



THE EFFECT OF DIGITAL TRANSFORMATION ON SUPPLY CHAIN EFFICIENCY IN CAMEROONIAN SMEs

Ayankeng Godlove Nkemkiafu
University of Yaounde 2

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ABSTRACT

Objective: This study examines the effect of digital transformation on supply chain efficiency in small and medium-sized enterprises (SMEs) in Cameroon.

Methodology: A quantitative cross-sectional survey design was employed, collecting primary data from 35 SMEs operating in the Douala and Yaoundé metropolitan areas across retail, manufacturing, and service sectors. Ordinary least squares regression was used to analyse the relationship between digital transformation index (DTI) and supply chain efficiency (SCE), controlling for firm size, firm age, educational level of manager, and industry sector.

Findings: The regression model explained only 5.5% of variance in supply chain efficiency ($R^2 = 0.055$, $F(5,29) = 0.337$, $p = 0.887$), and the overall model was not statistically significant. Digital transformation showed a positive but non-significant effect ($\beta = 0.215$, $p > 0.05$). None of the control variables – firm size ($\beta = 0.145$, $p > 0.05$), firm age ($\beta = -0.120$, $p > 0.05$), educational level ($\beta = 0.060$, $p > 0.05$), or industry sector ($\beta = -0.076$, $p > 0.05$) – achieved statistical significance.

Recommendations: Digital transformation, in its current form, does not significantly enhance supply chain efficiency among Cameroonian SMEs. Practitioners should address foundational barriers to digital adoption – including infrastructure limitations, digital skills gaps, and technology affordability – before expecting efficiency gains. Policymakers should prioritise investments in digital infrastructure and SME technology support programmes.

Conclusion: The non-significant findings challenge the Resource-Based View's prediction that digital technologies function as strategic resources automatically enhancing performance. Digital transformation's efficiency effects depend on complementary organisational capabilities and enabling infrastructure conditions not yet fully established in the Cameroonian SME sector.

KEYWORDS: Digital Transformation, Supply Chain Efficiency, Small and Medium Enterprises, Cameroon, Technology Adoption

JEL CODE: O33, L25, M15, O55

1. INTRODUCTION

Cameroonian small and medium-sized enterprises operate within a business environment characterised by persistent logistical bottlenecks, information asymmetry, and fragmented supplier networks. These enterprises face immense difficulties in tracking inventory, coordinating with distributors, and responding to customer demand in real time. The absence of integrated digital systems means that many SMEs still rely on manual record-keeping and phone-based communication, which breeds inefficiencies, delays, and costly errors. This problem manifests acutely in supply chain operations, where poor visibility and lack of coordination undermine competitiveness and stunt business growth (Fazlali Dastjerdi & Chatzipanagiotou, 2025; Alfian, Arrin & Alfian, 2025; Sowaif & Osama, 2025).

The importance of this problem extends beyond individual firm performance to touch upon broader economic development. SMEs constitute the backbone of the Cameroonian economy, providing employment and essential services across urban and rural communities. When these enterprises suffer from supply chain inefficiencies, the consequences ripple outward—higher consumer prices, product waste, and missed market opportunities. Digital transformation offers a pathway to address these challenges by enabling real-time tracking, automated inventory management, and data-driven decision-

making. Understanding how digital tools affect supply chain efficiency therefore carries significant implications for economic resilience and poverty reduction (Jam, 2025; Obiri-Yeboah, Tetteh, Amoako & Kyeremeh, 2025; Abilakimova, Bauters & Ogunyemi, 2024).

Practitioners should care deeply about this topic because the difference between survival and failure often hinges on operational efficiency. SME owners and managers in Cameroon confront rising customer expectations and intensifying competition from imported goods. Those who harness digital technologies can reduce lead times, minimise stockouts, and build stronger relationships with suppliers and customers. Conversely, those who lag behind risk losing market share to more agile competitors. This article provides practical insights into which digital investments deliver the greatest returns for supply chain performance, helping practitioners make informed decisions about technology adoption (Bin Sowaif & Osama, 2025; Obiri-Yeboah et al., 2025; Fazlali Dastjerdi & Chatzipanagiotou, 2025).

The theoretical interest in this topic stems from ongoing debates about how digital capabilities translate into operational outcomes in resource-constrained environments. Existing theories, such as the Resource-Based View, suggest that firms gain competitive advantage through unique combinations of



resources and capabilities. However, scholars disagree about whether digital technologies function as direct performance drivers or whether they require complementary organisational changes to realise their potential. This article contributes to these theoretical conversations by examining the mechanisms through which digital transformation influences supply chain efficiency in a developing country context (Jam, 2025; Sowaif & Osama, 2025; Abilakimova et al., 2024).

Current knowledge about digital transformation and supply chain performance has grown substantially in recent years. Researchers have documented positive associations between technology adoption and operational outcomes in various geographical contexts. Studies from Pakistan demonstrate that digital technologies enhance supply chain innovation and performance in SMEs (Jam, 2025). Research from Ghana reveals that digital supply chain capabilities strengthen resilience and viability among manufacturing firms (Obiri-Yeboah et al., 2025). Investigations in Tunisia show that digitalisation enables circular economy practices, which in turn improve environmental and economic performance (Mkaouar & Sallem, 2025).

The state of the art in this field involves sophisticated examinations of mediating and moderating mechanisms. Scholars now recognise that digital transformation does not affect performance directly but operates through intermediate variables such as supply chain innovation, dynamic capabilities, and circular economy practices. Recent studies employ structural equation modelling and hierarchical regression to untangle these complex relationships. The literature also increasingly distinguishes between different types of digital technologies—Internet of Things, artificial intelligence, blockchain—and their specific contributions to supply chain outcomes (Jam, 2025; Mkaouar & Sallem, 2025; Fazlali Dastjerdi & Chatzipanagiotou, 2025).

Despite these advances, significant shortcomings persist in the current knowledge base. The overwhelming majority of studies focus on Asian, European, or North African contexts, leaving sub-Saharan Africa severely under-researched. Cameroon specifically has received almost no attention in the digital transformation and supply chain literature. Furthermore, existing studies tend to examine large firms or SMEs in developed economies, where infrastructure and institutional conditions differ markedly from those in Central Africa. This geographical and contextual bias limits the generalisability of findings and leaves Cameroonian policymakers and practitioners without evidence-based guidance (Alfian et al., 2025; Abilakimova et al., 2024; Kimaro & Mushi, 2025).

This article addresses these shortcomings by investigating the effect of digital transformation on supply chain efficiency specifically within Cameroonian SMEs. The study collects primary data from 35 enterprises across various sectors, providing context-specific evidence that reflects local realities. By focusing on Cameroon, the research fills a critical gap in the literature and offers findings directly relevant to stakeholders in the Central African economic space. The use of ordinary least squares regression with robust estimation techniques ensures

methodological rigour while accommodating the characteristics of SME data (Mkaouar & Sallem, 2025; Bera & Ng, 2002; Kiefer, Vogelsang & Bunzel, 2000).

The paper contributes to knowledge in three distinct ways. First, it extends the geographical scope of digital transformation research into a previously unexplored context, revealing how technology effects manifest under conditions of infrastructural constraint. Second, it provides empirical evidence on the relative importance of different digital tools for supply chain outcomes, helping to prioritise investments. Third, it tests the applicability of established theoretical frameworks in the Cameroonian setting, contributing to theory development in non-Western contexts. These contributions hold value for academics, practitioners, and policymakers alike (Jam, 2025; Obiri-Yeboah et al., 2025; Sowaif & Osama, 2025). The single objective guiding this research is to examine the effect of digital transformation on supply chain efficiency in Cameroonian SMEs.

2. LITERATURE REVIEW

2.1 Theoretical Foundation: The Resource-Based View

The Resource-Based View (RBV) of the firm, propounded by Barney in 1991, provides the theoretical lens for this study. This theory posits that firms achieve sustainable competitive advantage through possessing and deploying resources that are valuable, rare, inimitable, and non-substitutable—collectively known as VRIN attributes. Barney argues that internal organisational characteristics, rather than external industry factors, primarily determine performance differences between firms. Resources encompass all assets, capabilities, organisational processes, firm attributes, information, and knowledge controlled by the firm that enable the conception and implementation of strategies improving efficiency and effectiveness (Barney, 1991; Jam, 2025; Mkaouar & Sallem, 2025).

The RBV rests on several key assumptions about firm resources and competitive dynamics. The first assumption holds that firms within an industry or strategic group may possess heterogeneous bundles of resources. This heterogeneity means that some firms control unique assets that competitors cannot easily replicate. The second assumption asserts that these resources may be imperfectly mobile across firms, meaning that resource differences can persist over time despite competitive pressures. These two assumptions—resource heterogeneity and resource immobility—form the foundation for explaining why some firms consistently outperform others even when operating in the same markets (Barney, 1991; Jam, 2025; Obiri-Yeboah et al., 2025).

The theory exhibits certain weaknesses that scholars have identified over three decades of application. Critics point to the tautological nature of some RBV reasoning, where success proves the existence of valuable resources without independent verification. The theory also struggles with specifying exactly which resources matter under which conditions, leading to a potentially endless list of relevant capabilities. Furthermore, the RBV pays insufficient attention to how resources develop over time and how firms acquire new capabilities in dynamic



environments. These limitations have prompted extensions and refinements, including the dynamic capabilities framework that addresses resource development and renewal (Jam, 2025; Abilakimova et al., 2024; Alfian et al., 2025).

The relevance of RBV to this article lies in its treatment of digital technologies as strategic resources. When Cameroonian SMEs implement digital tools for supply chain management, they potentially create valuable capabilities that competitors find difficult to imitate. A cloud-based inventory system, for instance, may provide real-time visibility that enables faster response to customer orders. The uniqueness of such a resource depends on how well the firm integrates the technology with its processes and human skills. RBV thus directs attention not merely to technology adoption but to the organisational capabilities that make technology productive (Jam, 2025; Obiri-Yeboah et al., 2025; Mkaouar & Sallem, 2025).

2.2 Conceptual Review: Digital Supply Chain Transformation

Digital supply chain transformation refers to the integration of digital technologies into supply chain processes to fundamentally change how firms source materials, manage inventory, coordinate logistics, and serve customers. This concept encompasses both the adoption of specific technologies—such as enterprise resource planning systems, Internet of Things devices, and data analytics platforms—and the organisational changes required to leverage these tools effectively. Transformation implies a shift from traditional, linear supply chain models toward connected, intelligent, and responsive networks (Fazlali Dastjerdi & Chatzipanagiotou, 2025; Sowaif & Osama, 2025; Kimaro & Mushi, 2025).

The dimensions of digital supply chain transformation include visibility, velocity, and flexibility. Visibility refers to the ability to track products, information, and finances as they move across the supply chain network. Real-time visibility allows firms to identify bottlenecks before they cause disruptions and to provide accurate information to customers about order status. Velocity captures the speed at which information and goods move through the chain, encompassing reduced lead times and faster response to demand changes. Flexibility describes the capacity to adjust supply chain operations in response to disruptions or shifting customer requirements (Jam, 2025; Obiri-Yeboah et al., 2025; Mkaouar & Sallem, 2025).

For SMEs in developing countries, digital supply chain transformation often begins with basic technologies before progressing to more sophisticated applications. Foundational tools include mobile payment systems, simple inventory management software, and communication platforms like WhatsApp for coordinating with suppliers. As capabilities develop, firms may adopt cloud-based accounting systems, customer relationship management software, and eventually more advanced analytics. This staged progression recognises the resource constraints that SMEs face while still enabling incremental efficiency gains at each step (Alfian et al., 2025; Kimaro & Mushi, 2025; Abilakimova et al., 2024).

2.3 Empirical Review

Jam (2025) investigated how the adoption of digital technologies in supply chain management enhances supply chain performance among SMEs in Pakistan. The study employed structural equation modelling on data collected from 482 enterprises operating across various sectors. Findings revealed that digital technology adoption significantly enhances supply chain innovation and performance, with supply chain innovation playing a critical mediating role. The study concluded that SMEs should leverage cost-effective digital tools for improved efficiency and competitiveness. This article differs from Jam's work by focusing specifically on the Cameroonian context, where infrastructural and institutional conditions diverge substantially from those in South Asia.

Obiri-Yeboah, Tetteh, Amoako and Kyeremeh (2025) examined the relationship between digital supply chain capabilities, supply chain resilience, and supply chain viability among Ghanaian manufacturing SMEs. Using survey data from 349 enterprises and hierarchical linear modelling, the researchers found that digital supply chain capabilities positively enhance supply chain resilience. Supply chain resilience partially mediated the effect of digital capabilities on supply chain viability. The study concluded that managers should prioritise investments in digital supply chain capabilities. This article extends their work by incorporating control variables specific to the Cameroonian business environment and by employing robust regression techniques to address data characteristics.

Mkaouar and Sallem (2025) explored the synergistic interaction between digitalisation and circular economy principles in enhancing sustainable supply chain performance among Tunisian SMEs. Analysing data from 168 enterprises across manufacturing and service sectors, the researchers found that digitalisation positively influences environmental and economic performance indirectly through circular economy practices. The study concluded that integrated technological ecosystems, rather than isolated technology adoptions, advance sustainable supply chain management. This article diverges by focusing specifically on supply chain efficiency rather than sustainability outcomes and by examining a different national context with unique institutional characteristics.

Fazlali Dastjerdi and Chatzipanagiotou (2025) explored managers' perceptions of digital transformation in supply chains within Iranian food SMEs. Employing qualitative methods including interviews and document reviews, the research identified five key themes using the Technology-Organization-Environment framework. Findings showed that managers view digital transformation as a tool to streamline supply chain activities and enhance overall efficiency, with success factors including ICT infrastructure development and increased awareness of ICT benefits. This article complements their qualitative insights with quantitative evidence from Cameroon, enabling comparison across research approaches and national settings.

Alfian, Arrin and Alfian (2025) systematically reviewed literature on digital technology adoption in SMEs, focusing on



implications for performance in developing countries. Using the PRISMA framework, the review identified 13 studies for final analysis and found that digital platforms improve operational efficiency, financial performance, and competitiveness. The review highlighted persistent barriers including inadequate infrastructure and digital literacy. This article addresses the research gap identified in their review by providing primary empirical evidence from a developing country context, specifically Cameroon, which the review noted as under-represented in the literature.

Kimaro and Mushi (2025) explored digitalisation in logistics and supply chain management for agro-processing SMEs in Tanzania. Employing a qualitative case study design with pattern matching for data analysis, the research revealed varying levels of digital adoption across SMEs and improved efficiency for digitally transformed enterprises courtesy of real-time data and well-informed decision-making. The findings indicated common barriers including lack of digital skills and limited access to digital technologies. This article builds on their work by providing quantitative evidence from a neighbouring country and by focusing on supply chain efficiency as the primary outcome variable.

3. METHODOLOGY

This study adopts a quantitative research design to investigate the effect of digital transformation on supply chain efficiency in Cameroonian SMEs, utilising primary data collected through the administration of 35 structured questionnaires to owners and managers of small and medium-sized enterprises operating in the Douala and Yaoundé metropolitan areas, which represent the commercial and administrative hubs of Cameroon and host the highest concentration of SME activity. The target population comprises registered SMEs with between five and one hundred employees, operating across retail, manufacturing, and service sectors, from which the study draws a sample using simple random sampling techniques to ensure that every enterprise in the sampling frame has an equal probability of selection, thereby minimising selection bias and enhancing the representativeness of the findings.

The study employs ordinary least squares regression to estimate model parameters, as this technique provides consistent and unbiased estimates under the Gauss-Markov assumptions and remains appropriate for cross-sectional data analysis in small

business research. The model specification examines supply chain efficiency as a function of digital transformation and four control variables, expressed as:

Model Specification

$$SCE = \beta_0 + \beta_1 DTI + \beta_2 FSZ + \beta_3 FAG + \beta_4 EDL + \beta_5 IND + \varepsilon \quad (1)$$

Where:

- SCE = Supply Chain Efficiency (dependent variable)
- DTI = Digital Transformation Index (independent variable)
- FSZ = Firm Size (control variable)
- FAG = Firm Age (control variable)
- EDL = Educational Level of manager (control variable)
- IND = Industry Sector (control variable)
- β_0 = Constant term
- β_1 through β_5 = Coefficients to be estimated
- ε = Error term

The study employs reliability testing using Cronbach's alpha to assess internal consistency of the measurement scales, ensuring that the constructs demonstrate adequate reliability before proceeding to hypothesis testing. Variance Inflation Factor analysis tests for multicollinearity among independent variables, with values below ten indicating that multicollinearity does not threaten the stability of coefficient estimates. The study further employs robust regression techniques to address potential violations of normality and heteroskedasticity assumptions, an approach supported by Bera and Ng (2002), who demonstrate that robust tests for heteroskedasticity based on nonparametric estimation of the score function exhibit superior finite sample properties compared to standard tests and render separate normality tests unnecessary when implementing robust estimation procedures. Ethical considerations govern every stage of the research process: the study obtains informed consent from all participants after explaining the purpose of the research and the voluntary nature of participation; guarantees anonymity and confidentiality by removing identifying information from datasets and reporting only aggregate findings; ensures that questionnaire items avoid sensitive topics that might cause discomfort or reputational harm to respondents; and commits to using the data solely for academic research purposes without commercial exploitation or sharing with third parties.

4. PRESENTATION OF FINDINGS

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
SCE	35	2.400	1.193	1	5
DTI	35	2.229	1.262	1	5
FSZ	35	2.514	1.358	1	5
FAG	35	2.343	1.474	1	5
EDL	35	2.457	1.400	1	5
IND	35	2.971	1.339	1	5

Source: Author's computation (2026)

Table 1 presents the descriptive statistics for all variables. Supply chain efficiency (SCE) has a mean of 2.400 (SD = 1.193), indicating moderate efficiency levels among

Cameroonian SMEs. The digital transformation index (DTI) shows a mean of 2.229 (SD = 1.262), suggesting relatively low levels of digital technology adoption. Industry sector (IND)



shows the highest mean ($M = 2.971$, $SD = 1.339$), reflecting the sectoral distribution of the sample. All variables demonstrate acceptable variability for regression analysis.

Table 2: Variance Inflation Factor

Variable	VIF	1/VIF
IND	3.484	0.287
FSZ	2.914	0.343
EDL	1.411	0.709
FAG	1.303	0.768
DTI	1.230	0.813
Mean VIF	2.068	

Source: Author's computation (2026)

Table 2 presents the Variance Inflation Factor (VIF) results. All VIF values fall below the conventional threshold of 10, with industry sector (IND) showing the highest VIF at 3.484 and digital transformation (DTI) the lowest at 1.230. The mean VIF

of 2.068 indicates that multicollinearity does not threaten the stability of coefficient estimates, confirming that each predictor contributes unique information to the model.

Table 3: Pairwise Correlations

Variables	(1)	(2)	(3)	(4)	(5)
(1) DTI	1.000				
(2) FSZ	-0.156	1.000			
(3) FAG	0.289	0.027	1.000		
(4) EDL	0.039	0.089	0.335	1.000	
(5) IND	0.108	0.736	0.303	0.399	1.000

Source: Author's computation (2026)

Table 3 displays pairwise correlation coefficients. The strongest correlation emerges between firm size (FSZ) and industry sector (IND) at $r = 0.736$, which explains the elevated VIF for these variables. Digital transformation (DTI) shows weak

positive correlations with most control variables, the strongest being with firm age (FAG) at $r = 0.289$. The generally low correlations involving DTI suggest that digital transformation is not strongly associated with the included control variables.

Table 1: Reliability Statistics

Construct	Cronbach's Alpha	Number of Items	Interpretation
Supply Chain Efficiency (SCE)	0.883	5	Excellent Reliability
Digital Transformation Index (DTI)	0.856	5	Excellent Reliability
Inventory Management Digitalisation	0.841	3	Good Reliability
Digital Payment Systems Adoption	0.829	3	Good Reliability
Supplier Communication Platforms	0.838	3	Good Reliability

Overall Interpretation: All Cronbach's alpha coefficients exceed the conventional threshold of 0.70, with values ranging from 0.829 to 0.883, indicating that the multi-item scales employed in this study possess good to excellent internal consistency. The highest reliability is observed for Supply Chain Efficiency ($\alpha = 0.883$), which captured inventory turnover, order fulfilment speed, and delivery reliability dimensions, confirming that the scale consistently measures operational efficiency outcomes. The Digital Transformation

Index ($\alpha = 0.856$) demonstrates excellent reliability, indicating that items measuring adoption of inventory software, digital payments, and supplier communication platforms consistently reflect the digital transformation construct. The sub-dimensions of digital transformation (inventory management, digital payments, supplier communication) all exceed 0.82, confirming that the measurement instrument reliably captures technology adoption across the 35 SMEs surveyed.

Table 4: Linear Regression Results

SCE	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
DTI	0.215	0.189	1.14	0.266	-0.172	0.602	
FSZ	0.145	0.271	0.53	0.597	-0.409	0.698	
FAG	-0.120	0.167	-0.72	0.478	-0.461	0.221	
EDL	0.060	0.183	0.33	0.745	-0.314	0.434	
IND	-0.076	0.300	-0.25	0.803	-0.690	0.539	
Constant	1.916	0.723	2.65	0.013	0.437	3.395	**



Model Statistics	
Mean dependent var	2.400
SD dependent var	1.193
R-squared	0.055
Number of obs	35
F-test	0.337
Prob > F	0.887
Akaike crit. (AIC)	120.696
Bayesian crit. (BIC)	130.028

***p < 0.01, **p < 0.05, p < 0.1

Source: Author's computation (2026)

Table 4 presents the linear regression results examining the effect of digital transformation and control variables on supply chain efficiency. The model demonstrates very low explanatory power, with an R-squared of only 0.055 indicating that the independent variables collectively explain merely 5.5% of the variance in supply chain efficiency. The F-statistic (0.337, $p = 0.887$) confirms that the overall model is not statistically significant.

Digital transformation (DTI) shows a positive but non-statistically significant effect on supply chain efficiency ($\beta = 0.215$, $p > 0.05$), indicating that digital technology adoption does not translate into increased supply chain efficiency among Cameroonian SMEs. None of the control variables achieve statistical significance: firm size ($\beta = 0.145$, $p > 0.05$), firm age ($\beta = -0.120$, $p > 0.05$), educational level ($\beta = 0.060$, $p > 0.05$), and industry sector ($\beta = -0.076$, $p > 0.05$) all fail to reach conventional significance levels.

Table 5: Breusch-Pagan / Cook-Weisberg Test for Heteroskedasticity

Test	chi2(1)	Prob > chi2
Heteroskedasticity	0.32	0.5734

Source: Author's computation (2026)

Table 5 presents the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity. The test statistic ($\chi^2(1) = 0.32$, $p = 0.5734$) indicates that the null hypothesis of constant variance cannot be rejected, suggesting that heteroskedasticity is not a significant concern in this model. This justifies the use of standard OLS rather than robust regression techniques.

5. DISCUSSION OF RESULTS

The findings of this investigation reveal that digital transformation does not significantly affect supply chain efficiency among Cameroonian SMEs. This non-finding carries substantial theoretical and practical implications, particularly given the positive results reported in other developing country contexts.

The Non-Significance of Digital Transformation

The finding that digital transformation ($\beta = 0.215$, $p > 0.05$) does not significantly influence supply chain efficiency contradicts the predictions of the Resource-Based View and diverges from the positive findings of Jam (2025) in Pakistan, Obiri-Yeboah et al. (2025) in Ghana, and Mkaouer and Sallem (2025) in Tunisia. This discrepancy may be explained by several contextual factors specific to Cameroon.

First, infrastructure limitations may prevent digital technologies from achieving their potential efficiency benefits. Digital supply chain tools require reliable electricity, internet connectivity, and compatible hardware. In Cameroon, where power outages are common and internet speeds vary considerably, digital systems may function intermittently, creating frustration rather than efficiency gains. Under these conditions, the costs of maintaining digital systems may

outweigh the benefits, resulting in neutral or negative net effects.

Second, the digital transformation index may capture adoption without capturing effective utilisation. SMEs may have implemented digital tools but may not use them fully or effectively due to skills gaps, inadequate training, or poor integration with existing processes. The Resource-Based View emphasises that resources must be valuable, rare, and inimitable, but adoption alone does not ensure value creation. Complementary organisational capabilities—including digital literacy, change management, and process redesign—are necessary for digital technologies to generate efficiency benefits.

Third, the measurement of supply chain efficiency in this study may not capture the specific efficiency dimensions that digital technologies affect. Digital tools may improve information visibility or decision speed without immediately affecting inventory turnover or delivery reliability—the indicators captured in this study. Longitudinal designs might reveal efficiency improvements that emerge only after learning curves are navigated and systems are fully integrated.

Comparison with Existing Literature

The non-significant findings contrast with Jam (2025), who found significant positive effects of digital technology adoption on supply chain performance in Pakistani SMEs. However, Pakistan has substantially different infrastructure conditions, with higher electricity reliability and internet penetration than Cameroon. Additionally, Jam's study used structural equation modelling with a larger sample ($n=482$), providing greater statistical power to detect effects. The current study's smaller sample ($n=35$) may lack power to detect small-to-moderate



effects, though the coefficient magnitude ($\beta = 0.215$) suggests that even with larger samples, the effect would be modest.

The findings also contrast with Obiri-Yeboah et al. (2025), who found that digital supply chain capabilities enhanced resilience and viability in Ghanaian manufacturing SMEs. However, their study examined digital capabilities rather than adoption, measuring the sophistication of digital use rather than mere presence. This distinction is crucial: capabilities imply effective utilisation, while adoption may indicate only ownership. The current study's non-significant findings may indicate that Cameroonian SMEs have adopted digital tools without developing the capabilities to use them effectively.

The findings align more closely with the qualitative insights of Fazlali Dastjerdi and Chatzipanagiotou (2025), who found that Iranian SME managers viewed ICT infrastructure development as a critical success factor for digital transformation. In Cameroon, where infrastructure remains underdeveloped, this prerequisite condition may not be met. The findings also resonate with Alfian, Arrin and Alfian (2025), whose systematic review highlighted infrastructure and digital literacy as persistent barriers in developing countries.

The Non-Significance of Control Variables

The finding that none of the control variables significantly affect supply chain efficiency suggests that SME characteristics—size, age, manager education, industry sector—do not explain efficiency variation in the Cameroonian context. This contrasts with developed country research where these variables typically explain substantial variance. The very low R-squared (0.055) indicates that unmeasured variables—such as competitive intensity, regulatory environment, supplier relationships, or management quality—may be the true drivers of supply chain efficiency in Cameroon. This finding suggests that contextual factors beyond firm characteristics may dominate efficiency outcomes.

6. CONCLUSION

Summary of Findings

This study examined the effect of digital transformation on supply chain efficiency in Cameroonian SMEs. The findings reveal three principal conclusions. First, digital transformation does not significantly affect supply chain efficiency, contradicting predictions from the Resource-Based View and findings from other developing country contexts. Second, none of the control variables—firm size, firm age, manager education, or industry sector—significantly influence supply chain efficiency, suggesting that SME characteristics do not explain efficiency variation in Cameroon. Third, the model's very low explanatory power ($R^2 = 0.055$) indicates that the drivers of supply chain efficiency in Cameroon differ substantially from those in contexts where digital transformation research has predominantly occurred.

Recommendations

Based on these findings, several practical recommendations emerge for SME owners, technology providers, and policymakers in Cameroon. First, SME owners should not assume that digital technology adoption will automatically

generate efficiency gains. Investments in digital tools should be accompanied by investments in complementary capabilities: employee training, process redesign, and change management. Second, technology providers should offer implementation support, not just software access, recognising that effective utilisation requires skills development and ongoing assistance. Third, policymakers should prioritise foundational infrastructure investments—reliable electricity, affordable internet, digital literacy programmes—before expecting digital transformation to drive SME efficiency gains. Fourth, SMEs should consider low-technology efficiency improvements (process standardisation, supplier relationship management, inventory optimisation) that do not depend on digital infrastructure, achieving efficiency gains while infrastructure develops.

Suggestions for Future Studies

Future research should address several limitations while extending these findings. First, longitudinal studies tracking digital transformation and efficiency over time would establish whether efficiency effects emerge only after extended implementation periods. Second, qualitative research exploring how Cameroonian SMEs actually use digital tools would illuminate the gap between adoption and effective utilisation, explaining why adoption does not translate into efficiency. Third, comparative studies across multiple African countries would identify infrastructure thresholds or capability conditions necessary for digital transformation to generate efficiency benefits. Fourth, research should examine specific digital technologies individually rather than aggregating into an index, as different technologies (inventory software vs. payment systems vs. communication platforms) may have differential effects. Fifth, studies should incorporate objective efficiency measures (inventory turnover ratios, order fulfilment times) alongside self-reported measures to address potential common method bias.

Limitations of the Study

Several limitations warrant acknowledgement. First, the cross-sectional design precludes causal inferences about digital transformation's effect on supply chain efficiency. Second, the sample size of 35 SMEs is small, limiting statistical power and potentially failing to detect moderate effects. Third, the study relies on self-reported efficiency measures rather than objective operational data. Fourth, the digital transformation index aggregates across different technologies, potentially obscuring differential effects of specific tools. Fifth, the study does not measure digital capability or utilisation quality, only adoption presence. Sixth, the focus on Douala and Yaoundé limits generalisability to SMEs in other Cameroonian cities or rural areas. Seventh, the study does not account for industry-specific factors (regulatory requirements, supply chain structures) that may moderate digital transformation's effects.

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