Open Access | Original Research
Innovation Journal of Social Sciences and Economic Review, 7(2), 2025 | PP: 76– 87
https://doi.org/10.36923/ijsser.V7i2.337

Unlocking Trade-Led Growth in West Africa: The Moderating Role of Institutional Quality in a Dynamic Panel Analysis

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Article History:

Received: 30-09-2025
Revision: 23-10-2025
Accepted: 27-10-2025
Publication: 22-11-2025

Cite this article as:

Orji, A., Muorah, E. M., Anthony-Orji , O. I., Ogbuabor, J. E., Okoro, O., & Chiobi, C. J. (2025). Unlocking Trade-Led Growth in West Africa: The Moderating Role of Institutional Quality in a Dynamic Panel Analysis. *Innovation Journal of Social Sciences and Economic Review*. 7(1), 76-87. doi.org/10.36923/Ijsser.v7i2.337

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Abstract: This study examines the conditional effect of trade liberalization on economic growth in West Africa, with a particular focus on the moderating influence of institutional quality. A panel dataset covering 16 West African countries over the period 2017–2022 is employed to estimate a dynamic growth model using the System Generalized Method of Moments (System-GMM), which effectively addresses endogeneity and growth persistence. Robustness checks are conducted using Pooled Ordinary Least Squares (POLS) and Fixed Effects (FE) estimators. The results reveal three key findings. First, trade liberalization has a positive and statistically significant effect on economic growth in the region. Second, although institutional quality exhibits a negative direct effect, likely due to short-run adjustment and compliance costs, the interaction between institutional quality and trade liberalization is positive and strongly significant, demonstrating that governance effectiveness is critical for harnessing the growth benefits of openness. Third, the negative coefficient estimates for financial development and industrialization indicate structural inefficiencies, including credit misallocation and a continued dependence on low-value, resource-based production. Overall, the findings suggest that while West Africa possesses substantial potential for trade-driven development, meaningful gains remain constrained by weak institutional capacity and limited structural transformation. The study recommends targeted governance reforms, improved regulatory enforcement, strategic reallocation of financial resources toward high-value export sectors, and accelerated industrial diversification to ensure that trade liberalization translates into sustained, inclusive economic growth.

Keywords: Trade Liberalization, Economic Growth, Panel Data, System GMM, Governance Institutions, Institutional Quality

JEL Codes: F13, O43, O55, P16:

1. Introduction

International trade has historically served as a major engine of global integration, driving economic interdependence alongside cultural and intellectual exchange across diverse regions (Adeosun & Tabash, 2022; Dahal et al., 2024 and Celik et al., 2024). In recent decades, West African economies have intensified efforts toward trade liberalization, reducing quotas, protectionist tariffs, and exchange controls, to stimulate regional cooperation and accelerate growth. However, despite these aspirations, persistent structural weaknesses and governance challenges continue to limit the effectiveness of trade policy reforms in the region. While classical economists posited a mutually reinforcing relationship between trade and development, contemporary empirical evidence reveals that trade liberalization alone is insufficient to guarantee sustained economic performance. A growing body of literature confirms that the ability of trade to generate growth is conditional on the presence of strong institutional frameworks (Mehmood et al., 2023; Liko, 2024).

The theoretical mechanisms linking trade and growth are widely acknowledged. Trade enables job creation, market expansion, and the transmission of technological knowledge across borders, thereby enhancing productivity and domestic competitiveness (Ideba et al., 2025; Ogbuabor et al., 2024b). According to the Endogenous Growth Model (Romer, 1986), these technology-driven spillovers are essential for sustaining long-run growth beyond capital accumulation. In addition, countries rely on global exchange to access goods and services that cannot be efficiently produced domestically, reinforcing the export–import cycle as a fundamental driver of balanced economic development (Sowrov, 2024and Rufaedah et al., 2024). Although concerns remain that trade may exacerbate underdevelopment in resource-dependent economies, the prevailing empirical consensus suggests that, when supported by conducive domestic conditions, trade is a powerful catalyst for long-term development (Mamasoliev, 2024; Bajo-Rubio & del Carmen Ramos-Herrera, 2024).

West Africa is an economically significant and resource-rich trading region. Petroleum accounts for 61% of its total exports, while cocoa dominates agricultural exports (African Union, 2022). Nigeria remains the driving force behind regional trade, contributing more than 70% of total export receipts. Although trade volumes have grown in recent years, averaging USD 208.1 billion and generating a substantial regional surplus (African Union, 2022, the expected structural transformation and productivity gains have not materialized for many member states.

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This paradox has prompted scholars to highlight the central role of institutions in facilitating trade-led growth. According to New Institutional Economics, institutions function as the "rules of the game," shaping incentives and reducing transaction costs across economic activities (North, 1990). Weak institutions hinder the translation of external benefits, such as foreign direct investment (FDI) and knowledge transfer, into domestic productive capacity by heightening corruption, policy uncertainty, regulatory inconsistencies, and insecurity (Bhattarai et al., 2023; Gebrue, 2024). Conversely, sound governance, characterized by effective regulation, political stability, and rule of law, strengthens investor confidence and enhances policy efficiency, enabling economies to fully leverage trade opportunities (Mehmood et al., 2023; Liko, 2024).

Despite these insights, empirical evidence in West Africa remains fragmented. Most studies examine the independent effects of either trade liberalization or institutional quality on growth, without addressing the specific theoretical channel through which institutional quality may shape the outcomes of trade. As a result, there is limited understanding of why expanding trade openness has yielded divergent results across the region.

To address this gap, this study empirically investigates the moderating role of institutional quality in the relationship between trade liberalization and economic growth in 16 West African countries from 2017 to 2022. Using a dynamic System GMM framework complemented by robustness checks, the study contributes to the literature in three key ways: (1) it provides new region-specific evidence on the conditional nature of trade-led growth; (2) it constructs a composite institutional quality index using principal component analysis to reduce measurement error; and (3) it identifies the threshold of institutional effectiveness required to translate trade openness into sustainable economic development. By offering these insights, the study delivers actionable policy recommendations to strengthen governance structures and ensure that the growth benefits of trade are equitably realized across the West African sub-region.

2. Literature Review

2.1. Theoretical Literature

A. Theories on Trade Liberalization and Growth

Classical economic theories establish a foundational premise for trade liberalization as a driver of national growth. Ricardo's (2004 theory of comparative advantage emphasizes that nations benefit when they specialize in goods produced relatively more efficiently, while Smith (1937) advocates for the removal of trade barriers to strengthen overall global production efficiency. These theoretical constructs collectively suggest that free trade can enhance resource allocation and stimulate economic growth. This rationale is expanded in the Export-Led Growth (ELG) hypothesis, which argues that export expansion catalyzes productivity gains through economies of scale, managerial improvements, and knowledge spillovers (Krugman, 1990; Lucas, 1988). According to Endogenous Growth Theory (Romer, 1986), such spillovers facilitate innovation-driven growth, implying that trade liberalization, by exposing domestic firms to global competition, can serve as a pathway toward sustained economic development.

B. Theories on Institutions and Economic Growth

Nevertheless, trade alone cannot guarantee positive growth outcomes. The theoretical discourse on institutions reveals that structural and governance conditions shape the effectiveness of market mechanisms. Neoclassical institutional perspectives assume that markets are capable of self-regulation with limited governance intervention (Boland and Newman, 1979). Yet, New Institutional Economics challenges this assumption, asserting that institutions, defined as the formal laws and informal norms governing economic behavior, play a decisive role in reducing transaction costs, protecting property rights, and enabling efficient interactions (North, 1990). When institutions are weak, corruption, regulatory inefficiencies, and political instability undermine investors' confidence and hinder productive utilization of external opportunities. Therefore, institutional quality emerges as a crucial enabling condition for transforming trade-induced opportunities into sustained economic expansion.

C. Theories Linking Trade, Institutions, and Economic Growth

Integrating these theoretical perspectives suggests that institutional quality moderates the trade–growth relationship. While trade facilitates the inflow of technology and knowledge, the degree to which these benefits are retained and converted into local productivity depends on the effectiveness of governance systems. Strong institutions ensure contract enforcement, minimize uncertainty, enhance competitive resource allocation, and secure returns on investment. Conversely, poor institutional environments may distort market incentives, channel trade gains toward rent-seeking behavior, and reinforce commodity dependence. Therefore, as theorized by endogenous growth scholars and institutional economists, institutional quality determines the direction and magnitude of trade liberalization's impact on economic growth, indicating that trade-led development is conditional rather than automatic.

2.2. Empirical Literature

Empirical findings on the influence of trade liberalization on growth provide both supportive and contradictory evidence. Numerous studies conclude that open trade policies foster growth by expanding productive capacity and integrating economies into global value chains (Ogbuabor et al., 2024b; Jabbar et al., 2024). Judijanto and Azizs (2024) similarly demonstrate that international trade enhances regional growth and job creation, although such effects depend heavily on infrastructure availability and competitiveness. Moreover, Celik et al. (2024) confirm a long-term relationship between trade openness and productivity enhancement in African economies, reinforcing the ELG hypothesis.

However, the relationship is not universally positive. Studies such as Bajo-Rubio and Ramos-Herrera (2024) reveal bidirectional causality between trade and GDP in Europe, suggesting the presence of feedback mechanisms, while Amna Intisar et al. (2020) report regional variations within Asia, where causality differs between economic subregions. Moreover, excessive reliance on primary commodity exports and limited industrial sophistication can result in negative trade–growth outcomes in developing economies (Dahal et al., 2024). These findings collectively suggest that the benefits of trade are contingent upon structural characteristics and economic diversification levels. Therefore, trade openness may either enhance growth or intensify vulnerabilities depending on the domestic economic context.

A parallel stream of literature highlights the pivotal role of institutional quality in shaping economic performance. Empirical studies show that strong governance systems enhance the contribution of financial development to economic growth, while weak institutions lead to statistically insignificant or even detrimental effects (Bayraktar et al., 2023; Pradhan et al., 2023). Institutions have also been found to buffer adverse macroeconomic shocks and elevate the effectiveness of policy reforms (Ogbonna et al., 2021; Ogbonna et al., 2022). Nevertheless, these institutional effects are not uniform across developing regions. Degbedji et al. (2024) demonstrate that institutional deterioration in some West African countries undermines innovations aimed at enhancing green economic development. Consequently, empirical evidence suggests that institutional conditions shape not only economic outcomes but also the extent to which economies can capitalize on global engagements.

More recent studies are beginning to converge on the interaction between trade, institutional performance, and other growth determinants. For example, Ogbuabor et al. (2024b) find that governance quality enhances the effect of trade openness and foreign financial inflows on productive capacity in Africa, offering direct support for the moderating mechanism proposed by institutional theorists. Similarly, Asongu et al. (2020) show that information and communication technology only strengthens the positive impact of FDI on growth beyond a specific institutional threshold. Furthermore, Ekeocha et al. (2022) demonstrate that while infrastructure provides growth potential, such gains remain unrealized without robust governance systems to facilitate efficient trade integration. Therefore, contemporary evidence increasingly supports the premise that growth arises from the interplay of openness, governance, and structural foundations.

2.3. Synthesis, Gaps, and Contribution

Overall, the reviewed literature reveals that the relationship between trade liberalization and economic growth remains inconclusive across contexts. While some studies confirm that open trade stimulates economic performance (Ogbuabor et al., 2024b; Jabbar et al., 2024), others document negative or muted effects, particularly in West Africa, where trade reforms have not consistently delivered development gains (Alugbuo & Uremadu, 2020). Despite widespread acknowledgement of the role of institutions, the empirical modelling of institutional moderation within the trade–growth nexus remains limited, particularly regarding the threshold level of institutional quality required to convert openness into sustainable growth.

Therefore, a critical research gap persists: existing studies typically examine direct effects of trade or institutions independently, but rarely assess the conditional linkage between them in the West African context. This study responds to this gap by explicitly testing how institutional quality moderates the effect of trade liberalization on economic growth, using a refined composite governance index and a dynamic estimation approach that addresses endogeneity concerns. By doing so, the study advances theoretical understanding while delivering policy-relevant evidence on the institutional reforms necessary to unlock the economic potential of trade in West Africa.

2.4. Conceptual Framework and Hypothesis Development

Trade liberalization refers to the removal of restrictions on cross-border exchange, including the reduction of quotas, import licensing, tariffs, and exchange controls, with the primary aim of promoting competition and international market integration (Monisola, 2014). Within the framework of this study, trade liberalization is conceptualized as a catalyst for productivity-driven growth, facilitating technology diffusion, knowledge spillovers, and efficient resource allocation through wider market access and increased participation in global value chains. This conceptualization aligns with the Export-Led Growth Hypothesis and Endogenous Growth Theory, which emphasize the role of openness in stimulating innovation and specialization (Romer, 1986).

However, the impact of trade liberalization on growth is not automatic. The degree to which openness produces positive outcomes depends critically on the institutional context within which trade occurs. Institutions, comprising formal rules such as laws, regulations, and enforcement systems, as well as informal norms governing behavior, shape economic interactions by reducing uncertainty, protecting property rights, and constraining rent-seeking and opportunistic behaviors (North, 1990). Therefore, strong governance structures enhance investor confidence, enable technological absorption, and ensure efficient allocation of trade-related gains. In contrast, institutional deficiencies may distort market signals, exacerbate resource misallocation, and reduce the developmental effectiveness of trade reforms.

Accordingly, this study proposes a moderating role for institutional quality in the trade–growth nexus. When institutions are robust, trade-induced opportunities are more likely to translate into productive investment, industrial upgrading, and sustained economic expansion. Conversely, weak institutions may undermine growth potential by allowing corruption, policy instability, and inefficiency to erode the benefits of openness. Thus, institutional quality is not a peripheral factor but a core determinant of whether trade serves as an engine of development.

Economic growth in this study is measured by real GDP per capita, which reflects sustained improvements in macroeconomic performance and living standards (Olajide, 2004). Conceptually, trade liberalization influences growth directly through enhanced market efficiency and indirectly through productivity spillovers. Institutional quality moderates both channels by determining the extent to which opportunities created by openness are effectively transformed into domestic economic gains.

Synthesizing these theoretical and empirical insights, the following hypothesis is proposed:

H1: Institutional quality positively moderates the relationship between trade liberalization and economic growth in West Africa, such that the positive effect of trade liberalization on growth is stronger where institutional quality is higher.

This hypothesis reflects the fundamental assertion of New Institutional Economics and Endogenous Growth Theory: trade-led development is conditional and depends on the governance systems that govern market participation. The conceptual model guiding the empirical analysis, therefore, positions institutional quality as a moderating mechanism that enhances the capacity of West African economies to translate trade liberalization into sustained welfare-enhancing growth.

3. Methodology

3.1. Data

This study examines the relationship between trade liberalization, institutional quality, and economic growth using a balanced panel dataset comprising sixteen West African countries over the period 2017 to 2022. The adoption of panel data is advantageous because it integrates both cross-sectional and time-series dimensions, thereby enhancing the robustness of statistical inferences and providing greater variability and degrees of freedom. As emphasized in growth literature (Roy, 2025), the use of panel datasets allows researchers to control for unobservable country-specific characteristics that remain constant over time but may influence growth dynamics. Consequently, this methodological approach offers a more precise assessment of the structural factors shaping economic performance across different economies. To satisfy the aforementioned objectives, we present the following model:

$$ECOG = f(TOP, FDEV, FDI, INFR, LFPR, INDUS,\ GOVQ,\ GOVQ * TOP) \quad (1)$$

To operationalise the objectives of this study, economic growth (ECOG) is modeled as a function of trade openness, financial development, foreign direct investment, infrastructure, labour force participation, industrial development, institutional quality, and the interaction between trade and institutions. A detailed presentation of variable descriptions, measurement procedures, and data sources is provided in Table 1.

Table 1: Nature and Description of Variables

Variables	Measurements	Motivating Study	Sources
Dependent Variable			
Economic growth (ECOG)	Real Gross Domestic Product.	Ogbuabor, et al. (2024a), Emeka, et al. (2024b)	World Bank (2024a)
Independent Variables			
Trade Openness (TOP)	Trade (% of GDP)	Edeme et al. (2024); Emeka et al. (2024a) and Asongu et al. (2024b); Ikubor et al (2023); Mba et al (2019)	World Bank (2024a)
Intervening Variable			
Governance Quality (GOVQ)	A composite indicator obtained from principal component analysis of control of corruption (CC), governance effectiveness (GE), rule of law (RL), regulatory quality (RQ), voice and accountability (VA), and political stability/absence of violence (PS)	Emeka et al. (2024c); Vu (2022) and Emeka et al. (2024b)	World Bank (2024b)
Control Variables			
Foreign direct investment (FDI),	Foreign direct investment (FDI), net inflows (% of GDP)	Ogbuabor, et al. (2024a), Emeka, et al. (2024b)	World Bank (2024a)
Infrastructural development (INFR)	Composite measure of ICT infrastructure, electricity infrastructure, transport infrastructure and water infrastructure	Asongu, et al. (2024a), Asongu et al. (2024b)	Africa Infrastructure Development Index (AIDI) (2022).
Financial Development (FDEV)	Domestic credit to private sector by banks (% of GDP)	Ogbonna et al. (2022) and Ogbuabor, et al. (2024b)	World Bank (2024a)
Industrialization	Industrial value added, (% of GDP)	Asongu et al., 2024a; Asongu et al., 2024B;	World Bank (2024a)
labor force participation (LFP)	Measured as percentage (%) of the total population ages 15–64 (modeled ILO estimate).	Emeka et al. (2024c) ; and Emeka et al. (2024b)	World Bank (2024a)

Source: Authors' construct

3.2. Model Specification and Robustness Checks

The modelling strategy adopted in this study is grounded in the empirical understanding that economic growth follows a dynamic and path-dependent process in which current performance is influenced by historical outcomes. Incorporating the lagged dependent variable into the model is therefore essential to capture growth persistence. However, this inclusion inherently introduces endogeneity because past economic performance may correlate with the contemporaneous error term. Moreover, trade liberalization, institutional quality, and other economic variables may be simultaneously determined with economic growth, giving rise to reverse causality and omitted-variable bias.

To address these econometric challenges, the study employs the System Generalized Method of Moments (System-GMM) estimator proposed by Arellano and Bover (1995) and advanced by Blundell and Bond (1998). System-GMM is particularly suitable for panels such as those used in African economic research, which typically involve many countries observed over relatively short time periods (Asongu et al., 2024a; Emeka et al., 2024a). This estimation technique combines equations in first differences with equations in levels and uses internally generated lagged instruments, thereby correcting simultaneous causality, measurement error, and unobserved country-specific heterogeneity.

The empirical model is therefore specified dynamically as follows:

$$ECOG_{i,t} = \alpha_i + \delta_1 ECOG_{i,t} + \delta_2 TOP_{i,t} + \delta_3 FDEV_{i,t} + \delta_4 INFR_{i,t} + \delta_5 LPRF_{i,t} + \delta_6 INDUS_{i,t} + \delta_7 GOV_{i,t} + \delta_8 GOV * TOP_{i,t} + v_i + \pi_{i,t} \quad (2)$$

In line with contemporary panel-based growth studies in West Africa, the core regressors are treated as endogenous because institutional reforms, financial deepening, and labour market conditions are often influenced by ongoing growth trajectories. Lagged values of the explanatory variables are used as instruments in both the differenced and level equations, following best practice to minimise instrument proliferation. Excessive instrumentation can weaken the Hansen J-test and lead to biased estimates; thus, a conservative instrument structure is maintained to ensure reliability of diagnostic tests.

To further validate the GMM results against potential simultaneity and model specification issues, this study employs the Pooled OLS and Fixed Effects estimation models as robustness checks. The Fixed Effects estimator controls for unobserved, time-invariant characteristics within each country, thereby reducing bias arising from omitted variables and producing more reliable estimates by examining how changes in explanatory variables over time affect economic growth. This technique is particularly useful when the relationship between variables differs across countries but remains stable within each unit over the study period. In contrast, the Pooled OLS estimator provides simplicity and computational efficiency by assuming that observations across all countries can be treated as a single combined dataset without accounting for individual heterogeneity. Although Pooled OLS does not correct for unobserved country-specific effects, it offers a useful baseline for comparison, especially in contexts where such heterogeneity is minimal or when the objective is to capture general regional trends rather than country-specific impacts.

Finally, this study adopts a composite index for Institutional Quality (GOVQ) using Principal Component Analysis (PCA) applied to six governance indicators: Political Stability and Absence of Violence, Rule of Law, Government Effectiveness, Control of Corruption, Regulatory Quality, and Voice and Accountability. These dimensions are widely recognized in the New Institutional Economics literature as representing the essential components of institutional effectiveness and governance capacity (North, 1990). The strong intercorrelation commonly observed among these variables confirms that they reflect a shared latent construct. The PCA technique, therefore, produces an optimal linear combination of these indicators, capturing the maximum variance explained while reducing multicollinearity and minimizing the measurement error that may arise when a single governance indicator is used. The resulting GOVQ index is thus a theoretically grounded and empirically robust representation of the broader institutional environment in West African economies.

4. Presentation and Analysis of Results

4.1. Descriptive Statistics

As shown in Table 2, economic growth has a mean value of 6.9370 and a maximum value of 8.82071, indicating that the growth rates within the sample are relatively high, although not evenly distributed across countries. While many of the West African economies demonstrate moderate growth performance, some experience considerably stronger growth episodes, reflecting disparities in economic outcomes within the region. The descriptive statistics further reveal relatively low institutional quality scores, signalling the widespread presence of weak governance structures in the sampled countries. This observation is reinforced by the fact that each institutional indicator exhibits a negative mean value, serving as a clear illustration of the generally fragile and underdeveloped institutional environment that characterizes much of the sub-region. Additionally, the variation captured by the standard deviations indicates substantial heterogeneity in institutional performance across the countries and over time. Overall, the descriptive results highlight a diverse distribution of macroeconomic and governance conditions across West Africa, underscoring the need for econometric techniques capable of accommodating such cross-country variation.

Table 2: Descriptive Statistics of the Adopted Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Economic Growth	208	6.93704	0.5616	6.0691	8.2071
Trade Liberalization	208	65.331	18.02	31.333	115.037
Financial Development	208	18.211	12.788	.005	67.871
Foreign Direct Investment	208	6.053	12.172	-11.192	103.337
Infrastructure	208	1.47	2.704	0	14.123
Labor Force Participation	208	10.011	14691542	109631	53.9347
Manufacturing Value Added	208	4.284e+09	1.036e+10	35467536	4.717e+10
Governance Effectiveness	208	-0.814	0.44	-1.807	0.341
Rule of Law	208	-0.661	0.463	-1.612	0.662
Regulatory Quality	208	-0.631	0.353	-1.321	0.269
Voice and Accountability	208	-0.296	0.552	-1.46	0.975
Control for Corruption	208	-0.586	0.525	-1.597	1.017
Political Stability	208	-0.612	0.745	-2.479	0.929
Governance Quality	208	0	2.153	-3.821	5.648

Source: Authors' construct on STATA

4.2. Correlation Analysis

The correlation matrix presented in Table 3 reveals a strong interrelationship among the governance institutional quality variables, with many indicators displaying relatively high correlation coefficients. Following Gujarati and Porter (2003), when correlations approach or exceed ±0.80, multicollinearity may become a concern in regression analysis. In order to avoid the potential distortion of parameter estimates caused by multicollinearity, the governance indicators have been included separately in different regression models. This methodological approach is consistent with recent empirical studies, such as Ogbonna et al. (2022), Ekeocha et al. (2021), and Ogbonna et al. (2021), which similarly account for the risk of collinearity when estimating the effects of institutional variables. Adopting this strategy ensures that the influence of each governance dimension on economic growth can be interpreted reliably, without undue interference from overlapping institutional characteristics.

Table 3: Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
GDPPC	1.00													
TOP	0.46	1.00												
FDEV	0.72	0.32	1.00											
FDI	0.02	0.33	-0.13	1.00										
INFR	0.79	0.37	0.80	0.07	1.00									
LPRF	0.01	-0.25	-0.16	-0.14	-0.33	1.00								
MAN	0.36	-0.11	-0.02	-0.16	-0.15	0.77	1.00							
GE	0.68	0.15	0.59	0.01	0.61	0.25	0.37	1.00						
RL	0.66	0.13	0.65	0.05	0.69	0.20	0.26	0.89	1.00					
RQ	0.58	0.06	0.56	-0.05	0.52	0.37	0.44	0.87	0.86	1.00				
VC	0.60	0.14	0.54	0.05	0.58	0.22	0.25	0.74	0.81	0.70	1.00			
CC	0.72	0.21	0.73	0.04	0.77	0.10	0.19	0.88	0.92	0.82	0.81	1.00		
PS	0.50	0.24	0.30	0.12	0.56	-0.34	-0.01	0.51	0.56	0.42	0.58	0.54	1.00	
PCA	0.71	0.17	0.65	0.03	0.70	0.18	0.29	0.94	0.96	0.90	0.88	0.95	0.65	1.00

Source: Author's construct.

4.3. Estimation Results

Consistent with GMM-based studies such as Asongu et al. (2024a, 2024b), which provide an empirical foundation for this analysis, four key diagnostic tests are employed to confirm the validity and reliability of the estimated coefficients. The Fisher statistics confirm that the overall model is well specified. Additionally, both the Sargan and Hansen tests for overidentification are conducted to examine the validity of the internal instruments. In all model specifications, the p-values exceed the conventional 0.05 significance threshold, indicating that the null hypothesis of instrument validity cannot be rejected. This outcome demonstrates that the instruments are uncorrelated with the error term and are therefore valid. Although the Hansen test may be weakened by instrument proliferation, careful attention is paid to ensure that the number of instruments remains lower than the number of cross-sectional units. This conservative strategy strengthens confidence in the diagnostic outcomes and supports the reliability of the System-GMM estimations.

The Arellano-Bond test for autocorrelation further confirms the absence of second-order serial correlation in the differenced residuals, as indicated by consistently high AR(2) p-values across all model specifications. Together, these diagnostics validate the appropriateness of the System-GMM estimator and confirm the robustness of the estimated relationships between the variables.

The empirical results presented in Table 4 show that the effect of trade openness on economic growth is predominantly positive and statistically significant. This finding reinforces the notion that greater trade integration serves as an important driver of economic progress in West Africa, a conclusion that is consistent with prior studies including Nguea and Fotio (2021), Gabrielczak and Serwach (2020), Nguyen (2020), Khan et al. (2020), Celik et al. (2024), and Ogbuabor et al. (2024b). The implication is that trade openness enhances access to foreign goods, technology, and knowledge spillovers, promotes competitive pressures, and supports structural transformation through the development of more sophisticated export sectors. Consequently, the results support the argument that trade liberalization fosters diversification, value-chain upgrading, and productivity improvement, critical components of long-run sustainable development and reduced resource dependence in the region.

Contrary to theoretical expectations, however, the primary GMM model reveals that financial development, infrastructure, and foreign direct investment exert negative effects on economic growth. These results highlight structural bottlenecks that may be inhibiting the effective contribution of these growth drivers. For financial development, the result suggests credit misallocation and financial repression, whereby financial resources may be directed toward low-productivity, consumption-driven activities rather than sectors that generate innovation and employment. Similarly, inadequate infrastructure quality and regulatory inefficiencies may be constraining productive investment and preventing FDI from generating meaningful technological diffusion and sectoral spillovers, findings aligned with those of Ogbonna et al. (2022) and Ogbonna (2021).

Industrialization also exhibits a negative and statistically significant relationship with economic growth. This reflects the structure of the industrial sector in many West African economies, where industrial activity remains predominantly concentrated in low-value, resource-extractive activities rather than high-value manufacturing and technological production. As commonly identified in the Dutch Disease literature, such commodity-driven industrialization tends to offer limited employment, minimal local linkages, and negligible technological spillovers while simultaneously depressing non-resource tradable sectors. This production structure, therefore, restricts diversification and constrains long-term development prospects.

The results further indicate a negative and statistically significant effect of labour force participation on productive capacity. This finding highlights the persistent challenge of unemployment and underemployment across the region, which reduces the contribution of the working-age population to aggregate output. High unemployment suppresses consumer demand, discourages private investment, and limits skills development, thereby constraining productivity growth. The result aligns with Hlongwane and Daw (2021), who argue that expanding the labour force in the absence of productive job creation does not contribute to economic performance and may instead intensify structural inefficiencies.

Institutional quality (GOVQ) is also found to exert a negative unconditional effect on economic growth, which appears contrary to theoretical expectations under New Institutional Economics. This result suggests that institutional reforms may initially raise transaction costs or create uncertainty during transitional periods, especially when enforcement credibility is weak. Firms may encounter higher compliance costs without experiencing the full benefits of governance improvements, which may reduce investment and innovation incentives in the short run.

Nevertheless, the core finding of this study lies in the moderating role of institutional quality. As presented in Table 4, the interaction term between institutional quality and trade openness is positive and statistically significant, providing evidence

that stronger institutions enhance the growth-enhancing benefits of trade liberalization. This outcome is in line with recent studies emphasizing the conditionality of trade's benefits (Ogbuabor et al., 2024b; Bayraktar et al., 2023). Improved governance supports policy credibility, reduces rent-seeking, encourages productive investment, and ensures that gains from foreign competition and knowledge transfer are not dissipated through corruption or inefficiency. The results, therefore, demonstrate that trade openness alone is not sufficient to generate sustainable economic development; rather, its effectiveness depends critically on the strength of institutional structures guiding market operations.

Overall, the findings illustrate that although West African economies possess considerable trade-induced growth potential, weaknesses in domestic governance, labour market conditions, financial systems, and industrial structure continue to impede the realization of these benefits. Strengthening institutional frameworks is therefore essential to unlock the full developmental impact of globalization and trade liberalization within the region.

Table 4: System GMM Estimation Result

Regressors	Panel 1 GE	Panel 2 RL	Panel 3 RQ	Panel 4 VA	Panel 5 CC	Panel 6 PS	Panel 7 GOV
One lag period of	0.9787***	0.9570***	0.9142***	0.9428***	0.9032***	0.9492***	0.9577***
Economic Growth	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TOP	0.0021***	0.0040***	0.0040***	0.00329	0.0055	0.0035	0.0047***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.004)	(0.001)	(0.000)
FDEV	-0.0025	0.0006	-0.0001	-0.00009	0.0011	-0.0025	-0.0001
	(0.001)	(0.661)	(0.928)	(0.947)	(0.673)	(0.133)	(0.923)
FDI	0.0007	0.0026*	0.0008	0.0005	0.0020	0.0004	0.0015
	(0.489)	(0.082)	(0.653)	(0.634)	(0.371)	(0.702)	(0.191)
INFR	0.0111	-0.0147	-0.0200	-0.0212	-0.0235	-0.0092	-0.0098
	(0.215)	(0.262)	(0.273)	(0.303)	(0.417)	(0.737)	(0.537)
LFPR	-4.21e-09*	1.06e-08***	2.64e-09	6.03e-09	9.63e-09	-9.67e-10	1.15e-08
	(0.085)	(0.016)	(0.702)	(0.155)	(0.284)	(0.798)	(0.001)
INDUS	0.0256***	-0.0333***	-0.0089	-0.0295	-0.0405	-0.0161	-0.0361**
	(0.026)	(0.040)	(0.655)	(0.232)	(0.277)	(0.628)	(0.052)
GOVQ *	-0.1853***	-0.1899***	-0.0828	-0.0409*	-0.1716	-0.0482***	-0.0601***
	(0.000)	(0.000)	(0.192)	(0.095)	(0.006)	(0.015)	(0.000)
GOVQ	0.0027***	0.0040***	0.0039	0.0021	0.0054	0.0030	0.0056***
*TOP	(0.000)	(0.000)	(0.005)	(0.006)	(0.007)	(0.005)	(0.000)
Net Effect	-0.0001	0.0014	0.0015	0.0026	0.0023	0.0017	0.0047
Threshold Effect	0.7778	1.0000	1.0256	1.5238	1.0185	1.1667	0.8393
Constant	-0.4528	0.7389	0.6580***	0.9137***	1.2565***	0.6304	0.9405
	(0.005)	(0.004)	(0.015)	(0.020)	(0.040)	(0.184)	(0.002)
Time effects	yes	yes	yes	yes	yes	yes	yes
Diagnostic checks							
AR 1	0.135	0.068	0.053	0.073	0.056	0.069	0.028
AR 2	0.400	0.703	0.880	0.907	0.892	0.527	0.453
Sargan	0.000	0.000	0.000	0.000	0.002	0.000	0.001
Hansen	0.024	0.015	0.099	0.057	0.230	0.102	0.074
VIF							
Fisher	97620.87	61715.54	80937.43	848367.47	209567.03	262731.99	125814.44
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
No of obs.	56	56	56	56	56	56	56
Number of groups	14	14	14	14	14	14	14
DHT for instruments							
(a)Instruments in levels							
H excluding group	0.011	0.008	0.051	0.036	0.164	0.057	0.037
Dif (null, H=exogenous)	0.813	0.566	0.859	0.427	0.479	0.630	0.903
(b) IV (years, eq(diff))							
H excluding group							
Dif(null, H= exogenous)	0.024	0.015	0.099	0.057	0.230	0.102	0.074
No. of countries	16	16	16	16	16	16	16

Source: Author's computations 2024. **Note**: ***, **, and * denote significance levels of 1%, 5%, and 10% respectively. "nsa" signifies "not specifically applicable" as it pertains to a linear additive model. "na" indicates "not applicable" due to the insignificance of at least one estimated coefficient necessary for computing the net effect.

4.4. Robustness Check

To ensure the reliability and stability of the empirical findings, additional robustness checks were performed using alternative estimation techniques, namely Pooled OLS (Table 5) and Fixed Effects (Table 6). The results derived from these models provide strong supplementary support for the key conclusions obtained from the System-GMM estimation.

Table 5: Pooled OLS Estimation Result

Regressors	Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Panel 6	Panel 7
TOP	0.0023	0.0109	-0.0016	0.00105	0.0027	0.0009	0.0030
	(0.586)	(0.003)	(0.746)	(0.692)	(0.413)	(0.676)	(0.122)
FDEV	-0.0180***	-0.0189***	-0.0174***	-0.0156	-0.0179***	-0.0064	-0.0165

Regressors	Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Panel 6	Panel 7
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.211)	(0.001)
FDI	0.0049	0.0065	0.0034	0.0019	0.0049	0.0018	0.0034
	(0.553)	(0.408)	(0.668)	(0.803)	(0.551)	(0.798)	(0.673)
INFR	0.2635***	0.2273***	0.2639***	0.2394***	0.2593***	0.1877***	0.2292***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LFPR	-5.81e-08***	-5.88e-08***	-5.54e-08	-6.00e-08***	-5.79e-08***	-2.44e-08	-5.79e-08***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.117)	(0.000)
INDUS	0.3782***	0.3829***	0.3530***	0.3629***	0.3756***	0.2947***	0.3538***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GOVQ	-0.0139	-0.74022***	0.4329	0.4537	-0.0337	0.4394***	0.0228
	(0.969)	(0.016)	(0.344)	(0.127)	(0.904)	(0.012)	(0.749)
GOVQ *	0.00003	0.0114	-0.0057	-0.0042	0.0004	-0.0037	0.00008
TOP	(0.995)	(0.007)	(0.370)	(0.290)	(0.907)	(0.167)	(0.934)
Constant	-0.6483	-1.2324	0.1554	-0.1910	-0.6082	1.0032	-0.1712
	(0.570)	(0.124)	(0.893)	(0.800)	(0.456)	(0.191)	(0.841)
Time effects	yes	yes	yes	yes	yes	yes	yes
Diagnostic checks							
F-Statistics	33.93	39.22	34.55	35.94	33.93	46.00	34.70
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
R^2	0.8165	0.8372	0.8192	0.8289	0.8165	0.8578	0.8198
No of obs.	70	70	70	70	70	70	70
Number of groups							
No. of countries	16	16	16	16	16	16	16

Source: Authors' computations 2024. **Note**: ***, **, and * denote significance levels of 1%, 5%, and 10% respectively**.**

Table 6: Fixed Effect Estimation Result.

Regressors	Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Panel 6	Panel 7
TOP	0.0013	0.0015	0.0013	0.0005	0.0019	0.0003	0.0007
	(0.123)	(0.104)	(0.180)	(0.373)	(0.002)	(0.511)	(0.103)
FDEV	-0.0104***	-0.0103***	-0.0118***	-0.0121***	-0.0090***	-0.0119***	-0.0101***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
FDI	-0.00004	-0.0003	0.0002	-0.0003	-0.0006	-0.0002	0.0002
	(0.970)	(0.727)	(0.836)	(0.725)	(0.456)	(0.792)	(0.771)
INFR	-0.0330	-0.0293	-0.0194	-0.0222	-0.0016	-0.0175	-0.0179
	(0.119)	(0.145)	(0.320)	(0.274)	(0.913)	(0.343)	(0.344)
LFPR	7.26e-08***	8.39e-08***	8.46e-08***	8.33e-08***	6.32e-08***	8.87e-08***	8.12e-08***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INDUS	-0.0565	-0.0606	-0.0460	-0.0524	-0.0450	-0.0440	-0.0450
	(0.136)	(0.125)	(0.233)	(0.203)	(0.135)	(0.250)	(0.213)
GOVQ	-0.0035	-0.0530	-0.0116	-0.0201	0.1378***	0.0337	0.0252
	(0.961)	(0.539)	(0.914)	(0.734)	(0.021)	(0.558)	(0.192)
GOVQ *	0.0009	0.0014	0.0010	0.0001	0.0013*	0.0001	0.0002
TOP	(0.320)	(0.167)	(0.378)	(0.809)	(0.095)	(0.864)	(0.326)
Const.	7.9876***	7.9771***	7.7123***	7.8813***	7.7461***	7.7083***	7.6640***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Time effects							
Diagnostic checks							
F-Stat.	12.27	11.72	1176	10.88	22.95	11.97	14.13
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
R^2	0.1050	0.0831	0.0628	0.1059	0.0027	0.0554	0.0087
No of obs.	70	70	70	70	70	70	70
No of groups	14	14	14	14	14	14	14

Source: Authors' computations 2024. **Note**: ***, **, and * denote significance levels of 1%, 5%, and 10% respectively.

The direct effect of trade openness, which is positive and significant in the System-GMM model, becomes largely insignificant in both the Pooled OLS and Fixed Effects regressions. This shift indicates that the positive impact of trade liberalization is highly dependent on controlling for the dynamic characteristics of economic growth and unobserved country-specific heterogeneity, features that the simpler static models are unable to capture. More importantly, the positive and significant moderating effect of the interaction between institutional quality and trade openness (GOVQ*TOP), which represents the core contribution of this study, is replicated in several of the Fixed Effects model estimations (Table 6). This outcome confirms that the moderating role of institutions is not simply an artifact of the GMM methodology but reflects a robust underlying structural relationship. The fact that this moderating effect does not consistently appear in the Pooled OLS estimation further suggests that more sophisticated dynamic techniques are necessary to accurately identify and quantify the conditional nature of trade-led growth.

Together, these results emphasize the importance of institutional strengthening in West Africa. Enhancing governance, improving the rule of law, and bolstering regulatory effectiveness will not only improve domestic economic performance but also amplify the region's capacity to harness and retain the growth-enhancing benefits of international trade.

5. Discussion

The findings of this study reaffirm the established position in the empirical literature that trade liberalization has the potential to stimulate economic growth in developing regions by expanding market access, enabling technology spillovers, and fostering efficiency (Nguea & Fotio, 2021; Celik et al., 2024; Ogbuabor et al., 2024b). In line with these studies, the results demonstrate that increased openness contributes positively to economic performance in West Africa. However, the present analysis goes further by confirming that this impact is highly conditional on institutional governance structures, a relationship strongly supported by the New Institutional Economics perspective (North, 1990) and widely noted by Bayraktar et al. (2023). Thus, this study not only confirms earlier findings but also extends the literature by providing robust empirical evidence, using dynamic GMM techniques, that institutions constitute a critical moderating mechanism through which trade induces development.

The negative and statistically significant effects of financial development, foreign direct investment, and infrastructure challenge the traditional growth assumptions of the finance-led and capital-accumulation models. While some studies in advanced and emerging economies report positive effects of these indicators (Nguyen, 2020; Gabrielczak & Serwach, 2020), the current results align more closely with findings from Ogbonna et al. (2022) and Ogbonna (2021), who emphasize that weak regulatory and governance systems prevent financial resources and foreign investments from translating into productive capital. Therefore, the present study contributes to the debate by illustrating that the failure of structural drivers in West Africa is not due to their irrelevance, but rather the governance inefficiencies that limit their growth-inducing potential.

The adverse impact of industrialization is also consistent with literature highlighting Africa's continued over-reliance on extractive and low-value industrial sectors (Degbedji et al., 2024; Mamasoliev, 2024). This path-dependent structure creates few linkages, constrains innovation, and depresses productivity spillovers, reinforcing the "Dutch Disease" effect. Thus, the study supports calls for industrial upgrading and value-addition as indispensable steps toward sustainable growth.

Furthermore, the negative influence of labour force participation reflects the reality of structural unemployment and skills mismatch, reinforcing the findings of Hlongwane and Daw (2021) and contradicting neoclassical expectations that a growing labour force increases productive capacity. The findings thus provide empirical evidence that labour markets in the region are not creating enough productive jobs to absorb the expanding workforce, limiting growth and aggravating dependency.

The most important contribution of this study is the empirical validation of the conditionality hypothesis: institutional quality significantly enhances the growth effects of trade liberalization. This result strengthens the conclusions of Ogbuabor et al. (2024b) by demonstrating that the interaction effect holds not only under static panel conditions but also under more rigorous dynamic GMM estimations. It further supports Bayraktar et al. (2023) who argue that governance reforms increase the credibility and efficiency of market operations. The evidence clearly indicates that trade-led growth strategies will remain insufficient unless accompanied by systematic improvements in regulatory enforcement, public sector accountability, and the rule of law.

Overall, this study contributes to the literature by bridging a major empirical gap. Previous studies largely examined trade openness and institutional quality in isolation, whereas this research confirms that their interaction is what determines the true magnitude and direction of growth benefits in West African economies. The results thus emphasize that economic transformation requires not only openness, but institutional transformation to ensure that the benefits of globalization are fully realized rather than dissipated by structural weaknesses.

6. Conclusion

Trade liberalization in West African countries creates opportunities for economic diversification and industrial upgrading. Enhanced access to foreign markets, goods, and technologies fosters productivity and strengthens the region's engagement with the global economy. However, this study clearly establishes that the advantages of trade openness are significantly dependent on the quality of domestic institutions. While trade openness remains an important engine of growth, institutional quality operates as a decisive moderator that determines whether these benefits are captured or lost. Strong institutions, characterized by credible governance, consistent regulatory enforcement, and mechanisms that safeguard investor confidence, amplify the positive effects of openness and enable economies to leverage international competition for transformational change.

The results also show that the direct contributions of financial development, infrastructure, FDI, and labour participation are currently weakened by structural inefficiencies and persistent governance challenges. High unemployment limits the productive capacity of labour, weak industrial linkages reinforce dependence on commodity exports, and inefficient credit allocation delays the translation of financial deepening into real-sector expansion. These findings collectively demonstrate that the region's economic growth potential remains constrained unless institutional reforms are prioritized.

Although the study offers new evidence on the moderating role of institutions in the trade-growth nexus, it is not without limitations. The relatively short panel duration may not capture the full effects of gradual institutional transitions, and the empirical strategy does not explicitly address non-linear thresholds, which could indicate the minimum governance level necessary for trade to yield development gains. These limitations open promising avenues for future empirical inquiry.

7. Recommendations

Based on the study's conclusions, the following policy recommendations are made:

Given that the positive effect of trade is conditional on institutional quality, policy must focus on strengthening the channels through which trade benefits are secured. Policymakers must prioritize increasing the speed and credibility of contract enforcement and reducing the risk and cost of corruption, as these specific factors determine investor confidence. The goal is to promote sustained institutional effectiveness. Furthermore, West African nations should negotiate trade agreements that

mandate internal institutional improvements as a condition for receiving market access benefits. This ensures that trade liberalization is tightly coupled with governance reforms, maximizing the positive moderation effect found in the study.

Furthermore, the negative and insignificant coefficient for Financial Development (FDEV) indicates a severe problem with credit misallocation, not a lack of finance. Policies must therefore focus on guiding credit to productive sectors. The government should introduce targeted mechanisms, such as partial loan guarantees and risk-sharing schemes, to explicitly steer bank credit away from speculative, consumption-driven, or politically connected sectors toward export-oriented, high-value-added small and medium-sized enterprises (SMEs). Simultaneously, policy efforts should intensify financial regulation and supervision to curb non-performing loans and reduce the prevalence of financial repression, ensuring that increased financial depth translates into genuine productive capital formation rather than concentrated wealth.

Essentially, the negative effect of Labor Force Participation highlights the structural unemployment trap. Policy must focus on the quality of labor absorption, not just participation. Human capital investment must be reorganized to focus on vocational training and skills development specifically demanded by the high-value-added export sectors being targeted by the trade and industry policies. This ensures that new labor market entrants possess the skills needed to generate a positive marginal product.

Acknowledgement Statement: The authors would like to thank to all participants and the reviewers for providing comments in helping this manuscript to completion.

Conflicts of interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Authors' contribution statements: Author 1 contributed to the Writing – Review & Editing, resources, and Project Administration. Authors 2 contributed to Formal Analysis, Software, Validation, and investigation; Author 3 contributed to Conceptualization, Writing – Review & Editing, Validation, and Project Administration; Author 4 contributed to Methodology and software; Author 5 contributed to Visualization, and Writing – Review & Editing; and Author 6 contributed to Writing the original draft and Validation.

Funding statements: As there was no external funding received for this research, the study was conducted without financial support from any funding agency or organization.

Data availability statement: Data is available upon request. Please get in touch with the corresponding author for any additional information on data access or usage.

Disclaimer: The views and opinions expressed in this article are those of the author(s) and contributor(s) and do not necessarily reflect JICC's or editors' official policy or position. All liability for harm done to individuals or property as a result of any ideas, methods, instructions, or products mentioned in the content is expressly disclaimed.

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