital Efficiency and Capital Employed Efficiency also have significant and positive association with the financial performance of quoted Pakistan firms.

Sedeaq (2020), ascertained the nature of the relationship between human capital efficiency and corporate financial performance of firms. The study covered 34 from 48 companies listed on Palestine Exchange (PEX) over the period of 2012-2018. Pulic's method of "Value Added Intellectual Coefficient (VAIC)" was deployed to measure human capital efficiency, and three of traditional accounting tools involving; return on equity (ROE), return on assets (ROA), and earning per share (EPS) ratios were used as proxies of firm financial performance. The findings of Panel data model showed that human capital efficiency (HCE) is considered as the most effective element of intellectual capital in the issue of value creation than structural capital and capital employed. Moreover, VAIC showed a good relationship with financial performance represented by return on assets (ROA).

Omodero and Worlu (2016), examined the effect of human capital development on financial performance of banks in Nigeria. The specific objective was to determine the extent to which the banks Personnel development and welfare affects the Profit After Tax, Total Revenue and the Net Asset. The research design employed was a cross sectional survey design. Time series data which comprise PDW, PAT, TR, and NA of quoted commercial banks in the NSE were the secondary data used. Statistical tools of Multiple Linear Regression and student t-test were used for the analysis. The regression model was estimated through the use of statistical package for social sciences (SPSS). The three null hypotheses used in this study were tested at 5% level of significance. The result obtained showed a no effect on PAT and no effect on TR, but a negative effect on NA. The p-value for all the independent variables are not significant. The F-test showed a good fit for the model. The study therefore concludes that banks have not invested adequately on human capital development that is why the effect on financial performance is not significant. Therefore, commercial banks in Nigeria were advised to give more attention to human capital development by way of training and adequate welfare to enhance their productivity.

Ozkan, Cakan and Kayacan (2017), analyzed the relationship between the human capital performance and financial performance of 44 banks operating in Turkey between 2005 and 2014. The human capital performance of banks was measured through the value added intellectual coefficient (VAIC) methodology. The intellectual capital performance of the Turkish banking sector was shown to be generally affected by human capital efficiency (HCE). In terms of bank types, development and investment banks have the highest average VAIC. When VAIC is divided into its components, it can be observed that capital employed efficiency (CEE) and human capital efficiency (HCE) positively affect the financial performance of banks. However, CEE has more influence on the financial performance of banks compared to HCE. Therefore, banks operating in the Turkish banking sector were advised to use their financial and physical capitals if they wish to reach a higher profitability level.

4. RESEARCH METHODOLOGY

This study used *ex post facto* research design. The *ex post facto* method of research seeks to establish causal relationships between events and circumstances. The population of this study is made up of service firms that are listed on the floor of the Nigerian stock exchange market for the period between 2010 and 2019 as at 31st December, 2019. and the total number of listed service firms were 25. The Taro Yamane Formula is used to determine the sample of this research which is 23 listed service firms. However, firms that got listed on the exchange market after the start period of this study (2010) or that got delisted before the end period of this study (2019) were deselected. Thus, our final sample size consists of 16 listed service firms. This study employed secondary data source. The data for the sampled service firms were sourced from the Nigerian Stock Exchange Fact Books and related companies' Annual Financial Reports for the periods covered in the study. This study made use of Spearman Rank correlation analysis and also employed Panel Least Square (PLS) regression analyses. Gujarati (2004) suggests some critical assumptions that must be met in validating the least square regression estimates. First, is the assumption of normality of residua which requires that the samples must be drawn from a normally distributed population if we must rely on the t-statistics. We examined this assumption using Shapiro Wiki test. Second, is the assumption of linearity of the model parameters (model specification error). Third, is the assumption of homoscedasticity which requires the variance of the error term across the group to be equal and fourth is the test for multi-collinearity. To carry out the test for multi-collinearity, this study employed variance inflation factors (VIF) technique as recommended by Gujarati (2004).

4.1 Model Specification

The model for this study is adopted from the study of Pulic (2004) to express the econometric equation as:

$NPTM_{it} = b_0 + b_1HCEE_{it} + b_2EITM_{it} + e_{it}$ ……(1)

$GPTM_{it} = b_0 + b_1HCEE_{it} + b_2EITM_{it} + e_{it}$ ……(2)

$PBTM_{it} = b_0 + b_1HCEE_{it} + b_2EITM_{it} + e_{it}$ ……(3)

Where:

NPTM	=	Net Profit after tax margin
GPTM	=	Gross profit margin
PBTM	=	Profit before tax margin
HCEE	=	Human capital efficiency
EITM	=	Earnings before interest and tax margin
"{i}"	=	Cross Section (Sample Service firms)
"t"	=	Time Frame (2010 to 2019)
e_{it}	=	Stochastic error Term

4.2 Operationalization of Variables

These are the operational definitions (tabulated) of the variables used in the study, i.e., the dependent and independent variables.

Table 1

Operationalization of Variables

Variables	Measurement	Source
NPTM (Dependent Variable)	Net Profit before tax margin in percentage is computed as profit after tax divided by revenue or sales.	Pulic (2004),
GPTM (Dependent Variable)	Gross Profit Margin in percentage is computed as gross profit divided by revenue or sales.	Pulic (2004),
PBTM (Dependent Variable)	Profit before tax margin in percentage is computed as profit before tax divided by revenue or sales.	Pulic (2004),
HCEE (Independent Variable)	Human Capital Efficiency is computed as Revenue minus cost of revenue divided by Staff Cost	Pulic (2004),
EITM (Control Variable)	EBIT margin in percentage is computed as Earnings before interest and taxes divided by revenue or sales.	Pulic (2004),

Source: Researcher's Compilation 2021

5. DATA PRESENTATION, ANALYSIS AND DISCUSSION

5.1 Descriptive Statistics

Table 2

Below shows the descriptive statistics for this study by firm year category.

summarize nptm gptm pbtm hcee eitm, separator (0)

Variable	Obs	Mean	Std. Dev.	Min	Max
nptm	155	-11.28643	80.96533	-675.4726	168.7132
gptm	155	35.14091	27.34811	-166.2416	100
pbtm	155	-10.18362	84.1227	-673.9995	188.4002
hcee	159	2.995209	2.827684	-3.1284	16.6473
eitm	155	-.542046	65.92086	-511.5227	194.4973

To examine the relationship between Human Capital Efficiency and firm performance, first, we conduct descriptive statistics which gives insight into the nature of the data obtained from the sampled firms. The result from the descriptive statistics table above shows that the on average, performance level for the sampled companies in terms of Net Profit After Tax, has negative mean value of (-11.28643), likewise Profit Before Tax, with a negative mean value of (-10.183662). Again, it is quit noticed that only Gross Profit Margin has positive performance which reached about (188.4002) meaning that continuously training and retraining of staff to acquire cognate and state-of-art skills to deliver services, can lead to high firm performance and competitive advantage. More than these, the descriptive statistics showed that the Earnings before Interest and Tax has a negative value of (-.542046) while the human capital efficiency of the firms in question is 2.995209.

5.2 Test for Normality Residual

Shapiro-Wilk test is the most powerful normality test and conducted a residual normality test, as shown in the table below:

Table 3
Shapiro Wilk Test for Data Normality

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
nptm	155	0.40691	70.978	9.680	0.00000
gptm	155	0.74075	31.025	7.800	0.00000
pbtm	155	0.40486	71.224	9.687	0.00000
hcee	159	0.74842	30.775	7.792	0.00000
eitm	155	0.40789	70.861	9.676	0.00000

From the table above, it is observed that the dependent variable of net profit after tax margin (Prob > z = 0.00000), gross profit margin (Prob > z = 0.00000), and profit before tax margin (Prob > z = 0.00000) are not normally distributed since the probability of the z-statistics is significant at 1%. The same can be said for the independent variables of human capital efficiency (Prob > z = 0.00000) and the control variable of earnings before interest and tax margin (Prob > z = 0.00000). This is justified following the study of Bera and Jarque (1982).

5.3 Correlation Analysis

This study employs the Spearman Rank Correlation technique to conduct the possible association between the variables of interest shown in the **Table 4** below:

Table 4
Spearman Rank Test for Correlation

Key
rho
Number of obs
Sig. level

	nptm	gptm	pbtm	hcee	eitm
nptm	1.0000				
	155				
gptm	0.2535*	1.0000			
	155	155			
	0.0015				
pbtm	0.9500*	0.2468*	1.0000		
	155	155	155		
	0.0000	0.0020			
hcee	-0.0966	0.2934*	-0.0851	1.0000	
	155	155	155	155	
	0.2319	0.0002	0.2923		
eitm	0.8272*	0.1030	0.8551*	-0.0510	1.0000
	155	155	155	155	155
	0.0000	0.2023	0.0000	0.5284	

5.4 Spearman Rank Test for Correlation

Specifically, the analysis from the spearman rank correlation showed that the independent variable of human capital efficiency has a negative association with the dependent variable of net profit after tax margin (-0.0966) as well as a negative association with the dependent variable of profit before tax margin (-0.0851). However, we observed a positive association between human capital efficiency and the dependent variable of gross profit margin (0.2934). For the control variable of earnings before interest and tax margin (EIBTM), we observed that it has a positive association with all three dependent variables. All associations are seen to be weak (less than 80%) hence there is room to suspect the presence of multicollinearity in the estimated model.

5.5 Regression Analysis

The study carries out Panel Least Square Regression analysis and proceed to check if the basic assumption of the pool least square regression has been violated. The results obtained from the panel least square regression is as shown in the table below;

Table 5
Panel Least Square Estimation Result

Models	NPTM	GPTM	PBTM
Variables			
Human capital Efficiency (HCEE)			
Coefficient	0.304	3.182	0.439
t_ Statistics	(0.52)	(5.08)	(0.77)
Probability_t	{0.601)	{0.000) *	{0.440)
EITM			
Coefficient	1.187	0.188	1.237
t_ Statistics	(47.06)	(6.90)	(50.24)
Probability_t	{0.000) *	{0.000) *	{0.000) *
No. of Obs	155	155	155
Prob. F statistics R^2	0.0000	0.0000	0.0000
	0.9374	0.3626	0.9448

Source: Author's computation 2021

5.6 Test for Multi-collinearity

Multi-collinearity is viewed as the presence of interdependence signified by high inter-correlations within a set of variables. In this study like in most other related studies, the researcher employs the variance inflation factor (VIF) technique to diagnose the presence or absence of multi-collinearity in the return on asset model. A cut-off value of 0.44 is given for regarding a VIF as high. Specifically, the researcher follows Gujarati (2004) which allows VIF to be less than 5. However, the result as depicted from the table above showed that VIF is less than five (5) for all independent variables of interest. Therefore, there is no problem of multi-collinearity.

Table 6
Regression Diagnostic Test

Models	NPTM	GPTM	PBTM
Multi-collinearity (VIF)	1.02	1.02	1.02
Heteroscedasticity			
	0.0007	0.0000	0.0000

Source: Author's computation 2021

5.7 Test for Homoskedasticity

When data come from a normally distributed population, rejection of the Breusch-Pagan test implies non-homogeneity of co-variances. However, if the population distribution is not known, then rejection of the Breusch-Pagan test can be due to either non-normality or non-homogeneity of co-variances. In general, one does not know whether the data are normally distributed. First, the researcher applies the Breusch-Pagan test. If the test is not rejected, then there is no ground to suspect non-normality or heterogeneity of co-variances. On the other hand, if the Breusch-Pagan test is rejected, then apply a nonparametric test of homoscedasticity. If the nonparametric test is not rejected, then it may conclude that the data are non-normal; and if the nonparametric test is rejected, then non-homogeneity of co-variances will be concluded. The result obtained from the regression results reveals a probability value of (P-value: 0.0007, 0.000 and 0.000 for all three models NPTM GPTM & PBTM respectively) obtained from the Breusch-Pagan test as seen in the table above. This result indicate that the assumption of homoscedasticity is been violated due to very low P-values which is statistically significant at 5%, 1% and 1% level respectively. However, to correct for this violation, the robust standard error regression as recommended by Greene, (2003) was employed.

5.8 Robust Standard Error Estimator

Because a single unusual observation can lead this estimator to fail, ordinary least square estimation in a linear model has been proven as non-resilient to outliers. In addition, the least square estimator requires a consistent moment condition on the error distribution. To address these issues, robust regression estimators were developed, and they have since become a staple tool in regression analysis. The conventional approach to statistical inference using robust regression methods is to compute the standard errors of the predicted regression coefficients and determine the robust estimator's limiting distribution. When the error terms are not independent and identically distributed (i.i.d) but have heteroskedasticity or autocorrelation, the robust standard errors remain valid. Even when non-i.i.d. error components are included, a resilient standard error consistently estimates the genuine standard error. Therefore, due to the presence of heteroscedasticity obtained from the panel least square regression estimator, the researcher proceeds to employ the Eicker-White standard errors which is relied upon for defend against heteroscedasticity. The result is presented below:

Table 7

Robust Standard Error Estimations

Models	NPTM	GPTM	PBTM
Variables			
Human Capital Efficiency (HCEE)			
Coefficient	-0.096	2.362	0.010
t_ Statistics	(-0.56)	(4.85)	(0.08)
Probability_t	{0.573)	{0.000) *	{0.936)
EITM			
Coefficient	1.034	0.060	1.000
t_ Statistics	(109.85)	(2.66)	(177.61)
Probability_t	{0.000) *	{0.009) **	{0.000) *
No. of Obs	154	154	155
Prob. F statistics	0.0000	0.0000	0.0000
R^2	0.9366	0.3626	0.9448

Note: t -statistics and respective probabilities are represented in () and {}
*Where: ** represents 5% & * represent 1% level of significance*
Source: Authors' Computations (2021)

The table above shows the result obtained from robust standard error estimator for the three models. Specifically, we provide interpretation for the robust standard error estimator as recommended by Gujarati (2004). The model's goodness of fit as captured by the Fisher statistics and the corresponding probability value (0.0000) for the net profit after tax margin (NPTM), (0.0000) for gross profit margin (GPTM), and (0.0000) for the profit before tax margin (PBTM) shows a 1% statistically significant level suggesting that the entire model is fit and can be employed for interpretation and policy recommendation. More than this, an R^2 value of 0.9366, 0.3626, and 0.9448 for NPTM, GPTM and PBTM respectively indicates that about 94%, 36% and 94% respectively of the variation in the dependent variables is being explained by all the independent variables in the model. This also means that about 6%, 64%, and 6% respectively of the variation in the dependent variables is left unexplained but have been captured by the error term.

5.9 Test of Hypotheses

Hypotheses 1: ***Human capital efficiency has no significant effect on Net profit after tax margin (NPTM) of listed service firms in Nigeria.***

The results obtained from the robust least square regression of the NPTM model revealed that human capital efficiency has an insignificant negative effect on firm performance as proxied by net profit after tax margin (NPTM) during the period under investigation. This is shown as; human capital efficiency (Coef. = -0.096, t = -0.56 and P -value = 0.573). Following the results above, it is revealed that the effect of human capital efficiency on firm performance is negative and insignificant on NPTM model. This finding is consistent with the stated null hypothesis. Hence, human capital efficiency has no significant effect on net profit after tax margin of listed service firms in Nigeria.

Hypotheses 2: ***Human capital efficiency has no significant effect on Gross Profit Margin (GPTM) of listed service firms in Nigeria.***

The results obtained from the robust least square regression of the GPTM model revealed that human capital efficiency has a significant positive effect on firm performance as proxied by gross profit margin (GPTM) during the period under investigation. This is shown as; human capital efficiency (Coef. = 2.362, t = 4.85 and P -value = 0.000). Following the results above, it is revealed that the effect of human capital efficiency on firm performance is positive and significant on GPTM model. This finding is inconsistent with the stated null hypothesis which leads to its rejection. Hence, human capital efficiency has a significant effect on gross profit margin of listed service firms in Nigeria.

Hypotheses 3: ***Human capital efficiency has no significant effect on Profit before tax margin (PBTM) of listed service firms in Nigeria.***

The results obtained from the robust least square regression of the PBTM model revealed that human capital efficiency has an insignificant positive effect on firm performance as proxied by profit before tax margin (PBTM) during the period under investigation. This is shown as; human capital efficiency (Coef. = 0.010, t = 0.08 and P -value = 0.936). Following the results above, it is revealed that the effect of human capital efficiency on firm performance is positive and insignificant on PBTM model.

6. DISCUSSION OF FINDINGS

The authors emphasize that in recent studies, human capital is the most powerful part of increasing firms' performance sufficiently. However, in this study we find that human capital efficiency has an insignificant effect on net profit after tax margin (NPTM) as well as on Profit before tax margin (PBTM). These findings are in line with prior studies of Ozkan, Cakan and Kayacan (2017), who found that human capital efficiency has no effect on the profitability of banks. Omodero and Worlu, 2016; Abubakar, Ayuba, Ishaya and Olanrewaju, 2020), also find similar findings for the firms operating in Nigeria. However, we find that for the gross profit margin, human capital efficiency exerts a significant positive effect. This result implies that human capital efficiency increases service firm's performance for the period under study. According to Pulic (2004), firm with high investment in human capital and its characteristics have improved their performance and success in terms of gross profit margin (Joshi et al., 2010; Mondal & Ghosh, 2012; Ting & Lean, 2009). According to Davydenko, Gulnara and Ovechikin (2021) and based on human capital theory, people who have more human capital (e.g., formal education, on-the-job training) tend to have more productivity and thus increase the firm performance.

7. CONCLUSION AND RECOMMENDATIONS

Today's business environment especially in this COVID pandemic era, is in the state of flux, where competition is the name of the game. Organizations that fail to change may be forced to change from existence to non-existence, hence survival is the panacea. To survive, companies must explore all available avenues that can bring about competitive advantage. To develop a competitive advantage, it is important that firms truly leverage on the workforce as a competitive weapon. A strategy for improving workforce productivity to drive higher value for the firms has become an important focus. Firms seek to optimize their workforce through comprehensive human capital development programs not only to achieve business goals but most important is for the long-term survival and sustainability of the organization. To accomplish this, firms will need to invest resources to ensure that employees have the knowledge, skills, and competencies they need to work effectively in a rapidly changing and complex. From the findings of this study, the researcher carefully recommends that service firms will achieve high performance relating to gross profit margin if they continuously train and retrain their staff to acquire cognate and state-of-art skills to deliver services, which in turn can lead to high firm performance and competitive advantage.

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