Human Capital Investment and Performance of Quoted Manufacturing Companies in Nigeria

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DOI: https://dx.doi.org/10.47772/IJRISS.2025.903SEDU0265

Received: 06 May 2025; Accepted: 11 May 2025; Published: 11 June 2025

ABSTRACT

The study investigates the influence of investment in human capital on the listed manufacturing firms' financial performance in Nigeria. Adopting an ex-post facto design, the study examined the experience of 38 listed manufacturing firms during the period 2014-2023. The study specifically examined the influence of the efficiency of human capital and employees' compensation on the return on assets and the operation expenses. The firms' annual reports provided the source of the data that were analyzed using descriptive correlation analysis and least square regression analysis. The findings of the study identify that HCE has a positive and significant influence on the ROA ($\beta = 1.5329$, $p < 0.05$), indicating that firms with higher human capital efficiency experience good financial performance. The employees' compensation also has a positive and significant influence on the ROA ($\beta = 1.0265$, $p < 0.05$), indicating that higher compensation yields higher profitability possibly with the aid of higher productivity and employees' staff retention rates. HCE also has a marginally significant influence on the OPEX ($\beta = 0.0631$, $p < 0.05$), indicating that companies that invest in human capital might record higher operation expenses with the inclusion of training and staff development expenses. The findings emphasize the significance of strategic investment in human capital in influencing the performance of the firm while offsetting the associated expenditure. The study advises that manufacturing companies optimize human capital efficiency with the development of skills and the use of performance-based compensation schemes and adopt the use of optimization of expenditure strategies to enhance profitability.

Keywords: Human capital efficiency, Employee compensation, Return on assets, Operating expenses, Manufacturing firms, financial performance.

INTRODUCTION

Background to the Study

Human capital is a primary driver of business performance in the current Nigerian economy. Businesses increasingly depend on workers to improve productivity, innovate, and maintain competitiveness (Aman-Ullah et al., 2022). Investment in human capital describes the investment of resources in employee improvement, such as education, training, health, and remuneration (Kucharčíková et al., 2023). Investment in human capital increases employees' efficiency and has the potential to enhance business performance. In labor-intensive industries such as manufacturing, human capital efficiency improves productivity and reduces costs of operation (Chao et al., 2025). The Nigerian manufacturing sector plays a vital role in employment generation, industrial growth, and economic diversification (Ibitoye et al., 2022). By transforming raw materials into finished goods, the sector contributes significantly to wealth creation. However, it faces persistent challenges including inadequate infrastructure, unreliable power supply, regulatory instability, and limited financing (Nneze et al., 2024). These issues escalate production costs and undermine competitiveness. Recent evidence identifies the pivotal contribution of the manufacturing industry in the Nigerian economy. As revealed by the Manufacturers Association of Nigeria, the industry contributes more than 80% of the employment

opportunities in the nation (Shehu, 2024). However, the sector has struggled greatly, with the National Bureau of Statistics noting a decrease in its contribution towards the Gross Domestic Product (GDP) from 9.0% in 2018 to 8.23% in 2023 (Udi, 2024). The industry further suffered a whopping 90.11% decrease in the year-on-year nominal GDP growth in the third quarter of 2024, indicating the need for strategic interventions (Tunji, 2024). A skilled and productive workforce is pivotal to mitigating these constraints and enhancing sectoral performance. As Omada and Nweze (2022) noted, investing in human capital through training, welfare schemes, and competitive compensation can improve operational efficiency and lower production costs. Many Nigerian firms acknowledge this by allocating resources to workforce development.

In spite of such recognition, economic insecurity, low funding, and high turnover among staff continue to inhibit investment in human capital (Olarewaju et al., 2021). Low productivity is common among many companies owing to ineffective training and poor workforce development plans (Taiwo et al., 2021). Pay structures continue to be below par, leading to low morale and high turnover. Such inefficiencies inhibit the full utilization of human capital in driving enhanced performance by companies. Improving workforce productivity and retention by investing strategically in training and remuneration is therefore critical towards sustaining the sector. In the midst of globalization and accelerating technology shifts, Nigerian manufacturers experience increased demands for modernization. Most of them embrace automation, digitalization, and advanced productive methods (Agbo et al., 2019). Nonetheless, the lack of human capital is a significant barrier against the adoption of these technologies. In the absence of regular skill building and talent retention techniques, companies risk losing ground against international competitors. Furthermore, labor costs continue to account for a high proportion of manufacturing costs, causing concern over procedural efficiency. Striking a balance between investment in human capital and financial performance is hence a priority for managers (Chali & Lakatos, 2024). Companies need to determine how wages, training, and staff benefits relate to productivity and profitability. It is therefore essential to grasp the link between investment in human capital and financial performance in improving firm performance.

Despite the extensive evidence of the value of human capital, numerous Nigerian manufacturing companies continue struggling with optimizing labor investments. Some of the common problems include poor training, low wages, and low labor productivity (Okwuchukwu et al., 2022; Olarewaju et al., 2021). The problems contribute towards high turnover as well as low capacity for a stable skill base. Further pressures from the outside world in the form of increased input prices, legal uncertainty, and financial instability broaden the range of inefficiencies (Ogunniyi & Igwe, 2021). While human capital efficiency is a proven factor in the success of firms, numerous organizations struggle with coherent development pathways (Ghani et al., 2022). The inefficiencies that detract from financial performance are induced by poor workforce management, as explained by Damnjanovic et al. (2023). One of the primary concerns is the low investment in the development and training of the workers. A number of the manufacturing companies lack systematic programs that facilitate the improvement of technical competencies and innovation (Okwuchukwu et al., 2022). Low incentives further aggravate the condition and cause workforce turnover. Empirical evidence indicates that companies with weak human capital investment exhibit lower productivity and increased production costs (Nyberg et al., 2018). In light of the importance of human capital and the economic challenges facing Nigeria, it is necessary to find out how productivity of the workforce and remunerations affect firm performance outcomes such as Return on Assets (ROA) and operating costs. The findings will be crucial for the formulation of policies and business decisions that aim to resuscitate the manufacturing industry.

Objectives of the Study

The main objective of this study is to examine the effect of human capital investment on the financial performance of quoted manufacturing companies in Nigeria. Specifically, the study seeks to:

1. Examine the effect of human capital efficiency on the return on assets of quoted manufacturing companies in Nigeria.

2. Assess the effect of employee compensation on the return on assets of quoted manufacturing companies in Nigeria.

3. Determine the effect of human capital efficiency on the operating expenses of quoted manufacturing companies in Nigeria.

Research Hypotheses

The study will test the following null hypotheses:

H_{01}: Human capital efficiency has no significant effect on the return on assets of quoted manufacturing companies in Nigeria.

H_{02}: Employee compensation has no significant effect on the return on assets of quoted manufacturing companies in Nigeria.

H_{03}: Human capital efficiency has no significant effect on the operating expenses of quoted manufacturing companies in Nigeria.

LITERATURE REVIEW

Conceptual Review

Human Capital Investment

Human capital investment includes the investment that organizations make in employees' skills, knowledge, and improvement of productivity (Bai, 2024). This investment is crucial because employees drive firm performance through problem-solving capabilities, efficiency, and innovations (Aman-Ullah et al., 2022). Organizations invest in human capital through training and development programs, compensation, education, and health. Training and development programs boost the capabilities of employees and allow firms to adjust to business transformations (Whitehead, 2022). Training and development enhance critical and decision-making capabilities and allow employees to perform effectively in the line of duty. Workplace wellness programs and health programs boost the welfare of employees and enhance productivity and attendance at the workplace (Tarro et al., 2020). Compensation such as bonuses, incentives, and salaries motivate employees and enhance them to perform effectively at the workplace (Tarro et al., 2020). Manufacturing firms specifically need skilled employees who will be capable of overseeing the manufacturing processes, take charge of the machines, and be responsible for the quality of the manufactured goods (Edeh et al., 2023). Through investment in human capital, firms build a competent and dedicated workforce that will drive superior finances (Israel et al., 2022). Failure to invest in human capital will leave firms with low productivity and a higher turnover of employees.

Human Capital Product

Human capital efficiency reflects the intensity of a firm's use of employees toward the realization of operational and financial goals (Egolum, 2021). Human capital efficiency is assessed against vital metrics such as productivity, profitability, and creativity (Omada & Nweze, 2022). An efficient workforce leads to the generation of profits and the realization of cost-cutting efforts, while inefficiencies may lead to unfavorable business outcomes. The Value-Added Intellectual Coefficient (VAIC) is a widely used index of human capital efficiency that captures the effort of employees toward the firm's activities of value-creation (Olarewaju & Msomi, 2021). Higher scores of the VAIC reflect better business outcomes because the firm maximizes the capabilities of employees. The productivity of employees calculated per worker also forms a vital index of the efficiency of the human capital. Higher rates of productivity reflect that the employees are highly skilled and effectively supervised (Olarewaju & Msomi, 2021). Manufacturing firms with good human capital efficiency maximize the application of processes of the firm, minimize waste and redundancy, and maximize the efficiency of operation. Poor human capital efficiency firms may be facing the issue of higher operational costs, poor output quality, and lower competitiveness (Okere & Igba, 2023).

Employee Compensation

Compensation of employees encompasses the overall rewards that employees earn for working, including wages, salaries, bonuses, and fringe benefits. Employee compensation schemes motivate workers and influence firm performance (Sorn et al., 2023). Good compensation schemes attract good employees, reduce worker turnover, and boost organizational commitment. Research has proven that firms with good compensation schemes record higher worker productivity and profitability (Ranta & Ylinen, 2023; Sorn et al., 2023). Employees who feel they receive a good compensation package will be highly motivated and therefore perform and work with higher efficiency. Low compensation and poor fringe benefits will lead to worker dissatisfaction and therefore higher worker turnover and lower organizational performance. Manufacturing firms specifically need to balance worker compensation with firm profitability. Raising the worker wage will boost worker satisfaction, yet higher worker compensation will diminish firm profitability. Firms therefore need to use strategic compensation schemes that align with the company's performance goals. Some firms may use the compensation system of rewarding employees based on the company's output and achievements such that bonuses and incentives tie with worker output and therefore workers receive incentives and bonuses based on the company's output and achievements (Boachie-Mensah & Delali Dogbe, 2011).

Return on Assets

Return on Assets (ROA) is a vital financial ratio that captures a company's efficiency at profit-making with the use of its assets. The ratio indicates the efficiency of a company in making a profit with the use of its resources (Yu, 2024). The higher the ROA, the better the company; a lower ROA may be an indicator of the occurrence of inefficiencies. Human capital investment may influence the ROA positively through the improvement of employees' productivity and efficiency of operation. Organizations that put efforts into training employees and skills development and offer equitable compensation will be profitable with the improvement of workforce output (Adzido et al., 2015). Organizations that do not prioritize human capital may be bogged down with inefficiencies that lower the ROA.

Operating Expenses

Operational expenses are the expenses for carrying out business activities such as salaries, rent, power, and administration charges. The higher the operational expenses, the lower the profitability of the firm and the higher the need for the management of such expenses (Nwatu & Idoko, 2020). Human capital efficiency comes in handy in the management of such expenses. Efficient and highly skilled employees help in the improvement of processes that enhance efficiency and minimize waste. Nevertheless, if the expenditure of the workforce increases with no matching improvement in productivity, the companies will be subjected to a strain on finances. Efficient human capital management in the manufacturing sector will help minimize operational expenditure and maximize profitability. Through investment in the development of employees and the maintenance of an adequate compensation system, companies will be able to maximize their profit while remaining cost-efficient (Onoriode, 2022).

Theoretical Framework

The study is based on the premise of three theories namely Human Capital Theory, Resource-Based View Theory, and Efficiency Wage Theory.

Human Capital Theory

Human Capital Theory developed by Becker (1964) argues that individuals and organizations realize returns from investment in training, education, and skills development (Kucharčíková et al., 2018). The theory views human capital as a vital asset that raises the productivity and economic growth of a population. In the business world, firms invest in employees through training schemes, health coverage, and competitive compensation in an effort to enhance them toward higher efficiency and productivity at the workplace (Obinna et al., 2024). Organizations that prioritize investment in human capital perform better financially under this theory. Employees with skills and knowledge drive innovations, smooth processes, and good decision-making

(Kucharčíková et al., 2018). Technical-skilled employees in the manufacturing sector drive the efficiency of the manufacturing processes, reduce wastages, and maximize the output of the final good. The companies with a good foundation of human capital therefore realize higher returns on assets (ROA) and lower operational expenses.

Resource-Based Theory

The Resource-Based View Theory (RBV), developed by Barney (1991), maintains that firms derive a competitive advantage through the acquisition and application of valuable, rare, inimitable, and non-substitutable (VRIN) resources (Bhandari et al., 2020). Human capital has been established as a vital strategic asset that differentiates top firms from the rest of the competition (Schulze & Dada, 2024). The RBV theory maintains that firms not only need to invest in human capital but also need to find ways of retaining and tapping the skills of employees within the firm. Employees with specialist skills and knowledge create value through efficiency improvement and the generation of innovations (Bhandari et al., 2020). This is particularly vital in the firm's manufacturing sector, where skilled employees power the firm's productivity and the management of the firm's costs. The application of the RBV theory within this study maintains that firms that invest in the development and compensation of employees realize superior returns. Through the acquisition and maintenance of highly skilled employees, firms maximize the operational efficiency of the firm and subsequently realize superior returns. The investment efficiency of the human capital, however, rests on how a firm incorporates the application of such a resource within the firm's strategy (Aman-Ullah et al., 2022).

Efficiency Wage Theory

The Efficiency Wage Theory explains the link between firm performance and the wage of employees. The theory argues that firms offer employees higher-than-average wage compensation in an effort to hire, motivate, and keep productive employees (Mazorodze, 2024). Higher wage compensation leads to higher worker effort and lower worker turnover and absence rates and results in firm improvement in performance (Onoriode, 2022). In the manufacturing sector with the demand for productivity and operational efficiency, higher paid workers will be more dedicated and work harder. They will be less inclined toward the absence and shirking behavior (Odunayo et al., 2022). Firms that offer employees equitable compensation also experience lower training and recruitment costs that boost general financial stability. The Efficiency Wage Theory explains the reason why compensation affects the performance of employees. Through the offer of good compensation and incentives based on the worker's effort and output, employees will be highly productive and motivated and will earn good returns. Low compensation will experience the opposite effect of higher worker turnover rates, lower worker effort and output, and higher training and recruitment costs.

Empirical Review

Olowolaju and Oluwasesin (2016) examined the influence of the expenditure of human capital on the profitability of Nigerian manufacturing firms. The 10 listed firms and panel regression analysis found a positive relationship between expenditure of human capital and profitability with the greatest influence of expenditure on the issues of health. Only expenditure on the issues of health turned out to be statistically significant. The study recommended the management of human capital as a major asset with the motive of making the firm profitable and long-lasting.

Sylvanus et al. (2024) analyzed the effect of intellectual capital on the 16 firms of the consumer goods sector during the period 2012-2018. The analysis used the VAIC framework and panel regression and found a notable effect of intellectual capital on the return on capital employed and the return on assets and not that of the earnings per share. The analysis emphasized the importance of intellectual capital in the firm's finances and recommended that investment in human capital be the topmost priority in the bid to be competitive.

Okoye and Emeneka (2021) analyzed the relationship of human capital efficiency with economic value added among Nigerian service firms during the period 2010-2019. Using panel least squares regression analysis, it concluded that human capital efficiency had a significant influence on economic value added. The study recommended investment in human capital and the use of expert professionals in an effort to enhance

efficiency and productivity. The study confirmed the importance of human capital development toward financial stability and long-term success.

Uchegbu et al. (2024) analyzed the effect of a knowledge economy on the financial stability of six Nigerian manufacturing companies between 2012 and 2023. The study applied the use of employees' expenditure as a benchmark of human capital and established an ineffective influence of the latter on the former. The study advised that companies should prioritize the development of human capital and investment in workforce capabilities and training in a bid to boost competitiveness and long-term stability of finances.

Clever (2024) analyzed relational capital investment and the financial performance of 30 Nigerian manufacturing firms. The multiple regression analysis showed a meaningful correlation with ROA and an ineffective influence on EPS and ROE. The study concluded that investments in human and relational capital boost financial performance and recommended that investment in the two be maximized in an effort to build competitive strength.

Odunayo et al. (2022) examined human capital diversity's effect on financial reporting quality in 66 Nigerian manufacturing firms. Using OLS regression, the study found a significant positive impact of diversity on reporting quality. It recommended that firms consider political, religious, and intellectual diversity to improve transparency and comparability in financial reports. The study emphasized fostering an inclusive workforce to enhance financial disclosures' credibility.

Reason and Imo (2023) analyzed the effect of intellectual capital on Nigerian insurance firms' financial performance between 2012 and 2020. Using multiple regression analysis of 13 firms' data, the study confirmed a weak and positive effect of human, structural, and capital-employed efficiency on the return on asset (ROA). The study recommended the formulation of obligatory intellectual capital reporting standards that will enhance the sector's financial openness and stakeholders' confidence in the sector.

Israel et al. (2022) analyzed the relationship between human resource expenditure and financial performance in Nigerian manufacturing firms. Using causal-comparative and descriptive research designs, the study found that salaries and allowances significantly impacted ROE and market value performance, while human resource efficiency had an insignificant but positive effect. It recommended increased investment in human capital development to drive corporate financial growth and success.

Tuamyil and Gado (2024) explored human capital development's role in firm performance, with innovation as a mediating factor. Focusing on manufacturing firms in Plateau State, the study found that human capital investment enhances financial performance by driving innovation. It recommended continuous workforce training to improve productivity and market position, ensuring long-term business sustainability and competitiveness.

Chude et al. (2023) researched the influence of intellectual capital on the financial performance of listed Nigerian manufacturing firms in the stock exchange. The study used the Value-Added Intellectual Coefficient (VAIC) in the analysis of the influence it has on Asset Turnover (ATR), Gross Profit Margin (GPM), and Return on Assets (ROA) during the period 2011-2019 based on the secondary data collected from company reports. The results indicated that there was a non-significant negative correlation of VAIC with the asset turnover and a non-significant yet positive influence on the GPM and ROA. The study reflects the limited influence of intellectual capital in the sector's financial performance.

Okere and Igba (2023) analyzed the relationship between human capital investment and the financial performance of listed manufacturing firms in Nigeria. Regressing panel data of 20 companies between 2009 and 2018 and subjecting it to the Hausman test, the study established a non-significant yet positively related correlation between human capital investment and financial performance. Nevertheless, the spending in human capital had a significant and negative effect. The study recommends strategic investment in human capital not solely with a view to profitability but also as a source of future innovations and competitiveness.

Egolum (2021) examined the effect of human capital efficiency on the Nigerian service firms' financial performance during the period 2010-2019. The primary metrics of performance that were utilized include net profit after tax margin, profit before tax margin, and the gross profit margin. Using panel regression analysis, the study confirmed that human capital efficiency negatively affected the net profit after tax margin and positively and significantly affected the gross profit margin. The effect of profit before tax margin was not significant and had a positive effect. The study recommends regular training and skills development to maximize the employees' efficiency and overall financial performance.

Onoriode (2022) researched the influence of the cost of developing human capital on the financial performance of manufacturing companies in the state of Delta, Nigeria, during 2014-2018. Human capital investment and welfare expenditure were analyzed with the use of panel data with the aid of descriptive and inferential statistics. The findings showed a strong correlation between human capital investment and the firm's financial performance. The study concludes that companies need to enhance spending on human capital in order to be competitive in a changing business environment. The study advises that human capital development be prioritized with the intention of leveraging firm value and long-term firm success.

Obinna et al. (2024) researched the effect of spending in human capital on the Nigerian listed consumer goods firms' profitability. The study applied the method of the technique of purposive sampling and analyzed 20 listed firms' secondary data. These results indicated that the effect of spending in the human capital category on profitability was not significant and not strong and that spending in this category does not have a positive effect on firm profitability. The study concludes that the listed consumer goods firms may need to revisit their human capital strategies so that spending has a real monetary benefit.

There has been a comprehensive study of the correlation between human capital investment and firm performance with regard to financial profitability, company performance, and the efficiency of intellectual capital. Still lacking in the literature is the specific influence of human capital efficiency and the compensation of employees on major financial metrics such as the return on assets (ROA) and operational expenses. This study covers the existing gap and investigates the influence of human capital efficiency on the ROA, employees' compensation, and the influence of human capital efficiency on operational expenses. This will deliver a more updated insight into the financial consequences of human capital investment.

METHODOLOGY

The study employs an ex post facto design. The use of the ex-post facto design is suitable because it involves the use of existing financial figures that allow the determination of cause and effect without the intervention of the researcher.

The sample of this study comprises 38 listed manufacturing companies of the Nigerian Exchange Group with the observation period ranging from 2014-2023. The companies were selected based on the availability of detailed figures during the observation period. The companies include a diversified sample of the Nigerian manufacturing sector including Aluminium Extrusion Industries, Berger Paints Nigeria, Beta Glass Company, Cadbury Nigeria, Chellarams, Chemical & Allied Products, Cutix, Dangote Cement, Dangote Sugar, Fidson Healthcare, Flour Mills of Nigeria, GlaxoSmithKline Nigeria, Greif Nigeria, Honeywell Flour Mills, Industrial & Medical Gases Nigeria, John Holt, Lafarge Cement WAPCO Nigeria, Livestock Feeds, May & Baker Nigeria, McNichols Consolidated, Meyer Plc, Nascon Allied, Neimeth International Pharmaceuticals, Nestlé Nigeria, Nigeria Breweries, Nigerian Enamelware, Northern Flour Mills Nigeria, Pharma-Deko, Portland Paints Nigeria, Premier Paints, PZ Cussons, SCOA Nigeria, Studio Press Nigeria, Thomas Wyatt, Transcorp Nigeria, UAC of Nigeria, Unilever Nigeria, and Vitafoam Nigeria. The companies were selected based on the availability of figures and the companies' significance in the manufacturing sector of Nigeria.

Data used in this study came from the firms' annual. The variables of interest in this study were human capital efficiency, compensation of employees, return on assets (ROA), and operational expenses. The analysis of the data entailed the use of descriptive and inferential statistics. The use of descriptive statistics allowed the analysis of the distribution and patterns of the data. The use of inferential statistics applied correlation and linear regression methods. The specification of the equation follows:

$ROA_{it} = \beta_0 + \beta_1 HCE_{it} + \beta_2 EC_{it} + \epsilon_{it}$ ..... Eq. I

$\text{OPEX}_{it} = \alpha + \alpha_1 HCE_{it} + \mu_{it}$ ..... Eq. II

where ROA_{it} represents the return on assets for firm i at time t, $OPEX_{it}$ denotes operating expenses, HCE_{it} represents human capital efficiency, EC_{it} denotes employee compensation, and ϵ_{it}, μ_{it} are error terms.

RESULTS AND DISCUSSION

Descriptive Statistics

Table 1 Descriptive Statistics

	ROA	OPEX	HCE	EC
Mean	4.2280	14.5426	2.3159	13.7070
Median	3.9350	14.3150	1.7750	13.3150
Maximum	108.90	20.3000	83.4800	18.3200
Minimum	-179.92	10.1200	-18.2900	8.4500
Std. Dev.	14.9707	2.0113	5.2348	2.0455
Observations	418	418	418	418

Source: Eviews 14 Output, 2024

The descriptive statistics provide insights into the distribution and variability of ROA, OPEX, HCE, and EC across 418 observations. ROA (Mean = 4.2280, Std. Dev. = 14.9707) exhibits high variability, with extreme values ranging from -179.92 to 108.90, indicating that some firms experienced significant losses or exceptionally high profitability. The median (3.9350) is close to the mean, suggesting a relatively symmetrical distribution despite outliers. OPEX (Mean = 14.5426, Std. Dev. = 2.0113) and EC (Mean = 13.7070, Std. Dev. = 2.0455) have relatively stable values, with minor deviations from their means, implying that operating expenses and employee compensation are consistent across firms. Their maximum and minimum values show some variation but are not as extreme as ROA. HCE (Mean = 2.3159, Std. Dev. = 5.2348) has a wide range (-18.29 to 83.48), indicating significant differences in human capital efficiency across firms. The negative minimum suggests some firms experience inefficiencies, possibly due to poor workforce productivity or resource misallocation.

Correlation Analysis

Table 2 Correlation Matrix

	ROA	OPEX	HCE	EC
ROA	1	0.2048	0.5518	0.2004
OPEX	0.2048	1	0.1641	0.9473
HCE	0.5518	0.1641	1	0.1122
EC	0.2004	0.9473	0.1122	1

Source: Eviews 14 Output, 2024

The correlation matrix shows the relationships between ROA, OPEX, HCE, and EC. HCE has a moderate positive correlation with ROA (0.5518), suggesting that higher human capital efficiency improves profitability. The weak correlations between ROA and OPEX (0.2048) and ROA and EC (0.2004) indicate that operating expenses and employee compensation have minimal direct effects on performance. OPEX and EC are highly correlated (0.9473), but since they are not used in the same model, multicollinearity concerns do not apply.

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume IX Issue IIIS May 2025 | Special Issue on Education

This strong correlation simply reflects that employee compensation is a major component of operating expenses. The weak relationships between HCE and OPEX (0.1641) and HCE and EC (0.1122) suggest that increasing operating costs or salaries does not necessarily enhance human capital efficiency. The results highlight human capital efficiency as a key driver of financial performance while operating expenses and employee compensation should be optimized for profitability.

Test of Hypotheses

Table 3 Regression Test

Dependent Variable: ROA				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-13.39239	4.098389	-3.267721	0.0012
HCE	1.532948	0.116168	13.19601	0.0000
EC	1.026501	0.297297	3.452773	0.0006
R-squared	0.323858	Mean dependent var		4.227967
Adjusted R-squared	0.320600	S.D. dependent var		14.97073
S.E. of regression	12.33974	Akaike info criterion		7.870678
Sum squared resid	63191.69	Schwarz criterion		7.899641
Log likelihood	-1641.972	Hannan-Quinn criter.		7.882127
F-statistic	99.38826	Durbin-Watson stat		1.818594
Prob(F-statistic)	0.000000			

Source: Eviews 14 Output, 2024

The regression results provide statistical evidence to test the two hypotheses regarding the impact of human capital efficiency (HCE) and employee compensation (EC) on return on assets (ROA).

For H_{01}: Human capital efficiency has no significant effect on ROA, the results show that HCE has a positive and highly significant effect on ROA (Coefficient = 1.5329, t = 13.1960, p = 0.0000). Since the p-value is less than 0.05, we reject H_{01}, indicating that higher human capital efficiency improves profitability. The strong relationship suggests that firms with more efficient use of human resources achieve better financial performance.

For H_{02}: Employee compensation has no significant effect on ROA, the coefficient of EC is 1.0265 with a t-statistic of 3.4528 and a p-value of 0.0006, which is statistically significant at a 5% level. Thus, we reject H_{02}, concluding that higher employee compensation positively impacts profitability, possibly through improved productivity and retention.

The R^2 value (0.3239) suggests that HCE and EC together explain 32.39% of variations in ROA, implying other factors also influence firm profitability. The F-statistic (99.3883, p = 0.0000) confirms the model's overall significance. Thus, both HCE and EC significantly influence ROA, highlighting the importance of human capital investment and employee incentives in enhancing firm performance.

Table 4 Regression Test Dependent Variable: OPEX				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	14.39657	0.106264	135.4793	0.0000
HCE	0.063069	0.018583	3.393998	0.0008
R-squared	0.026944	Mean dependent var		14.54263
Adjusted R-squared	0.024605	S.D. dependent var		2.011336
S.E. of regression	1.986437	Akaike info criterion		4.215335
Sum squared resid	1641.507	Schwarz criterion		4.234644
Log likelihood	-879.0050	Hannan-Quinn criter.		4.222968
F-statistic	11.51922	Durbin-Watson stat		1.886057
Prob(F-statistic)	0.000755			

Source: Eviews 14 Output, 2024

For H_{03}: Human capital efficiency has no significant effect on operating expenses. The results indicate that HCE has a positive and statistically significant effect on OPEX (Coefficient = 0.0631, t = 3.3940, p = 0.0008). Since the p-value is below 0.05, we reject H_{03}, suggesting that higher human capital efficiency leads to an increase in operating expenses. This could imply that firms investing in human capital, such as training and skill development, incur additional costs reflected in their operational expenses.

However, the R^2 value (0.0269) indicates that HCE explains only 2.69% of the variations in OPEX, implying that other factors primarily drive operating expenses. Despite the statistical significance, the relatively low explanatory power suggests that while human capital efficiency affects costs, its influence is limited compared to other operational cost determinants. The F-statistic (11.5192, p = 0.0008) confirms the model's overall significance, validating the relationship. Thus, while HCE significantly impacts OPEX, its effect size is small, meaning firms should consider broader cost management strategies alongside human capital investments.

DISCUSSION OF FINDINGS

The results of this study demonstrate a significant relationship between human capital efficiency (HCE) and financial performance, aligning with previous research. The rejection of H_{01} confirms that higher HCE improves return on assets (ROA), consistent with Sylvanus et al. (2024), who found a positive and significant effect of intellectual capital on corporate performance. Similarly, Okoye and Emeneka (2021) reported that HCE significantly influences economic value added, emphasizing the role of intellectual capital in enhancing firm performance. The significant impact of employee compensation (EC) on ROA supports Israel et al. (2022), who found that salaries and allowances positively affected return on equity (ROE) and market value

performance (MVP). However, Uchegbu et al. (2024) observed that employee costs had an insignificant effect on financial performance, suggesting that compensation alone may not be enough to drive profitability. This discrepancy may be attributed to industry-specific variations in human capital utilization. The observation that HCE increases the operating expenses (OPEX) of firms agrees with Olowolaju and Oluwasesin (2016), who also observed that expenditure of human capital in the forms of training and healthcare increases the firm's expenses. Reason and Imo (2023) established that the efficiency of human capital had a limited effect on the firm's finances, with the observation that the cost factors might cancel the gains in certain instances. The observation underscores the significance of strategic investment in human capital in attaining the state of financial sustainability. Even though HCE increases profitability, the linked expenditure underscores the necessity of firms matching human capital expenditure with efficiency strategies.

CONCLUSION

This study focused on the influence of human capital efficiency (HCE) and employee compensation (EC) on the financial performance of companies, specifically how they influence return on assets (ROA) and operational expenses (OPEX). The results of the study demonstrate that HCE has a strong influence on ROA, implying that companies that maximize the use of human capital realize higher profitability. Employee compensation also has a positive influence on ROA, implying that employees who get good compensation help the company perform better, potentially through higher productivity and worker retention. HCE also raises OPEX, implying that companies that spend on the development of human capital also bear higher expenditure, potentially affecting short-term company finances. The findings agree with previous literature highlighting the significance of human capital in the improvement of company performance. Companies that place a lot of emphasis on the investment of human capital realize long-term company stability and competitive strength. Nevertheless, companies need to balance the investment of human capital with the need for cost-effectiveness if they are to realize the maximum returns.

RECOMMENDATIONS

Based on the findings of this study, the following suggestions are made.

Improve Human Capital Investments: Firms should strategically invest in the enhancement of human capital, particularly skills development, training initiatives, and innovation programs with a focus toward maximizing efficiency and returns on investment in the long term. This will maximize the profitability of higher investment in human capital.

Implement Performance-Based Compensation Plans: Because compensation has a direct influence on profitability, firms need to adopt performance-based incentive programs that drive productivity and efficiency at a cost-effectiveness that will be a morale boost among employees.

Embracing Cost-Control Measures in Human Capital Building: Firms should incorporate cost-control methods including budget training programs, workforce optimization and leveraging technology in skills development in a bid to keep a tight grip on operational expenses while maintaining a top efficiency level.

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