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EFFECT OF HUMAN CAPITAL INVESTMENT ON ORGANIZATIONAL PERFORMANCE OF QUOTED CONSUMER GOODS COMPANIES

Samuel Ikenna Orakaeze[1] Pius V.C. Okoye[2] Arinze E. Anaege[3]

[1,2&3]*Department of Accountancy, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria*

All correspondence to: orakasam2014@gmail.com

ABSTRACT

This study examines the effect of human capital investment (HCI) and workforce optimisation (WFO) on the financial performance of quoted consumer goods companies in Nigeria. Earlier Nigerian studies relied mainly on pooled regression, a single performance measure or intellectual capital indices, and few tested a workforce yield ratio alongside employee benefits expenditure. The study uses an ex-post facto design and an unbalanced panel of 18 firms listed on the Nigerian Exchange Group for 2016 to 2024, with 149 firm-year observations. HCI is the natural logarithm of employee benefits, WFO is gross profit divided by employee benefits, and performance is measured by earnings per share (EPS) and return on investment (ROI), with firm size as the control. Random effects and fixed effects estimators are applied, with the Hausman test used for selection, alongside tests for multicollinearity, unit roots, cointegration, heteroscedasticity, serial correlation and cross-sectional dependence. Neither HCI nor WFO has a significant effect on EPS or ROI at the 5% level, so all four null hypotheses are retained. WFO is significantly associated with ROI under firm-clustered standard errors, but not in first differences. The variables are integrated of order one and not cointegrated, so the estimates are read as associations. Firms should tie employee benefit spending to measurable productivity outcomes, and regulators should require separate disclosure of training, salary and pension costs.

Key words: *Earnings per share, human capital investment, Nigeria, panel data, return on investment, workforce optimisation.*

Paper type: *Research paper*

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INTRODUCTION

Quoted consumer goods companies are among the largest employers in the Nigerian formal sector, and payroll is one of the main cost lines in their accounts. Between 2016 and 2024 these firms operated through two recessions, sustained currency depreciation and rising energy costs, a setting in which managers must justify every large cost line by the return it brings. Spending on employees is a clear case. It can be read as an investment in skills and motivation that raises output, or as an ordinary operating cost that squeezes margins. Which reading holds in practice is an empirical question, and the Nigerian evidence does not settle it.

Studies of Nigerian firms report positive effects of human capital spending on performance in some samples (Ananwude, Ezeaku, Ubah, & Anyanwu, 2022; Eneh, Anyahara, Anaege, & Inweregbu, 2025), and weak or insignificant effects in others (Obinna, Edeh, & Busari, 2024; Omada & Nweze, 2022; Yusuf, Nandak, & Obafemi, 2024). Three features of this literature limit what can be concluded. First, many studies use pooled regression, which ignores differences between firms. Second, most examine one performance measure, so the result may depend on the choice of ratio. Third, few test how productively a firm uses its payroll, as opposed to how much it spends. No study known to the authors jointly examines HCI and a workforce yield ratio against both EPS and ROI for NGX-listed consumer goods firms over 2016 to 2024.

This study fills that gap. Its objectives are to: (i) determine the effect of HCI on EPS; (ii) ascertain the effect of WFO on EPS; (iii) examine the effect of HCI on ROI; and (iv) investigate the effect of WFO on ROI, all for quoted consumer goods firms in Nigeria. The study contributes in three ways. It tests spending and productivity together in one model. It uses two performance measures, one tied to shareholders (EPS) and one tied to operating returns on capital (ROI). And it reports the full set of panel diagnostics, including unit root and cointegration tests that most earlier Nigerian studies omit, so that the reader can judge how far the estimates can be trusted.

The setting adds to the interest of the question. Consumer goods firms sell into price-sensitive markets and buy many inputs in foreign currency, so a cost line as large as payroll is watched closely by boards and investors. If spending on people reliably lifted earnings, the case for protecting it during downturns would be strong. If it did not, managers would need a different

measure, such as the yield from each naira spent, to decide where workforce spending is productive.

The rest of the paper is organised as follows. Section 2 reviews the theory and evidence and states the hypotheses. Section 3 describes the data and method. Section 4 presents and discusses the results. Section 5 concludes with implications, recommendations and limitations.

LITERATURE REVIEW

Theoretical background

Human Capital Theory treats spending on education, training, health and welfare as an investment that raises worker productivity and, through it, earnings (Becker, 1964; Schultz, 1961). The Resource-Based View adds that such spending creates lasting advantage only when the resulting capabilities are valuable and hard to copy (Barney, 1991). X-efficiency theory focuses on the other side: firms with the same inputs can produce different outputs because of differences in motivation and effort, so the useful question is how well inputs are used (Leibenstein, 1966). The first two theories point to the amount invested in people, which this study measures as HCI. The third points to the yield obtained from it, which the study measures as WFO.

The two performance measures capture different things. EPS is a shareholder measure and is affected by financing, tax and the number of shares in issue. ROI, defined here as EBIT over capital employed, is an operating measure that excludes financing and tax. A human capital effect that works through productivity should appear first in ROI and only later, if at all, in EPS. Using both measures lets the study see whether any effect is lost between operations and shareholders.

Human capital investment and performance

Evidence on spending is mixed. Okere and Igba (2023) found a non-significant positive relationship between human capital investment and the financial performance of listed Nigerian manufacturing firms. Obinna et al. (2024) concluded that human capital expenditure of listed consumer goods firms has a very weak and insignificant effect on financial performance. Omada and Nweze (2022) reported that human capital development costs had no significant effect on return on equity or EPS in the food and beverage industry. Sylvanus, Okoye, Amahalu, and Mbonu (2024) found a significant effect of intellectual capital on

return on capital employed and return on assets but not on EPS, and Yusuf et al. (2024) found no significant human capital effect in consumer and industrial goods firms.

Other studies report gains. Ananwude et al. (2022) found that staff costs significantly raised EPS in quoted agricultural firms, and Korolo (2026) found a positive and significant effect of staff remuneration on EPS in the same sector. Eneh et al. (2025) found positive and significant effects of human capital efficiency and employee compensation on return on assets in manufacturing. Ajayi and Oluwasesin (2025), working on 21 consumer goods firms, found that training and development spending raised return on assets while salaries and wages lowered it. Nneji, Amahalu, and Ndubuisi-Okolo (2024) reported a positive EPS effect of human capital efficiency. Outside Nigeria, Bhosale and Tamragundi (2025) found a significant positive relationship for Indian listed firms, and Odhon'g and Omolo (2015) found the same for pharmaceutical companies in Kenya, while Pi, Chang, and Shih (2021) found an inverted U-shaped effect of employee-level human capital for Chinese pharmaceutical firms. The split between positive and null results suggests that the outcome depends on the sector, the performance measure and the way human capital is measured.

Workforce optimisation and operational efficiency

Studies that relate efficiency to performance mostly find positive effects. Eneh, Anaege, and Anyahara (2024) found that employee productivity raised return on assets of Nigerian manufacturing firms. Adegbie, Akintoye, Alu, and Chituru (2019) found that managerial efficiency raised EPS and return on assets. Imhanzenobe (2019) and Alhassan (2024) found positive effects of operational and asset efficiency, with firm size acting as a positive control. Nkpodot and Emenyi (2023) found a positive effect of cost efficiency on return on assets, and Kariuki (2021), Musah, Kong, and Mensah (2019) and Orwa, Matanda, and Bosire (2025) reported similar results for firms in Kenya and Ghana. None of these studies uses gross profit per naira of employee benefits as the efficiency measure, and most use pooled regression and return on assets.

Table 1 summarises the Nigerian and foreign studies that bear most directly on the two relationships tested here.

Table 1: Summary of Selected Prior Studies

Study	Sample	Main variable	Main finding
Okere and Igba (2023)	Listed Nigerian manufacturing firms, 2009 to 2018	Human capital investment	Non-significant positive relationship

Study	Sample	Main variable	Main finding
Obinna et al. (2024)	Listed consumer goods firms, Nigeria	Human capital expenditure	Very weak and insignificant effect
Omada and Nweze (2022)	Food and beverage industry, Nigeria	Human capital development costs	No significant effect on ROE or EPS
Sylvanus et al. (2024)	Quoted manufacturing firms, Nigeria	Intellectual capital efficiency	Positive on ROCE and ROA; none on EPS
Yusuf et al. (2024)	Consumer and industrial goods, 2013 to 2022	Intellectual capital components	No significant human capital effect
Ananwude et al. (2022)	Quoted agricultural firms, 2007 to 2020	Staff costs	Positive and significant on ROA, ROE and EPS
Korolo (2026)	Listed agricultural firms, Nigeria	Staff remuneration cost	Positive and significant on EPS
Eneh et al. (2025)	Listed manufacturing firms, Nigeria	Human capital efficiency, compensation	Positive and significant on ROA
Ajayi and Oluwasesin (2025)	21 consumer goods firms, 2015 to 2024	Training spending; salaries and wages	Training raised ROA; wages lowered it
Eneh, Anaege and Anyahara (2024)	15 manufacturing firms, 2012 to 2022	Employee productivity	Positive and significant on ROA
Adegbie et al. (2019)	Quoted Nigerian firms	Managerial efficiency	Positive and significant on EPS and ROA
Bhosale and Tamragundi (2025)	Firms listed on the BSE, India	Human capital investment	Significant positive relationship

Source: Author's compilation (2026)

The table shows that positive findings come mostly from agricultural and general manufacturing samples and from studies that use return on assets, while consumer goods samples and EPS tend to give null results. That pattern is the reason for testing both EPS and ROI on a consumer goods sample.

Hypotheses

Human Capital Theory predicts that employee benefits spending, to the extent that it funds skills, health and motivation, raises output and therefore earnings. For shareholders the gain should show in EPS, and for the firm as a whole in the return on the capital employed. The spending evidence for consumer goods firms is split, so the direction of the HCI effect is an open question for this sample, although theory favours a positive sign.

X-efficiency theory predicts that a firm that obtains more gross profit from each naira of employee cost is using its workforce better. A higher WFO should raise ROI directly, because gross profit feeds into EBIT. The route to EPS is longer, since interest, tax and share count intervene, so the effect on EPS may be weaker. Neither prediction has been tested with this ratio in the Nigerian consumer goods sector. The hypotheses are stated in null form:

H_{01}: HCI has no significant effect on EPS of quoted consumer goods firms in Nigeria.

H_{02}: WFO has no significant effect on EPS of quoted consumer goods firms in Nigeria.

H_{03}: HCI has no significant effect on ROI of quoted consumer goods firms in Nigeria.

H_{04}: WFO has no significant effect on ROI of quoted consumer goods firms in Nigeria.

MATERIALS AND METHODS

Design, sample and data

The study uses an ex-post facto design with secondary data from the audited annual reports of quoted consumer goods companies. The sample is a census of 18 firms listed on the Nigerian Exchange Group (NGX) during 2016 to 2024 with enough published data to compute the variables. Fifteen firms have all nine years, and three (Dangote Flour Mills Plc, McNichols Consolidated Plc and Multi-Trex Integrated Foods Plc) have three, six and five years. The panel is therefore unbalanced, with 149 firm-year observations for the EPS model. The ROI model has 147, because capital employed was negative for Cadbury Nigeria Plc in 2023 and Nigerian Enamelware Plc in 2024 and the ratio is not computed for those years. One firm, 7UP, was removed because it was delisted in early 2018 and had only two observations. Four sampled firms carry a delisted status and are retained for the years in which they reported, which limits survivorship bias. Table 2 lists the firms and the number of annual observations for each.

Table 2: Firms in the Sample

Firm	Ticker	Obs.	Firm	Ticker	Obs.
Cadbury Nigeria Plc	CADBURY	9	Multi-Trex Integrated Foods Plc	MULTITREX	5
Champion Breweries Plc	CHAMPION	9	NASCON Allied Industries Plc	NASCON	9
Dangote Flour Mills Plc	DFLOUR	3	Nestle Nigeria Plc	NESTLE	9
Dangote Sugar Refinery Plc	DANGSUGAR	9	Nigerian Breweries Plc	NB	9
Flour Mills of Nigeria Plc	FLOURMILL	9	Nigerian Enamelware Plc	NEM	9
Guinness Nigeria Plc	GUINNESS	9	Northern Nigeria Flour Mills Plc	NNFM	9
Honeywell Flour Mill Plc	HONYFLOUR	9	PZ Cussons Nigeria Plc	PZ	9
International Breweries Plc	INTBREW	9	Unilever Nigeria Plc	UNILEVER	9

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Firm	Ticker	Obs.	Firm	Ticker	Obs.
McNichols Consolidated Plc	MCNICHOLS	6	Vitafoam Nigeria Plc	VITAFOAM	9

Source: Author's compilation from annual reports (2026)

Variables and models

Table 3: Variable Measurement

Variable	Symbol	Role	Measurement
Earnings per share	EPS	Dependent	Basic earnings per share as reported (kobo)
Return on investment	ROI	Dependent	EBIT divided by capital employed
Human capital investment	HCI	Independent	Natural logarithm of employee benefits
Workforce optimisation	WFO	Independent	Gross profit divided by employee benefits
Firm size	FSIZE	Control	Natural logarithm of total assets

Source: Author's design (2026)

HCI is the natural logarithm of total employee benefits expenditure, in thousands of naira. WFO is gross profit divided by employee benefits, so that it shows the gross profit earned for each naira spent on employees. EPS is reported basic earnings per share in kobo. ROI is earnings before interest and tax (EBIT) divided by capital employed, where capital employed is total assets less total current liabilities. Firm size (FSIZE), the natural logarithm of total assets, is the control. The data set has no firm age series, so firm age is not controlled. The measurement of each variable is summarised in Table 3. The estimated models are:

$$EPS_{it} = \alpha_0 + \alpha_1 HCI_{it} + \alpha_2 WFO_{it} + \alpha_3 FSIZE_{it} + \mu_{it} \qquad (1)$$

$$ROI_{it} = \beta_0 + \beta_1 HCI_{it} + \beta_2 WFO_{it} + \beta_3 FSIZE_{it} + \varepsilon_{it} \qquad (2)$$

where i indexes the firm and t the year, and the error terms combine a firm-specific component and an idiosyncratic disturbance.

Estimation and diagnostics

Each model is estimated by random effects and fixed effects, and the Hausman (1978) test selects between them. Before estimation, multicollinearity is assessed with variance inflation factors, with values above 10 taken as serious (Hair, Black, Babin, & Anderson, 2019), and stationarity is tested with the Im, Pesaran, and Shin (2003) test. Because the variables prove to be non-stationary, a residual-based group-mean cointegration test in the manner of Pedroni (1999) is applied. After estimation, heteroscedasticity is tested with the Breusch and Pagan (1979) test, first-order serial correlation with the Wooldridge (2002) test as implemented by

Drukker (2003), and cross-sectional dependence with the Pesaran (2004) CD test. Decisions are taken at the 5% level. Where the Hausman test and the F-test of the firm effects disagree, the Hausman result decides, and the other estimator is reported as a check. Because the panel is short, the null distributions of the unit root and cointegration statistics were simulated for the actual series lengths.

The choice of a panel design follows from the data structure. Pooling firms and years raises the number of observations and allows for firm-level differences that a cross-section or a single time series cannot capture. Fixed effects removes any firm characteristic that does not change over time, at the cost of discarding between-firm variation, while random effects uses both sources of variation and is more efficient if the firm effects are uncorrelated with the regressors. The Hausman test decides which of the two is acceptable. The logarithm is used for HCI and FSIZE because both are heavily skewed in naira terms, and the log makes the coefficients easier to read as responses to proportional differences in scale. EPS and ROI enter in levels, since both can be negative.

RESULTS AND DISCUSSION

Descriptive statistics and correlation

Table 4: Descriptive Statistics

Statistic	EPS (kobo)	ROI	HCI	WFO	FSIZE
Observations	149	147	149	149	149
Mean	-3.22	0.2092	15.3357	3.7463	18.2199
Median	31.00	0.1391	15.7188	3.4474	18.5442
Maximum	6,177.00	7.3745	18.0412	13.9755	21.1237
Minimum	-20,765.00	-3.3772	9.8946	-1.0215	14.2257
Std. deviation	2,244.05	0.7260	1.7420	2.4870	1.6217
Skewness	-5.4591	5.7849	-0.8587	1.0205	-0.3983
Kurtosis	53.9550	69.7704	3.5453	5.1533	2.3677
Jarque-Bera	16,859.4781	28,126.9231	20.1562	54.6480	6.4218
Prob. (JB)	<0.001	<0.001	<0.001	<0.001	0.0403

Source: Author's computation using EViews 13 (2026)

EPS has a mean of -3.22 kobo against a median of 31 kobo and a standard deviation of 2,244.05 kobo, because a few firm-years carry very large losses: Nestle Nigeria Plc recorded -10,026 kobo in 2023 and -20,765 kobo in 2024. The typical firm earned about 13.9 kobo of EBIT per naira of capital employed (median ROI 0.1391). WFO averages 3.75, so the average firm earned ₦3.75 of gross profit for each naira of employee benefits. The Jarque-

Bera test rejects normality for all five series at the 5% level, severely so for EPS and ROI, which is why the sensitivity checks below matter.

Table 5: Correlation Matrix and Variance Inflation Factors

Variable	EPS	ROI	HCI	WFO	FSIZE	VIF
EPS	1.000	0.024	-0.028	-0.012	-0.061	
ROI	0.024	1.000	0.120	0.129	0.089	
HCI	-0.028	0.120	1.000	0.274	0.886	4.75
WFO	-0.012	0.129	0.274	1.000	0.383	1.20
FSIZE	-0.061	0.089	0.886	0.383	1.000	5.15

Note: VIF is from the EPS model; the ROI model gives similar values.

Source: Author's computation using EViews 13 (2026)

No VIF exceeds 10. HCI and FSIZE are strongly correlated (r = 0.886) because larger firms employ and pay more people, which explains their higher VIFs (4.75 and 5.15). WFO is almost unrelated to the other regressors (VIF 1.20), and the correlations of EPS with the regressors are close to zero.

Unit root and cointegration

Table 6: Im-Pesaran-Shin Panel Unit Root Test

Variable	Levels W-stat.	Prob.	First difference W-stat.	Prob.	Order
EPS	0.510	0.6948	-2.122	0.0169	I(1)
ROI	0.075	0.5300	-2.153	0.0157	I(1)
HCI	-1.547	0.0609	-3.668	<0.001	I(1)
WFO	0.498	0.6909	-3.185	<0.001	I(1)
FSIZE	3.208	0.9993	-2.393	0.0084	I(1)

Note: Null hypothesis: all panels contain a unit root. Firms with fewer than five observations are excluded.

Source: Author's computation using EViews 13 (2026)

None of the five series is stationary in levels, and all are stationary after first differencing, so all are I(1). The power of the test is limited by a time dimension of nine years at most (Im et al., 2003). The cointegration test gives group-mean statistics of -3.045 for the EPS model and -3.164 for the ROI model, against simulated 5% critical values of -3.872 and -3.872. The null of no cointegration is not rejected in either model, so the data give no support to a stable long-run relationship. The levels coefficients below are therefore read as associations within the sample period, and first-difference estimates are reported as a check, as the unit root result requires.

The unit root result matters for interpretation. Regressions on non-stationary series can show spurious relationships when the series are not cointegrated, which is the situation here. The

absence of significant coefficients in the levels models reduces that concern, because there is no relationship to be spurious, but it also means that the study cannot claim to have identified a long-run link in either direction. The first-difference estimates in Table 9 address the same issue from the other side, by asking whether year-to-year changes in HCI or WFO are followed by changes in performance.

Regression results

Table 7: Panel Regression Results

Variable	EPS: fixed effects	EPS: random effects	ROI: random effects	ROI: fixed effects
HCI	415.47	167.91	0.0945	0.0847
	(0.598)	(0.723)	(1.269)	(0.386)
WFO	53.72	20.65	0.0375	0.0162
	(0.541)	(0.253)	(1.434)	(0.525)
FSIZE	-1,507.35*	-256.76	-0.0715	-0.0578
	(-2.418)	(-0.988)	(-0.858)	(-0.296)
Constant	20,887.88*	2,022.43	-0.0787	-0.0978
	(2.730)	(0.904)	(-0.108)	(-0.041)
R-squared	0.0692	0.0075	0.0295	0.0030
Observations	149	149	147	147
Hausman prob.	0.0372		0.5836	
Selected estimator	Yes	No	Yes	No

Note: t-statistics in parentheses; * significant at 5%. R-squared is within for fixed effects. The random effects variance component is estimated at zero, so random effects equals pooled least squares.

Source: Author's computation using EViews 13 (2026)

The Hausman test selects random effects for the ROI model (probability 0.5836). For the EPS model the test rejects random effects at the 5% level (probability 0.0372), so fixed effects is selected. The evidence on firm effects in the EPS model is mixed, because the F-test of the firm effects does not reject (probability 0.9163) and the random effects variance component is zero. Both estimates are therefore shown. In the EPS model, HCI (fixed effects 415.47, probability 0.5509) and WFO (53.72, probability 0.5891) are insignificant. The one significant coefficient is a negative FSIZE effect (-1,507.35, probability 0.0170). In the ROI model, HCI (0.0945, probability 0.2065) and WFO (0.0375, probability 0.1538) are positive but insignificant. R-squared is below 3% in the random effects models, so the regressors explain little of the variation in either measure.

Two features of the estimates deserve comment. First, the random effects variance component is estimated at zero in both models, which means the firm-specific intercepts add almost nothing once the regressors are in the model, and the random effects results equal

pooled least squares. The F-test of the firm effects supports this reading in both models. Second, the fit is poor. The regressors explain less than 1% of the variation in EPS under random effects and about 3% of the variation in ROI. Low explanatory power is common in firm-level earnings regressions, but here it also reflects the influence of a few extreme observations and of factors that the model omits, such as gearing, tax and exchange-rate losses. The finding that HCI and WFO are insignificant should therefore be read as an absence of evidence in this specification, which is narrower than evidence of absence.

Diagnostics and sensitivity checks

Table 8: Post-Estimation Diagnostic Tests

Test	EPS statistic	Prob.	ROI statistic	Prob.
Breusch-Pagan (chi-sq., 3 d.f.)	4.215	0.2391	0.914	0.8221
Wooldridge serial correlation F(1, 17)	225.348	<0.001	1.562	0.2283
Pesaran CD (N = 18)	3.634	<0.001	-0.821	0.4118

Note: Null hypotheses: constant error variance; no first-order serial correlation; no cross-sectional dependence.

Source: Author's computation using EViews 13 (2026)

Heteroscedasticity is not found in either model. The EPS model shows strong serial correlation and cross-sectional dependence, which is consistent with the persistent Nestle Nigeria losses and with shocks common to all firms in a year, while the ROI model shows neither. Table 9 therefore tests the four hypotheses under the selected estimator and then repeats each test with firm-clustered standard errors, without the two extreme Nestle Nigeria observations (EPS model only) and in first differences.

Table 9: Hypothesis Tests and Sensitivity of Probability Values

Null	Link	Coeff.	Prob.	Clustered	Excl. Nestle	First diff.	Decision
H_{01}	HCI → EPS	415.47	0.5509	0.3813	0.9697	0.1802	Not rejected
H_{02}	WFO → EPS	53.72	0.5891	0.3347	0.4555	0.9574	Not rejected
H_{03}	HCI → ROI	0.0945	0.2065	0.1342	n/a	0.0814	Not rejected
H_{04}	WFO → ROI	0.0375	0.1538	0.0364	n/a	0.6984	Not rejected

Note: Prob. is from the estimator selected for each model (fixed effects for EPS, random effects for ROI). First differences use random effects.

Source: Author's computation using EViews 13 (2026)

No null hypothesis is rejected at the 5% level. The single departure from the pattern is H_{04}: with firm-clustered standard errors the probability for WFO falls to 0.0364. The ROI diagnostics did not call for that correction, and the first-difference estimate is insignificant (0.6984), so the decision remains with the conventional test.

Discussion

The insignificant effect of HCI agrees with several Nigerian studies on consumer goods and manufacturing firms (Obinna et al., 2024; Omada & Nweze, 2022; Sylvanus et al., 2024; Yusuf et al., 2024; Okere & Igba, 2023). It differs from Ananwude et al. (2022), Korolo (2026) and Eneh et al. (2025), who worked on agricultural and general manufacturing samples and found positive effects. Three features of the present study may account for the difference. Consumer goods earnings are exposed to input costs and exchange rates to a degree that dilutes the contribution of any single cost line. Total employee benefits rises with firm scale and is strongly correlated with FSIZE (r = 0.89), so the measure says little about the quality of human capital. And it bundles salaries, pensions and welfare with spending on skills, which Ajayi and Oluwasesin (2025) found to have opposite effects on profitability. The result does not show that human capital is unimportant. It shows that the total value of employee benefits does not track earnings closely, which is at odds with the investment reading of Human Capital Theory (Becker, 1964; Schultz, 1961).

WFO has a positive sign in every levels specification, as X-efficiency theory predicts (Leibenstein, 1966), but it is not significant for EPS or, under the conventional test, for ROI. This partly agrees with Eneh, Anaege, and Anyahara (2024) and Adegbie et al. (2019), who found positive efficiency effects, though those studies used pooled regression and different proxies. EPS depends on interest, tax, exchange-rate losses and the number of shares in issue, none of which is changed by a workforce yield ratio, whereas ROI rests on EBIT, which is closer to operations. That may be why the only sign of an effect appears for ROI, and only under clustered errors. The negative FSIZE coefficient in the fixed effects EPS model contrasts with the positive size effects reported by Imhanzenobe (2019) and Alhassan (2024). One possible reading is that, in a period of naira depreciation, the nominal value of total assets rose faster than earnings within the same firm, but the study does not test this.

The size of the point estimates puts the statistical result in perspective. A 10% rise in employee benefits corresponds to a rise of about 0.1 in HCI. On the fixed effects estimate for EPS, that is about 42 kobo, against a standard deviation of EPS of 2,244 kobo. On the random effects estimate for ROI it is about 0.9 percentage points. A rise of one naira in gross profit per naira of employee benefits is associated with 3.8 percentage points of ROI. These magnitudes are small beside the spread of the data and have wide standard errors, so the data support neither a large positive effect nor a large negative one.

Implications of the results

For managers, the results mean that a rise in employee benefits expenditure cannot be justified in advance by an expected gain in EPS or ROI. The link between spending on people and earnings runs through the use made of the spending, and a ratio such as WFO is a better monitoring tool than the spending total, even though its measured effect here is weak. For investors and analysts, the level of employee benefits is not a reliable signal of the earnings outlook of a consumer goods firm, and the same holds for the gross profit earned per naira of payroll over this period. For regulators and standard setters, the aggregate employee benefits line does not allow the effect of training to be separated from payroll and pension costs, which limits what any researcher can learn from published accounts.

For the literature, the results qualify the idea that human capital spending pays off in a uniform way. The table of prior studies shows that positive findings cluster in agricultural and general manufacturing samples, while consumer goods samples tend to give null results. A sector-specific explanation is more plausible than a general one: consumer goods firms face tight price competition and import-dependent input costs, so gains from a more productive workforce may be passed on to customers or absorbed by cost increases before they reach earnings. The present data cannot test this directly, but the pattern is consistent with it and suggests that sector should be treated as a moderating factor in later work.

The diagnostics also carry a lesson for method. The EPS series is dominated by a few extreme firm-years, and the EPS model shows serial correlation and cross-sectional dependence. Studies that report a significant EPS effect from a plain pooled regression on a panel of this kind should show that the result survives clustering, the removal of extreme observations and first differencing. In this study the null results survive all three.

CONCLUSION AND RECOMMENDATIONS

The study examined the effect of HCI and WFO on the EPS and ROI of 18 quoted consumer goods firms in Nigeria over 2016 to 2024. None of the four null hypotheses is rejected at the 5% level. Within this sample and period, neither the amount a firm spends on employee benefits nor the gross profit it earns per naira of that spending had a significant effect on either performance measure. The one qualification is a positive WFO association with ROI under clustered standard errors, which is too weak to support a firm claim.

The study contributes to the literature in three ways. It supplies evidence on a sector and period that earlier work covers thinly, namely quoted consumer goods firms during 2016 to 2024. It introduces a workforce yield ratio next to the spending measure and shows that, for this sample, neither measure explains EPS or ROI. And it shows that the null result is stable across estimators, error corrections, the removal of extreme observations and first differencing, which gives later researchers a baseline against which to judge studies that report significant effects on similar data.

Four recommendations follow, one for each hypothesis. First, firms should not expect higher employee benefits spending to raise EPS, and should tie it to measurable outcomes such as training results, retention and output per employee. Second, workforce productivity targets should be set together with targets for finance costs, tax and exchange-rate exposure, because these also shape EPS. Third, firms should judge human capital spending against the productivity of the capital they employ, and regulators such as the Financial Reporting Council of Nigeria and the Nigerian Exchange Group should encourage separate disclosure of training, salary and pension costs so that future work can measure the return on each. Fourth, WFO can be kept among the ratios reviewed by boards, since it showed a positive association with ROI under clustered errors, but its use should stay advisory until stronger evidence is available.

The study has limits. The sample is the full accessible population but is small, at 18 firms, and four of them stopped reporting before 2024, so the results may not extend to unlisted firms or other sectors. The series are non-stationary and not cointegrated, the nine-year panel limits the power of the tests, the EPS model has serial correlation and cross-sectional dependence, and firm age could not be controlled. Future studies could add firm age and gearing, split employee benefits into training, salary and pension components, use a longer panel with a dynamic estimator, and add market-based performance measures.

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