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Procurement Control Practice and the Supply Chain Performance of Information and Communication Technology Firms in Nairobi City County, Kenya

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ABSTRACT: The purpose of the study was to assess procurement control practice on supply chain performance of information and communication technology (ICT) firms in Nairobi City County, Kenya. The study was anchored on Stewardship Theory. A descriptive survey design with an explanatory approach was adopted, with a target population of 268 procurement and supply chain, internal audit and finance, and ICT project implementation personnel across 15 selected ICT firms. A sample of 73 respondents was obtained using Nassiuma's formula, and 60 completed questionnaires were returned, representing an 82.2% response rate. Primary data were collected using structured questionnaires. Instrument reliability was assessed through a pilot test, with Cronbach's alpha of 0.785. Data were analysed using descriptive and inferential statistics and the results presented in tabular form. The findings revealed a positive and statistically significant relationship between budgetary control and supply chain performance ($r = 0.640$, $p < 0.001$). The study concluded that stronger budgetary control is associated with better perceived supply chain performance, although the cross-sectional findings do not establish causation. The study recommended that ICT firm management and procurement teams strengthen software subscription monitoring, foreign exchange risk provision, periodic variance analysis and timely corrective action while maintaining efficient procurement approvals.

KeyWords: *Procurement Control Practice, Budgetary Control, Supply Chain Performance*

I. Background of the Study

Budgetary control refers to the systematic process through which organizations prepare budgets, allocate financial resources, monitor expenditure, compare actual financial performance against predetermined budgetary targets, and take corrective measures to address deviations (Drury, 2021). The practice involves establishing financial objectives, preparing operational budgets, allocating resources to organizational activities, monitoring budget implementation, evaluating expenditure variances, and reporting financial performance to management (McLaney, 2022).

Budgetary controls are particularly relevant to supply chain performance because supply chain activities involve substantial financial commitments, multiple operational processes, supplier relationships, and continuous resource allocation (Atrill, 2022). Effective budgetary controls enable organizations to anticipate supply chain costs, minimize unnecessary expenditure, prevent resource wastage, improve financial accountability, and ensure the availability of resources required for uninterrupted operations (Drury, 2021). In addition, budgetary controls facilitate coordination between procurement, finance, operations, inventory management, and distribution departments by ensuring that supply chain decisions are aligned with organizational financial priorities (Muncaster, 2025).

Globally, budgetary controls have become increasingly important in supply chain management as organizations respond to rising operational costs, market uncertainties, technological changes, and disruptions in international supply networks (Atrill & McLaney, 2022). The increasing complexity of global supply chains has compelled organizations to strengthen financial planning, expenditure monitoring, cost management, and performance evaluation to ensure that supply chain operations remain efficient and financially sustainable (Chopra, 2023). According to the World Economic Forum (2023),

supply chain resilience requires organizations to strengthen risk management, improve resource allocation, and develop adaptive operational strategies (Drury, 2021).

In Europe, budgetary controls are increasingly important in technology and telecommunications companies because of the substantial financial resources required to maintain digital infrastructure, acquire technological equipment, manage suppliers, and deliver reliable services (Drury, 2021). Organizations operating in the European ICT industry use financial planning and budget monitoring to coordinate procurement expenditure, manage inventory costs, evaluate supplier performance, and control operational expenditure (Atrill & McLaney, 2022;). The increasing dependence on international technology suppliers has also made financial forecasting and expenditure monitoring important in managing fluctuations in procurement costs, foreign exchange movements, and supply chain uncertainties (Lumatete & Alala, 2021).

In South Africa, budgetary controls are particularly important to ICT firms because of the substantial financial resources required to acquire technological equipment, maintain digital infrastructure, procure software systems, manage supplier relationships, and support reliable service delivery (World Bank, 2023). The country's ICT sector comprises telecommunications operators, software development companies, IT service providers, hardware distributors, and digital technology enterprises that depend on efficient supply chain operations (Makiva, 2023). The Department of Communications and Digital Technologies (DCDT, 2023) recognizes the importance of digital infrastructure, technological innovation, and investment in ICT development in supporting South Africa's digital economy. However, ICT firms face supply chain management challenges associated with imported technological equipment, fluctuations in exchange rates, electricity supply constraints, and rising operational costs (South African Reserve Bank [SARB], 2024).

In Kenya, the ICT sector has become an important contributor to economic development through telecommunications, internet services, software development, digital financial services, information technology infrastructure, and business process outsourcing. According to the Kenya National Bureau of Statistics (KNBS, 2025), the value of output in the information and communication sector increased by 8.3% to KSh 701.3 billion in 2024, while the sector's value added increased from KSh 339.5 billion in 2023 to KSh 364.5 billion in 2024. This growth reflects the expanding role of ICT in Kenya's economic transformation and the increasing demand for digital products and services. The National ICT Policy provides a framework for developing the country's digital economy through investment in ICT infrastructure, digital business, innovation, and technological capacity (Ministry of Information, Communications and Technology [MICT], 2019).

Budgetary controls are particularly relevant to Kenyan ICT firms because their supply chain activities involve acquiring technological equipment, computer hardware, software licences, networking devices, communication infrastructure, and other specialized components (Muncaster, 2025). Most of these activities require substantial financial commitments and coordination with local and international suppliers. The Communications Authority of Kenya (CA, 2025) monitors developments in the communications sector through quarterly statistics reports covering service providers and industry performance. (KNBS, 2025).

Supply chain performance of information and communication technology (ICT) firms refers to the extent to which organizations effectively manage and coordinate procurement, sourcing, inventory management, supplier relationships, logistics, distribution, and delivery of technological products and services to achieve organizational objectives (Chopra, 2023). It reflects the ability of ICT firms to acquire the required technological resources, manage operational costs, maintain product and service quality, ensure timely delivery, and respond effectively to changing customer and market requirements (Christopher, 2022). Supply chain performance can therefore be assessed through indicators such as cost efficiency, delivery reliability, product and service quality, inventory availability, and supply chain responsiveness, which collectively reflect the effectiveness of supply chain activities in supporting organizational competitiveness and operational sustainability (CIPS, 2023; OECD, 2023). A well-performing supply chain in an ICT firm should ensure that technological equipment, software, networking devices, and other essential resources are available at the required time, in the appropriate quantities, and at reasonable costs while maintaining the quality and reliability of products and services delivered to customers. Chopra (2023) emphasizes that effective supply chain management requires organizations to balance responsiveness, operational efficiency, inventory investment, and customer service requirements to achieve sustainable supply chain performance.

Supply chain performance of ICT firms can be assessed through several indicators, including cost efficiency, delivery reliability, and product and service quality, which collectively reflect the ability of organizations to minimize supply chain expenditure, meet delivery commitments, and provide products and services that satisfy customer expectations (Chopra, 2023) Cost efficiency refers to the ability of ICT firms to minimize the financial resources required to undertake

procurement, inventory management, transportation, warehousing, supplier coordination, and distribution activities without compromising operational effectiveness (Atrill & McLaney, 2022). It involves controlling procurement costs, reducing inventory holding expenses, minimizing transportation expenditure, avoiding unnecessary operational costs, and improving the utilization of financial and material resources (Christopher, 2022). Efficient supply chain cost management enables ICT firms to maintain competitive prices, improve profitability, and allocate available resources to other strategic activities, including technological innovation and infrastructure development (Drury, 2021).

Delivery reliability refers to the ability of ICT firms to consistently deliver technological products, equipment, software solutions, and related services according to agreed timelines, quantities, specifications, and customer requirements (Christopher, 2022). It reflects the extent to which organizations fulfil delivery commitments without unnecessary delays, incomplete orders, or disruptions in the supply chain. Delivery reliability is particularly important in ICT firms because delays in the supply of computer hardware, networking equipment, communication devices, software infrastructure, and other technological components can interrupt business operations and affect customer satisfaction (Chopra, 2023). Reliable delivery requires effective procurement scheduling, supplier coordination, transportation management, inventory planning, and monitoring of order fulfilment processes.

Product and service quality refers to the extent to which technological products and services supplied by ICT firms conform to established technical specifications, industry standards, contractual requirements, and customer expectations (Christopher, 2022). It encompasses the reliability, durability, functionality, accuracy, and consistency of technological equipment, software applications, networking devices, and ICT-related services delivered to customers (OECD, 2023). In ICT firms, quality performance is particularly important because defective hardware, incompatible technological components, unreliable software systems, and poor-quality services can result in operational interruptions, increased maintenance costs, customer complaints, and reputational damage. Maintaining product and service quality requires effective supplier evaluation, quality inspection, compliance monitoring, technical testing, and continuous assessment of supplier performance. Through these practices, ICT firms can minimize product defects, reduce returns and rework, enhance service reliability, and improve customer satisfaction (Chopra, 2023).

Inventory availability refers to the ability of ICT firms to maintain adequate quantities of technological products, equipment, spare parts, software-related resources, and other essential materials to meet operational and customer requirements whenever they arise (Chopra, 2023). It reflects the extent to which organizations can prevent stockouts, minimize excessive inventory accumulation, and ensure the continuous availability of critical resources required for business operations. Inventory availability is particularly important in ICT firms because technological equipment and components are often required for network maintenance, system upgrades, software implementation, infrastructure development, and customer service delivery. Inadequate inventory levels can result in delayed installations, interrupted technical support, postponed procurement projects, and reduced customer satisfaction (Chopra, 2023). Conversely, excessive inventory can increase storage costs, expose firms to technological obsolescence, and tie up financial resources that could be utilized in other operational activities.

II. Statement of the Problem

Supply chain performance is critical for information and communication technology (ICT) firms because it determines their ability to manage operational costs, ensure timely delivery of technological products and services, maintain product quality, optimize inventory levels, and respond effectively to changing customer and market requirements. Effective supply chain performance enables ICT firms to minimize procurement and logistics costs, maintain uninterrupted availability of technological equipment, strengthen supplier relationships, and improve customer satisfaction. Despite its importance, supply chain performance remains a significant concern for ICT firms operating in Kenya, particularly due to their dependence on imported technological equipment, foreign suppliers, specialized components, and rapidly changing technologies.

Evidence from the Communications Authority of Kenya (2025) indicates continued expansion of the communications sector, increasing the demand for reliable technological infrastructure, equipment, and related services. However, the expansion of the ICT sector also increases supply chain management demands, particularly in procurement cost management, inventory availability, supplier coordination, and timely delivery. The World Bank (2023) identifies logistics inefficiencies, infrastructure constraints, and delays in the movement of goods as important challenges affecting supply chain reliability. Similarly, exchange-rate fluctuations and international supply chain disruptions can increase procurement costs and affect the availability of imported technological products

Existing empirical studies have examined different determinants of supply chain performance, but limited attention has been directed towards budgetary controls among ICT firms in Nairobi City County. For instance, Nyanjala (2021) examined procurement practices and supply chain performance among telecommunication firms in Kenya, focusing on supplier partnerships, information technology adoption, contract monitoring, and lean procurement rather than budgetary controls. Similarly, Sugut and Ondara (2023) examined inventory management practices and supply chain performance at Nairobi City County, focusing on economic order quantity, just-in-time delivery, material requirements planning, and strategic supplier partnerships. More recently, Kuria (2026) investigated electronic procurement strategies and supply chain performance among telecommunication firms in Kenya, focusing on e-sourcing, e-tendering, e-auctioning, and e-ordering. Although these studies provide useful insights into supply chain performance, they do not comprehensively establish how budgetary control influence supply chain performance among ICT firms operating in Nairobi City County.

III. Theoretical Framework

The study was anchored on stewardship theory. The theory was developed by Donaldson and Davis 1999. The theory explains the relationship between organizational owners and managers by assuming that managers are trustworthy stewards who are motivated to act in the best interests of the organization rather than pursuing personal interests. The theory emphasizes collective goals, organizational commitment, accountability, trust, and responsible utilization of organizational resources. It argues that managers are more likely to achieve organizational objectives when they are empowered, provided with adequate resources, and entrusted with responsibilities that promote organizational success (Davis et al., 1997).

The theory is relevant to ICT firms because procurement activities in this sector may involve substantial expenditure on hardware, software, network infrastructure, maintenance and specialized ICT services. Effective budgetary control can provide a framework through which procurement personnel and managers exercise responsible stewardship over these resources. When procurement decisions are guided by approved budgets and expenditure is continuously monitored, organizations can minimize unnecessary expenditure, identify budget variances and promote value for money. Stewardship Theory therefore provides a basis for explaining how budgetary control can influence supply chain performance. Responsible management of procurement expenditure can contribute to cost efficiency, timely availability of resources and continuity of supply. Conversely, weak budgetary control may result in uncontrolled expenditure, resource constraints and delays in procurement activities. The theory consequently provided the theoretical foundation for the second objective, which sought to evaluate the effect of budgetary control on supply chain performance of ICT firms in Nairobi City County, Kenya. Its emphasis on accountability, responsible resource utilization and alignment of decisions with organizational objectives makes it particularly relevant to the financial control dimension of procurement

IV. Empirical Review

Budgetary control refers to the systematic process through which organizations establish financial plans, allocate resources, monitor expenditure, compare actual financial performance against predetermined budgetary targets, and implement corrective measures to address identified variances (Atrill & McLaney, 2022). It involves budget preparation, resource allocation, expenditure monitoring, budget variance analysis, and financial performance evaluation to ensure that organizational activities are undertaken within approved financial limits. Effective budgetary control enables organizations to promote financial accountability, minimize unnecessary expenditure, improve resource utilization, and align operational activities with strategic objectives (Bhimani et al., 2023).

Nyaga et al. (2025) carried out to focus on the impact of resource planning on project performance. The research objectives were to assess the effects of resource budgeting and material planning on project performance. The study adopted a pragmatic philosophy, cross-sectional descriptive survey design, and quantitative approach. Researchers gathered data from 117 project managers from 166 telecommunication companies involved in deploying fibre optic using structured questionnaires with a response rate of 79.5 per cent and analysed the data through descriptive and inferential statistics. The study concludes that robust resource planning enhances cost, time, and quality outcomes, though external and internal limitations persist. Recommendations include adopting advanced budgeting tools, centralized scheduling systems, enhanced workforce training, and optimized material management, alongside policy support to mitigate financial and regulatory barriers.

Otieno (2026) established the effect of budgeting practices and financial performance of manufacturing firms in Kenya. The study utilized a mixed research design. The study used primary data and secondary data collection sheet. The study target population were 741 manufacturing firms operating in Kenya. The unit of observation were finance managers, accountants, and supervisors from the supervisory level management. Questionnaires were administered as the main

tool of data collection. Secondary data was administered from the financial reports in the books of sampled manufacturing. To check the validity and reliability of the questionnaires, a pilot study was carried out. Descriptive statistical methods were applied to describe application of budgeting practices in the sampled manufacturing firms. Inferential statistical techniques such as correlation analysis and regression analysis were applied to test the hypotheses of association and differences. The collected data was processed using the statistical package for social science (SPSS). The study findings revealed that budget planning, budget monitoring & control, budget evaluation, and budget communication, have significant positive effect on the financial performance of manufacturing firms in Kenya.

V. Conceptual Framework

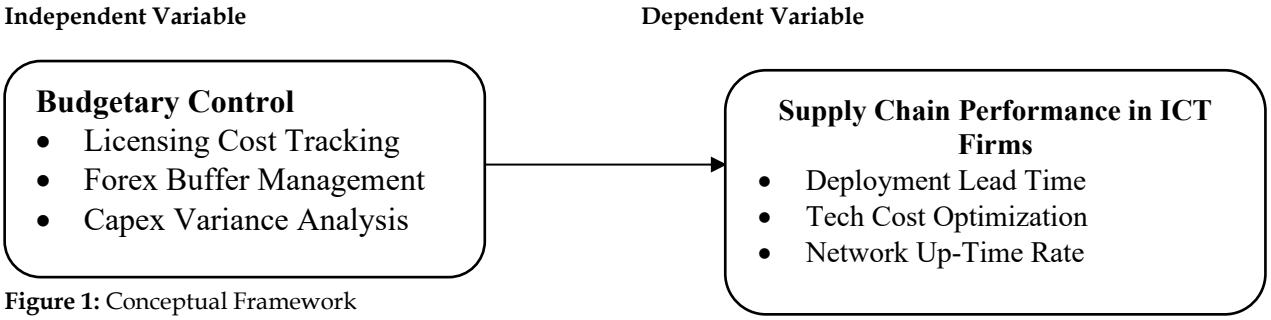


Figure 1: Conceptual Framework

VI. Methodology

The study adopted a descriptive survey research design to examine the influence of budgetary controls on the supply chain performance of Information and Communication Technology firms in Nairobi City County, Kenya. The unit of analysis comprised of 15 selected ICT firms. while the unit of observation comprised personnel whose roles and responsibilities were directly related to procurement, internal control and ICT project implementation. The target population comprised 268 personnel across the selected firms. The study used Nassiuma (2000) formula to sample 73 respondents. Primary data were collected using a structured, self-administered questionnaire which facilitated consistent and objective responses across participants. The pilot study involved 15 respondents drawn from HubTech Limited, Konvergenz Network Solutions and Glitex Solutions Limited to assess the reliability and validity of the research instrument. Validity was established through face and construct validity assessments via expert and supervisor review, while reliability was evaluated using Cronbach's Alpha, with the constructs recording values above the 0.7 threshold. Both descriptive and inferential statistics were utilized for data analysis. Descriptive statistics, including percentages, frequencies, means, and standard deviations, were employed to summarize the characteristics of inventory management practices and procurement function performance. Inferential statistics involved correlation analysis and multiple linear regression analysis, was applied to test the hypothesized relationship between budgetary control and supply chain performance at 95% confidence level ($\alpha = 0.05$). Diagnostic test involved the normality test, ensuring the robustness of the results. Data analysis was conducted using the Statistical Package for Social Sciences (SPSS) version 25, and findings were presented in tables and figures.

VII. Results

7.1 Response Rate

The study administered 73 questionnaires to the targeted respondents of which 60 were successfully completed and returned. This represented a response rate of 82.2 %. The remaining 13 questionnaires representing 17.8% were not returned. According to Mugenda and Mugenda (2019) regard 50% as a sufficient response rate to conduct an analysis and reporting, 60% as a good response rate and 70% and more as a very good one. The response rate was considered adequate for conducting the subsequent statistical analyses as provided in Figure 2.

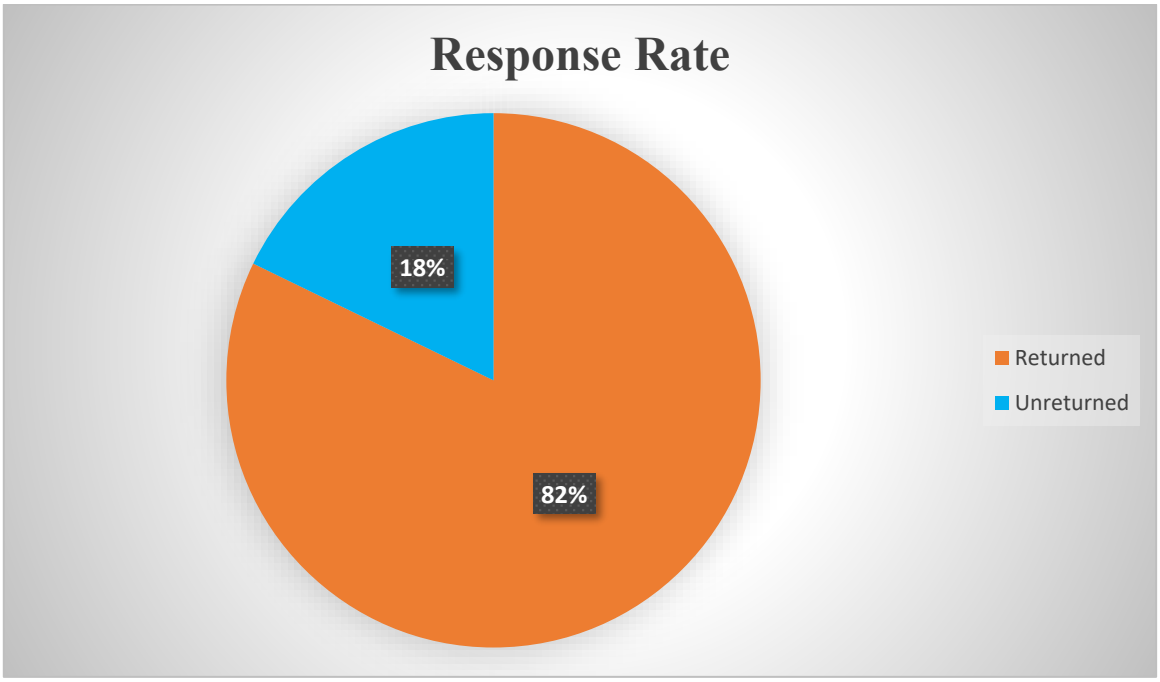


Figure 2: Response Rate

7.2 Profile of Respondents

7.2.1 Respondents' Roles

The respondents represented different functional areas relevant to the procurement control practices and ICT project implementation.

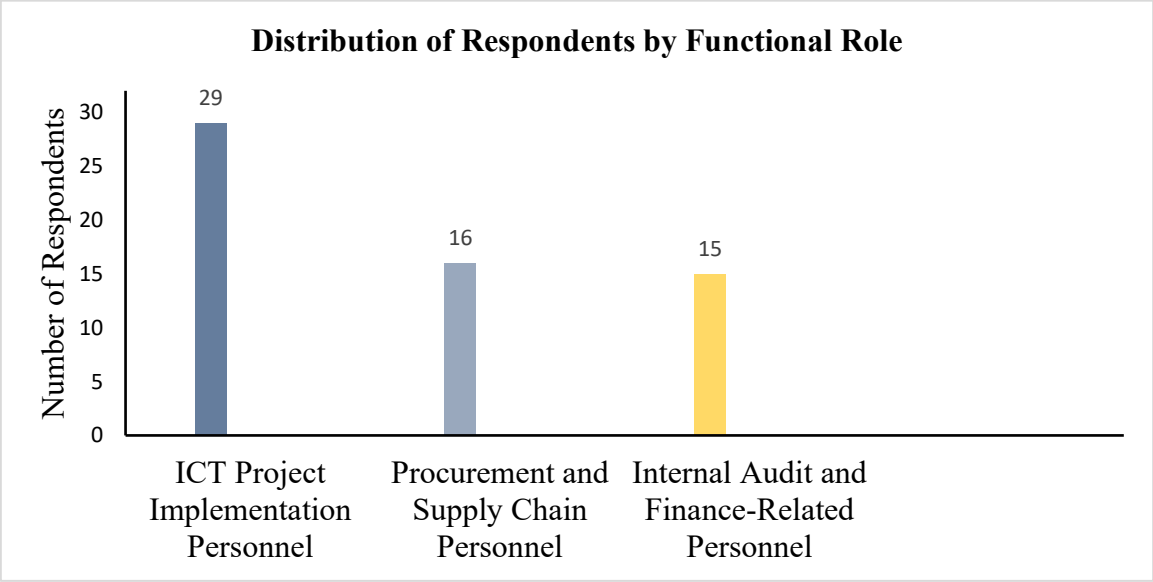


Figure 3: Distribution of Respondents by Functional Role

The largest group comprised ICT Project Implementation personnel with 29 respondents (48.3%). Procurement and Supply Chain personnel for 16 respondents 26.7% while internal audit and finance-related personnel accounted for 15 respondents 25%. The distribution indicates that the study obtained responses from personnel directly from procurement, audit, finance and ICT project personnel was particularly relevant because procurement control practices often involve several organizational functions rather than the procurement department alone.

7.2.2 Work Experience

The findings indicated that 22 respondents had between 6 and 10 years of professional experience representing 36.7% of the sample. Respondents with more than 10 years of experience accounted for 20 respondents 33.3 % while 14 respondents 23.3% had between 2 and 5 years of experience. Only 4 respondents 6.7% had less than 2 years of experience. The findings demonstrate that most respondents had considerable professional experience. This suggests that a substantial proportion of the respondents had adequate exposure to organizational procurement processes, controls and ICT related supply chain activities.

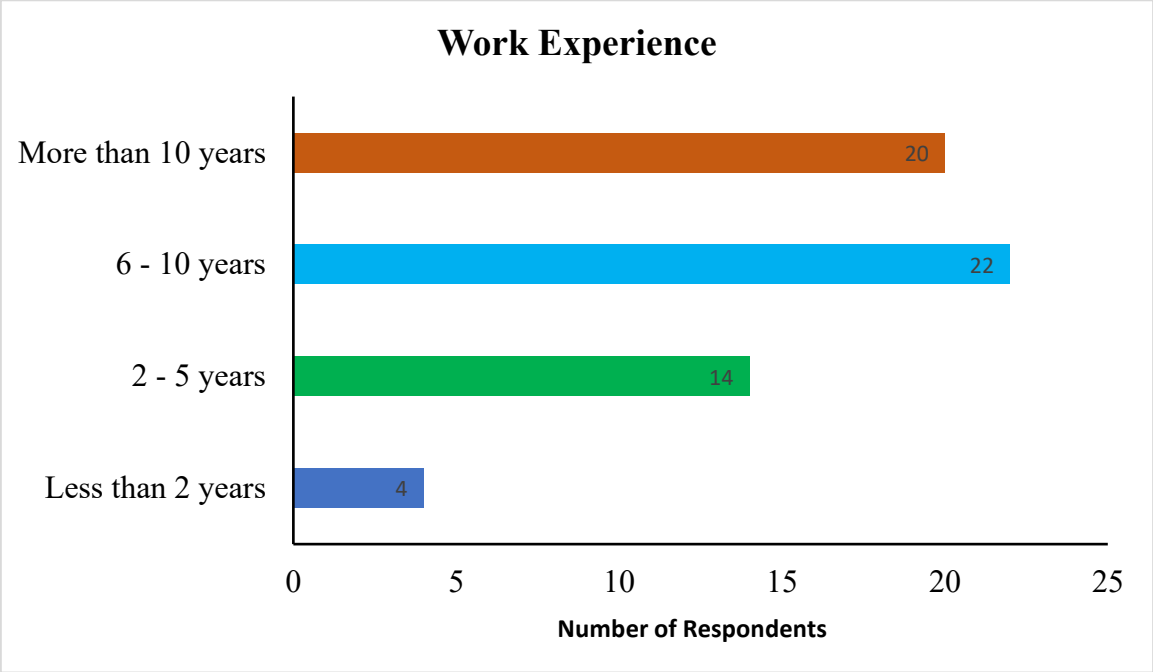


Figure 4: Respondents' Work Experience

7.3 Descriptive Statistics

7.3.1 Budgetary Control

Table 1: Descriptive Statistics on Budgetary Control

#	Statement on Budgetary Control	Mean	Std. Deviation
1	We use real-time monitoring tools to track software licensing and SaaS subscription spending against our budget.	3.425	1.212
2	Our organization successfully prevents budget overruns caused by unmonitored or auto-renewing software licenses.	3.521	1.132
3	We integrate dedicated foreign exchange buffers into our procurement budgets for imported hardware and software	4.164	0.986
4	Currency fluctuations rarely cause us to halt or downscale ongoing ICT procurement projects.	3.616	0.827
5	We conduct regular variance analysis to compare actual IT capital expenditures against budgeted baselines.	3.712	1.060
6	Corrective financial actions are taken immediately whenever a significant budget variance is detected in an ICT project.	3.630	1.349
	Overall Mean	**3.678**	**0.739**

The findings indicate that budgetary control was generally practiced among the ICT firms as reflected by the overall mean of 3.678. The highest mean was recorded for the integration of dedicated foreign exchange buffers into procurement budgets for imported hardware and software (M = 4.164, SD = 0.986). This indicates that the respondents generally agreed that their organizations accounted for foreign exchange risks when budgeting for imported ICT resources. Regular variance analysis of actual IT capital expenditure against budgeted baselines recorded a mean of 3.712 (SD = 1.060) suggesting that the respondents generally agreed that budget performance was periodically assessed.

These findings suggest that although budgetary control mechanisms were generally in place, real-time monitoring of technology related expenditure and control of software subscription costs were comparatively weaker areas. Overall, the findings indicate that ICT firms demonstrated a moderate to relatively strong application of the budgetary control particularly in managing the foreign risks and monitoring budget variances.

7.3.2 Supply Chain Performance

Table 2: Descriptive Statistics on Supply Chain Performance

#	Statements on Supply Chain Performance	Mean	Std
1	Our ICT hardware and software infrastructure are delivered and deployed within scheduled project timelines.	3.877	0.971
2	Our internal procurement approvals cause minimal delays in getting technology into the hands of users.	3.055	1.153
3	We consistently eliminate duplicate software licenses and waste through our current procurement processes.	4.123	0.897
4	Our organization successfully secures competitive volume pricing and optimal total cost of ownership (TCO) for ICT assets.	3.863	0.732
5	The quality of hardware and software procured through our system ensures high network availability and minimal downtime.	4.014	0.754
6	We rarely experience system outages caused by poorly sourced infrastructure or unvetted vendors.	3.767	0.965
	Overall Mean	**3.783**	**0.607**

The findings indicated that supply chain performance was generally favorable among ICT firms as reflected by the overall mean of 3.783. The highest mean was recorded for the elimination of duplicate software licenses and waste through existing procurement processes (M = 4.123, SD = 0.897). This suggests that the respondents generally agreed that procurement processes contributed to the reducing unnecessary software expenditure and resource wastage. The quality of procured hardware and software in ensuring the high network availability and minimal downtime also recorded a high mean of 4.014 (SD = 0.754). Similarly, delivery and deployment of ICT infrastructure within the scheduled project timelines recorded a mean of 3.877 (SD = 0.971) while securing competitive volume pricing and optimal total cost of ownership recorded mean of 3.863 (SD = 0.732). These findings suggest that the ICT firms generally achieved favorable outcomes in terms of timely deployment, cost management and infrastructure quality.

7.4 Inferential Statistics

Under inferential statistics the study conducted both correlation and regression analysis.

7.4.1 Correlation Analysis

The Pearson correlation was employed with a range of -1.00 to +1.00. While the negative values indicate negative correlations, the positive numbers indicate positive associations between the variables under the study as shown in Table 3.

Table 3: Correlation Matrix

		Budgetary control
Supply Chain Performance	Pearson Correlation	.640**
	Sig. (2-tailed)	.000
	N	60

The Pearson correlation analysis indicated that the independent variable had a positive and statistically significant relationship with the supply chain performance. The results indicated budgetary control had a strong, positive, and statistically significant impact on supply chain performance ($r = 0.64$, $p < 0.001$).

7.4.2 Testing of Hypothesis

A regression analysis was performed to determine the link between the independent and dependent variables. The research tested the study model's fitness using F-statistics and the corresponding P-values. P-values at a 0.05 significance level were used to determine whether to reject or accept the null hypothesis

Table 4: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.055	0.539		1.957	0.055
	Budgetary Control	0.446	0.140	0.530	3.195	0.002

a. Dependent Variable: Supply Chain Performance

The results in Table 4 indicate that budgetary control had a positive and statistically significant influence on supply chain performance. The simple regression analysis is

$$\mathbf{Y = 1.821 + 0.539X_1}$$

The positive regression coefficient (B = 0.539) indicates that a one unit increase in budgetary control was associated with an estimated 0.539 unit increase in supply chain performance. The effect was statistically significant at the 5% significance level ($p < 0.001$). This finding is consistent with Nyaga et al. (2025) who established that resource budgeting had a significant positive influence on project performance among telecommunication companies involved in fiber-optic deployment ($\beta = 0.284$, $p = 0.001$). Similarly, Otieno (2026) found that budget planning, budget monitoring and control, budget evaluation and budget communication had a significant positive effect on the financial performance of manufacturing firms in Kenya. These findings provide empirical support for the positive influence of effective budgeting and budgetary control on performance outcomes. Based on the statistically significant regression coefficient ($B = 0.539$, $p < 0.001$, the null hypothesis that budgetary control has no significant influence on the supply chain performance of ICT firms in Nairobi City County, Kenya was rejected. The study therefore established that budgetary control has a positive and statistically significant influence on supply chain performance.

VIII. Conclusion

The study concludes that it had the strongest and most independently relationship with the supply chain performance among the four procurement control practices examined. Budgetary control was significantly associated with supply chain performance both when considered independently and when the four procurement control practices were entered simultaneously into the regression model. The study therefore concludes that budgetary control represents the most distinct procurement control practice for explaining variations in the supply chain performance of ICT firms studied.

Recommendations

Given that budgetary control was the only procurement control practice that retained a statistically significant unique contribution to supply chain performance in the multiple regression model, ICT firms should give priority to strengthening budgetary monitoring and control systems. Particular attention should be directed towards real-time monitoring of software licensing, subscriptions, foreign exchange exposure and other recurring ICT expenditure. Firms should also establish clearly defined thresholds for budget variances and corresponding response procedures. Responsibility and timelines for investigating and correcting significant variances should be clearly assigned to relevant procurement, finance and operational personnel to facilitate corrective action.

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