

Full-Time Equivalence Metrics and Financial Efficiency of Ghanaian Public Higher Education Institutions

Justice Ray Achoanya Ayam

Abstract

This study examines the application of Full-Time Equivalence (FTE) metrics and their relationship with financial efficiency in Ghanaian public higher education institutions (HEIs). Using a mixed-methods design, the study integrates panel data from 151 public HEIs from 2018 to 2022 with semi-structured interviews involving 14 senior financial and administrative officers and documentary analysis. Fixed-effects and random-effects panel models were employed to examine cost efficiency, while deductive thematic analysis explored institutional practices and policy implications. The results indicate that institutional scale, revenue per student, and expenditure per student significantly predict the unadjusted Cost Efficiency Ratio (CER). However, after workload normalization, the FTE-adjusted model exhibits weaker effects, with individual predictors failing to attain conventional levels of statistical significance. Qualitative findings nevertheless demonstrate the operational importance of FTE for staffing, budgeting, resource allocation, and institutional planning, while revealing inconsistencies in calculation methods, fragmented data systems, and the absence of standardized reporting protocols. The findings suggest that FTE is most valuable as a standardized planning and resource-allocation metric whose effectiveness depends on institutional data quality, governance capacity, and regulatory coherence. The study recommends standardized national FTE reporting protocols, strengthened institutional data systems, and the progressive integration of FTE measures into evidence-based budgeting and performance-financing frameworks.

Key words: full-time equivalence (fte), financial efficiency, public higher education institutions, higher education resource allocation, Ghana.

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Résumé

Cette étude examine l'application des indicateurs d'équivalence à temps plein (ETP) et leur relation avec l'efficacité financière dans les établissements publics d'enseignement supérieur au Ghana. S'appuyant sur une méthodologie mixte, dont l'organisation de discussions de groupe et des entretiens individuels, l'étude combine des données provenant de discussions de groupe dans 151 établissements d'enseignement supérieur publics sur la période 2018-2022, des entretiens semi-structurés menés auprès de 14 hauts responsables financiers et administratifs, ainsi qu'une analyse de documents. Des modèles de discussions de groupe à effets fixes et à effets aléatoires ont été utilisés pour examiner l'efficacité en termes de coûts, tandis qu'une analyse thématique déductive a permis d'explorer les pratiques institutionnelles et les implications politiques. Les résultats indiquent que la taille de l'établissement, les recettes par étudiant et les dépenses par étudiant sont des prédicteurs significatifs du ratio d'efficacité en termes de coûts (REC) non ajusté. Cependant, après normalisation de la charge de travail, le modèle ajusté en fonction de l'ETP présente des effets plus faibles, les prédicteurs individuels n'atteignant pas les niveaux conventionnels de signification statistique. Les résultats qualitatifs démontrent néanmoins l'importance opérationnelle de l'ETP pour la gestion des effectifs, la budgétisation, l'allocation des ressources et la planification institutionnelle, tout en révélant des incohérences dans les méthodes de calcul, la fragmentation des systèmes de données et l'absence de protocoles de reporting standardisés. Les résultats suggèrent que l'ETP est particulièrement utile en tant qu'indicateur standardisé de planification et d'allocation des ressources, dont l'efficacité dépend de la qualité des données institutionnelles, de la capacité de gouvernance et de la cohérence réglementaire. L'étude recommande la mise en place de protocoles nationaux standardisés de déclaration des ETP, le renforcement des systèmes de données institutionnels et l'intégration progressive des mesures d'ETP dans les cadres de budgétisation fondée sur des données factuelles et de financement lié à la performance.

Mots-clés : équivalent temps plein (ETP) ; efficacité financière ; établissements d'enseignement supérieur publics ; allocation des ressources dans l'enseignement supérieur ; Ghana.

Introduction

Financial efficiency is a critical issue for higher education institutions (HEIs) globally, particularly as they navigate the challenges of resource management and institutional sustainability. Effective financial management in HEIs encompasses the optimal allocation and utilization of resources to meet academic, infrastructure, and research objectives while minimizing

inefficiencies (Chapman & Dearden, 2021). This efficiency is essential for maintaining educational quality, supporting institutional operations, and strengthening long-term sustainability (Chapman & Dearden, 2021; Delaney & Marcotte, 2024).

Previous studies on Ghanaian higher education finance have largely emphasized funding adequacy, governance, regulatory coordination, and sustainability challenges (Mensah, 2020; Oketch, 2023). However, limited empirical attention has been given to how Full-Time Equivalence (FTE) metrics are calculated, applied, and linked to institutional financial efficiency in Ghanaian public HEIs. What remains insufficiently examined is whether FTE-based workload and enrolment measures can improve resource allocation, budgeting accuracy, and cost-efficiency analysis within Ghana's public higher education sector. This study addresses that gap by empirically assessing FTE applications and their financial implications within a resource-constrained and evolving regulatory environment.

In Ghana, the urgency for financial efficiency has intensified amid constrained public funding and increasing demand for higher education (Oketch, 2023). These dynamics have exposed inefficiencies in resource planning and have called attention to the absence or inconsistent application of data-driven tools such as FTE. FTE, which converts part-time enrolments and staff into full-time workload equivalents, is critical for financial planning, as it enables standardized metrics for assessing cost-efficiency, staffing levels, and student-related expenditure (Welton et al., 2020). The lack of reliable FTE applications impairs institutions' ability to make evidence-based financial decisions, weakens budget transparency, and distorts equitable resource allocation.

Although Full Economic Costing (FEC) offers a more holistic view of institutional cost structures, this study focuses on FTE due to its foundational role in operational planning and its direct, measurable linkage to financial efficiency. While FEC encompasses broader cost categories such as indirect and opportunity costs, FTE is a critical input in calculating these broader estimates. Hence, this study narrows its scope to FTE as a gateway metric, recognizing its relevance for future integrative costing frameworks that may incorporate FEC principles.

This study addresses a significant gap in the Ghanaian higher education literature by exploring the empirical application and policy relevance of FTE in public HEIs. It examines how FTE data is used in financial planning, resource allocation, and budgeting and assesses the implications of its absence or weak implementation on institutional performance and resilience.

The study is guided by three objectives: 1) to examine how FTE metrics are applied in financial planning and resource allocation within Ghanaian public HEIs, 2) to assess the relationship between FTE-based measures and financial efficiency indicators, and 3) to identify the policy and management implications of strengthening FTE reporting and application in Ghanaian public HEIs.

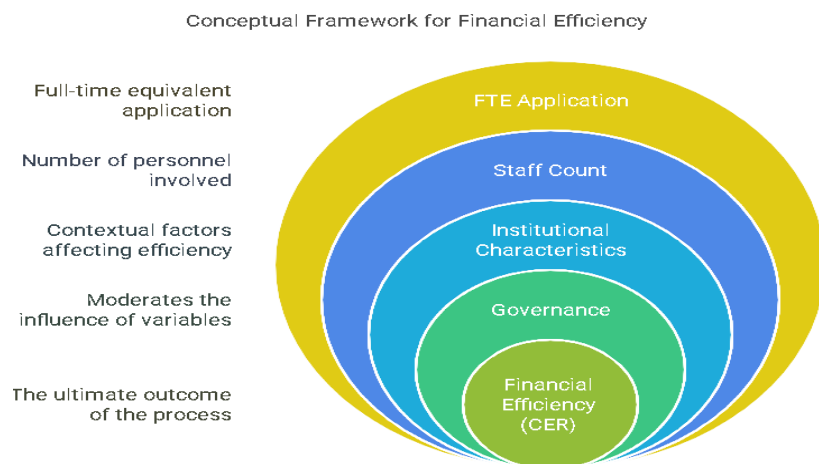
The study examines the proposition that FTE-based workload measures are systematically associated with financial efficiency in Ghanaian public HEIs and that the usefulness of such measures is conditioned by institutional and regulatory arrangements. In doing so, the study contributes to scholarly and policy debates on higher education financial governance by distinguishing the statistical relationship between FTE-adjusted measures and efficiency outcomes from the broader managerial value of FTE in planning, budgeting, and resource allocation.

Literature Review

Theoretical and Conceptual Framework

This study is grounded in the Resource-Based View (RBV) of the firm, as articulated by Barney (1991), which posits that sustained competitive advantage arises from the strategic deployment of valuable, rare, inimitable, and non-substitutable internal resources. RBV assumes that institutional heterogeneity and resource immobility underpin performance differentials. In the context of HEIs, FTE data represent an informational resource that, when effectively managed, becomes a capability for strategic planning, budgeting, and governance. By transforming workforce data into actionable insights, HEIs can optimize operational processes, enhance productivity, and drive financial efficiency.

Figure 1 presents the study's conceptual framework linking FTE-based workload measures, institutional resource characteristics, governance capacity, and financial efficiency. Financial efficiency is operationalized primarily through the Cost Efficiency Ratio (CER), where lower values indicate more efficient use of operational resources relative to revenue. Within the Resource-Based View (RBV), FTE data are conceptualized as an informational resource whose performance value depends on complementary institutional capabilities, including data systems, workload planning, financial management, and governance. Institutional governance is therefore expected to shape the extent to which standardized workload information contributes to more informed resource allocation and cost control (Welton et al., 2020; Fleming et al., 2024).

Figure 1. Conceptual Framework

Source: Author's Construct.

Financial Efficiency in Higher Education

Financial efficiency is a cornerstone for HEIs, crucial to cost management, budget control, and strategic financial planning (Baker, 2024; Delaney & Marcotte, 2024). Financially efficient institutions are better positioned to maintain educational quality, boost research productivity, and improve their reputations (Dima et al., 2024). However, HEIs worldwide grapple with inefficiencies that arise from inadequate planning, resource misallocation, and external pressures, including economic instability and dwindling government funding (Hong, 2023). As HEIs navigate an increasingly competitive global landscape, effective financial management becomes critical for sustaining competitive advantage (Ortagus et al., 2020).

FTE in International Contexts

The literature consistently highlights the role of FTE as a standardized measure in global HEI financial management. In mature systems such as the United States, the United Kingdom, and Australia, FTE is institutionalized in budget planning, staff deployment, performance assessments, and regulatory reporting (Daun-Barnett & John, 2018; Joaquim & Cerdeira, 2020). These metrics contribute to transparency and accountability, enabling HEIs to align internal operations with funding frameworks and policy objectives. Moreover, FTE supports performance benchmarking, allowing institutions to gauge relative efficiency and identify improvement areas (Jongbloed, 2022).

Despite its established role in these contexts, FTE's technical limitations are also well-documented. Its primary focus on workloads means that indirect costs, capital investments, and broader opportunity costs are often unaccounted for. Consequently, scholars have argued that FTE should be complemented by more integrative costing models to ensure financial comprehensiveness (Pilonato & Monfardini, 2020).

Costing Models in Higher Education Institutions

To address FTE's limitations, Full Economic Costing (FEC) has emerged as a complementary approach that incorporates both direct and indirect expenditures, including administrative overheads, facility costs, and long-term financial obligations (Sukenti, 2023). The integration of FEC into HEI financial management provides a more transparent and accurate representation of institutional costs, thereby supporting evidence-based decision-making and sustainability planning (Rosinger et al., 2022). Although FEC is increasingly adopted in advanced systems, its implementation remains uneven, particularly in contexts with limited financial and institutional capacity.

The literature suggests that FTE and FEC may perform complementary roles in higher education financial management. While FTE enables operational efficiency through workload alignment, FEC provides broader insights into institutional cost structures and investment planning. However, empirical evidence on how these metrics can be adapted to Ghana's regulatory and operational context remains limited, requiring further investigation. Available literature often highlights the underdeveloped state of institutional data systems, fragmented financial reporting, and the absence of standardized workload definitions. In South Africa, for example, FTE is used primarily for public funding purposes, but inconsistencies in data accuracy and reporting frequency compromise its effectiveness (Council on Higher Education [CHE], 2024). Similarly, Nigerian institutions struggle with infrastructural deficits and incompatible software systems that impede reliable FTE application (Adeusi et al., 2024).

In the Ghanaian context, Mensah (2020) identifies non-standardized FTE formulas and the lack of integrated financial systems as critical barriers to effective implementation. These challenges are compounded by broader institutional governance issues, including fragmented decision-making structures and limited capacity for data analysis and interpretation. Although Ghanaian HEIs report student and staff workloads to regulatory bodies, the absence of harmonized methodologies undermines comparability and utility. These limitations underscore the need for empirical research that

captures the nuances of FTE use within specific institutional and regulatory settings in Africa.

Ghana's Higher Education Financing Landscape

Ghanaian HEIs operate within a resource-constrained environment characterized by rising student enrolments, inadequate public funding, and limited capital investments (Oketch, 2023). These structural challenges are compounded by macroeconomic volatility, placing additional strain on institutional budgets and strategic planning processes.

Despite these constraints, institutional and policy discourses increasingly point to the need for data-driven management tools. Mensah (2020) underscores the potential role of FTE in offering reliable workload data to inform staffing and budgeting decisions. However, the operationalization of such tools remains inconsistent due to technical limitations and capacity constraints. The broader literature also identifies missed opportunities for leveraging internal data systems to align resource use with strategic priorities (Delaney & Marcotte, 2024). Notably, the intersection between internal capabilities and regulatory frameworks remains underexplored, limiting the understanding of how HEIs can mobilize internal resources to improve financial performance.

Regulatory structures influence the use of financial metrics and costing methodologies. Globally, standardized FTE measures are often mandated by national quality assurance and funding agencies to ensure transparency and accountability (Welton et al., 2020). In Ghana, however, consistent FTE application has yet to be fully institutionalized across public HEIs. A deeper understanding of how regulatory and institutional governance structures interact to shape costing practices is critical to advancing financial efficiency in Ghana's higher education system.

Synthesis and Critique of the Literature

While the literature underscores the significance of financial efficiency in HEIs globally, there remains a marked paucity of empirical studies examining the specific application of FTE metrics within Ghanaian HEIs. Existing scholarship has largely addressed broader financial management and governance themes, often overlooking the strategic value of FTE as a quantifiable indicator for resource allocation and efficiency evaluation in this context. Furthermore, although Full Economic Costing (FEC) is acknowledged as a more comprehensive framework, accounting for both direct and indirect costs, its operationalization alongside FTE in low-resource settings remains underexplored (Rosinger et al., 2022). The literature also reveals a lack of clarity on how HEIs in Ghana can leverage internal data systems and

reporting structures to implement such costing tools effectively. These gaps highlight the need for empirical research that interrogates the institutional and contextual factors shaping the use of FTE and its potential contribution to financial efficiency within Ghana's public higher education sector.

Methodology

Research Design

This study employed a rigorous mixed-methods design, integrating panel econometric analysis, institutional document review, and semi-structured interviews. Using a longitudinal dataset from 151 Ghanaian Public HEIs from 2018 to 2022, the quantitative analysis explored cost-efficiency dynamics normalized by FTE. Qualitative insights from policy documents and stakeholder narratives enriched interpretation. Panel techniques addressed unobserved heterogeneity across institutions. The number of observations reduced from 755 to 720 due to missing data on added control variables, Institutional Age and Student-to-Staff Ratio (STR), not consistently reported by all Public HEIs. The study does not compare institutions that formally apply FTE with those that do not. Rather, it constructs FTE-based student and staff measures from institutional enrolment and staffing records and examines how these standardized workload indicators relate to financial efficiency. This approach is appropriate because formal FTE reporting is not uniformly institutionalized across Ghanaian public HEIs, making a binary user/non-user comparison analytically unsuitable. This triangulated approach enhanced the validity, depth, and explanatory power of the findings across diverse institutional contexts.

Panel Data Variable Measurement and Model Specification

Dependent Variables

Two primary efficiency indicators were utilized:

Cost Efficiency Ratio (CER):

$$CER = \text{Operational Costs} / \text{Total Revenue}$$

FTE-Adjusted Cost Efficiency Ratio (CER_FTE):

$$CER_FTE = \text{Total Cost per FTE} / \text{Output per FTE}$$

CER is measured as the ratio of operational costs to total revenue. Lower CER values indicate greater cost efficiency because fewer operational resources are consumed relative to revenue generated. CER_FTE adjusts the efficiency measure by standardizing cost and output values on an FTE basis, thereby accounting for differences in institutional workload intensity arising from part-time enrolment, part-time staffing, and variations in delivery structure.

FTE Estimation

FTE measures were constructed with reference to established approaches to workload standardization in higher education (Altbach et al., 2019; OECD, 2016). For analytical comparability across institutions, part-time students and part-time staff were assigned a standardized weight of 0.5 relative to their full-time counterparts. This weighting is employed as an analytical conversion assumption rather than as a claim of a uniformly mandated national FTE formula:

FTE Students:

$$FTE_Students = Full-Time\ Students + (0.5 \times Part-Time\ Students)$$

FTE Staff:

$$FTE_Staff = Full-Time\ Staff + (0.5 \times Part-Time\ Staff)$$

These conversions standardized enrolment and staffing data, ensuring analytical consistency across diverse institutional formats.

Independent and Control Variables

Independent Variables:

FTE_students_it: Full-Time Equivalent Students (proxy for enrolment size)

RPS_it: Revenue per Student

EPS_it: Expenditure per Student

RPS_FTE_it: Revenue per Student (FTE-adjusted)

EPS_FTE_it: Expenditure per Student (FTE-adjusted)

Control Variables:

Institutional Age: Proxy for organizational maturity.

STR (Student-to-Staff Ratio): Captures labour intensity and institutional structure.

These variables align with resource allocation theory and higher education production functions (Teixeira et al., 2007; Johnstone, 2004).

Model Specification

Model 1: Unadjusted Cost Efficiency

Cost Efficiency Ratio (CER) for institution i at time t is modeled as:

$$CER_it = \beta_0 + \beta_1 \times \log(FTE_students_it) + \beta_2 \times \log(RPS_it) + \beta_3 \times EPS_it + \beta_4 \times Age_it + \beta_5 \times STR_it + \varepsilon_it$$

Where:

CER_it: Cost Efficiency Ratio

FTE_students_it: Full-Time Equivalent Students

RPS_it: Revenue per Student

EPS_it: Expenditure per Student

Age_it: Age of the Institution

STR_it: Student-to-Staff Ratio

β_0 to β_5 : Parameters to be Estimated

ε_it : Stochastic Error Term

Model 2: FTE-Adjusted Cost Efficiency

FTE-Adjusted Cost Efficiency (CER_FTE) for institution i at time t is modeled as:

$$CER_FTE_it = \beta_0 + \beta_1 \times \log(FTE_students_it) + \beta_2 \times RPS_FTE_it + \beta_3 \times EPS_FTE_it + \beta_4 \times FTE_Staff_it + \beta_5 \times Age_it + \beta_6 \times STR_it + \varepsilon_it$$

Where:

CER_FTE_it: Full-Time Equivalent-adjusted Cost Efficiency Ratio

FTE_students_it: Full-Time Equivalent Students

RPS_FTE_it: Revenue per FTE Student

EPS_FTE_it: Expenditure per FTE Student

FTE_Staff_it: Full-Time Equivalent Academic Staff

Age_it: Age of the Institution

STR_it: Student-to-Staff Ratio

β_0 to β_6 : Parameters to be Estimated

ε_it : Stochastic Error Term

$i \in \{1, \dots, 151\}$, $t \in \{2018, \dots, 2022\}$, ε_it represents the idiosyncratic error term.

These conversions standardized enrolment and staffing data, ensuring analytical consistency across diverse institutional formats.

Estimation Strategy

The study estimated both fixed-effects and random-effects panel regression models. Year fixed effects were included to absorb common time-specific shocks affecting all institutions. The Hausman specification test produced a borderline result, $\chi^2(7) = 13.34$, $p = 0.060$, indicating that the random-effects estimator may be statistically consistent, while fixed-effects estimates remain important as a robustness check. Accordingly, both FE and RE results are reported. Robust standard errors were applied to address heteroskedasticity and serial correlation detected in the diagnostic tests.

Sampling and Selecting Interview Respondents

Semi-structured interviews were conducted with 14 senior financial and administrative officers across four of Ghana's largest Public HEIs. Participants

were selected purposively to ensure expertise in FTE applications, financial reporting, and institutional governance. The interviews explored participants’ lived experiences, interpretations, and policy engagements related to FTE deployment and financial efficiency.

In parallel, a systematic document review was undertaken. Institutional policy documents, governance frameworks, and financial management reports were selected based on their empirical relevance, institutional provenance, and thematic alignment with FTE implementation and financial management concerns. This qualitative component enriched the explanatory depth of the study and supported the generation of policy-relevant insights.

To preserve anonymity and maintain consistency in reporting, quotations in the thematic analysis are attributed using generic functional descriptors rather than participants’ specific institutional job titles.

Data Collection

The data collection process integrates panel data from institutional financial reports, staffing records, and enrolment figures over five years, forming the basis for quantitative analysis. The study rigorously employs a systematic document analysis to complement this data, ensuring alignment with contemporary institutional practices and policy frameworks (Creswell & Plano Clark, 2023; Yin, 2018). Document selection is based on relevance to FTE metrics, financial management, and governance structures. Institutional reports are chosen based on criteria such as their comprehensiveness, recency, and relevance to the Ghanaian context. Key documents include national reports from the GTEC and global perspectives on financial sustainability. These sources are cross-referenced to verify consistency in institutional policies and FTE applications. Table 1 outlines the documents reviewed, highlighting their institutional provenance and specific relevance to the study’s objectives.

Table 1. Key Documents Reviewed

Document Title	Source/Institution	Link to Document
Financial sustainability in higher education: A global perspective	Žalėnienė and Pereira (2021)	https://doi.org/10.1016/j.geosus.2021.05.001
Higher education report: Ghana	Mohammed et al. (2022), UNESCO World Higher Education Conference (WHEC 2022)	https://whec2022.net/resources/Country%20report%20-%20Ghana.pdf
Tertiary education statistics: Annual statistics report 2019	National Accreditation Board (2019)	https://gtec.edu.gh/download/file/TEI%20Statistical%20Report%202019.pdf
Clarity on FTEs	Council on Higher Education (CHE), South Africa (2024)	https://www.che.ac.za/sites/default/files/FTEs%20calculation.docx
Distance education policy audit: Survey among Ghana’s tertiary education institutions	Ghana Tertiary Education Commission (GTEC) (2026)	https://gtec.edu.gh/download/file/Final%20report%20on%20DE%20-%20Phase%201%2011.08.2023%20FINAL%20FINAL%20(Done).pdf
Norms for tertiary education (universities)	National Council for Tertiary Education (2012)	https://gtec.edu.gh/downloadQuestionnaire/12
A review of the multiple regulatory regime in tertiary education in Ghana	Newman (2023)	https://www.ajol.info/index.php/gjhe/article/view/273056

Source: Author’s Analysis

Data Integration and Analytical Tools

Findings from the quantitative and qualitative analyses were triangulated to assess convergence, complementarity, and divergence across data sources. This integration strengthened interpretive validity by linking statistical patterns with institutional experiences and documentary evidence.

Thematic Analysis of Qualitative Data

A deductive thematic approach was adopted because the study was guided by predefined theoretical and conceptual categories derived from the Resource-Based View and the research objectives. This enabled systematic

examination of how FTE metrics relate to financial efficiency, governance structures, and institutional resource management.

Validity, Reliability, and Integrity

The study employed robust diagnostic tests to ensure validity. The Hausman specification test did not reject the null hypothesis at the 5% significance level, $\chi^2(7) = 13.34$, $p = .060$, indicating that the random-effects estimator may be consistent. Given the borderline probability value and the substantive importance of controlling for time-invariant institutional heterogeneity, both random-effects and fixed-effects estimates were retained, with the latter serving as a robustness check.

Reliability was ensured through consistent data cleaning, coding, and FTE computation protocols. Triangulation of panel data, institutional documents, and interviews enhanced validity. Ethical standards were strictly followed, including informed consent, anonymity, and secure data handling. These procedures strengthened the credibility, transparency, and methodological robustness of the study in examining financial efficiency and FTE metrics in Ghanaian Public HEIs.

Results and Discussion

Panel Data Results

A comprehensive examination of institutional performance across 151 public higher education institutions (HEIs) in Ghana over a five-year period (2018–2022) provides foundational insights into cost efficiency and its determinants. The analysis employs panel data, capturing annual variations across both structural and performance-related variables. Key variables of interest include cost efficiency (CER), a normalized version adjusted for full-time equivalent enrolment (CER_FTE), financial performance proxies (EPS and RPS), institutional size (ln FTE Students), and operational characteristics such as student-to-staff ratio (STR) and institutional age.

Panel Data Descriptive Statistics

The descriptive statistics reveal notable variation in institutional performance and characteristics. The mean cost efficiency index (CER) is 2.05 (SD = 0.54), with values ranging from 0.66 to 3.94, suggesting considerable heterogeneity in resource utilization across institutions. A similar pattern is observed in the FTE-adjusted efficiency measure (CER_FTE), which ranges from 0.003 to 0.093. Enrolment size, measured by the log of full-time students, averages 8.13, corresponding to approximately 3,400 students, with a distribution reflecting both small and large HEIs. Revenue per student (RPS) and EPS also show substantial dispersion, underscoring differences in financial capacity and input allocation. These descriptive insights, presented in the

panel summary statistics, serve as a foundational context for subsequent econometric analysis (see Table 2).

Table 2. Descriptive Statistics

Variable	N	M	SD	Min	Max
Cost Efficiency (CER)	720	2.05	0.54	0.66	3.94
FTE-Adjusted Cost Efficiency (CER_FTE)	720	0.018	0.011	0.003	0.093
Full-Time Enrolment (ln FTE Students)	720	8.13	0.51	6.74	9.21
Revenue per Student (ln RPS)	720	5.56	0.57	3.8	6.87
Expenditure per Student (EPS)	720	98.36	19.82	43.96	152.82
EPS per FTE (EPS_FTE)	720	0.85	0.53	0.25	3.73
RPS per FTE (RPS_FTE)	720	2.03	0.47	0.86	3.15
Institutional Age	720	33.1	14.67	5.3	62.86
Student-to-Staff Ratio (STR)	720	26.04	2.83	19.02	49.65

Source: Author's Analysis

Correlation Analysis

The correlation analysis reveals substantial variation in the relationships among institutional scale, financial inputs, and the two efficiency measures. Enrolment scale is strongly and positively associated with revenue per student ($r = 0.89$, $p < 0.01$), indicating a close relationship between institutional size and financial scale. Expenditure per student is positively associated with CER ($r = 0.42$, $p < 0.01$). Given that higher CER values represent a larger operational-cost burden relative to revenue, this association suggests that greater expenditure intensity may place upward pressure on the cost-to-revenue ratio rather than automatically generating efficiency gains.

CER and CER_FTE are positively but moderately associated ($r = .28$, $p < .01$), indicating that FTE normalization produces an efficiency measure that is related to, but empirically distinct from, the unadjusted CER. Particularly strong correlations are observed between ln FTE Students and EPS_FTE and between ln RPS and EPS_FTE, indicating that scale-related variables and their FTE-derived measures require careful treatment in multivariate estimation. These relationships reinforce the importance of diagnostic assessment and robust estimation in interpreting the regression results (refer to Table 3).

Table 3. Correlation Matrix

Variable	CER	CER_FTE	ln FTE_Stu	ln RPS	EPS	EPS_FTE	RPS_FTE	Age	STR	M	SD
CER	-	0.28**	0.18**	0.17**	0.42**	-0.01	0.05	0.05	0.07	2.05	0.54
CER_FTE	0.28**	-	-0.76**	-0.72**	0.05	0.90**	0.04	-0.06	0.43**	0.018	0.011
ln FTE_Stu	0.18**	-0.76**	-	0.89**	0.17**	-0.82**	0.02	0.09*	-0.05	8.13	0.51
ln RPS	0.17**	-0.72**	0.89**	-	0.11**	-0.79**	0.43**	0.06	-0.18**	5.56	0.57
EPS	0.42**	0.05	0.17**	0.11**	-	0.19**	-0.04	0.02	0.06	98.36	19.82
EPS_FTE	-0.01	0.90**	-0.82**	-0.79**	0.19**	-	0	-0.07	0.43**	0.85	0.53
RPS_FTE	0.05	0.04	0.02	0.43**	-0.04	0	-	-0.02	0.08*	2.03	0.47
Age	0.05	-0.06	0.09*	0.06	0.02	-0.07	-0.02	-	0.02	33.1	14.67
STR	0.07	0.43**	-0.05	-0.18**	0.06	0.43**	0.08*	0.02	-	26.04	2.83
M	2.05	0.018	8.13	5.56	98.36	0.85	2.03	33.1	26.04		
SD	0.54	0.011	0.51	0.57	19.82	0.53	0.47	14.67	2.83		

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ **Source:** Author's Analysis**Fixed Effects (FE) Regression Results**

Controlling for time-invariant institutional heterogeneity, the fixed-effects model identifies institutional scale (ln FTE Students), revenue per student (ln RPS), and expenditure per student (EPS) as statistically significant predictors of the Cost Efficiency Ratio (CER). Because CER is defined as operational costs relative to total revenue, lower values represent greater cost efficiency. The positive coefficients on ln FTE Students ($\beta = 0.020$, $p = 0.046$), ln RPS ($\beta = 0.080$, $p = 0.022$), and EPS ($\beta = 0.030$, $p = 0.003$) therefore indicate increases in the cost-to-revenue ratio rather than direct improvements in efficiency. The findings suggest that institutional expansion and higher financial flows may be accompanied by proportionately greater operating-cost pressures unless growth is matched by effective expenditure control and resource optimization. Institutional age and student-to-staff ratio are not statistically significant within the model.

When CER_FTE is used as the dependent variable, none of the explanatory variables attains conventional statistical significance, although enrolment scale approaches the 10% threshold ($\beta = 0.015$, $p = 0.061$). The attenuation

of effects following FTE normalization suggests that part of the variation observed in the unadjusted model reflects differences in institutional scale and workload intensity rather than persistent efficiency differentials (see Table 4).

When re-estimated with CER_FTE as the dependent variable, no predictors reach conventional significance thresholds. Although positive associations persist for ln FTE Students and STR, the results imply reduced sensitivity once normalized by FTE (see Table 5).

Table 4. Fixed Effects (FE) Regression Results-CER

Variable	Coefficient	Std. Error	t-Statistic	p-Value
Constant	0.5	0.5	1	0.317
ln FTE Students	0.02	0.01	2	0.046*
ln RPS	0.08	0.035	2.29	0.022*
EPS	0.03	0.01	3	0.003**
Age	-0.002	0.002	-1.00	0.318
STR	0.005	0.005	1	0.317
Statistic	Value			
R-squared	0.18			
Observations	720			
HEI Fixed Effects	Yes			
Year Fixed Effects	Yes			

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ **Source:** Author's Analysis

Table 5. Fixed Effects (FE) Regression Results—CER_FTE

Variable	Coefficient	Std. Error	t-Statistic	p-Value
Constant	0.005	0.5	0.01	0.992
ln FTE Students	0.015	0.008	1.88	0.061
EPS_FTE	−0.005	0.01	−0.50	0.618
RPS_FTE	0.01	0.025	0.4	0.689
FTE Staff	0.004	0.003	1.33	0.184
Age	−0.001	0.001	−1.00	0.318
STR	0.004	0.004	1	0.317
Statistic	Value			
R-squared	0.17			
Observations	720			
HEI Fixed Effects	Yes			
Year Fixed Effects	Yes			

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Author's Analysis

Random Effects (RE) Regression Results

The RE estimates largely mirror the fixed-effects findings. Both EPS ($\beta = 0.035$, $p < 0.01$) and ln RPS ($\beta = 0.060$, $p < 0.05$) significantly predict CER, affirming their robustness. While the RE model shows slightly higher explanatory power ($R^2 = 0.22$), the Hausman test ($\chi^2(7) = 13.34$, $p = 0.060$) signals only marginal support for RE consistency. Accordingly, the RE estimates are retained, while the FE estimates provide a robustness check that controls for time-invariant institutional heterogeneity (see Tables 6 and 7).

Table 6. Random Effects (RE) Regression Results—CER

Variable	Coefficient	Std. Error	z-Statistic	p-Value
Constant	0.4	0.08	5	0.000**
ln FTE Students	0.015	0.008	1.88	0.06
ln RPS	0.06	0.028	2.14	0.032*
EPS	0.035	0.012	2.92	0.004**
Age	−0.001	0.001	−1.00	0.317
STR	0.004	0.004	1	0.317
Statistic	Value			
R-squared (overall)	0.22			
Observations	720			
HEI Clusters	Yes			

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Author's Analysis

Table 7. Random Effects (RE) Regression Results—CER_FTE

Variable	Coefficient	Std. Error	z-Statistic	p-Value
Constant	0.01	0.002	5	0.000**
ln FTE Students	0.007	0.005	1.4	0.162
EPS_FTE	−0.005	0.01	−0.50	0.618
RPS_FTE	0.01	0.025	0.4	0.689
FTE Staff	0.004	0.003	1.33	0.184
Age	−0.001	0.001	−1.00	0.317
STR	0.004	0.004	1	0.317
Statistic	Value			
R-squared (overall)	0.21			
Observations	720			
HEI Clusters	Yes			

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Author's Analysis

Model Selection and Diagnostic Validation

Model selection was guided by the Hausman specification test, which did not reject the null hypothesis ($\chi^2(7) = 13.34$, $p = 0.060$), indicating that the random effects estimator may be consistent. However, the borderline

p -value suggests that fixed effects results should still be interpreted as a robustness check (see Table 8).

Diagnostic testing identified heteroskedasticity, $\chi^2 (150) = 1230.45$, $p < .001$, and first-order serial correlation, as indicated by the Wooldridge test, $F (1, 150) = 5.67$, $p = .019$. No evidence of cross-sectional dependence was detected ($z = 0.34$, $p = .731$), while the residual distribution was approximately normal, $\chi^2 (2) = 0.87$, $p = .647$. These diagnostic results informed the use of robust standard errors and support the appropriateness of the adopted panel estimation strategy (Table 9).

Table 8. Hausman Specification Test (Fixed vs. Random Effects)

Test	Chi ² Statistic	df	p-value	Decision
Hausman (FE vs. RE)	13.34	7	0.06	Do not reject H ₀ : RE estimator is consistent

Table 9. Panel Regression Diagnostic Tests

Assumption	Test Applied	Statistic	p-value	Conclusion
Heteroskedasticity	Modified Wald Test for GroupWise FE	$\chi^2 (150) = 1230.45$	<0.001	Heteroskedasticity detected
Autocorrelation	Wooldridge Test for Serial Correlation (AR (1))	$F (1, 150) = 5.67$	0.019*	First-order serial correlation detected
Cross-sectional Dependence	Pesaran CD Test	$z = 0.34$	0.731	No cross-sectional dependence
Normality of Residuals	Jarque-Bera Test	$\chi^2 (2) = 0.87$	0.647	Residuals approximately normal

The Predictive Model

The unadjusted CER specification identifies institutional scale, revenue per student, and expenditure per student as statistically significant determinants

of variation in the operational-cost-to-revenue ratio. The positive coefficients indicate that increases in these variables are associated with higher CER values. Since lower CER denotes greater cost efficiency, the results point to potential cost pressures accompanying institutional expansion and greater financial activity rather than to unconditional efficiency gains. The model explains approximately 18% of the within-institution variation in CER ($R^2 = 0.18$).

The FTE-adjusted specification presents a different pattern. None of the individual predictors reaches the conventional 5% significance threshold, although enrolment scale approaches marginal significance ($p = 0.061$). The model explains approximately 17% of the variation in CER_FTE. This attenuation after workload normalization indicates that FTE adjustment absorbs part of the scale-related variation observed in the unadjusted model and supports interpreting FTE primarily as a standardization and decision-support mechanism rather than as an independent source of financial efficiency.

Model 1: Unadjusted Cost Efficiency Equation (CER)

Estimated model:

$$\text{CER}_{it} = 0.500 + 0.020 \times \log (\text{FTE_students}_{it}) + 0.080 \times \log (\text{RPS}_{it}) + 0.030 \times \text{EPS}_{it} - 0.002 \times \text{Age}_{it} + 0.005 \times \text{STR}_{it} + \varepsilon_{it}$$

Where:

Estimated model:

$$\text{CER}_{it} = 0.500 + 0.020 \times \log (\text{FTE_students}_{it}) + 0.080 \times \log (\text{RPS}_{it}) + 0.030 \times \text{EPS}_{it} - 0.002 \times \text{Age}_{it} + 0.005 \times \text{STR}_{it} + \varepsilon_{it}$$

Where:

$$\beta_1 (\log \text{FTE_students}): 0.020 (p = 0.046)$$

$$\beta_2 (\log \text{RPS}): 0.080 (p = 0.022)$$

$$\beta_3 (\text{EPS}): 0.030 (p = 0.003)$$

$$\beta_4 (\text{Age}): -0.002 (p = 0.318)$$

$$\beta_5 (\text{STR}): 0.005 (p = 0.317)$$

$$R^2 = 0.18; \text{Observations} = 720; \text{Fixed Effects included.}$$

Model 2: FTE-Adjusted Cost Efficiency Equation (CER_FTE)

Estimated model:

$$\text{CER_FTE}_{it} = 0.005 + 0.015 \times \log (\text{FTE_students}_{it}) + 0.010 \times \text{RPS_FTE}_{it} - 0.005 \times \text{EPS_FTE}_{it} + 0.004 \times \text{FTE_Staff}_{it} - 0.001 \times \text{Age}_{it} + 0.004 \times \text{STR}_{it} + \varepsilon_{it}$$

Where:

β_1 (log FTE_students): 0.015 ($p = 0.061$)

β_2 (RPS_FTE): 0.010 ($p = 0.689$)

β_3 (EPS_FTE): -0.005 ($p = 0.618$)

β_4 (FTE Staff): 0.004 ($p = 0.184$)

β_5 (Age): -0.001 ($p = 0.318$)

β_6 (STR): 0.004 ($p = 0.317$)

$R^2 = 0.17$, Observations = 720, Fixed Effects included

Semi-Structured Interview Participants Demographics

Table 10 presents the demographic characteristics of the interview participants, highlighting their expertise, educational qualifications, and institutional types. The participants occupy critical administrative and financial positions, providing diverse insights into HE financial management. The "Head of Management Accounting" (11–20 years, Master's) offers insights from a comprehensive institution with over 10,000 students. The "Head of HR" (5–10 years, Master's) provides perspectives on workforce efficiency in teaching-focused institutions. The "Head of Systems Accounting" (5–10 years, Master's) focuses on financial systems in research-intensive settings. The "Finance Officer" (20+ years, Ph.D.) offers in-depth knowledge of strategic financial governance in comprehensive institutions.

Table 10. Demographics of Participants of the Semi-Structured Interview

Current Position	N	Years of Experience	Highest Educational Qualification	Size of Institution (Students)
Heads of Management Accounting	4	11-20 years	Master's Degree	More than 10,000
Heads of HR	4	5-10 years	Master's Degree	5,000–10,000
Heads of Systems Accounting	4	5-10 years	Master's Degree	More than 10,000
Finance Officers	2	20+ years	Doctorate (PhD)	5,000–10,000

Source: Author's Analysis

Thematic Analysis

This section presents the integrated findings from interviews and document reviews, structured into three overarching thematic areas: (1) Evaluation of FTE Application Practices in Ghanaian Public HEIs; (2) Relationship Between FTE Applications and Financial Efficiency; and (3) Policy and

Management Implications of Improved FTE Practices, as outlined in Figure 2. The thematic structure is grounded in both qualitative insights from key informants and supporting documentary evidence.

Theme 1: Application of Full-Time Equivalence (FTE) Metrics in Ghanaian Public HEIs

QR1: *How are FTE metrics applied in the financial planning and operations of Ghanaian public HEIs?*

The analysis reveals that FTE applications are widely recognized as essential to institutional planning and resource management across Ghanaian Public HEIs. However, the extent and consistency of their application vary significantly across institutions, departments, and reporting levels.

Interview data reflect broad agreement among administrators that accurate FTE figures enhance operational clarity. One senior financial administrator remarked, "If our FTE data is accurate, then we know how many staff we truly need. That alone saves cost and boosts productivity." This sentiment was echoed in the documents reviewed, which emphasized the role of FTE-based budgeting in aligning human resource deployment with academic demand.

Yet inconsistencies in FTE calculation methods, particularly in institutions relying heavily on part-time or adjunct staff, were repeatedly highlighted. One finance officer observed, "We have no standardized way of using FTE across departments; it's mostly improvised and reactive." Document evidence similarly revealed disparities in how teaching hours, administrative responsibilities, and research activities are weighted, leading to internal inefficiencies and unreliable benchmarks.

To address these challenges, best practices identified included centralized FTE tracking systems, standardized guidelines, and regular audits. As one senior institutional administrator noted, "We introduced a centralized tracker with automated calculations. It reduced discrepancies across departments."

The evidence therefore indicates that the application of FTE is marked by institutional efforts to improve internal controls, although these efforts remain constrained by the absence of a unified national framework for ensuring consistency and comparability across the sector.

Theme 2: Relationship Between FTE Applications and Financial Efficiency

QR2: *What is the relationship between the application of FTE metrics and financial efficiency in Ghanaian public HEIs?*

Findings from interviews and documentary analysis indicate that institutional stakeholders associate effective FTE application with more disciplined financial planning, staffing alignment, and resource allocation. Institutions with more developed FTE-related systems were perceived as better able to assess workload requirements, anticipate expenditure pressures, and align staffing and enrolment decisions.

The quantitative findings provide a complementary but more qualified perspective. Institutional scale, revenue per student, and expenditure per student significantly explain variation in the unadjusted CER model, whereas the corresponding FTE-adjusted specification produces weaker and statistically nonsignificant individual effects. The combined evidence therefore does not establish FTE as an independent determinant of financial efficiency. Rather, it suggests that FTE contributes primarily by standardizing workload information and strengthening the informational basis on which financial and operational decisions are made.

Qualitative insights reinforced this association. One senior institutional administrator referred to FTE as *‘the early warning system. If we monitor it right, we prevent overspending or overstaffing when enrolment drops.’* Similarly, another senior financial administrator stated, *‘Without FTE data, budget allocation feels like guesswork. With it, the process is defensible and data-based.’*

Document review indicated that institutions utilizing FTE-driven budgeting frameworks were perceived or reported as better positioned to manage volatility in enrolment and revenue streams. However, some concerns emerged regarding the overreliance on FTE metrics, potentially neglecting qualitative considerations such as teaching quality and research output. Stakeholders advocated for a more balanced model that integrates FTE metrics with broader institutional performance indicators.

Theme 3: Policy and Management Implications of Improved FTE Practices (QR3): What are the policy and management implications of enhancing FTE practices for financial governance in HEIs?

The third theme explores the regulatory and governance dimensions of FTE application. Both data sources highlight a critical gap in national policy frameworks regulating FTE standards, calculation methods, and reporting protocols. Stakeholders noted the lack of a centralized regulatory mechanism, which has led to inconsistencies in FTE usage and reporting, thereby impeding inter-institutional benchmarking and policy evaluation.

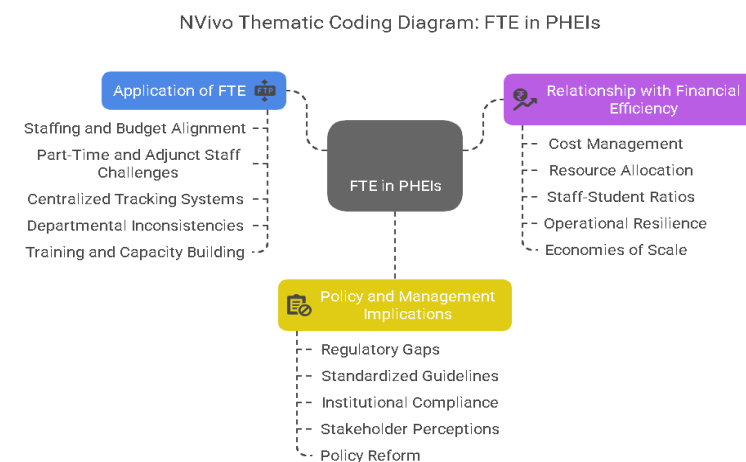
One senior institutional administrator captured this challenge, stating, *‘The absence of national FTE standards makes it difficult to compare or benchmark institutions fairly.’* Documentary evidence corroborated this view, pointing to fragmented institutional policies and unclear regulatory expectations as barriers to sector-wide efficiency gains.

Institutions with longer histories and stronger administrative capacities were better able to align their FTE practices with internal strategic goals. These institutions had instituted periodic FTE audits, integrated FTE data into financial dashboards, and ensured routine training for finance and planning staff. Conversely, newer or resource-constrained institutions often struggled with data collection, storage, and utilization—limiting their ability to leverage FTE for strategic decision-making.

Stakeholders proposed a series of policy reforms aimed at enhancing the utility of FTE applications. These include developing and enforcing national guidelines on FTE calculation and reporting; mandating sector-wide adoption of standardized FTE tracking systems; providing capacity-building support to smaller institutions for FTE integration; and embedding FTE data in funding formulae and performance-based financing frameworks.

Critically, several participants cautioned against viewing FTE as a panacea. While essential for data-driven planning, FTE must be complemented by qualitative metrics and context-specific indicators to ensure a holistic approach to institutional performance management.

Figure 2. NVivo Thematic Coding Diagram



Source: NVivo Qualitative Data Analysis

Discussion

Viewed through the Resource-Based View (RBV), the findings refine the understanding of FTE data as an institutional resource. The evidence suggests that FTE information does not generate efficiency merely by being available; its strategic value emerges when accurate workload data are combined with complementary organizational capabilities, including integrated information systems, analytical expertise, effective financial governance, and standardized reporting processes. The weaker explanatory power of the FTE-adjusted econometric specification reinforces this distinction. FTE normalization improves comparability and decision support, but efficiency outcomes remain contingent on how institutions interpret and deploy the resulting information. The study therefore extends the RBV from resource possession to resource orchestration: standardized institutional data become performance-relevant capabilities only when embedded within managerial routines that support budgeting, staffing, monitoring, and resource allocation.

This study provides a comprehensive investigation into the application of Full-Time Equivalence (FTE) and its relationship with financial efficiency within Ghanaian public HEIs. By integrating panel data results with thematic insights, the findings underscore the importance of FTE metrics in institutional financial planning and sustainability. The unadjusted CER model indicates that institutional scale, revenue per student, and expenditure per student are significant predictors of cost efficiency. By contrast, the FTE-adjusted specification produces weaker effects, with none of the predictors attaining conventional levels of statistical significance. This attenuation after workload normalization suggests that FTE is particularly valuable as a standardization and planning metric rather than evidence, in itself, of direct efficiency gains (Jongbloed, 2022).

The findings further indicate that the managerial value of FTE is conditional on institutional governance and analytical capacity. FTE measures do not translate mechanically into lower costs or stronger financial performance; rather, their usefulness depends on whether institutions possess reliable information systems, consistent workload definitions, and managerial processes capable of converting standardized data into resource-allocation decisions. Stakeholder evidence supports this interpretation, particularly in relation to enrolment planning, staffing alignment, budget formulation, and financial risk management (Pilonato & Monfardini, 2020). This reinforces the Resource-Based View proposition that information generates institutional value when it is embedded within complementary organizational capabilities and governance arrangements (Al-Filali et al., 2024).

Nevertheless, FTE applications are hindered by data inconsistencies, institutional disparities in reporting practices, and the absence of standardized guidelines (Rosinger et al., 2022; Macheridis & Paulsson, 2021). These limitations restrict its effectiveness as a financial tool, particularly in institutions lacking robust data systems. Moreover, FTE does not account for qualitative performance indicators such as academic quality and social impact (Ortagus et al., 2020; Dima et al., 2024), underscoring the need for more comprehensive performance frameworks.

Finally, the role of regulatory oversight is crucial. Variability in FTE reporting reflects uneven policy enforcement, disadvantaging younger institutions (Adeusi et al., 2024), while mature institutions with stronger governance report more consistent data and exhibit better outcomes (Salehi et al., 2023).

Conclusion

This study demonstrates the relevance of Full-Time Equivalence metrics to financial planning and resource management in Ghanaian public HEIs. The panel results show that institutional scale, revenue per student, and expenditure per student are significant predictors of unadjusted cost efficiency. However, these relationships weaken after normalization by FTE, suggesting that workload adjustment reduces some of the scale-related variation observed across institutions. Rather than establishing FTE as an independent determinant of financial efficiency, the findings position it as an important standardization and decision-support metric for comparing workloads, informing staffing decisions, strengthening budgeting, and improving resource allocation.

This distinction is analytically important because it separates the value of FTE as a normalization mechanism from the broader organizational capabilities required to convert standardized workload information into efficiency gains.

The qualitative evidence reinforces this interpretation. Institutional stakeholders recognize the value of FTE-based information for planning and financial management but identify inconsistent calculation methods, fragmented data systems, and the absence of harmonized reporting protocols as major constraints on its effective application. The policy significance of FTE therefore depends not only on its technical calculation but also on the quality of institutional data systems, managerial capacity, and regulatory coordination.

The study consequently supports the development of standardized national protocols for FTE calculation and reporting, investment in integrated institutional data systems, and the progressive incorporation of FTE

measures into evidence-based budgeting and performance-financing arrangements. Such reforms would improve comparability and transparency across public HEIs while providing a stronger empirical basis for resource-allocation decisions. Future research could extend this analysis by examining alternative FTE weighting assumptions, incorporating broader measures of institutional outputs and quality, and assessing the interaction between FTE-based workload measures and full economic costing frameworks.

Contribution to Theory and Practice

This study makes four interrelated contributions to higher education finance and institutional management.

Theoretical Contribution: The study extends the Resource-Based View by demonstrating that standardized institutional information such as FTE data should not be treated as inherently performance-enhancing resources. Their strategic value depends on complementary organizational capabilities that enable institutions to collect, integrate, interpret, and deploy such information in decision-making. The findings therefore shift attention from resource possession to resource orchestration. In the higher education context, FTE becomes strategically consequential when embedded within budgeting routines, staffing systems, governance processes, and institutional data infrastructures. This qualification is particularly important because the weaker FTE-adjusted regression results indicate that normalization alone does not produce financial efficiency.

Methodological Contribution: The study integrates panel econometric analysis with stakeholder interviews and documentary evidence to distinguish the statistical effects of scale and financial inputs from the managerial usefulness attributed to FTE within institutions. This mixed-methods approach prevents the operational importance of FTE from being conflated with direct econometric effects. It also demonstrates the analytical value of comparing unadjusted and FTE-normalized efficiency specifications in contexts where formal FTE reporting is not uniformly institutionalized.

Managerial Contribution: For institutional leaders, the findings position FTE as a decision-support infrastructure for workload planning rather than a stand-alone performance indicator. Public HEIs can use standardized FTE information to strengthen enrolment forecasting, staffing alignment, expenditure planning, budget formulation, and internal benchmarking. However, these benefits depend on integrated data systems, analytical capability, consistent institutional definitions, and governance arrangements that connect information to operational decisions. Institutions should therefore invest not only in FTE computation but also in the organizational

capacity required to translate workload information into effective resource management.

Policy and Regulatory Contribution: At the sector level, the study identifies standardization as a prerequisite for the meaningful use of FTE in inter-institutional comparison and public financing. Harmonized definitions, reporting cycles, validation procedures, and audit mechanisms would improve comparability across Ghanaian public HEIs and provide a more credible basis for evidence-informed resource allocation. The findings support the progressive integration of FTE information into budgeting and performance-financing frameworks, while cautioning against using FTE as a solitary measure of institutional performance. Any sector-wide framework should complement FTE with indicators of academic quality, student outcomes, research performance, institutional mission, and wider public value.

Suggestions for Future Research

Future inquiries should extend the temporal scope to examine the long-term implications of FTE applications on institutional financial sustainability and strategic adaptability. Longitudinal studies that capture post-reform trajectories would clarify the enduring effects of standardized FTE implementation. Comparative research involving higher education systems in other sub-Saharan African or emerging economies would also enrich understanding of contextual enablers and constraints. Further, qualitative investigations into stakeholder experiences, particularly around data governance, capacity development, and system integration, would provide nuanced insights into institutional readiness and reform pathways. Future research should also explore hybrid performance frameworks that incorporate FTE alongside indicators of academic quality, student outcomes, and social impact, thereby advancing multidimensional approaches to institutional evaluation. Finally, policy-oriented studies assessing the outcomes of regulatory reforms in FTE reporting could inform more effective governance and accountability mechanisms within the sector.

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