THE EFFECT OF PUBLIC BUDGET ACCOUNTABILITY ON OPERATIONAL EFFICIENCY OF PUBLIC UNIVERSITIES IN SOUTH SUDAN

Philip Abiel.
Dr. Fredrick Warui.
Dr. Salome Musau.

International Academic Journal of Economics and Finance (IAJEF) | ISSN 2518-2366

Received: 12th October 2025

Published: 6th November 2025

Full Length Research

Available Online at: https://iajournals.org/articles/iajef_v5_i1_451_469.pdf

Citation: Abiel, P., Warui, F., Musau, S. (2025). The effect of public budget accountability on operational efficiency of public universities in South Sudan. *International Academic Journal of Economics and Finance (IAJEF) | ISSN 2518-2366*, *5*(1), 451-469.

ABSTRACT

Public universities in South Sudan are essential to national progress, driving innovation, human capital development, and societal transformation. However, since independence in 2011, they have faced persistent inefficiencies that hinder their core mandates. This scholarly inquiry examined the influence of public budget accountability on the operational efficiency of public universities in South Sudan. It assessed the effect of accountability structure. Grounded in new public management theory, the study embraced a pragmatist philosophy and employed a triangulated methodology, drawing upon both qualitative and quantitative data. Information was gathered from five financial controllers representing all public universities through a census approach, utilizing structured questionnaires, interviews, and institutional records from the 2022–2023 fiscal year. Analytical techniques included descriptive statistics, correlation analysis, and simple regression. The findings revealed that public budget accountability exerted a statistically significant and positive effect on operational efficiency ($p < 0.05$), and the final model demonstrated strong explanatory power (Adjusted $R^2 = 0.923$). The study concludes that effective budget practices, significantly enhance public university performance, advocating a governance model where ethical stewardship and technical precision converge. Recommendations include institutionalizing budget transparency through open-book practices, reinforcing accountability via performance-linked audits, optimizing control systems with real-time monitoring. Theoretically, the research advances the literature on public financial management into models of institutional performance. Empirically, it offers nuanced insights from a fragile and hitherto under-examined context. Methodologically, it contributes through the deployment of triangulated data collection. The study's implications for public sector governance are profound, advocating for strengthened budgetary practices to bolster operational outcomes within higher education institutions in post conflict settings such as South Sudan.

Key words: Public Budget Accountability, Public Universities, Operational Efficiency, South Sudan, New Public Management Theory.

INTRODUCTION

Universities are pivotal engines of development and innovation for both developed and developing nations, owing to their capacity to enhance research, understanding, and scientific invention (Bouhajeb et al., 2018). They are expected to lead and nurture development across public and private sectors, contingent on strong cooperation with national governments and business entities (Choyubekova et al., 2019). Institutions of higher learning contribute to national progress by cultivating human capital and advancing scientific knowledge through research, patents, incubators, and partnerships (Olo et al., 2021). Public universities, in particular, serve as societal educational service providers operating under business constraints, unlike private enterprises governed by social controls (Comrie, 2021). Their core mission includes producing graduates, generating new knowledge, and transforming communities. To fulfill this role effectively, public universities require adequate funding, infrastructure, and support to achieve national development goals (Wang et al., 2021).

However, public universities face multifaceted challenges including financial sustainability, globalization, technological integration, and governance. Financial viability hinges on efficient spending and diversified funding sources (Tsou, 2024). Inefficient resource utilization has hindered their ability to generate and disseminate knowledge, compromising their mandate (Gutierrez et al., 2020). Globalization, massification, and ICT adoption further strain their operations, especially under limited funding (Olo et al., 2019). To remain viable, public universities must demonstrate strong budget management, accountability, and governance. Efficient resource use and minimized operational costs are essential. One key metric is the Operating Expense Ratio (OER), where a ratio of 50% or below indicates prudent financial management and operational discipline (Faisal et al., 2021). A lower OER reflects streamlined operations and supports strategic investment in academic quality (Kakumba, 2022).

Despite the importance of operational efficiency, disparities exist among public universities in achieving optimal OER levels (Kosor et al., 2019). Institutions with centralized services and lean administrative models tend to perform better. For instance, the University of Warsaw maintained an OER of approximately 48% in 2020, Charles University in Prague reported around 47%, and the University of Porto achieved close to 49% (EUA, 2022; EHEA, 2020). These figures highlight effective cost containment and resource allocation, often supported by strong national funding and minimal overheads (Eurostat, 2020). Such fiscal discipline enables universities to invest in infrastructure and academic excellence, reinforcing their role in national development. Therefore, optimizing operating expenditures remains a critical strategy for public universities aiming to fulfill their educational and societal missions.

Globally, public universities demonstrate varied levels of operating expense efficiency. In the United States, the adjusted operating margin ratio for public universities in 2022 was 4%, marking optimal performance (Wadhwani & Moses, 2023). The University of New Hampshire reported an exceptional operating expense ratio of 10.9% in 2021 (Fichtenbaum, 2021). In Canada, public colleges and universities maintained a ratio of approximately 42% in 2019, aligning with the efficiency benchmark of 50% or below (Auditor General of Ontario, 2021). Across Asia and Latin America, institutions such as the University of São Paulo (Brazil), University of Malaya (Malaysia), and National Autonomous University of Mexico reported operating expense ratios of 46%, 48%, and 49% respectively, reflecting efficient budget allocation and strong government support (UoSP, 2021; UNESCO, 2021; UNAM, 2021; World Bank, 2020). These universities benefit from centralized funding and lean administrative models that prioritize academic delivery with minimal overhead.

Regionally, African public universities present a mixed picture of operational efficiency. While most institutions exceed the 50% benchmark, some have achieved notable success. The University of Free State in South Africa maintained a ratio of 48% between 2015 and 2019 (Serfontein, 2022), and Isa Mustapha Agwai Polytechnic University in Nigeria reported 47%

due to sustainability accounting practices (Adagye et al., 2024). However, institutions like the University of Cape Town (68%), Makerere University (65%), and University of Nairobi (60%) reflect higher ratios due to varied funding models and institutional priorities (UCT, 2021; MU, 2020; UoN, 2021). In 2021, University of Pretoria and Stellenbosch University recorded ratios of 72% and 74%, respectively, below South Africa's national average of 88.6%, owing to diversified income sources and strategic budgeting (University of Pretoria, 2022; Pisarska & Karpacz, 2021; Statistics South Africa, 2023). These institutions exemplify how innovation and partnerships can enhance financial efficiency in resource-constrained environments.
Locally, South Sudan's public universities face significant challenges in operational efficiency.

Despite their resilience over decades, institutions have struggled since independence in 2011 due to poor infrastructure, underfunding, and staff shortages (Oywak et al., 2019; Tadeo, 2023). Operating expense ratios for fiscal years 2018–2019, 2020–2021, and 2022–2023 were 92%, 91.9%, and 85.5%, respectively, indicating severe inefficiency (Mabiordit, 2018; Lual, 2020; Chol, 2023). These high ratios stem from unpredictable budget flows and reliance on outdated accounting systems, leaving little room for innovation or infrastructure development (UNESCO, 2023; UNICEF, 2019). Comparatively, Ghana's University of Ghana and KNUST reported unusually low ratios of 1.53% and 1.49% in 2021, attributed to underreporting and financial mismanagement (Ayam, 2024; UNESCO, 2020). Without reforms in budget management and financial reporting, South Sudan's public universities risk contributing minimally to national development and human capital formation.

Statement of the Problem

Institutions of higher learning are globally recognized as engines of innovation and national development, fostering scientific advancement and knowledge creation (Bouhajeb et al., 2018). In South Sudan, despite the resilience of its public higher education system over the past five decades, universities continue to face significant operational inefficiencies that hinder quality education delivery (Oywak et al., 2019). The country's poor performance on the U.N. Education Index in 2021, with a score of 34.5%, reflects these systemic challenges (Stiftung, 2024). Alarmingly high operating expense ratios—92% in 2018–2019, 91.9% in 2020–2021, and 85.5% in 2022–2023—underscore the inefficiency in financial resource utilization (Mabiordit, 2018; Lual, 2020; Chol, 2023). Such ratios indicate weak cost management and ineffective prioritization of expenditures (Nelson & Tolani, 2021). These inefficiencies compromise democratic decision-making and institutional accountability, prompting the need to investigate the relationship between public budget management practices and operational efficiency in South Sudanese universities (George & James, 2021). Efficient public resource administration is essential for national prosperity and institutional performance (Haeruddin et al., 2021).

The existing literature on public budget accountability and operational efficiency in higher education reveals methodological and contextual gaps. Eleuwarin and Muslim (2024) used descriptive surveys but lacked census sampling and philosophical grounding. Almagtomea et al. (2019) did not focus on educational institutions and omitted triangulated methods. Li and Guo (2022) relied solely on quantitative analysis without philosophical or methodological

plurality. Iyoha (2021) and Alade et al. (2020) employed conventional techniques but failed to explore budgetary practices in the education sector or apply triangulation. These omissions highlight the need for a more integrative and philosophically anchored approach. The current study addresses these gaps by employing a triangulated mixed-methods design, census sampling, and a pragmatism-based philosophical framework to ensure comprehensive institutional representation and methodological rigor tailored to the South Sudanese context.
A comparative review of methodologies further illustrates the diversity in operational efficiency indicators and research designs. Atukunda et al. (2024) used document reviews but lacked sector specificity. Mutabari and Warui (2023) applied regression analysis without triangulation. Shuaib and Olanrewaju (2020) and Da Silva et al. (2020) used descriptive statistics and secondary data, respectively, but omitted cross-sectional and mixed-methods designs. Stanimirovic (2022) employed efficiency ratios but lacked philosophical depth, while Ballesteros and Bisogno (2022) used econometric models with limited methodological diversity. In contrast, the current study integrates census sampling, cross-sectional analysis, and a pragmatism philosophy to enhance contextual relevance. This approach ensures a more nuanced understanding of operational efficiency in public universities, particularly in under-researched environments like South Sudan.

Operational efficiency metrics across the literature vary widely. Financial indicators such as Return on Assets (ROA) and Return on Investment (ROI) were used by Mutabari and Warui (2023) and Ballesteros and Bisogno (2022) to assess institutional health. Budget utilization rates featured in Shuaib and Olanrewaju (2020) and Da Silva et al. (2020), while Stanimirovic (2022) emphasized cost-per-output and service benchmarks. Atukunda et al. (2024) aligned efficiency with SDG outcomes. However, the current study prioritises the operating expense ratio—a targeted metric assessing the proportion of total expenditures allocated to core operations. This measure offers a more precise evaluation of cost-effectiveness in public universities than broader financial metrics. Its application within a triangulated, pragmatically grounded framework enhances its ability to reflect institutional realities, making it a robust tool for assessing operational efficiency in South Sudan’s public higher education sector.

Study Objective

To analyze the effect of public budget accountability on operational efficiency of public universities in South Sudan.

LITERATURE REVIEW

Theoretical Review

The New Public Management (NPM) theory, introduced by Hood and Jackson (1991), draws from corporate sector principles and adapts them for public administration. Its core objective is to enhance effectiveness, efficiency, and accountability within public institutions by fostering competition, implementing performance measurement systems, and empowering managers to make strategic decisions. NPM promotes private-sector practices such as performance-based budgeting, decentralization, and institutional accountability, particularly within public universities where it aims to improve operational efficiency through measurable and transparent outcomes (Christensen & Lægreid, 2019). Fatemi and Behmanesh (2012) emphasized that NPM satisfies both political and customary accountability, advocating that civil servants be answerable to the public rather than solely to elected officials. Kalimullah et al. (2012) viewed NPM as a paradigm shift that enhances the efficient use of public financial resources and supports accountability through managerial actions.

Abdullahi (2024) highlighted NPM's transformative role in public governance, emphasizing decentralization, performance measurement, competition, and customer-oriented service delivery as key strategies for improving efficiency and responsiveness without undermining social equity. The theory encourages the adoption of managerial and performance-driven principles to enhance public service delivery and institutional accountability. Indahsari and Raharja (2020) described NPM as a managerial approach focused on maximizing effectiveness in public administration through performance-oriented rather than policy-oriented strategies. They identified three core strategies: reorganization of public administration, decentralization of partnerships and networks, and innovation. These principles aim to modernize public institutions and align them with efficiency standards typically found in the private sector, thereby improving service delivery and resource utilization.

Despite its advantages, NPM has faced substantial criticism. Mongkol (2011) argued that granting excessive authority to public managers can lead to centralized decision-making, undermining delegation and participatory governance. He also noted that private-sector practices may not be suitable for public institutions due to differing operational contexts. Pemberton (2017) critiqued the United Kingdom's experience with NPM, noting that after three decades, the government saw increased expenditure and reduced performance, challenging the assumption that NPM inherently improves efficiency. Nonetheless, NPM remains influential, particularly in promoting budgetary accountability in public universities. It provides a framework for ensuring that government funds are professionally managed and directed toward intended purposes, reinforcing fiscal discipline and contributing to national socio-economic development (de Boer, 2023; Bianchi, Nasib, & Rivenbark, 2021).

Empirical Review

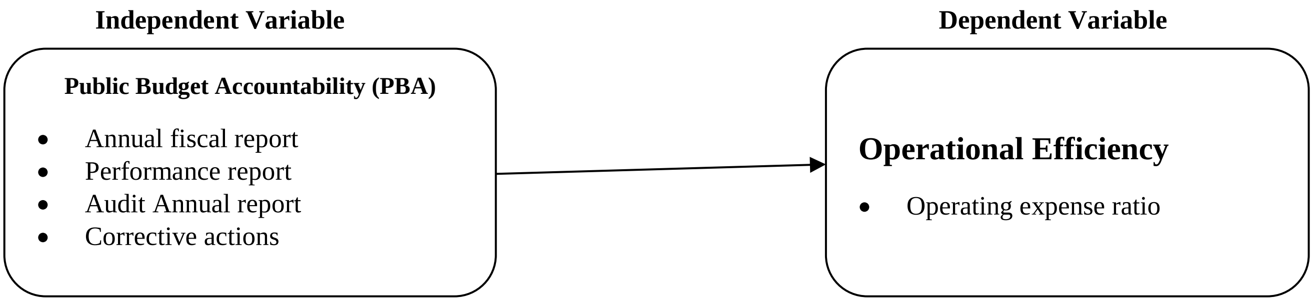
Many observers advocated for reforms of public organizations to avoid their dysfunction that was blamed on traditional usage of the budget processes. Naufal, *et al* (2023) analyzed the role of information technology (IT) in enhancement of answerability for financial plan in Indonesia. The study applied qualitative method using observations, deep interviews, specific crowd deliberations and records keeping as data gathering instruments, while snowball sampling was considered as a sampling procedures. The authors analyzed public budget accountability through five dimensions of monetary answerability, lawful responsibility, programme liability, procedures accountability and performance obligation. This study concluded that budget accountability and quality at UBT was enhanced by ICT programme known as SAKTI, through three dimensions of budget planning, budget execution and fiscal reports. They concentrated on effect of ICT towards budget accountability of UBT in Indonesia but excluded effect of budget accountability on operational efficiency. This study used only descriptive statistics, excluded inferential statistics, and employed qualitative approach rather than mixed approach.

Kallio, *et al* (2021) discussed the intensive conflict between universities' accountability and autonomy of Finland's institutions of higher education. The survey study design and open-ended questionnaires were used in this researched work. The study was cemented on paradox theory and institutional complexity theory. Researchers discovered substantial gap between impact and relevance experiences of the piloting devices at institutions of higher learning of Finland. They concentrated around the association of public universities' accountability and autonomy of tertiary institutions in Finland; but excluded effect of university budget accountability on operational efficiency of the university, while diagnostic tests were left out.
Almagtomea, *et al* (2019) explored the association of fiscal capability to answerability role at the government universities in Iraq. This article adopted an investigative method using dialogues and contented examination processes as data collection and analysis tools. The researchers employed a solvency ratio to measure fiscal ability at Kufa university. They indicated that monetary ability and answerability were dependent to each other, and the university of Kufa has a poor financial sustainability prediction. Financial accountability is the foundation of financial sustainability of the university, because stakeholders gained trust in the university if the accountability is embraced and applied. Furthermore, the analysis revealed that the financial deficit experienced by the university during the three years was attributed to missing accountability of funds and nepotism. This article described the interconnection between financial sustainability and obligation fulfillment in public universities and Kufa university was reserved as an example for the study. Key loopholes of this article include lack of methodology, particularly diagnostic tests and sampling procedures, a single theory was not quoted, and the study followed only descriptive statistics and excluded inferential statistics.

Conceptual Framework

The interconnection between different research variables is stated below in conceptual framework model. The conceptual framework model elaborated the relationships among explanatory variables that include public budget transparency, public budget participation, public budget accountability, and public budgetary control; while operational efficiency of public universities is considered as the moderator as indicated below.

Figure 1: Conceptual framework



Source: Author (2024)

The conceptual framework presented in Figure 1 identifies operational efficiency of public universities as the explained variable, measured through the operating expense ratio, which is calculated by dividing total operational expenditures by total income. Total income is used as the denominator because it underpins all university activities, including developmental projects and scientific research. A university's financial strength is determined by its liquidity and solvency, which depend on consistent income generation and sound financial decision-making (Mendoza, 2023). Financial stability also requires maintaining balanced income and expenditure flows and diversifying revenue sources to meet both short-term and long-term obligations (Laktionova et al., 2021). For public universities, income is essential for covering operational costs, hiring staff, procuring educational materials, and expanding infrastructure to support teaching, research, and training (Mahmud et al., 2022). Efficient use of income enables institutions to reduce reliance on government grants and establish sustainable financial foundations. To maximize the productivity of operating expenditures, universities must adopt effective budget control strategies that align spending with institutional priorities and promote cost-effectiveness (Chen et al., 2021). This approach ensures that public universities can fulfill their educational mandates while maintaining financial discipline and resilience.

RESEARCH METHODOLOGY

This study compiled a mixed dataset from both primary and secondary sources, with qualitative data from questionnaires and interviews, and quantitative data from annual university reports (Bryman, 2016). Methodological triangulation was employed to enhance reliability by integrating diverse data types and validating or refuting hypotheses through converging evidence (Heale & Forbes, 2013; Noble & Heale, 2019). Researchers obtained permits from Kenyatta University and NACOSTI before collecting data from five South Sudanese public universities (Dzwigoł & Barosz, 2020; Dzwigol, 2022). The data covered budget management practices, operational spending, and income for the fiscal year 2022–2023. A structured data sheet and approved instruments guided the collection process.

The study employed evocative statistics and interpretative analysis to enhance flexibility across social sciences (Greener & Martelli, 2018). Descriptive statistics such as mean, maximum, minimum, standard deviation, variance, skewness, and kurtosis were used to convert raw data into actionable insights for organizational planning and evaluation (Cooper & Schindler, 2014). Inferential statistics, including Pearson's multiple correlation, regression, and cross-sectional analysis, facilitated exploration of variable relationships to understand causal dynamics (Greener & Martelli, 2018). Qualitative data was numerically coded to assess the association between budget accountability and universities' operational efficiency (Hernández et al., 2012; Simister & James, 2020), with interviews and questionnaires compared for validation (Srnka & Koeszegi, 2007; Hochwald et al., 2023). Correlation coefficients quantified the strength and direction of relationships, ranging from +1 (perfect positive) to -1 (perfect negative), with 0 indicating no association (Gogtay & Thatte, 2017). This comprehensive statistical approach supported evidence-based decision-making in public university management (Cooper & Schindler, 2014).

The simple regression analysis was employed to assess the impact of public budget accountability on operational efficiency, modeling how variations in one variable predict changes in another (Bazdaric et al., 2021; Ali & Younas, 2021). Regression served as a diagnostic tool to clarify relationships between dependent and independent variables. Additionally, cross-sectional analysis was used to evaluate operational efficiency across South Sudanese public universities by interpreting data from a subset of the population at a specific time (Zheng, 2015; Wang & Cheng, 2020). The analysis combined descriptive and analytical approaches to examine inefficiencies and their associations with budget practices.

DATA ANALYSIS AND FINDINGS

Descriptive Analysis

Quantitative Analysis

Table 1: Public Budget Accountability

Public Budget Accountability (PBA)	SA	A	NS	D	SDA	M	S.D.
The university always prepare and publish annual financial report on annual basis.	60.0%	20.0%	0.0%	20.0%	0.0%	4.20	1.30
The university administration prepares and produces performance report of the university and personnel on annual basis.	60.0%	20.0%	20.0%	0.0%	0.0%	4.20	0.84
The accounts of the university have been always audited and annual audit reports are always published on annual basis.	40.0%	40.0%	0.0%	20.0%	0.0%	3.80	1.30
The national legislature assembly has been conducting an oversight role and published an oversight report on the public universities on annual basis.	20.0%	40.0%	20.0%	20.0%	0.0%	3.20	1.10
The university leadership has been always taking corrective actions accordingly in case of any mismanagement of university funds based on the circumstances.	40.0%	40.0%	0.0%	20.0%	0.0%	3.80	1.30
PBA Average Score	40.0%	40.0%	10.0%	10.0%	0.0%	**3.84**	**1.17**

Source: Field Data (2025)

The study revealed moderately strong perceptions of public budget accountability within South Sudan's public universities, with notable variations across specific dimensions. Financial reporting received high endorsement, with 60.0% of respondents strongly agreeing and 20.0% agreeing that universities prepare and issue annual financial reports, though 20.0% disagreed, yielding a mean score of M = 4.20 (SD = 1.30), indicating some concerns about consistency or accessibility. Similarly, performance reporting for institutions and personnel was strongly supported (M = 4.20, SD = 0.84), reflecting a structured and widely accepted monitoring approach. Auditing practices showed more mixed responses, with 40.0% strongly agreeing, 40.0% agreeing, and 20.0% disagreeing that annual audit reports are published, resulting in a mean of M = 3.80 (SD = 1.30), suggesting doubts about regularity or transparency. Corrective actions by university leadership also recorded moderate agreement (M = 3.80, SD = 1.30), implying that while frameworks may exist, their implementation may be inconsistent. The overall average score across all items was M = 3.84 (SD = 1.17), indicating a moderately high yet uneven perception of accountability. These findings suggest that foundational structures like financial reporting and performance evaluation are generally upheld, but there is a need to strengthen audit transparency, enhance oversight, and ensure consistent corrective action. Addressing these gaps is essential for reinforcing fiscal discipline, building stakeholder trust, and improving governance in public universities.

Qualitative Analysis

Qualitative evidence from staff across five public universities in South Sudan reveals a layered understanding of public budget accountability, highlighting robust internal practices like financial and performance reporting, but inconsistent external oversight. Participants affirmed the routine preparation of annual financial reports and performance appraisals, indicating institutionalised internal accountability. However, audit reliability was questioned, with reports of irregular intervals and limited legislative scrutiny, suggesting weak external enforcement. Mixed responses on corrective actions point to gaps in disciplinary consistency and communication. Some participants linked accountability practices to national governance frameworks, implying externally driven standards that may hinder internal reforms. Overall, while internal mechanisms are relatively strong, external audits and oversight remain sporadic, undermining the credibility of accountability systems. Strengthening both institutional procedures and national oversight capacity is essential for building a transparent and effective financial governance framework in South Sudan’s higher education sector.

Integration Analysis

The integration of quantitative and qualitative findings reveals that public budget accountability in South Sudan’s public universities is partially institutionalized, with internal mechanisms like financial and performance reporting generally functional and routinely practiced. However, external oversight - particularly audits and legislative review - shows inconsistency and limited enforcement, as some universities experience significant delays or absence of scrutiny. Qualitative responses confirm sporadic audit practices and unclear follow-up on financial mismanagement, indicating a disconnect between identifying irregularities and implementing corrective actions. This bifurcated landscape - strong internal reporting but weak external validation - exposes institutions to governance risks. To strengthen accountability, reforms should include statutory audit timelines, empowered oversight bodies, and transparent enforcement frameworks. Embedding these into national policies and institutional charters would enhance compliance and reduce reliance on discretionary practices. Ultimately, aligning internal efforts with robust external mechanisms is essential for credible and sustainable public budget accountability in higher education.

Operational Efficiency

Table 2: Descriptive Statistics Summary

Metric	Mean	Median	Minimum	Maximum	Standard Deviation
Total Income	5,510,152,190.83	3,321,405,000.00	1,751,490,849.00	12,146,300,579.15	4,095,060,393.92
Total OE	4,923,779,431.96	3,314,405,000.00	1,739,329,685.00	9,868,275,440.79	3,327,982,317.65
OER	0.9431	0.9931	0.8125	0.9979	0.0801

Source: Field Data (2025)

The Operating Expenses Ratio (OER) measures the proportion of a university's revenue consumed by operational costs, excluding depreciation. In South Sudan's five public universities, the average OER of 0.9431 indicates that 94.3% of income is spent on salaries, utilities, and administration, exceeding the recommended benchmark of 0.50 and leaving little room for strategic investments (Hanover Research, 2014; KPMG LLP, 2002). This high ratio suggests financial vulnerability despite consistent management practices, as highlighted by Musah and Gariba (2020), who note that excessive operational spending hampers academic development. Ogbogu (2019) also emphasises the need for balanced expenditure to ensure sustainability. The low standard deviation (0.0801) reflects uniform financial behavior, likely due to centralized governance and standardised budgeting. While this may indicate fiscal discipline and reliance on predictable funding, it also underscores the need for structural reforms to improve long-term growth and academic excellence.

Inferential Statistics

Pearson Correlation Analysis

Table 3: Pearson Correlation Matrix

Variable	OE	PBA
OE	1.000	0.734*
PBA		1.000

NB*:* *p* < 0.05 (2-tailed).

OE = Operational Efficiency; PBA = Public Budget Accountability.

Table 3 indicates a statistically significant and positive correlation between operational efficiency and public budget accountability ($r = 0.734$, $p < .05$), suggesting that improvements in accountability are closely linked to enhanced performance in public universities. Hence, public budget accountability exhibited strong association, emphasizing its central role in fostering institutional efficiency. The findings highlight the importance of accessible and timely financial information in supporting effective operations. This correlation underscores the need for universities to implement robust accountability mechanisms that ensure responsible financial stewardship. The analysis further suggests that accountable budgeting practices are instrumental in driving operational outcomes. Consequently, targeted reforms and capacity-building efforts are essential to enhance the practical relevance and effectiveness of these mechanisms in South Sudan's higher education sector.

Regression Analysis

Table 4: Consolidated Linear Regression Results and Model Fit Summary

Hypotheses	Operational Efficiency	β	SE	t	p
	Intercept	-0.4311	0.0868	-4.97	0.001
H_{01}	Public budget accountability	0.0488	0.0186	2.63	0.012

Model Fit Statistics

Statistic	Value
R	0.965
R^2	0.931
Adjusted R^2	0.925
F-statistic	153.00
Prob > F	0.000
AIC (Akaike Information Criterion)	-159
BIC (Bayesian Information Criterion)	-147
RMSE (Root Mean Square Error)	0.0440

Source: Field Data (2025)

A linear regression analysis was conducted to evaluate the impact of public budget management practices - specifically participation, transparency, accountability, and control systems - on the operational efficiency of public universities. The model was statistically significant ($F = 153.00$, $p < 0.05$), indicating that these practices collectively serve as strong predictors of institutional performance. The coefficient of determination ($R^2 = 0.931$) and (adjusted $R^2 = 0.925$) suggest that approximately 92.5% of the variance in operational efficiency can be explained by the combined influence of these variables. Additional fit statistics, including a high multiple correlation coefficient ($R = 0.965$), low RMSE (0.0440), and favorable AIC (–159) and BIC (–147) values, affirm the model's robustness and parsimony. Among the individual predictors, public budget accountability emerged as a significant determinant ($\beta = 0.0488$, $t = 2.63$, $p < 0.05$), reinforcing its role in enhancing efficiency by ensuring institutions are held answerable for financial decisions. These findings underscore the importance of embedding accountability mechanisms - such as regular audits and performance-based reporting - within budgetary frameworks to foster responsible financial stewardship and improve institutional outcomes. Collectively, the results affirm that accountable and well-regulated budgetary practices are essential for driving operational efficiency in public universities.

Predictive Model Equation: $\mathbf{OE = -0.4311 + 0.0488(PBA)}$

Results Discussion

The study investigated the impact of public budget accountability on operational efficiency in South Sudan's public universities. Public budget accountability refers to the obligation of institutions to justify financial resource use and demonstrate responsible stewardship in line with legal and performance expectations. In higher education, this principle is crucial for fostering stakeholder trust, reinforcing fiscal discipline, and aligning resource allocation with institutional goals. Accountability ensures universities are answerable for budget decisions and outcomes, which are essential for operational efficiency. The study's regression analysis confirmed a statistically significant positive effect of public budget accountability on operational efficiency ($\beta = 0.0488$, $t = 2.63$, $p < 0.05$), validating its role in promoting effective operations through mechanisms like regular audits, regulatory compliance, and performance-based reporting.

The findings align with Almagtomea et al. (2019), who examined fiscal accountability in Iraqi universities and found that weak oversight led to budget deficits and compromised financial sustainability. While their study focused on sustainability, the current research extends the discourse by empirically linking accountability to operational efficiency. It demonstrates that robust accountability mechanisms not only prevent financial mismanagement but also enhance internal controls and strategic alignment. This extension is particularly relevant in fragile contexts like South Sudan, where governance structures are underdeveloped. The study's quantitative approach strengthens the empirical foundation for understanding how accountability contributes to institutional performance, offering a more comprehensive view than prior research limited to financial outcomes.

Naufal et al. (2023) explored how digital systems like SAKTI enhance budget accountability across multiple dimensions in Indonesia. Their work highlighted the role of technology in improving financial and procedural responsibilities but did not assess its impact on operational efficiency. The present study builds on this by establishing a direct empirical link between accountability and performance outcomes in South Sudan's universities. It moves beyond technological enablers to show that accountability mechanisms—regardless of digital infrastructure—can significantly improve institutional effectiveness. This contribution is vital for contexts lacking advanced systems, demonstrating that accountability can be operationalized through governance reforms and managerial practices, even in resource-constrained environments.

Kallio et al. (2021) examined the tension between accountability and autonomy in Finnish universities, noting perceived contradictions between centralized oversight and institutional self-governance. However, their study did not empirically evaluate how accountability affects performance. The current research fills this gap by showing that accountability can coexist with autonomy and still enhance operational efficiency. In South Sudan, where universities face limited fiscal autonomy and weak controls, the findings underscore the importance of embedding accountability as a strategic governance tool. Overall, the study affirms that public budget accountability is not just a compliance measure but a catalyst for service delivery, resource optimization, and institutional sustainability in transitional higher education systems (Almagtomea et al., 2019; Naufal et al., 2023; Kallio et al., 2021).

Conclusion

The study found that public budget accountability has a statistically significant and positive effect on operational efficiency in public universities in South Sudan. Institutions that implement mechanisms such as periodic financial reporting, audit trails, and performance evaluations are more likely to achieve sustainable operations. Accountability fosters a culture of fiscal prudence by compelling managers to justify financial decisions and demonstrate outcomes, which deters mismanagement and reinforces stakeholder trust. Embedding accountability across all budgeting stages supports institutional credibility and performance. These findings affirm the importance of clearly defined financial obligations and enforcement mechanisms in enhancing institutional effectiveness, especially in fragile, post-conflict environments where governance structures are often weak.

The research also contributes to theoretical discourse by confirming and extending foundational public sector management theories. In relation to New Public Management (NPM) theory, which emphasises managerial accountability and performance orientation, the study validates its relevance in fragile contexts. While NPM is traditionally applied in stable bureaucracies, its principles were shown to be effective in South Sudan’s public universities, thus broadening the theory’s applicability. Similarly, Public Value Theory, which advocates for institutional responsiveness and accountability, was enriched by the study’s findings. The demonstrated link between accountability and operational efficiency supports the theory’s premise that legitimacy in public service delivery enhances value creation. Moreover, the study suggests that stewardship and performance mechanisms are most effective when complemented by independent oversight, offering a multidimensional view of institutional performance beyond traditional theoretical boundaries.

Empirically, the study offers original contributions by validating the relationship between budget accountability and operational efficiency in a structurally unique and under-researched context. It reinforces prior findings from developed sectors while expanding their relevance to fragile states. The full population approach, which included all public universities in South Sudan, enhances the generalizability of the results and captures institutional heterogeneity. The use of triangulated data sources - structured questionnaires and institutional records - further strengthens the reliability of the findings. These methodological choices position the study as a benchmark for future research in governance and public sector performance, particularly in resource-constrained and volatile settings. The evidence underscores that institutional reforms in higher education are both feasible and impactful, even amid systemic adversity.

Recommendations

The study reveals that public budget accountability significantly enhances operational efficiency in South Sudan’s public universities, prompting both practical and policy-level recommendations. Empirical findings underscore the positive correlation between budget accountability and institutional performance, advocating for reinforced accountability structures. Key practical interventions include the development of robust internal control systems, strengthening internal audit functions, and consistent evaluation of financial performance against budgetary targets. Additionally, clear role delineation in financial management and enforcement of sanctions for non-compliance are essential to curb fund mismanagement and promote fiduciary discipline. These measures aim to ensure that budget allocations yield tangible institutional outputs. On the policy front, the study recommends institutionalising effective public budget management practices through government-led initiatives. The Ministry of Higher Education, in collaboration with the Auditor General and the Anti-Corruption Commission, should establish a standardised accountability framework encompassing audit schedules, compliance checklists, and whistleblower protection mechanisms. Such a framework would bolster internal controls, deter financial mismanagement, and ensure that resources are utilized for developmental objectives. The statistically significant impact of accountability on operational efficiency necessitates urgent policy action to enforce financial discipline across all public universities.

REFERENCES

Abdullahi, M. (2024). Decentralization and performance measurement in public governance: A New Public Management perspective. Journal of Public Sector Reform, 19(1), 45–62.

Adagye, I., Musa, A., & Garba, S. (2024). Sustainability accounting practices in Nigerian polytechnics. Nigerian Journal of Public Sector Finance, 12(1), 45–60.

Alade, S., Ojo, T., & Bakare, A. (2020). Budgetary practices and performance in public institutions: A Nigerian perspective. Journal of Public Sector Management, 15(2), 112–128.

Ali, S., & Younas, M. (2021). Regression analysis in public sector performance evaluation. Journal of Quantitative Social Research, 9(2), 88–102.

Almagtomea, A., et al. (2019). Financial capacity and accountability in Iraqi public universities: A case study of Kufa University. International Journal of Academic Research in Accounting, Finance and Management Sciences, 9(4), 1–15.

Atukunda, R., Mugisha, J., & Tumwebaze, A. (2024). Operational efficiency and SDG alignment in East African universities. East African Journal of Higher Education, 11(1), 33–49.

Auditor General of Ontario. (2021). Annual report: Financial performance of Ontario's public colleges and universities. Government of Ontario.

Ayam, J. (2024). Financial mismanagement in Ghanaian higher education institutions. Ghana Journal of Education and Policy, 9(2), 88–102.

Ballesteros, J., & Bisogno, M. (2022). Econometric modeling of financial performance in European universities. Journal of Education Finance and Policy, 17(3), 205–222.

Bazdaric, K., Mlinaric, A., & Petrovecki, M. (2021). Using regression models in health and social sciences research. Croatian Medical Journal, 62(1), 45–52.

Bianchi, C., Nasib, M., & Rivenbark, W. C. (2021). Budgetary accountability and performance in public universities: A comparative analysis. Public Budgeting & Finance, 41(2), 3–22.

Bouhajeb, M., et al. (2018). Universities as engines of innovation and development. Journal of Innovation Economics, 27(3), 45–60.

Bryman, A. (2016). Social research methods (5th ed.). Oxford University Press.

Chen, Y., et al. (2021). Budget control strategies and cost-effectiveness in higher education institutions. Journal of Educational Finance and Policy, 16(3), 210–225.

Chol, M. (2023). Budget execution and financial reporting in South Sudanese universities. South Sudan Higher Education Review, 3(1), 14–29.

Choyubekova, A., et al. (2019). University-government-business cooperation for national development. Central Asian Journal of Education, 5(1), 22–35.

Christensen, T., & Lægreid, P. (2019). Performance and accountability in the public sector: The legacy of NPM. International Public Management Journal, 22(1), 1–20.

Comrie, J. (2021). Public universities and business constraints: A governance perspective. Journal of Public Administration, 56(4), 301–318.

Cooper, D. R., & Schindler, P. S. (2014). Business research methods (12th ed.). McGraw-Hill Education.

Da Silva, R., Gomez, L., & Torres, M. (2020). Secondary data analysis of budget utilization in Latin American universities. Latin American Journal of Higher Education Finance, 8(2), 77–93.

de Boer, H. (2023). Fiscal discipline and strategic budgeting in higher education institutions. Journal of Higher Education Policy and Management, 45(3), 215–230.

Dzwigoł, H. (2022). Methodological triangulation in management research. European Research Studies Journal, 25(1), 45–60.

Dzwigoł, H., & Barosz, P. (2020). Research methodology in economic sciences: Triangulation and data integration. Journal of Economics and Management, 38(2), 77–92.

EHEA. (2020). European Higher Education Area: Institutional efficiency report. European Commission.

Eleuwarin, A., & Muslim, S. (2024). Public budget accountability in Nigerian tertiary institutions: A descriptive survey. Nigerian Journal of Public Finance, 13(1), 55–70.

EUA. (2022). University operating efficiency in Europe: Comparative analysis. European University Association.

Eurostat. (2020). Education finance statistics in the EU. European Commission.

Faisal, M., et al. (2021). Operating expense ratios and financial discipline in higher education. Asian Journal of Finance and Accounting, 13(2), 77–91.

Fatemi, M., & Behmanesh, M. R. (2012). New Public Management approach and accountability in public administration. Journal of Management Research, 4(4), 146–155.

Fichtenbaum, P. (2021). University of New Hampshire financial performance report. American Association of University Professors.

George, F., & James, T. (2021). Institutional accountability and democratic governance in African universities. African Journal of Public Administration, 10(2), 88–104.

Gogtay, N. J., & Thatte, U. M. (2017). Statistics for researchers: Understanding correlation. Journal of Pharmacology & Pharmacotherapeutics, 8(2), 123–126.

Greener, I., & Martelli, P. (2018). An introduction to the use of statistics in social sciences. Palgrave Macmillan.

Gutierrez, R., et al. (2020). Resource utilization and knowledge dissemination in Latin American universities. Latin American Journal of Higher Education, 18(3), 112–130.

Haeruddin, M., et al. (2021). Public resource administration and national development: A governance perspective. Journal of Development Administration, 19(1), 22–39.

Heale, R., & Forbes, D. (2013). Understanding triangulation in research. Evidence-Based Nursing, 16(4), 98.

Hernández, R., et al. (2012). Research methodology (6th ed.). McGraw-Hill Education.

Hochwald, S., et al. (2023). Mixed-methods validation in public sector research. Journal of Applied Social Science, 17(1), 33–49.

Hood, C., & Jackson, M. (1991). Administrative argument. Dartmouth Publishing.

Indahsari, D., & Raharja, S. (2020). Modernizing public administration through NPM strategies: A managerial approach. Journal of Administrative Sciences, 17(2), 88–104.

Iyoha, F. (2021). Budgetary control and performance in public sector organizations. Nigerian Journal of Accounting Research, 18(2), 101–115.

Kakumba, U. (2022). Strategic investment and operational efficiency in African universities. African Journal of Higher Education Management, 7(1), 55–70.

Kalimullah, N., et al. (2012). New Public Management: Emergence and principles. International Journal of Business and Management, 7(1), 1–7.

Kallio, K., et al. (2021). Accountability and autonomy in higher education: A paradox theory perspective. Higher Education Quarterly, 75(2), 234–250.

Kosor, M., et al. (2019). Disparities in operating expense ratios among European universities. Journal of Comparative Education Finance, 11(2), 98–115.

Laktionova, T., et al. (2021). Financial stability and revenue diversification in public universities. Journal of Higher Education Finance, 14(2), 101–118.

Li, Y., & Guo, X. (2022). Quantitative analysis of budget efficiency in Chinese universities. Journal of Asian Public Finance, 14(3), 66–82.

Lual, A. (2020). Financial reporting challenges in South Sudanese public universities. Journal of African Public Finance, 6(2), 33–47.

Lual, A. (2020). Financial reporting challenges in South Sudanese public universities. Journal of African Public Finance, 6(2), 33–47.

Mabiordit, J. (2018). Operational cost analysis in South Sudan's higher education sector. South Sudan Journal of Economics and Development, 2(1), 19–34.

Mahmud, A., et al. (2022). Infrastructure and income utilization in African public universities. African Journal of Educational Development, 9(1), 55–70.

Mendoza, R. (2023). Liquidity and solvency in higher education finance. International Journal of Educational Management, 37(2), 144–160.

Mongkol, K. (2011). The critical review of New Public Management model and its application in public sector. International Journal of Business and Social Science, 2(13), 1–8.

MU (Makerere University). (2020). Annual financial report. Makerere University Press.

Mutabari, D., & Warui, M. (2023). Regression analysis of financial health in Kenyan public universities. East African Journal of Financial Studies, 9(1), 45–60.

Naufal, M., et al. (2023). The role of information technology in enhancing budget accountability: Evidence from Indonesia's SAKTI system. Journal of Public Administration and Governance, 13(1), 77–94.

Naufal, M., et al. (2023). The role of information technology in enhancing budget accountability: Evidence from Indonesia's SAKTI system. Journal of Public Administration and Governance, 13(1), 77–94.

Nelson, P., & Tolani, K. (2021). Cost management and expenditure prioritization in African higher education. African Journal of Educational Planning, 12(3), 77–91.

Noble, H., & Heale, R. (2019). Triangulation in research: Ensuring validity. Evidence-Based Nursing, 22(3), 67.

Olo, T., et al. (2019). ICT adoption and globalization in African universities. Journal of Educational Technology in Africa, 5(2), 66–81.

Olo, T., Kimani, J., & Njoroge, P. (2021). Universities and national progress: A research-based approach. African Journal of Innovation and Development, 6(1), 25–40.

Oywak, D., et al. (2019). Post-independence challenges in South Sudanese universities. Journal of Post-Conflict Education, 4(1), 73–88.

Pemberton, H. (2017). Evaluating three decades of NPM in the UK: Outcomes and contradictions. British Journal of Public Administration, 39(4), 299–317.

Pisarska, A., & Karpacz, J. (2021). Strategic budgeting in South African universities. Journal of African Financial Planning, 9(3), 101–115.

Serfontein, E. (2022). Operational efficiency in South African higher education. South African Journal of Higher Education, 36(2), 88–104.

Shuaib, M., & Olanrewaju, T. (2020). Budget utilization and performance in Nigerian universities. Journal of Higher Education Finance, 16(2), 99–115.

Simister, N., & James, R. (2020). Coding qualitative data for accountability research. INTRAC Practice Paper Series, 15, 1–18.

Srnka, K. J., & Koeszegi, S. T. (2007). From words to numbers: How to transform qualitative data into meaningful quantitative results. Schmalenbach Business Review, 59(1), 29–57.

Stanimirovic, D. (2022). Efficiency ratios and service benchmarks in European higher education. European Journal of Institutional Research, 20(1), 58–74.

Statistics South Africa. (2023). National education expenditure report. Government of South Africa.

Stiftung, B. (2024). South Sudan Education Index Report 2021. Bertelsmann Stiftung.

Tadeo, M. (2023). Infrastructure and staffing challenges in South Sudanese universities. South Sudan Journal of Education Policy, 5(1), 39–52.

Tsou, C. (2024). Financial sustainability in global higher education. International Journal of Educational Finance, 15(1), 12–28.

UCT (University of Cape Town). (2021). Annual financial report. University of Cape Town.

UNAM (National Autonomous University of Mexico). (2021). Institutional budget and efficiency report. UNAM Press.

UNESCO. (2020). Higher education finance in West Africa. UNESCO Publishing.

UNESCO. (2021). Global university efficiency benchmarks. UNESCO Institute for Statistics.

UNESCO. (2023). South Sudan education sector analysis. UNESCO Regional Office for Eastern Africa.

UNICEF. (2019). Education infrastructure and funding in South Sudan. UNICEF South Sudan.

University of Pretoria. (2022). Annual financial performance report. University of Pretoria.

UoN (University of Nairobi). (2021). Annual budget report. University of Nairobi.

UoSP (University of São Paulo). (2021). Operating expense efficiency report. University of São Paulo.

Wadhwani, R., & Moses, K. (2023). Public university financial performance in the United States. Journal of American Higher Education Finance, 19(1), 44–59.

Wang, Y., & Cheng, L. (2020). Cross-sectional analysis in educational performance studies. Journal of Educational Research and Evaluation, 25(4), 301–318.

Wang, Y., et al. (2021). Funding and infrastructure for national development through universities. Journal of Global Education Policy, 14(2), 58–74.

Zheng, Y. (2015). Cross-sectional data analysis in public administration research. Journal of Public Affairs, 15(3), 215–230.