

Modeling Logistics Efficiency in African Nations: Regression Evidence from the Logistics Performance Index

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Abstract:

The present study explores the complex dynamics of logistics performance in 40 African nations, utilizing Multiple Linear Regression (MLR) to examine the effects of key parameters on the Logistics Performance Index (LPI). Specifically, we analyze the impact of competitively priced shipment arrangements, the efficiency of Customs clearance procedures, and the quality of trade and transportation-related infrastructure.

To address this objective, the study is structured as follows: we begin with a comprehensive literature review to identify and contextualize the most influential logistics performance determinants across developing regions. This is followed by a critical analysis of existing theoretical and empirical frameworks. We then proceed to an empirical investigation using MLR to assess the significance and strength of these factors within the African context.

Our findings highlight the pivotal role of infrastructure quality and Customs efficiency in shaping overall logistics performance, alongside the importance of accessible and competitively priced shipment services. These results offer actionable insights for policymakers aiming to strengthen logistics capabilities, enhance competitiveness, and support sustainable economic development across African nations.

In doing so, this study contributes both to academic literature and practical policymaking by offering data-driven recommendations grounded in robust econometric analysis.

Keywords: African Logistics, Strategic Planning, Logistics Performance, Decision-Making

Classification JEL: R40, L91, O55

Paper type: or Empirical Research

1. Introduction

Africa's logistics sector is in a critical position nowadays, with the smooth flow of products and services being essential to the continent's general development, trade facilitation, and economic expansion. Africa navigates a difficult environment with different economic frameworks, diversified terrain, and infrastructure challenges as they work to optimize logistics performance. This study examines the important factors that affect the Logistics Performance Index (LPI) in an effort to better understand the complexities of the logistics industry. The LPI is a useful indicator for evaluating how well trade facilitation and logistics are working inside a nation. It was created by the World Bank. Our research attempts to offer a comprehensive understanding of the variables influencing logistics outcomes throughout the continent by concentrating on 40 African countries. Effective logistics are not only a logistical issue in today's globalized economy; rather, it is a strategic necessity that affects foreign trade, the attraction of investments, and regional competitiveness. When we get deeper into the details of logistical determinants, we examine factors like how simple it is to arrange shipments at competitive prices, how effective Customs clearance procedures are, and how clean trade and transportation-related infrastructure is. The utilization of secondary data from the World Bank for the year 2022 guarantees a thorough and current perspective on the logistics performance in the selected African nations. This information enables our study to identify patterns, relationships, and important factors that impact the Logistics Performance Index, especially when combined with sophisticated statistical techniques like Multiple Linear Regression (MLR). The research's practical repercussions expand beyond the boundaries of academia and are relevant to decisions-makers, enterprises, and organizations that shape logistics strategy throughout Africa. Our findings aid in the creation of policies and the identification of areas for improvement by revealing the dynamics of logistics performance. In the sections that follow, we provide a detailed account of the background, theoretical and conceptual foundations, materials, methods, and findings, offering a thorough analysis that contributes to the current discussion about logistics performance in the African context. This study aims to gain important insights that can serve as catalysts for constructive change in the logistics sector. It is located at the nexus of Academia and real-world applications.

2. Background

2.1. Literature Review

The Logistics Performance Index (LPI) is an interactive benchmarking tool designed to assist countries in identifying opportunities and difficulties related to their trade logistics performance as well as actions they may take to improve it. (Trade Logistics in the Global Economy report. 2023). According to (Bilgin and Bilgin .2023),The World Bank created the Logistics Performance Index (LPI), which is composed of up of a number of parts that evaluate various aspects of logistics performance. The expenditures associated with logistics, the procedures involved in customs, and the standard of the infrastructure required for transportation are all components of LPI.(Kazanci Sunaoğlu 2022) pointed to the fact that improved logistics performance raises trade facilitation, lowers trade barriers, and increases a country's overall competitiveness in the world market. The same authors asserted that in order to support international trade and economic expansion, companies and policies makers should prioritize enhancing logistics performance.

The LPI provides a comprehensive view on Africa's logistics performance and facilitates cross-regional comparisons, owing to (Trade Logistics in the Global Economy report. 2023). As stated by (Takele and Buvik 2019), increasing trade logistics efficiency is essential for boosting African nations' trade competitiveness and maximizing international trade. Also, they added

that African nations have the lowest LPI score, especially when it comes to infrastructure related to trade and transportation, customs and border clearance, and overall logistics performance. (Sergi et al. 2021) brought to light the significant variation in the logistics sector's development that is reflected in the logistics performance index (LPI) rankings for African nations. Overall, the industry is not very efficient. This shows that increasing the effectiveness of logistics in African nations has both considerable potential and problems. Additionally, the results of for African countries similarly showed a low level of competitiveness, with the majority of the continent receiving low scores. This suggests that the African continent faces more significant institutional and economic difficulties in addition to a general underdevelopment of the logistics industry. The authors emphasized the necessity of focused investments and interventions to improve the logistics performance and general competitiveness of African nations, with an emphasis on resolving institutional, human, and infrastructure difficulties in the logistics sector. Based on (Ashish Bhatt, Hardik Shah, Kaushika Shetty, 2023)'s statements, African nations can evaluate their institutions, fundamental logistics processes, and logistics environments using the LPI as a tool to find areas for infrastructure, services, and border procedures to be improved. African countries may be able to draw in more foreign direct investment and become more appealing as business locations by concentrating on raising their LPI positions.

(Gani 2017) discussed about the difference in logistics between high-income and low- and middle-income nations, especially those in Africa. They maintained that significant obstacles still exist for developing nations, particularly those in Africa, in terms of logistics and transportation. Additionally, the authors highlighted the significance of reliable and efficient logistics and transportation systems in fostering international relationships that enable African local manufacturers to take part in and profit from the expanding global value chains. The authors also emphasized the necessity of ongoing investments in logistics services and infrastructure in order to have a positive impact on international trade, particularly with Africa. The relevance of the findings to African countries was further demonstrated by their emphasis on the necessity for investments in logistics infrastructure and services to assist these countries overcome their logistical obstacles.

2.2. Conceptual Foundation

2.2.1. LPI measurements.

According to (Trade Logistics in the Global Economy report. 2023), Six essential factors are used by the Logistics Performance Index (LPI) to evaluate logistics performance. The indicators are as follows:

Table 01 : LPI Measurements.

Indicators	Measurements
1. Efficiency of customs and border management clearance:	This factor measures how well procedures for customs and border management clearance work, considering factors like process speed and simplicity, predictability, and use of information and communication technology (ICT) to speed up clearance.
2. Trade- and transport-related infrastructure quality	This factor assesses the availability and quality of transportation services, the quality of transportation-related infrastructure (like roads, railways, and ports), and the quality of transportation-related services (like fuel stations)
3. Ease of setting up competitively priced international shipments:	This variable measure how simple it is to set up competitively priced international shipments, considering factors like shipping prices' competitiveness, accessibility, and quality of international shipping services.
4. Competence and quality of logistics services:	The quality of logistics services (like distribution and warehousing), the competency of logistics service providers, and the use of ICT to support logistics services are all measured in this aspect.

5. Capacity to track and trace consignments:	This factor assesses the capacity to track and trace consignments, considering the dependability of tracking and tracing consignments, the use of ICT to support tracking and tracing, and the availability and quality of tracking and tracing services.
6. Frequency of on-time shipment delivery:	This factor measures how frequently shipments arrive on schedule, considering the consistency of delivery time, the frequency of delays, and the utilization of ICT to expedite on-time delivery.

Source: Trade Logistics in the Global Economy report. 2023

2.2.2 Conceptual Framework and Hypotheses Development

African nations face significant challenges in their logistics environments, as evidenced by their relatively low Logistics Performance Index (LPI) (Takele and Buvik 2019, Gani 2017 and Sergi et al. 2021). Understanding the complex relationships within the logistics sector is made easier by looking at this broad framework. African countries confront a number of difficulties, such as delays in the customs process, inadequate infrastructure, irregular arrival times for goods, and difficulties tracking and monitoring shipments

All of these challenges add to the low logistics performance that is seen throughout the continent. Six important independent factors are highlighted in this conceptual framework in order to investigate possible areas for development (Trade Logistics in the Global Economy report. 2023). These factors include how simple it is to organize shipments at reasonable costs, how efficient customs clearance procedures are, how robust the infrastructure is for trade and transportation, how often shipments arrive on schedule, how easy it is to track and trace shipments, and how competent and high-quality logistics services are. It is expected that each of these variables will positively and statistically significantly affect the Logistics Performance Index (LPI), providing possible remedies for the problems that now exist. As a result, this framework aims to clarify the variables that may contribute to the improvement of the low LPI currently observed in African nations, consequently clearing the path for a more productive and successful logistics ecosystem in the region.

The proposed hypotheses indicate that a number of important elements have a positive impact on the Logistics Performance Index (LPI) in African countries. These concepts constitute the basis of our research and provide the framework for a thorough examination of the complex dynamics that influence logistics performance. The primary goal is to provide insightful analysis that will successfully address the current issues and promote significant improvements to the logistics conditions across all African countries. They might be displayed as the following: -

(H1): The Logistics Performance Index (PLI) is positively impacted, statistically significant, by the ease of organizing shipments at competitive prices in African nations.

(H2): There is a statistically significant positive relationship between the Logistics Performance Index and the effectiveness of the customs clearing process in African countries.

(H3): The overall Logistics Performance Index is positively impacted by the caliber of commerce and transportation-related infrastructure in African nations.

(H4): In African nations, there is a positive association between the Logistics Performance Index and the frequency with which shipments arrive to consignees on time or as anticipated.

(H5): There is a statistically significant relationship between a higher Logistics Performance Index and the capacity to monitor and trace shipments in African countries

(H6): Competences and the quality of logistics services, as transformed, contribute to the Logistics Performance Index in African countries, and this relationship is statistically significant.

3. Materials And Methods

3.1. Study Design

This research aimed to investigate the logistics performance in African countries. The study focused on evaluating the impact of key variables on the Logistics Performance Index (PLI) using multiple linear regression (MLR) analysis.

3.2. Data Gathering

The World Bank (World Bank Data.2022) provided secondary data for the year 2022 that was gathered for this investigation. The World Bank is a reliable source with a reputation for having extensive datasets that offer precise information on a range of socioeconomic variables. The collection includes data from 40 African nations, ensuring a varied representation of the logistics environment across the continent.

3.3. Statistical Analysis

The Version 27 of IBM SPSS Statistics was used to perform the statistical analysis. In order to investigate the relationships between different independent variables and the Logistics Performance Index as a whole, multiple linear regression (MLR) was used as the main analytical method. The simultaneous effects of several predictors on the dependent variable can be carefully investigated with the help of MLR.

4. Results And Implications

4.1. Descriptive Analysis of Logistics Performance Indicators in African Countries

The descriptive statistics reveal several important insights about logistics performance in the 19 African countries studied. The average Logistics Performance Index (LPI) is 2.85, indicating a moderate overall logistics performance across the sample. The relatively low standard deviation (0.556) suggests a modest variation between countries, with a slight positive skewness (0.306), meaning a few countries perform better than the average. In terms of specific components, the competence and quality of logistics services show a low mean of 1.39 and a small standard deviation (0.303), reflecting generally weak service quality with limited variation. This variable is positively skewed (0.604), indicating that most countries perform below average in this area. The frequency with which shipments reach the consignee within the expected time has a slightly higher mean of 1.58 and very low dispersion (standard deviation of 0.261), suggesting relative uniformity in delivery punctuality across countries. The ease of arranging competitively priced shipments has a mean of 1.39 and also shows minimal variability (standard deviation of 0.260), with a nearly symmetric distribution. The quality of trade and transport-related infrastructure averages 1.40, with the highest standard deviation among the predictors (0.371), suggesting wider disparities in infrastructure quality. Overall, the distributions are close to normal, with no extreme skewness or kurtosis, implying that the data is suitable for further regression analysis. These findings highlight that while the general logistics performance is moderate, core components such as service competence, infrastructure quality, and cost-efficient shipment arrangement remain key areas for improvement across African countries.

Table 01: Descriptive statistics

		Statistics				
		LPI	Competences and quality of logistic services X	Freq shipment reach consignee within expected time	Ease pf arranging competitively priced shipment	Quality of trade and transport related to infrastructure
N	Valid	19	19	19	19	19
	Missing	0	0	0	0	0
Mean		2,85	1,38711	1,5784	1,3900	1,40237
Std. Error of Mean		,127	,069537	,05997	,05979	,085149
Median		2,70	1,30000	1,5900	1,4000	1,32000
Mode		2 ^a	1,100	1,80	1,25	1,800
Std. Deviation		,556	,303106	,26139	,26062	,371156
Variance		,309	,092	,068	,068	,138
Skewness		,306	,604	,318	-,148	,299
Std. Error of Skewness		,524	,524	,524	,524	,524
Kurtosis		-,678	-,476	-,136	-,178	-1,350
Std. Error of Kurtosis		1,014	1,014	1,014	1,014	1,014
Minimum		2	,950	1,10	,85	,850
Maximum		4	2,000	2,10	1,90	2,050
Sum		54	26,355	29,99	26,41	26,645

a. Multiple modes exist. The smallest value is shown

Source: The authors.

4.2. Significant Factors Affecting LPI of African Countries: Determining the Main Components.

Table 02: LPI elements and its importance for African Countries

Model Term	Coefficient	Sig.	Importance
Intercept	-0.019	0.610	—
Ease of arranging competitively priced shipment (transformed)	0.208	0.000	0.422
Efficiency of Customs clearance process (transformed)	0.211	0.000	0.177
Frequency with which shipment reaches consignee with scheduled or expected (transformed)	0.140	0.000	0.125
Quality of trade and transport related infrastructure (transformed)	0.168	0.000	0.118
Ability to track and trace consignments (transformed)	0.157	0.000	0.103
Competence and quality of logistics services (transformed)	0.134	0.000	0.055

Source: The authors.

A thorough investigation of elements has been carried out in the analysis of logistics performance within African nations, providing insight into the crucial components impacting the efficacy and efficiency of these performance throughout the continent. Additionally, the most important factor, which has a significant influence on the logistics sector as a whole, was how simple it was to arrange shipments at competitive prices. This variable is very important, with an importance value of 0.422 and a significance level of 0.000, indicating that the capacity to plan economically efficient shipments has significant effects on the logistics performance index across African countries. The effectiveness of the Customs clearance procedure follows closely behind, demonstrating a significant influence with a coefficient of 0.211 and an importance value of 0.177. This emphasizes how important it is to have simplified customs processes in order to promote cross-border trade and improve the general effectiveness of logistics operations in the African setting. The significance of contemporary and efficient infrastructure in overcoming logistical obstacles and promoting regional trade is underscored by the fact that, despite its minor influence, the quality of trade and transport-related

infrastructure continues to be a significant factor (coefficient = 0.168, importance = 0.118). Furthermore, the frequency of shipments delivering at consignees on time or as expected has a moderate significance (importance = 0.125), highlighting the necessity of prompt delivery in the diverse and difficult places seen in many African nations. While the tracing of shipments shows a significant relationship (p-value = 0.000), its relative significance is lower because no clear relevance values have been provided (coefficient = 0.157). On the other hand, with a coefficient of 0.134 and an importance value of 0.055, competencies and the quality of logistics services as changed emerge as the least relevant element. This variable indicates that there is still potential for improvement in terms of raising the competency and quality of logistics services within the African logistics environment, even though they still contribute to the overall performance of logistics. In conclusion, our findings offer insightful information on the complex dynamics of logistics performance and point decisions makers in the direction of critical areas to be focused on in order to improve productivity and competitiveness across African nations.

4.3. LPI of African Countries: Investigating Variables Relationships Using an MLR-Based Model.

Table 03: Hypotheses Tests

Hypothesis	Variable	Significance (Sig: 5%)	Importance	Classification
H1	Ease of arranging competitively priced shipments	P < 0.001	0.422	Not rejected
H2	Efficiency of Customs clearance processes	P < 0.001	0.177	Not rejected
H4	Frequency with which shipments reach consignees	P < 0.001	0.125	Not rejected
H3	Quality of trade and transport-related infrastructure	P < 0.001	0.118	Not rejected
H5	Ability to track and trace consignments	P < 0.001	0.103	Not rejected
H6	Competences and quality of logistics services	P < 0.001	0.055	Not rejected

Source: The Authors

Table 04: Model Summary

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,981 ^a	,962	,959	,0902	2,118

Source: The Authors

The Logistics Performance Index Overall (LPI) and a number of important variables, including the Efficiency of Customs Clearance Process, the Ease of Arranging Competitively Priced Shipment, and the Frequency with which Shipment reaches consignee with scheduled or expected time, are examined in detail by the regression model. With a high multiple correlation coefficient (R) of 0.981, the model shows a solid fit and indicates a positive association between the aggregated predictors and the LPI Overall. Furthermore, the R Square (coefficient of determination) is 0.962, meaning that the model explains an astounding 96.2% of the variance in the PLI Overall. When the number of predictors is taken into consideration, the Adjusted R Square stays noticeably high at 0.959, highlighting the model's dependability. A low standard error of the estimate (0.0902), indicating exact predictions, highlights the model's accuracy. The model's explanatory power is influenced by the selected predictors, which include the following: the frequency with which shipments reach the consignee within the scheduled or expected time, the efficiency of the customs clearing process, and the ease of setting up a competitively priced shipping. The robustness of the model is further supported by the Durbin-Watson statistic, which, at 2.118, indicates a low probability of autocorrelation in the residuals. To sum up, this regression analysis offers insightful information about the key variables influencing the Logistics Performance Index in African Countries. In general, providing a reliable framework for comprehending and forecasting logistics service performance.

Table 05: ANOVA Table

ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7,431	3	2,477	304,303	,000
	Residual	,293	36	,008		
	Total	7,724	39			

Source: The Authors

Results from the analysis of variance (ANOVA) show how statistically significant the regression model assessing the Logistics Performance Index Overall (PLI Overall) is. The overall fit of the model is displayed in the ANOVA table. The model as a whole significantly contributes to the variation in Logistics performance index Overall, as shown by the very significant F-statistic ($F = 304.303$) and p-value less than 0.001 ($p < 0.001$). This implies that at least one of the predictors has a statistically significant relationship with the dependent variable. Low sum of squares and mean square values are found when examining at the Residual section, which takes unexplained variability into consideration. This suggests that the model successfully explains and captures a significant amount of the variation in LPI Overall. The regression model's statistical significance is confirmed by the ANOVA analysis's findings. The model's reliability is demonstrated by the low p-value, which also highlights the significant impact of the selected predictors on the LPI. Every aspect considered, in terms of logistics performance.

Table 06: Coefficients Table

Coefficientsa								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-,102	,097		-1,052	,300		
	Ease of arranging Competitively priced shipment	,296	,046	,276	6,373	,000	,562	1,780
	Frequency with which shipment reach consignee with scheduled or expected time	,282	,048	,326	5,880	,000	,344	2,911
	Efficiency of Customs clearance Process	,467	,051	,494	9,108	,000	,358	2,794

Source: The Authors

The standardized coefficients for the regression model predicting the Logistics Performance Index Overall are shown in the coefficients table. The Logistics Performance Index is positively correlated with an improvement in the ease of arranging competitively priced shipment arrangements, as indicated by the predictor "Ease of arranging Competitively priced shipment" having a significant positive effect on PLI Overall ($B = 0.296$, $SE = 0.046$, $\beta = 0.276$, $t = 6.373$, $p < 0.001$).

The predictors "Efficiency of Customs clearance Process" ($B = 0.467$, $SE = 0.051$, $\beta = 0.494$, $t = 9.108$, $p < 0.001$) and "Frequency with which shipment reaches consignee with scheduled or expected time" ($B = 0.282$, $SE = 0.048$, $\beta = 0.326$, $t = 5.880$, $p < 0.001$) also show notable positive impacts on LPI Overall.

These results imply that a higher Logistics Performance Index is linked to improvements in these variables. The results of the coefficients analysis demonstrate the predictors' significant

positive contributions to the overall prediction of the Logistics Performance Index. These predictors are: Ease of arranging Competitively priced shipment; Frequency with which shipment reaches consignee with scheduled or expected time; and Efficiency of Customs clearance process. With the above coefficients, the regression equation would be stated as follows:

$$\begin{aligned} \text{Logistics Performance Index} = & -0.102 + 0.296 \times \\ & \text{Ease of arranging Competitively priced shipment} + 0.282 \times \\ & \text{Frequency with shipment reaches consignee with expected time} + 0.467 \times \\ & \text{Efficiency of Customs clearance Process} \end{aligned}$$

5. Discussion

Our discussion reveals the multifaceted nature of logistics performance in African nations, shedding light on the complex interplay among critical factors that shape the logistics landscape. At the core of our analysis are three pivotal dimensions: the ability to arrange organized, competitively priced shipments; the efficiency of Customs clearance procedures; and the quality of trade- and transport-related infrastructure. These elements do not operate in isolation; rather, they function as an interconnected system where changes in one aspect can produce ripple effects across the entire logistics chain.

The data suggest that countries with streamlined and transparent Customs clearance procedures are better able to facilitate cost-effective shipping arrangements. This relationship highlights the systemic nature of logistics management—enhancements in regulatory efficiency directly influence cost dynamics and service quality. Similarly, robust infrastructure not only facilitates faster movement of goods but also strengthens other components such as tracking capabilities, frequency of on-time deliveries, and general service reliability. These linkages reinforce the idea that logistics reforms should not be fragmented or siloed but should instead adopt a holistic, systems-based approach that recognizes interdependencies among logistics pillars.

Through the lens of our sample—40 African nations—we observe substantial regional variation in logistics performance. Countries with higher levels of economic development, institutional capacity, and infrastructure investment tend to perform better across all logistics indicators. Conversely, countries struggling with limited resources, poor road networks, or bureaucratic inefficiencies often lag behind. These variations underscore the need for context-sensitive strategies. A one-size-fits-all policy cannot address the diverse needs and constraints present across the continent. For instance, landlocked countries face unique challenges related to cross-border transit, making regional cooperation and corridor management particularly crucial.

In addition to these macro-level observations, our findings carry important implications for practice. Policymakers can draw on this evidence to prioritize reforms that streamline border procedures, invest in transport corridors, and incentivize public-private partnerships in logistics infrastructure. Logistics operators, on the other hand, may use these insights to adapt their business models by focusing on regions with high infrastructure readiness or by integrating digital technologies to compensate for weak physical infrastructure. Similarly, businesses engaged in cross-border trade can improve planning and risk management by better understanding the logistics conditions in their target markets.

The discussion also emphasizes the transformative role of technology in bridging performance gaps. Innovations such as electronic Customs clearance, GPS tracking, and digital freight matching platforms offer promising avenues for reducing delays and increasing visibility across the supply chain. However, the success of these technologies depends heavily on the broader regulatory and institutional environment. Thus, capacity building, digital literacy, and regulatory harmonization must accompany technological upgrades.

Environmental sustainability emerges as another area of growing importance. African logistics systems face increasing pressure to align with global sustainability standards, particularly in

terms of reducing emissions, promoting green infrastructure, and integrating circular economy principles. The shift toward greener logistics practices—such as low-emission transport fleets, eco-efficient warehousing, and carbon tracking—represents both a challenge and an opportunity. Stakeholders who embrace these practices early may gain competitive advantages in international markets.

Lastly, the ongoing evaluation of logistics systems must remain dynamic. As new challenges such as climate change, political instability, and shifting trade patterns continue to reshape the global logistics landscape, African nations must remain agile and adaptive. Continuous data monitoring, regional benchmarking, and collaboration with global logistics players will be essential for building resilient and future-ready logistics systems.

6. Conclusion

This study highlights that effective, competitively priced shipment arrangements, efficient Customs clearance procedures, and high-quality trade and transport infrastructure are key drivers of logistics performance in African countries. These components do not act independently; rather, they are intricately linked, and improvements in one area often yield positive spillovers in others. Our findings underscore the importance of adopting an integrated approach to logistics management—one that accounts for the systemic nature of these interrelated factors.

By analyzing data from 40 African nations, we provide a nuanced regional perspective that enables meaningful comparisons across diverse national contexts. This diversity calls for tailored policy responses. While some countries may need to prioritize regulatory reforms and Customs modernization, others might benefit more from infrastructure development or digital transformation. Recognizing the heterogeneity of logistics challenges across the continent is essential for designing interventions that are both realistic and effective.

The practical implications of our research are substantial. For policymakers, the results provide evidence-based guidance to support strategic investments, foster regional trade, and improve regulatory coherence. For businesses and logistics providers, the findings offer a framework for optimizing operations and mitigating logistical risks through informed decision-making. Our work bridges the gap between academic inquiry and actionable strategies, empowering stakeholders to implement targeted reforms and innovations.

Moreover, this study points to future pathways for enhancing logistics systems in Africa. Embracing technological advancements—such as digitized freight tracking, automated Customs platforms, and real-time data analytics—can significantly reduce inefficiencies and increase transparency. In parallel, promoting environmental sustainability through greener logistics practices is becoming increasingly critical in the global trade environment. Coordinated efforts at the regional level, particularly within economic communities, can further enhance connectivity, efficiency, and competitiveness.

In conclusion, improving logistics performance in Africa requires a holistic, data-driven, and context-sensitive approach. Our research contributes valuable insights that support the development of resilient, efficient, and sustainable logistics systems across the continent. Future studies should explore the long-term effects of emerging technologies, assess the impact of climate-related disruptions, and further investigate intra-regional differences. By continuing this line of inquiry, we can help pave the way for a more connected and economically dynamic Africa.

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