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INSTITUTIONAL QUALITY AND UNEMPLOYMENT IN NIGERIA: A DYNAMIC VAR ANALYSIS, 1996–2024

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Abstract

This study examines the linkage between the quality of institutions and unemployment in Nigeria. This covers all six World Bank indicators and extends previous single indicator methods from 1996 to 2024. Worldwide Governance Indicators: control of corruption, regulatory quality, rule of law, combined government effectiveness, voice and accountability and political stability into one composite index. The Institutional Quality Index (IQI) was built using Principal Component Analysis (PCA). Sampling the Kaiser-eyer-Olkin measure (0.709) and Bartlett's test of adequacy confirm the adequacy for the PCA. The sphericity ($\chi^2 = 133.25$, $p < .001$) and the first principal component that loads positively on all variables indicated that the initial factor is a general factor of all variables in a single organization. The indicator's political stability accounts for 59.6% of the total variance. The unemployment rate rose. Resulting index are integrated of order one, I(1). In this study, the Johansen trace and both maximum eigenvalue tests and Engle-Granger residual-based test confirmed that the two variables were co-integrated. In this context, the long run association is estimated with the use of Dynamic Ordinary Least Squares (DOLS), and short run dynamics are examined using a bivariate vector autoregression (VAR). The results show the use of vector autoregression (VAR) in first differences, Granger causality tests, impulse responses, and error variance decomposition. A statistically significant difference is indicated by the DOLS estimates. This is in contrast to the level of institutional quality and unemployment rate, which has no negative association in the absence of an economic impact. When confirmed cointegration is found, it is interpreted as the common historical trend common to both series. By contrast, the contemporaneous short run coefficient on the capital stock-employment relationship is not necessarily a stable one. The quality of institutions is negatively correlated with the outcome, and as predicted by theory, this correlation is significant. The VAR the Granger causality test does not provide evidence of any Granger causality in either direction, while the forecast error variance share test shows an insignificant share. (less than 5%) due to institutional shocks. In short annual series, and on a point basis, long-run governance–unemployment associations are indicated in the following manner: a small, modern, logically coherent channel leading to an institutional output. The study recommends that Nigerian policymakers should pursue sustained, incremental improvements in control of corruption, regulatory quality and rule of law as a complement to (not a substitute for) direct active labour market and job creation programmes.

Keywords: Institutional Quality Index; Principal Component Analysis; Unemployment; Dynamic OLS; Vector Autoregression; Johansen Cointegration

JEL Classification: **D73; J64; O43; C22; C38**

1. Introduction

Unemployment remains one of the most persistent socioeconomic challenges confronting both developed and developing economies, with far reaching consequences for economic growth, poverty, income inequality, and social stability (Haruna & Alhassan, 2022). The International Labour Organization (2024) estimated the global unemployment rate at roughly 5% in 2023, with more than 183 million people unemployed worldwide, and the gap is especially pronounced among younger cohorts: global youth unemployment stood at 12.4%, with some 260 million young people classified as not in employment, education, or training (International Labour Organization, 2026). While advanced economies have seen gradual labour market improvement, developing countries continue to experience persistently higher unemployment, reflecting structural bottlenecks, weak governance, and inadequate investment (Tang & Issahaku, 2024).

A growing body of institutional economics scholarship attributes much of this persistence to the quality of governance rather than to macroeconomic conditions alone. Institutions, the formal and informal rules that structure political, economic, and social interaction shape the incentive environment within which firms invest and hire (North, 1990). Strong institutions characterised jointly by government effectiveness, regulatory quality, rule of law, control of corruption, political stability, and voice and accountability, create the stable, predictable environment that investment and entrepreneurship require; weak institutions raise transaction costs and discourage the productive activity on which employment ultimately depends (Kaufmann et al., 2010). Because these six dimensions are conceptually distinct yet empirically correlated facets of the same underlying phenomenon, a growing methodological literature constructs a single composite institutional quality index via principal component analysis rather than examining each dimension in isolation, on the grounds that a data driven composite better captures the common governance signal while avoiding the multicollinearity that arises when all six correlated indicators are entered separately into a regression (Hadipour et al., 2023).

This relationship is particularly consequential in Sub-Saharan Africa, where rapid population growth and an expanding labour force continue to outpace employment creation despite the region's abundant natural and human resources. Corruption, weak regulatory institutions, political instability, and ineffective public administration have constrained economic diversification and private sector growth, leaving unemployment and underemployment widespread across many African economies (African Development Bank, 2024). Nigeria, the Africa's largest economy and one of its most populous countries, with a population exceeding 230 million illustrates the pattern starkly. Despite a rapidly growing labour force and successive employment programmes, including the National Employment Policy, the National Development Plan 2021–2025, the Presidential Employment Generation Programme, and the Nigeria Youth Investment Fund, unemployment and underemployment remain significant development challenges (National Bureau of Statistics [NBS], 2024). Under its revised measurement methodology, the NBS recorded headline unemployment fluctuating between 4.3% and 5.3% across 2024, but the more comprehensive labour underutilisation rate, combining unemployment and time related underemployment stood at 13%, informal employment accounted for 93% of the workforce, and the youth not in employment education or training rate remained above 12% (NBS, 2024). This gap between a modest headline rate and severe underlying labour underutilisation indicates that Nigeria's employment challenge is substantially structural rather than merely cyclical.

Institutional quality in Nigeria continues to be characterised by persistent governance deficiencies across all six World Bank dimensions, not merely corruption control considered in isolation. On the control of corruption dimension specifically, Nigeria's percentile rank stood at just 16.98 in 2023, placing it among the weakest performers globally (World Bank, 2024), and Transparency International's (2024) Corruption Perceptions Index similarly scored Nigeria 26 out of 100, ranking it 140th of 180 countries and below the Sub-Saharan African average of 33. Nigeria's

regulatory quality, rule of law, government effectiveness, and political stability estimates have remained similarly negative throughout the 1996–2024 period covered by this study, with political stability the weakest performing dimension of all six. These governance weaknesses undermine policy implementation, discourage investment, and reduce the ability of employment programmes to translate budgetary commitment into productive jobs, suggesting that a single indicator view of institutional quality risks understating the breadth of the governance challenge facing Nigerian labour markets.

Although a substantial literature has examined the effects of individual governance indicators, or of conventional macroeconomic variables, on unemployment in Nigeria, comparatively few studies combine all six Worldwide Governance Indicators into a single empirically derived index and test its relationship with unemployment using cointegration and dynamic timeseries techniques suited to a genuinely composite measure. This study addresses that gap in three respects. First, it constructs a Institutional Quality Index for Nigeria from all six governance dimensions using principal component analysis, validated by formal sampling adequacy diagnostics. Second, rather than the Autoregressive Distributed Lag bounds testing approach common in this literature, it applies the Johansen and Engle-Granger cointegration tests together with Dynamic OLS and a vector autoregressive framework estimator better suited to establishing whether a genuine long run equilibrium exists between two series before that equilibrium is estimated and interpreted. Third, it extends the sample to 2024, capturing Nigeria's most recent governance and labour market developments. The remainder of the study proceeds as follows: Section 2 reviews the conceptual, theoretical, and empirical literature and identifies the specific gap the study addresses. Section 3 describes the data, the construction of the institutional quality index, and the econometric methodology. Section 4 presents and discusses the empirical results. Section 5 concludes with policy recommendations.

2. Literature Review

This section clarifies the core concepts of institutional quality and unemployment as used in this study, sets out the theoretical framework linking governance to labour market performance, reviews empirical evidence from Nigeria and comparable contexts, and identifies the specific gap the study addresses.

2.1 Conceptual Clarification

North (1990) defines institutions as the formal and informal rules that govern political, economic, and social interaction, with institutional quality referring to the effectiveness of these rules in reducing uncertainty, protecting property rights, and enforcing contracts. Kaufmann et al. (2010) operationalise institutional quality through six governance dimensions: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. These captured in the World Bank's Worldwide Governance Indicators (WGI). Rather than selecting a subset of these dimensions, this study follows the composite index tradition (Hadipour et al., 2023; Khan et al., 2019) of combining all six into a single Institutional Quality Index via principal component analysis, on the reasoning that unemployment is unlikely to respond to any one governance dimension in isolation and that a data driven weighting of the shared variance across dimensions better represents the underlying institutional environment than any single indicator or an arbitrarily weighted average.

Unemployment is defined, following the International Labour Organization (2024), as the condition in which individuals of working age who are available for and actively seeking work are unable to obtain gainful employment. This definition is adopted because it represents the internationally accepted standard for labour market analysis and permits comparison with cross country institutional and labour market literature.

2.2 Theoretical Framework

This study is anchored on the Keynesian theory of employment, developed by Keynes (1936) in The

General Theory of Employment, Interest and Money. The theory holds that the level of employment in an economy is fundamentally determined by effective demand, the sum of consumption, investment, government expenditure, and net exports rather than by wage flexibility alone, and that involuntary unemployment persists whenever aggregate demand falls short of the economy's productive capacity. Keynes argued that government intervention through fiscal and monetary policy is necessary to restore full employment; however, the effectiveness of such intervention depends critically on the quality of the public institutions responsible for formulating and implementing it. Weak governance, corruption, and poor public financial management can blunt the employment impact of even well designed fiscal measures, which is precisely the channel through which institutional quality is expected to affect unemployment in this study.

Two complementary perspectives sharpen this framework. Institutional theory (North, 1990; Acemoglu & Robinson, 2012) holds that inclusive institutions characterised by secure property rights, equal access to opportunity, and accountable governance stimulate investment and job creation, while extractive institutions concentrate power and weaken economic incentives. New Institutional Economics (Williamson, 1985; North, 1990) adds that institutions matter principally by reducing transaction costs: economies with strong institutional quality experience lower transaction costs, greater investor confidence, and higher rates of employment generation, while weak institutions raise business risk through corruption, bureaucratic delay, and regulatory uncertainty. Because these theoretical channels operate jointly across governance dimensions rather than through any single indicator, they motivate treating institutional quality as a unified latent construct.

2.3 Empirical Review

Nigerian evidence on institutional quality and unemployment is fairly extensive but methodologically varied, and most prior studies examine individual governance indicators rather than a composite measure. Using ARDL estimation on 1996–2023 data, Adebayo and Ojo (2025) found that improvements in government effectiveness and regulatory quality significantly reduced unemployment in the long run, while weak control of corruption contributed positively to unemployment. Eze and Okonkwo (2024), applying Fully Modified and Dynamic OLS to 1996–2023 data, similarly found that government effectiveness and regulatory quality exerted significant negative effects on unemployment, while corruption significantly increased it by discouraging productive investment. Using a Nonlinear ARDL approach on 1996–2024 data, Okafor et al. (2025) found that institutional deterioration produced disproportionately larger increases in youth unemployment than the reductions achieved by equivalent governance improvements, implying an asymmetric relationship between institutional quality and labour market outcomes.

Earlier Nigerian studies report broadly convergent findings using individual indicators. Adeyemi and Salami (2021), using ARDL bounds testing on 1996–2020 data, found that government effectiveness and regulatory quality significantly reduced unemployment in the long run, while weak rule of law increased it. Afolabi and Oladele (2019), also using ARDL bounds testing but on 1984–2017 data, found that corruption significantly increased unemployment and identified a bidirectional causal relationship between the two. Nwosu and Uche (2020), using a Vector Error Correction Model on 1986–2018 data, found a long run equilibrium relationship in which government effectiveness and regulatory quality reduced unemployment while corruption and weak legal institutions increased it.

Outside Nigeria, the composite index approach adopted in this study has become increasingly common. Hadipour et al. (2023) constructed a PCA-based institutional quality index from all six WGI dimensions across 158 countries and found it significantly associated with health outcomes, illustrating the broader applicability of the composite approach beyond labour markets. Bassey and Udo (2023), using System GMM estimation on Sub-Saharan African panel data

(2000–2021), found that stronger institutional quality was consistently associated with lower unemployment, with government effectiveness and regulatory quality the most influential governance dimensions. Ekong and Essien (2019) and Olawale and Yusuf (2022) report broadly convergent findings for Sub-Saharan Africa and West Africa respectively, though both rely on individual or simply averaged governance indicators rather than a PCA-derived composite.

2.3 Research Gap

The reviewed literature consistently finds that stronger institutional quality is associated with lower unemployment, but two gaps remain salient for the present study. First, most Nigerian studies examine only one or two governance indicators, or a simple average of several, rather than a data driven composite that captures the shared variance across all six WGI dimensions while accounting for the fact that political stability behaves quite differently from the other five in Nigeria's context. Second, the ARDL bounds testing approach that dominates this literature tests cointegration and estimates short and long run coefficients within a single restrictive functional form; the Johansen, Engle Granger, DOLS, and VAR framework applied here instead separates the question of whether a long run relationship exists from the question of what that relationship, or the absence of one, implies for short run dynamics, a distinction of particular importance in a 29year annual series where the risk of spurious regression between trending variables is nontrivial. This study addresses both gaps by constructing a PCA-based composite institutional quality index and applying this more diagnostic driven econometric sequence, providing an updated and methodologically more cautious empirical basis for institutional and labour market policy in Nigeria.

3. Data and Methods

3.1 Data Sources and Authenticity

The study employs annual time series data covering 1996–2024 (N = 29), the full period for which the World Bank's Worldwide Governance Indicators (WGI) are available following the project's 2025 methodological revision, which recalculated historical governance estimates back to 1996 to ensure consistency over time (Kaufmann & Kraay, 2024; World Bank, 2025). Unemployment is drawn from the World Bank's World Development Indicators, modelled ILO estimate series (indicator SL.UEM.TOTL.ZS); the six governance indicators viz: control of corruption, regulatory quality, rule of law, government effectiveness, voice and accountability, and political stability and absence of violence are drawn from the WGI (Kaufmann et al., 2010).

As part of preparing this analysis, the underlying governance series were checked against an independent World Bank sourced aggregator (TheGlobalEconomy.com) at the 2024 endpoint for all six indicators; the values matched within a margin consistent with routine revisions between WGI vintages, supporting the general reliability of the series. This check also revealed a data entry irregularity in the originally compiled dataset used in the preliminary stage of this research: the values recorded for 1997–1999 were found to be exactly duplicated at 2004–2006 across all six governance indicators simultaneously, a pattern inconsistent with genuine year specific governance estimates and indicative of a row mapping error rather than an authentic data feature. These three years were therefore corrected by linear interpolation between the genuine, nonduplicated 2003 and 2007 observations, a standard and transparent treatment for a small, clearly identified run of erroneous values; no other years required adjustment. All reported descriptive statistics, index construction, and estimation results in this study are based on the corrected series.

Table 1: Variable Definitions, Measurement, and Sources

Label	Variable	Measurement	Source
UNEMP	Unemployment rate	% of total labour force (modelled ILO estimate)	World Bank WDI
CC	Control of corruption	Governance estimate, approx. −2.5 to 2.5	World Bank WGI
RQ	Regulatory quality	Governance estimate, approx. −2.5 to 2.5	World Bank WGI
RL	Rule of law	Governance estimate, approx. −2.5 to 2.5	World Bank WGI
GE	Government effectiveness	Governance estimate, approx. −2.5 to 2.5	World Bank WGI
VA	Voice and accountability	Governance estimate, approx. −2.5 to 2.5	World Bank WGI
PS	Political stability and absence of violence	Governance estimate, approx. −2.5 to 2.5	World Bank WGI
IQI	Institutional Quality Index	First principal component of the six WGI series	Author's computation

Source: Authors Compilation, 2026

Construction of the Institutional Quality Index

Following the composite index approach of Hadipour et al. (2023) and Khan et al. (2019), the six governance indicators are combined into a single Institutional Quality Index using principal component analysis (PCA). Because the six series are measured on comparable but not identical scales, each is standardised to zero mean and unit variance prior to extraction. Sampling adequacy is assessed using the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity before proceeding; a KMO statistic above 0.60 and a significant Bartlett's test are conventionally required to justify PCA. The first principal component, retained as the Institutional Quality Index (IQI) on the Kaiser criterion (eigenvalue exceeding one) and its substantially larger share of explained variance relative to subsequent components, is defined as

$$IQI_t = w_1CC_t + w_2RQ_t + w_3RL_t + w_4GE_t + w_5VA_t + w_6PS_t \text{.....(1)}$$

Where the asterisk denotes the standardised series and $w_1 \ldots w_6$ are the component loadings reported in Section 4.2, oriented so that higher values of IQI correspond to stronger institutional quality.

3.2 Model Specification

Following the Keynesian theoretical framework set out above, unemployment is specified as a function of the composite institutional quality index:

$$UNEMP = f(IQI) \text{.....(2)}$$

with the long run cointegrating form

$$UNEMP_t = \beta_0 + \beta_1 IQI_t + \varepsilon_t \text{.....(3)}$$

Where β_0 is the intercept and β_1 is the long run parameter of interest. Consistent with theory, β_1 is expected to be negative: an improvement in Nigeria's composite institutional quality should reduce transaction costs, strengthen investor confidence, and raise labour demand, thereby lowering unemployment.

3.3 Estimation Strategy

Estimation proceeds in five steps, chosen specifically to avoid the risk inherent in single equation techniques such as the ARDL bounds test of estimating and reporting a long run coefficient before formally establishing whether a genuine long run relationship exists. First, the Augmented Dickey-Fuller (ADF) test establishes the order of integration of UNEMP and IQI. Second, given that both series are integrated of the same order, the Johansen (1991) trace and maximum eigenvalue tests are applied to test directly for cointegration within a vector autoregressive framework, without imposing a single equation structure; this is corroborated by an Engle and Granger (1987) residual based test as a crosscheck, since the two procedures rest on different identifying assumptions and their joint (dis)confirmation strengthens the reliability of the cointegration verdict. Third, because efficient estimation of any long run relationship in a small annual sample requires an estimator robust to the serial correlation and regressor endogeneity that

ordinary least squares cannot address, the long run coefficient is estimated using Dynamic OLS (DOLS; Stock & Watson, 1993), which augments the static regression with leads and lags of the differenced regressor and uses heteroscedasticity and autocorrelation consistent (HAC/Newey-West) standard errors; DOLS is asymptotically as efficient as full system maximum likelihood while remaining a simple, single equation estimator well suited to short samples. Fourth, because the DOLS long run coefficient is only meaningfully interpreted as an equilibrium relationship if cointegration is confirmed, a bivariate vector autoregression (VAR; Sims, 1980) in first differences is estimated as a complementary, cointegration agnostic description of the short run dynamic relationship between the two series, with lag order selected by the Akaike Information Criterion, accompanied by Granger (1969) causality tests, orthogonalised impulse response functions, and forecast error variance decomposition. Fifth, model adequacy is assessed throughout using the Jarque-Bera test for residual normality, the Ljung-Box test for residual autocorrelation, and a check of VAR stability via the companion matrix roots.

4. Results and Discussion

4.1 Descriptive Statistics

Table 2 reports descriptive statistics for the six governance indicators and unemployment. Mean unemployment over the period was 4.30%, ranging from 3.70% to 6.00%, with a modest standard deviation of 0.77 indicating gradual rather than volatile change. All six governance indicators are, on average, negative throughout the sample consistent with Nigeria's persistently weak institutional environment with political stability the weakest dimension on average (mean −1.81) and voice and accountability the least weak (mean −0.78). Regulatory quality shows the narrowest range (−1.25 to −0.74), which, as discussed in Section 4.6, limits the statistical power available to detect its independent effect in single indicator specifications and is one motivation for the composite index approach adopted here.

Table 2: Descriptive Statistics: Governance Indicators and Unemployment

Variable	Mean	SD	Min.	Max.
UNEMP (%)	4.304	0.770	3.700	5.999
CC	1.239	0.160	1.688	1.043
RQ	0.937	0.160	1.249	0.740
RL	1.088	0.191	1.526	0.794
GE	1.086	0.171	1.526	0.846
VA	0.779	0.223	1.569	0.498
PS	1.807	0.263	2.186	1.116

Source: Authors Compilation, 2026

Note. N = 29 annual observations (1996–2024). CC = control of corruption; RQ = regulatory quality; RL = rule of law; GE = government effectiveness; VA = voice and accountability; PS = political stability and absence of violence. Higher (less negative) values indicate stronger institutional performance.

4.2 Construction and Validation of the Institutional Quality Index

Table 3 reports the correlation matrix of the six standardised governance indicators together with the PCA sampling adequacy diagnostics. The overall Kaiser-Meyer-Olkin measure of sampling adequacy is 0.709, comfortably above the conventional 0.60 threshold, and Bartlett's test of sphericity is highly significant ($\chi^2 = 133.25$, $p < .001$), jointly confirming that the correlation structure among the six indicators is suitable for principal component extraction. Correlations among control of corruption, regulatory quality, rule of law, and government effectiveness are uniformly positive and often strong (e.g., r = .86 between control of corruption and rule of law), whereas political stability correlates weakly, and in some cases negatively, with the other five dimensions (e.g., r = −.33

with regulatory quality), a pattern that anticipates its distinctive loading pattern in the PCA reported below.

Table 3: Correlation Matrix of Standardised Governance Indicators

	CC	RQ	RL	GE	VA	PS
CC	1.000					
RQ	.696	1.000				
RL	.861	.573	1.000			
GE	.857	.652	.860	1.000		
VA	.275	.548	.415	.518	1.000	
PS	.156	.330	.104	.031	.567	1.000

Source: Authors Compilation, 2026

Note. KMO overall measure of sampling adequacy = .709. Bartlett's test of sphericity: $\chi^2(15) = 133.25$, $p < .001$.

Table 4 reports the PCA results. The first principal component (PC1) has an eigenvalue of 3.706 and accounts for 59.6% of total variance across the six indicators, well ahead of the second component (eigenvalue 1.604, 25.8%), and is retained as the Institutional Quality Index (IQI) on the Kaiser criterion and its clear dominance in explained variance. PC1 loads positively and fairly evenly on control of corruption (.470), regulatory quality (.439), rule of law (.470), government effectiveness (.493), and voice and accountability (.338), confirming that it captures a genuine common governance signal running through these five dimensions, but loads negatively and weakly on political stability (−.089), reflecting the low or negative correlation between political stability and the other five indicators already visible in Table 3. Substantively, this indicates that in Nigeria over 1996–2024, perceived political (in) stability has moved largely independently of the corruption control, regulatory, legal, administrative, and civic voice cluster of governance plausibly because political stability perceptions in Nigeria respond heavily to election cycles, security incidents, and transitions of power, which do not necessarily track the slower-moving administrative and regulatory reforms captured by the other five dimensions.

Table 4: Principal Component Analysis: Eigenvalues and Component Loadings

Indicator	PC1 loading	PC2 loading
Control of corruption (CC)	.470	.301
Regulatory quality (RQ)	.439	.175
Rule of law (RL)	.470	.239
Government effectiveness (GE)	.493	.120
Voice and accountability (VA)	.338	.501
Political stability (PS)	.089	.746
Eigenvalue	3.706	1.604
% variance explained	59.64	25.81
Cumulative % variance	59.64	85.45

Source: Authors Compilation, 2026

Note. Loadings shown are oriented so that higher IQI values correspond to stronger institutional quality (signflipped from the raw PCA output so that the control of corruption loading is positive).

4.3 Unit Root Tests

Table 5 reports the ADF results for unemployment and the constructed IQI. Both series are nonstationary in levels but stationary after first differencing, confirming that each is integrated of order one, I(1). This shared order of integration is the minimum precondition for the cointegration tests that follow.

Table 5: Augmented Dickey-Fuller Unit Root Test Results

Variable	Level ADF	Level p	1stdiff. ADF	1stdiff. p	Order
UNEMP	0.821	.813	3.070	.029	I(1)
IQI	1.585	.491	3.807	.003	I(1)

Source: Authors Compilation, 2026

Note. Constant included; lag length selected by AIC (maximum 3 lags).

4.4 Cointegration Tests

Table 6 reports the Johansen trace and maximum eigenvalue tests. Both statistics fail to reject the null hypothesis of no cointegrating relationship at the 5% level: the trace statistic of 8.53 falls well short of the 15.49 critical value, and the maximum eigenvalue statistic of 7.20 falls short of the 14.26 critical value. This result is corroborated by an Engle-Granger residual based test: a static regression of unemployment on the IQI yields a Durbin-Watson statistic of just 0.24, and while the residual ADF statistic of −2.17 would appear marginally significant against standard Dickey-Fuller critical values, it falls well short of the more conservative Engle-Granger critical values appropriate for testing cointegration in an estimated residual series (approximately −3.67 at the 5% level for this sample size), so this test likewise fails to confirm cointegration. Taken together, the evidence does not support a stable long run equilibrium relationship between institutional quality and unemployment over this sample. The extremely low Durbin-Watson statistic in the static regression is itself a classic symptom of the kind of spurious correlation that can arise between two independently trending, no cointegrated I(1) series (Granger & Newbold, 1974).

Table 6: Johansen Cointegration Test

Hypothesised no. of CE(s)	Trace stat.	Trace 95% CV	Max-Eigen stat.	Max-Eigen 95% CV	Decision
None	8.528	15.494	7.203	14.264	Fail to reject
At most 1	1.325	3.842	1.325	3.842	Fail to reject

Source: Authors Compilation, 2026

Note. k_ar_diff = 1 (VAR lag order selected by AIC). CE(s) = cointegrating equation(s). Neither statistic exceeds its 95% critical value, so the null of no cointegration cannot be rejected at either rank.

4.5 Dynamic OLS Long Run Estimates

Table 7 reports the DOLS estimates (two leads and lags, HAC standard errors). The coefficient on the level of IQI is positive and highly significant ($\beta = 0.285$, $p < .001$): taken at face value, this indicates that higher institutional quality is associated with higher, not lower, unemployment, the opposite of the theoretically expected sign. Given the absence of confirmed cointegration in Section 4.4 and the very low Durbin-Watson statistic reported there, this positive level coefficient is best interpreted with considerable caution: it plausibly reflects the fact that both series trended upward over much of the sample. Nigeria's institutional quality improved markedly from the mid2000s onward as banking sector consolidation, anticorruption institution building, and telecommunications sector liberalisation took hold, while unemployment also rose over the same period for largely unrelated structural reasons, chiefly labour force growth outpacing job creation rather than a genuine causal or equilibrium relationship running from institutions to joblessness.

More informative is the contemporaneous short run term, ΔIQI_t, which is negative and statistically significant ($\beta = -0.280$, $p = .025$): a same year improvement in institutional quality is associated with a reduction in unemployment, consistent with theoretical expectations and with the Keynesian and institutional channels. The one year lagged term is negative and marginally significant ($\beta = -0.203$, $p = .056$), suggesting this contemporaneous relationship

may persist weakly into the following year, while the remaining lead and lag terms are not statistically distinguishable from zero.

Table 7: Dynamic OLS Estimates: Dependent Variable = Unemployment

Variable	Coeff.	SE	P
Constant	4.303	0.197	<.001
IQI (level)	0.285	0.081	<.001
ΔIQI (t)	0.280	0.124	.025
ΔIQI (t−1)	0.203	0.106	.056#
ΔIQI (t−2)	0.162	0.105	.124 n.s.
ΔIQI (t+1)	0.007	0.067	.920 n.s.
ΔIQI (t+2)	0.025	0.082	.763 n.s.

Source: Authors Compilation, 2026

Note. HAC (Newey-West) standard errors, 2 lags. N = 24 (1999–2022, after loss of observations to leads/lags). R^2 = .475, adjusted R^2 = .290. p < .001. p < .05. # p < .10 (marginal). n.s. = not significant.

4.6 VAR, Granger Causality, and Variance Decomposition

Given the absence of confirmed cointegration, short run dynamics are further examined using a bivariate VAR in first differences. Lag order selection by AIC on the unrestricted differenced system favours zero lags, indicating no significant own or cross-lag predictability once the series are differenced; for completeness and to permit formal Granger causality testing, a VAR(2) is nonetheless estimated, consistent with conventional practice for annual macro series. The estimated system is stable (all companion matrix roots lie inside the unit circle), and residual diagnostics indicate normally distributed residuals for the IQI equation (Jarque-Bera p = .767) but nonnormal residuals for the unemployment equation (Jarque-Bera p < .001), attributable to the sharp, singular 2020 unemployment increase associated with the COVID19 pandemic.

Granger causality tests (Table 8) find no significant predictive relationship in either direction: changes in IQI do not significantly Granger cause changes in unemployment (F = 0.54, p = .584), nor does unemployment Granger cause IQI (F = 0.20, p = .822). Consistent with this, the forecast error variance decomposition attributes only a small and stable share, rising from 0.3% at a one year horizon to 4.7% at an eight year horizon of unemployment's forecast error to institutional quality shocks, with the remainder attributable to unemployment's own shocks. The orthogonalised impulse response of unemployment to a one standard deviation IQI shock is small in magnitude (peaking at 0.045 percentage points in the second year) and decays toward zero within four years, reinforcing the conclusion that institutional quality shocks are not a dominant driver of unemployment dynamics in Nigeria over this sample, at least at the annual frequency and composite level examined here.

Table 8: VAR (2) Granger Causality Tests and Variance Decomposition

Test / horizon	Statistic	p / share
ΔIQI does not Granger cause ΔUNEMP	F = 0.544	p = .584
ΔUNEMP does not Granger cause ΔIQI	F = 0.198	p = .822
FEVD of ΔUNEMP attributable to ΔIQI, 1year horizon	—	0.3%
FEVD of ΔUNEMP attributable to ΔIQI, 4year horizon	—	4.7%
FEVD of ΔUNEMP attributable to ΔIQI, 8year horizon	—	4.7%

Source: Authors Compilation, 2026

Note. FEVD = forecast error variance decomposition. VAR estimated in first differences with 2 lags; system confirmed stable.

4.7 Discussion of Findings

The central methodological finding of this study is that a composite, PCA-derived measure of Nigeria's institutional quality is not cointegrated with unemployment over 1996–2024, a result confirmed by two independent tests (Johansen and Engle-Granger) rather than asserted on the strength of a single procedure. This is itself a substantive contribution relative to the ARDL bounds testing literature reviewed, much of which reports significant long run governance–unemployment relationships without the benefit of a comparably diagnostic driven confirmation sequence; it suggests that at least some of those reported long run effects, particularly in short annual Nigerian series similar in length to this one may warrant re-examination for the possibility of spurious regression.

Substantively, the results point to a more modest and more theoretically consistent story than a simple long run coefficient would suggest. The significant negative contemporaneous DOLS coefficient indicates that same year improvements in Nigeria's composite institutional quality are associated with lower unemployment, consistent with Adebayo and Ojo (2025) and Eze and Okonkwo (2024), who found negative effects of government effectiveness and regulatory quality on Nigerian unemployment, and with the Keynesian and institutional economics channels: stronger institutions reduce the transaction costs and uncertainty that discourage hiring. However, the VAR-based Granger causality and variance decomposition results show that this relationship does not extend into a strong, persistent, or highly predictive short run dynamic institutional shocks explain under 5% of unemployment's forecast error variance even at an eight year horizon, indicating that whatever benefit institutional improvement confers on Nigerian unemployment operates modestly and is easily dominated by other, unmeasured determinants of the labour market.

The positive DOLS level coefficient, by contrast, should not be read as evidence that stronger institutions raise unemployment. Rather, it illustrates a well documented hazard in timeseries institutional economics: two genuinely unrelated (or only weakly and contemporaneously related) I(1) series that happen to trend in the same direction over a multidecade sample can produce a statistically significant positive levels relationship purely as an artefact of shared trend, a risk flagged by the very low Durbin-Watson statistic accompanying that estimate and precisely the reason the cointegration tests were conducted before, rather than instead of, the DOLS estimation. This methodological sequencing, testing for cointegration first, and interpreting any long run coefficient in light of that result is the principal advantage of this study over the single equation ARDL approach common in the comparable literature, and the qualification it produces here is arguably a more honest empirical conclusion than a confidently reported long run elasticity would have been.

The PCA results also carry a substantive implication independent of the unemployment relationship: political stability behaves distinctly from Nigeria's other five governance dimensions, loading only weakly and negatively on the common institutional quality factor. This suggests that Nigeria's perceived political (in) stability shaped heavily by election cycles, security incidents in specific regions, and transitions of power should not be assumed to move in lockstep with slower moving administrative and regulatory reforms, a distinction with direct relevance for policymakers seeking to prioritise among governance reform areas rather than treating institutional quality as a single undifferentiated target.

5. Conclusion and Policy Recommendations

This study constructed a composite Institutional Quality Index for Nigeria from all six World Bank Worldwide Governance Indicators using principal component analysis, validated by strong sampling adequacy diagnostics, and examined its relationship with unemployment over 1996–2024 using a sequence of cointegration and dynamic timeseries techniques deliberately chosen in place of the single equation ARDL bounds testing approach common in this literature. Two independent cointegration tests find no

evidence of a stable long run equilibrium relationship between institutional quality and unemployment. Dynamic OLS estimates a statistically significant but, absent cointegration, cautiously interpreted positive level relationship, alongside a theoretically consistent negative and significant contemporaneous short run relationship; a complementary VAR analysis finds no significant Granger causality in either direction or only a small forecast error variance contribution from institutional shocks. The overall picture is one of a modest, contemporaneous, but not dominant or stably persistent channel through which Nigeria's institutional quality bears on its unemployment outcomes, a more qualified conclusion than prior single indicator, ARD based studies in this literature typically report, but one better supported by the diagnostic sequence applied here.

Policy Recommendations

Because the contemporaneous relationship between institutional quality and unemployment is negative and significant, government should continue to pursue governance reform, particularly in control of corruption, regulatory quality, rule of law, and government effectiveness, the four dimensions that load most strongly on the common institutional quality factor as part of, rather than a substitute for, direct employment generation policy.

Given that political stability was found to move largely independently of Nigeria's other governance dimensions, security and political stability policy should be resourced and evaluated separately from administrative and regulatory reform programmes rather than assumed to improve automatically alongside them.

Because no stable long run equilibrium relationship was found between institutional quality and unemployment, policymakers should not rely on governance improvement alone as a long run employment strategy; it should be pursued alongside complementary macroeconomic, industrial, and labour market policies capable of directly expanding labour demand.

Given the narrow historical range of Nigeria's regulatory quality estimate relative to the other dimensions, sustained and more ambitious regulatory reform rather than incremental adjustment may be necessary before its effect on unemployment becomes statistically detectable.

Future national data collection and monitoring frameworks should track a composite institutional quality measure of the kind constructed here, alongside its individual components, to allow policymakers to distinguish genuine broad based governance improvement from movement in any single indicator.

Limitations and Future Research

Three limitations qualify these findings. First, the annual frequency and 29year span of internationally comparable governance data constrain statistical power, particularly for the VAR and Granger causality tests, and the DOLS estimation sample shrinks further once leads and lags are incorporated (N = 24). Second, the nonnormality detected in the unemployment equation's VAR residuals, plausibly driven by the singular 2020 COVID19 shock, suggests that outlier robust or structural break aware extensions of this framework would be a valuable robustness check. Third, this analysis is confined to the direct relationship between a composite institutional quality index and aggregate unemployment; it does not decompose the index back into its six components' individual marginal effects, nor does it examine subnational, sectoral, or youth specific unemployment, each of which may relate to institutional quality differently than the aggregate measure examined here. Future research should extend this framework with structural break robust cointegration tests, disaggregate governance effects by subindex and unemployment by demographic group, and explore threshold or asymmetric specifications given prior Nigerian evidence (Okafor et al., 2025) of asymmetric institutional effects on youth unemployment.

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Data availability: The data supporting this study are publicly available from the World Bank's World Development Indicators and Worldwide Governance Indicators databases.

Author contributions: Tijjani Mamman: conceptualisation, data curation, formal analysis, writing original draft **Abdullahi Shehu Liman:** methodology, validation, writing review and editing, supervision

References

Acemoglu, D., & Robinson, J. A. (2012). *Why nations fail: The origins of power, prosperity, and poverty*. Crown Business.

Adebayo, A. A., & Ojo, O. S. (2025). Institutional quality and unemployment dynamics in Nigeria: An ARDL approach. *Journal of African Development Studies, 42*(1), 45–67.

Adeyemi, O. O., & Salami, A. O. (2021). Institutional quality and unemployment in Nigeria: Evidence from ARDL bounds testing approach. *Nigerian Journal of Economic Policy, 28*(3), 112–129.

African Development Bank. (2024). *African economic outlook 2024: Driving Africa's transformation.* African Development Bank Group.

Afolabi, M. O., & Oladele, R. A. (2019). Corruption and unemployment in Nigeria: An ARDL bounds testing approach. *Journal of Economics and Sustainable Development, 10*(4), 56–71.

Bassey, E. O., & Udo, A. B. (2023). Institutional quality and labour market performance in Sub Saharan Africa: A system GMM approach. *Journal of African Economics, 32*(4), 412–435.

Ekong, C. N., & Essien, E. A. (2019). Governance quality and unemployment in Sub Saharan African countries: A system GMM approach. *African Journal of Governance and Development, 8*(2), 89–106.

Engle, R. F., & Granger, C. W. J. (1987). Cointegration and error correction: Representation, estimation, and testing. *Econometrica, 55*(2), 251–276. https://doi.org/10.2307/1913236

Eze, C. O., & Okonkwo, C. N. (2024). Governance quality and unemployment in Nigeria: Evidence from FMOLS and DOLS techniques. *Nigerian Economic Review, 18*(3), 34–52.

Granger, C. W. J. (1969). Investigating causal relations by econometric models and crossspectral methods. *Econometrica, 37*(3), 424–438. https://doi.org/10.2307/1912791

Granger, C. W. J., & Newbold, P. (1974). Spurious regressions in econometrics. *Journal of Econometrics, 2*(2), 111–120. https://doi.org/10.1016/03044076(74)900347

Hadipour, A., Delavari, S., & Bayati, M. (2023). What is the role of institutional quality in health outcomes? A panel data analysis on 158 countries from 20012020. *Heliyon, 9*(9), Article e20251. https://doi.org/10.1016/j.heliyon.2023.e20251

Haruna, M. A., & Alhassan, S. I. (2022). Unemployment and economic development in Sub Saharan Africa: Challenges and policy options. *African Development Review, 34*(1), 78–95.

International Labour Organization. (2024). *World employment and social outlook: Trends 2024.* International Labour Office.

International Labour Organization. (2026). *Global employment trends for youth 2026.* International Labour Office.

Johansen, S. (1991). Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. *Econometrica, 59*(6), 1551–1580. https://doi.org/10.2307/2938278

Kaufmann, D., & Kraay, A. (2024). *The worldwide governance indicators: Methodology and 2024 update* (Policy Research Working Paper). World Bank.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2010). *The worldwide governance indicators: Methodology and analytical issues* (World Bank Policy Research Working Paper No. 5430). World Bank.

Keynes, J. M. (1936). *The general theory of employment, interest and money.* Macmillan.

Khan, M. A., Kong, D., Xiang, J., & Zhang, J. (2019). Impact of institutional quality on financial development: Cross-country evidence based on emerging and growth leading economies. *Emerging Markets Finance and Trade, 55*(4), 1–17.

National Bureau of Statistics. (2024). *Nigeria labour force survey, Q2 2024.* National Bureau of Statistics.

North, D. C. (1990). *Institutions, institutional change and economic performance.* Cambridge University Press.

Nwosu, C. O., & Uche, C. O. (2020). Institutional quality and labour market performance in Nigeria: A vector error correction approach. *Journal of African Business and Economic Research, 9*(3), 45–67.

Okafor, E. N., Ibrahim, A., & Musa, S. (2025). Institutional quality and youth unemployment in Nigeria: Nonlinear ARDL approach. *Journal of Labour Market Studies, 48*(1), 23–45.

Olawale, A. A., & Yusuf, T. O. (2022). Institutional quality and unemployment in West Africa: Evidence from panel cointegration analysis. *West African Economic Review, 16*(3), 156–178.

Sims, C. A. (1980). Macroeconomics and reality. *Econometrica, 48*(1), 1–48. https://doi.org/10.2307/1912017

Stock, J. H., & Watson, M. W. (1993). A simple estimator of cointegrating vectors in higher order integrated systems. *Econometrica, 61*(4), 783–820. https://doi.org/10.2307/2951763

Tang, M. K., & Issahaku, H. (2024). Fiscal imbalances, public debt, and labour markets in Sub Saharan Africa. *Economic Modelling, 138*, 106–128.

Transparency International. (2024). *Corruption perceptions index 2024.* Transparency International. https://www.transparency.org/en/cpi/2024/index/nga

Williamson, O. E. (1985). *The economic institutions of capitalism: Firms, markets, relational contracting.* Free Press.

World Bank. (2024). *worldwide governance indicators: Control of corruption, percentile rank, Nigeria.* World Bank. https://databank.worldbank.org/source/worldwidegovernanceindicators

World Bank. (2025). *the worldwide governance indicators: 2025 methodology revision.* World Bank. https://www.worldbank.org/en/publication/worldwidegovernanceindicators