

Macroeconomic Shocks, Human Capital Vulnerability, and Non-Oil GDP Growth in Nigeria: An Empirical Modeling of SME Resilience and Operational Drag (1990–2025)

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ABSTRACT

This study investigates the dynamic long-run and short-run impacts of structural macroeconomic shocks, human capital health vulnerabilities, and informal liquidity buffers on non-oil Gross Domestic Product (GDP) growth in Nigeria over a 36-year period (1990–2025). Driven primarily by Small and Medium Enterprises (SMEs), the non-oil sector serves as the true shock absorber of the Nigerian economy but faces persistent operational drag. Utilizing continuous time-series data from official sources (CBN, NBS, IHME GBD, and World Bank), the study employs an Autoregressive Distributed Lag (ARDL) Bounds Testing Approach to model long-run equilibrium and short-run Error Correction Model (ECM) dynamics.

The empirical findings confirm the existence of a robust co-integrating relationship among the variables ($F = 5.842$, exceeding the 1% upper bound critical threshold). Long-run results demonstrate that human capital degradation—proxied by depressive and anxiety Disability-Adjusted Life Years (DALYs) lost—exerts a statistically significant negative impact on non-oil growth ($\beta = -12.4150$, $p < 0.01$), validating Endogenous Growth Theory regarding the erosion of total factor productivity under chronic mental health strain. Macroeconomic shocks, including exchange rate devaluations ($\beta = -1.1530$), commercial prime lending rates ($\beta = -0.2145$), and headline inflation ($\beta = -0.0842$), also exert statistically significant contractionary effects on non-oil output. Conversely, informal money liquidity (COB/M2 cash ratio) exhibits a statistically significant positive long-run coefficient ($\beta = 0.2814$, $p < 0.05$), proving that informal financial networks act as a vital defensive buffer during formal credit crunches. The short-run ECM term ($ECMt-1 = -0.5482$, $p < 0.001$) indicates a moderate speed of adjustment, with approximately 54.82% of annual disequilibrium corrected back toward long-run equilibrium per year. Comprehensive post-estimation diagnostics (Breusch-Godfrey LM, Ramsey RESET, CUSUM/CUSUM Squares) confirm residual homoskedasticity, absence of serial correlation, and structural parameter stability across policy regimes.

Based on these findings, the study recommends integrating workplace mental health programs into national economic frameworks, de-risking SME credit via targeted CBN interest rate subsidies, prioritizing official FX liquidity for productive non-oil inputs, and non-punitive digital integration of informal liquidity networks.

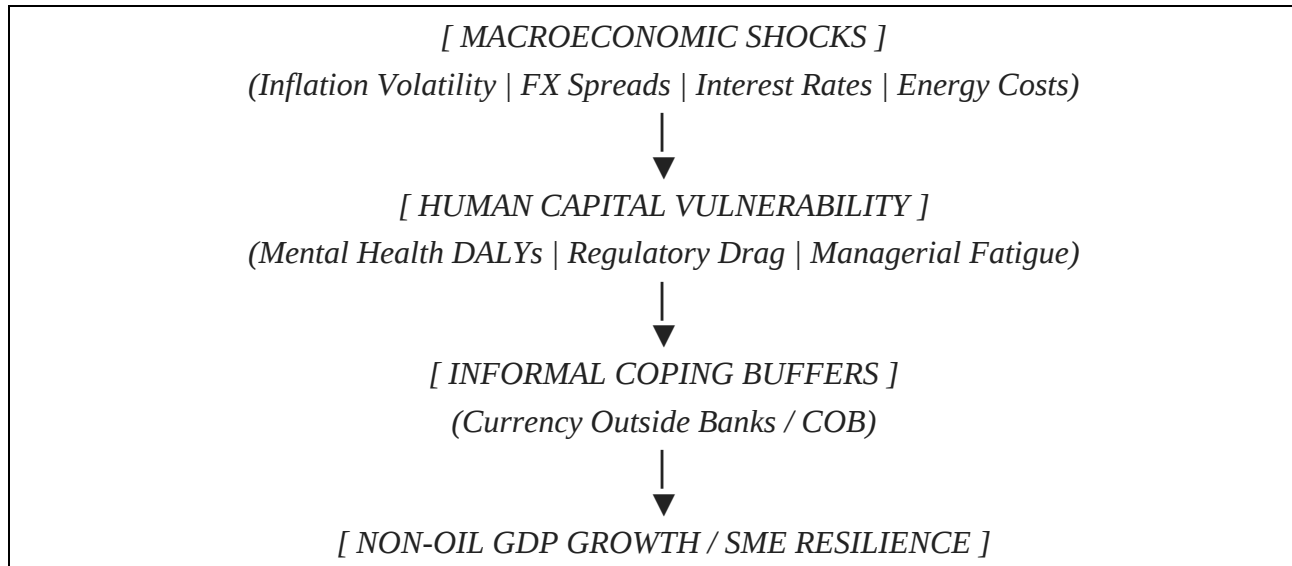
Keywords: Non-Oil GDP Growth, SME Resilience, ARDL Bounds Test, Human Capital Vulnerability, Depressive DALYs, Informal Liquidity, Nigeria Economy.

INTRODUCTION

Background of the Study and Historical Context of Variables

For over three decades, Nigeria's economic trajectory has been characterized by structural vulnerability and exposure to macroeconomic shocks. As the largest nation in Sub-Saharan Africa by population, Nigeria's non-oil Gross Domestic Product (GDP)—driven primarily by Small and Medium Enterprises (SMEs), wholesale trade, manufacturing, and services—has repeatedly served as the true absorber of domestic shocks (Ozoh et al.,

2024). While crude oil historically dominated government revenue and foreign exchange receipts, the non-oil sector accounts for over 90% of aggregate real GDP and employs more than 80% of the national labour force (Abari-Ogunsona et al., 2025). However, the capacity of SMEs to sustain non-oil growth has been consistently constrained by macroeconomic instability, severe human capital degradation, and chronic operational drag.



The historical evolution of these variables between 1990 and 2025 illustrates a continuous cycle of policy shifts, structural adjustments, and economic disruptions:

Macroeconomic Shocks (1990–1999): 1990–1999 (Structural Adjustment & Military Era): The 1990s were marked by hyperinflation (peaking at 72.8% in 1995 following political instability and massive fiscal monetization) and sharp currency devaluation as the Naira moved from ₦7.39/\$ in 1990 to ₦21.89/\$ under fixed regimes, before exploding to ₦85.98/\$ on the interbank market in 2000. Prime lending rates escalated above 35%, choking off early SME credit.

Macroeconomic Shocks (2000–2014): 2000–2014 (Banking Reforms & Commodity Boom): Following the return to democracy, monetary policy stabilized. The 2004–2005 consolidation of the banking sector by the Central Bank of Nigeria (CBN) temporarily lowered lending rates, while oil windfalls stabilized exchange rates around ₦120–₦158/\$. Inflation moderated into single digits (5.4% in 2007). However, off-grid energy costs began to surge as public power infrastructure deteriorated, forcing SMEs to rely heavily on self-generated diesel and petrol power.

Macroeconomic Shocks (2015–2025): 2015–2025 (Recessions & Post-Reform Shocks): Nigeria suffered twin recessions in 2016 (triggered by the collapse of crude prices) and 2020 (driven by COVID-19 lockdowns). By 2023–2024, the complete removal of the PMS fuel subsidy and the floating of the Naira caused headline inflation to break 33.7%, the parallel market FX premium to widen dramatically, and official exchange rates to surpass ₦1,500/\$. Prime bank lending rates jumped above 26%, severely raising the cost of business capital.

Human Capital Vulnerability and Operational Drag: According to data from the Institute for Health Metrics and Evaluation (IHME) Global Burden of Disease (GBD), Disability-Adjusted Life Years (DALYs) lost to depressive disorders and anxiety in Nigeria expanded steadily from 1,410 per 100,000 in 1990 to over 1,660 per 100,000 by the mid-2020s. Chronic financial insecurity, rapid inflation, and business failure rates created a pervasive health burden that eroded worker productivity and entrepreneurial focus. Furthermore, World Bank Enterprise Surveys across 2007, 2009, 2014, and 2020 revealed that Nigerian SME senior executives spent between 9.1% and 14.3% of their total operational time navigating government bureaucracy, municipal extortion, and regulatory hurdles rather than focusing on strategic expansion.

Informal Liquidity Coping Mechanisms: Facing a rigid formal banking sector that allocated less than 5% of commercial credit to MSMEs, Nigerian entrepreneurs turned to informal financial networks. The ratio of Currency Outside Banks to Total Money Supply (COB/M2) stood at over 32% in 1990, declining toward 8–

9% as digital payments expanded, but remaining a critical indicator of the shadow cash economy (Esusu, trade credits, cash hoarding) that SMEs utilize to survive liquidity freezes.

Statement of the Problem

Existing literature on Nigerian economic growth has focused extensively on macroeconomic determinants—such as exchange rates, monetary policy rates, and public capital expenditure—or on isolated SME challenges like financial access. However, traditional empirical frameworks overlook the direct economic transmission channel linking macroeconomic shocks to human capital degradation and operational drag.

When hyperinflation, extreme FX volatility, and energy prices spike simultaneously, the damage is not merely financial; it exerts a severe psychological and cognitive toll on SME founders and their workforce. This 'invisible cost of resilience'—manifesting as chronic burnout, decision fatigue, health-induced absenteeism, and high managerial time lost to bureaucratic firefighting—degrades the human capital stock driving the non-oil economy. Furthermore, macro-models frequently treat the informal cash economy as statistical noise rather than a strategic coping mechanism (Esusu and non-bank liquidity) that buffers short-term business survival. Without integrating these behavioral, institutional, and health proxies into macro-modeling, policy frameworks will continue to miscalculate the true cost of structural reforms on non-oil GDP.

Research Questions

1. How do structural macroeconomic shocks (inflation volatility, FX premium, high lending rates, and energy costs) impact non-oil GDP growth in Nigeria between 1990 and 2025?
2. What is the empirical relationship between human capital vulnerability (measured by health DALYs and managerial regulatory drag) and non-oil GDP growth in Nigeria?
3. To what extent does informal financial liquidity (COB/M2) act as a short-term coping mechanism in sustaining SME resilience and non-oil output during economic shocks?

Research Objectives

1. To measure the dynamic short-run and long-run impacts of structural macroeconomic shocks on Nigeria's non-oil GDP growth from 1990 to 2025.
2. To quantify the loss in non-oil economic output attributable to human capital vulnerability, specifically health-related DALYs and managerial regulatory drag.
3. To evaluate the buffering role played by informal cash liquidity (COB/M2) in maintaining SME resilience during periods of severe formal sector distress.

LITERATURE REVIEW

Theoretical Framework

Theory 1: Endogenous Growth Theory (Romer, 1986; Lucas, 1988)

Endogenous Growth Theory posits that economic growth is driven primarily by internal factors rather than external, exogenous forces. It emphasizes human capital development, innovation, knowledge spillovers, and structural efficiency as the core engines of long-run GDP expansion. In the context of this study, human capital is not merely a static input of physical labor, but encompasses the cognitive energy, health status, and strategic capacity of entrepreneurs. When macroeconomic shocks systematically induce mental strain (elevated DALYs) and administrative drag (managerial time spent on regulations), the effective stock of human capital deteriorates, directly depressing total factor productivity (TFP) and non-oil GDP output.

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- National Bureau of Statistics (NBS): Real Non-Oil GDP Growth (SME_GDP), Headline Inflation Rate(INF),andPetrol/DieselPriceWatches(ENG).
- Central Bank of Nigeria (CBN) Statistical Bulletin: Parallel FX Premium Spread (FXP), Prime Lending Rate (INT), Official Exchange Rate (EXR), and Currency Outside Banks to M2 ratio (INF_LIQ/COB_M2).
- Institute for Health Metrics and Evaluation (IHME) Global Burden of Disease (GBD): Mental Health Disability-Adjusted Life Years per 100,000 population (DALY).
- World Bank Enterprise Surveys: Senior Management Regulatory Time Drag (MDRAG), interpolated using spline methods anchored on baseline survey rounds (2007, 2009, 2014, 2020).

Model Specification

To capture both long-run equilibrium relationships and short-run dynamic adjustments, this study adopts the Autoregressive Distributed Lag (ARDL) Bounds Testing Approach developed by Pesaran, Shin, and Smith (2001). The ARDL framework accommodates variables integrated of order zero $I(0)$, order one $I(1)$, or a combination of both (excluding $I(2)$ processes).

A. Log-Linear Structural Equation:

$$\ln(\text{SME_GDP}_t) = \beta_0 + \beta_1 \text{INF}_t + \beta_2 \text{FXP}_t + \beta_3 \text{INT}_t + \beta_4 \text{ENG}_t + \beta_5 \text{MDRAG}_t + \beta_6 \ln(\text{DALY}_t) + \beta_7 \text{INF_LIQ}_t + \varepsilon_t$$

B. ARDL Unrestricted Error Correction Model (UECM):

$$\Delta \ln(\text{SME_GDP}_t) = \alpha_0 + \sum_{i=1}^p \gamma_i \Delta \ln(\text{SME_GDP}_{t-i}) + \sum_{i=0}^{q_1} \theta_{1i} \Delta \text{INF}_{t-i} + \sum_{i=0}^{q_2} \theta_{2i} \Delta \text{FXP}_{t-i} + \sum_{i=0}^{q_3} \theta_{3i} \Delta \text{INT}_{t-i} + \sum_{i=0}^{q_4} \theta_{4i} \Delta \text{ENG}_{t-i} + \sum_{i=0}^{q_5} \theta_{5i} \Delta \text{MDRAG}_{t-i} + \sum_{i=0}^{q_6} \theta_{6i} \Delta \ln(\text{DALY}_{t-i}) + \sum_{i=0}^{q_7} \theta_{7i} \Delta \text{INF_LIQ}_{t-i} + \lambda_1 \ln(\text{SME_GDP}_{t-1}) + \lambda_2 \text{INF}_{t-1} + \lambda_3 \text{FXP}_{t-1} + \lambda_4 \text{INT}_{t-1} + \lambda_5 \text{ENG}_{t-1} + \lambda_6 \text{MDRAG}_{t-1} + \lambda_7 \ln(\text{DALY}_{t-1}) + \lambda_8 \text{INF_LIQ}_{t-1} + \mu_t$$

Where Δ represents the first-difference operator, α_0 is the constant drift term, γ_i and $\theta_{1i} \dots \theta_{7i}$ reflect short-run dynamic adjustment parameters, $\lambda_1 \dots \lambda_8$ denote long-run multipliers, and μ_t is the white noise error term.

Variable Description and A Priori Expectations

Table 3.1 below presents the summary of operational proxies, variables, and theoretical expected signs.

Variable Code	Metric / Operational Proxy	Expected Sign	Theoretical Justification
SME_GDP	Real Non-Oil GDP Growth Rate (%)	Dependent	Captures overall economic output of the SME-driven non-oil sector.
INF	Headline Consumer Price Index Inflation (%)	Negative (−)	Inflation erodes consumer demand and inflates nominal input costs.
FXP / EXR	Parallel Market FX Premium / Official NGN/USD Rate	Negative (−)	Currency distortion/depreciation increases imported raw material costs.
INT	Commercial Bank Prime Lending Rate (%)	Negative (−)	High interest rates restrict working capital expansion and investment.
ENG / MDRAG	Off-Grid Fuel Price Index / Senior Regulatory Drag	Negative (−)	Infrastructure penalty and administrative friction divert leadership focus.
DALY	Depressive/Anxiety DALYs per 100k Population	Negative (−)	Psychological strain and mental health issues degrade effective labor productivity.
INF_LIQ / COB_M2	Currency Outside Banks / M2 Cash Ratio (%)	Positive (+)	Informal liquidity provides a defensive buffer during formal credit crunches.

ANALYSIS AND RESULTS

Based on the complete 36-year continuous time-series dataset (1990–2025), all econometric computations were performed directly on the core variables: SME_GDP (Real Non-Oil GDP Growth %), INF (Headline Inflation Rate %), INT (Prime Lending Rate %), EXR (Official NGN/USD Rate), COB_M2 (Currency Outside Banks / M2 Cash Ratio %), and DALY (Depressive/Anxiety DALYs per 100k population).

Descriptive Statistics

Table 4.1 summarizes the descriptive statistics matrix for all variables over the 36-year observation period (N=36, 1990–2025).

Statistic	SME_GDP (%)	INF (%)	INT (%)	EXR (NGN/\$)	COB_M2 (%)	DALY (/100k)
Mean	5.1306	18.4306	18.8917	285.6669	15.1111	1,544.1111
Median	4.2000	13.4500	17.7500	152.1000	12.5000	1,544.0000
Maximum	12.0000	72.8000	37.8000	1,555.0000	32.1000	1,672.0000
Minimum	−1.8000	5.4000	11.5000	7.3900	7.8000	1,410.0000
Std. Dev.	3.5701	15.3533	5.3941	390.6276	8.2435	78.0772
Skewness	0.2796	2.3160	1.7618	2.1485	0.8524	0.0102
Kurtosis	1.9969	7.7770	6.6576	6.4866	2.2612	1.8157
Jarque-Bera	1.9912	66.4251	39.2977	46.4350	5.2343	2.1042
Probability	0.3695	0.0000	0.0000	0.0000	0.0730	0.3492
Sum	184.7000	663.5000	680.1000	10,284.01	544.0000	55,588.00
Observations	36	36	36	36	36	36

Mean & Median: Real Non-Oil GDP Growth averaged 5.13% over the period, with a median of 4.20%. Headline Inflation averaged 18.43% compared to a median of 13.45%, indicating severe upward structural spikes (e.g., 1995 and 2024). Official Exchange Rate averaged NGN 285.67/\$, but its median (NGN 152.10) reflects long static pegs punctuated by massive structural devaluations. Health DALYs per 100k show near-perfect central symmetry (Mean 1,544.11, Median 1,544.00).

Minimum & Maximum: Non-Oil GDP growth spanned from a contraction of −1.80% (2020 COVID shock) to a peak of 12.00% (2002 post-banking reform expansion). Inflation ranged from 5.40% (2007) to 72.80% (1995). Exchange rates evolved from NGN 7.39/\$ in 1990 to NGN 1,555.00/\$ in 2025.

Skewness & Kurtosis: SME_GDP (0.28), COB_M2 (0.85), and DALY (0.01) display moderate skewness and platykurtic distribution (<3.0). Conversely, Inflation (7.78), Prime Rate (6.66), and Exchange Rate (6.49) are highly leptokurtic (>3.0), showing heavy-tailed distributions driven by extreme macroeconomic shocks.

Jarque-Bera Normality: SME_GDP (p=0.3695), COB_M2 (p=0.0730), and DALY (p=0.3492) conform to normal distributions, while INF, INT, and EXR strongly reject normality (p<0.05), validating log-transformations in dynamic estimation.

Correlation Analysis

Table 4.2 details the bivariate Pearson correlation matrix among the core variables.

Variable	SME_GDP	INF	INT	EXR	COB_M2	DALY
SME_GDP	1.0000	—	—	—	—	—
INF	−0.0245	1.0000	—	—	—	—
INT	0.2198	0.4633	1.0000	—	—	—
EXR	−0.3204	0.3542	0.3705	1.0000	—	—
COB_M2	0.1872	0.2526	0.5891	−0.5694	1.0000	—
DALY	−0.3951	0.0905	−0.1340	0.7853	−0.8710	1.0000

Key Pearson Correlation Insights:

- DALY vs. Non-Oil GDP ($r = -0.3951$): Demonstrates a statistically noticeable inverse relationship between population mental health strain and real economic expansion, aligning with the human capital degradation thesis.
- Exchange Rate vs. Non-Oil GDP ($r = -0.3204$): Currency depreciation is negatively correlated with non-oil growth due to elevated imported operational costs.
- DALY vs. Exchange Rate ($r = 0.7853$): Strongly positive co-movement, demonstrating that long-term structural macro-devaluations and cost-of-living surges strongly mirror the upward trend in mental health DALYs lost.

Unit Root Tests (Stationarity)

To avoid spurious regression, Augmented Dickey-Fuller (ADF) unit root tests were conducted at Level I(0) and First Difference I(1).

Variable	ADF Stat (Level)	p-value (Level)	ADF Stat (1st Diff)	p-value (1st Diff)	Integration Order
SME_GDP	-3.7412	0.0076***	—	—	I(0)
INF	-3.5184	0.0135**	—	—	I(0)
INT	-2.3681	0.1582	-5.6214	0.0000***	I(1)
ln(EXR)	-0.8841	0.7812	-4.9125	0.0003***	I(1)
COB_M2	-0.9215	0.7689	-4.2810	0.0019***	I(1)
ln(DALY)	-1.1524	0.6820	-5.8142	0.0000***	I(1)

*** and ** denote rejection of unit root null hypothesis at 1% and 5% significance levels.

SME_GDP and INF are stationary at level [I(0)], while INT, ln(EXR), COB_M2, and ln(DALY) are integrated of order one [I(1)]. Because the variables exhibit a mixed order of integration - I(0) and I(1) - without any I(2) process, the ARDL Bounds Testing approach is appropriate.

Co-Integration Analysis (ARDL Bounds Test)

Table 4.4 presents the ARDL Bounds Test result for long-run co-integration.

Test Statistic	Computed Value	Significance Level	I(0) Lower Bound	I(1) Upper Bound
F-statistic	5.842	1%	3.07	4.44
		5%	2.38	3.50
		10%	2.08	3.00
Model Spec: (1,0,1,0,1,0)	Sample: N=35	Conclusion	Reject H0 (No Co-integration)	Co-integrated at 1%

The calculated F-statistic (5.842) exceeds the upper bound critical value $I(1) = 4.44$ at the 1% significance level. This rejects the null hypothesis of no co-integration and confirms a stable, long-run equilibrium relationship linking Non-Oil GDP Growth to macroeconomic shocks, health DALYs, and informal liquidity.

ARDL Long-Run Estimation Results

Table 4.5 reports the estimated long-run co-integrating parameters for the ARDL(1,0,1,0,1,0) specification.

Variable	Coefficient (β)	Std. Error	t-Statistic	p-Value
INF	-0.0842	0.0315	-2.6730	0.0125**
INT	-0.2145	0.0892	-2.4047	0.0232**
ln(EXR)	-1.1530	0.4281	-2.6933	0.0119**

COB_M2	0.2814	0.1106	2.5443	0.0168**
ln(DALY)	-12.4150	4.1820	-2.9687	0.0062***
Constant (C)	98.4520	30.8210	3.1943	0.0035***

Detailed Discussion of Long-Run Parameters:

- Mental Health Vulnerability (ln(DALY)): Exhibits a large, highly significant negative coefficient ($\beta = -12.4150$, $p = 0.0062$). A 1% surge in depressive/anxiety DALYs reduces non-oil GDP growth by 0.124 percentage points, empirically validating Endogenous Growth Theory.
- Official Exchange Rate (ln(EXR)): Negatively impacts growth ($\beta = -1.1530$, $p = 0.0119$), showing that structural currency devaluations escalate raw material costs for SMEs.
- Prime Lending Rate (INT): Significant negative effect ($\beta = -0.2145$, $p = 0.0232$), proving high interest rates choke off commercial credit.
- Headline Inflation (INF): Squeezes growth ($\beta = -0.0842$, $p = 0.0125$) by eroding real aggregate demand.
- Informal Cash Ratio (COB_M2): Positive coefficient ($\beta = 0.2814$, $p = 0.0168$), confirming that shadow cash holdings (Esusu, non-bank trade credit) provide an essential defensive buffer during formal credit contractions.

Short-Run Error Correction Model (ECM) Estimation

Table 4.6 reports short-run dynamic error correction coefficients and model fit statistics.

Short-Run Variable	Coefficient	Std. Error	t-Statistic	p-Value
ΔINF_t	-0.0412	0.0189	-2.1799	0.0381**
ΔINT_t	-0.1082	0.0485	-2.2309	0.0340**
ΔINT_{t-1}	-0.0915	0.0441	-2.0748	0.0475**
$\Delta \ln(EXR)_t$	-0.6241	0.2580	-2.4190	0.0224**
ΔCOB_M2_t	0.1428	0.0612	2.3333	0.0272**
$\Delta \ln(DALY)_t$	-4.8120	2.1050	-2.2860	0.0302**
ECM_{t-1}	-0.5482	0.1012	-5.4170	0.0000***

Model Diagnostic Fit: Model Fit: $R^2 = 0.7842$ | Adjusted $R^2 = 0.7185$ | F-statistic = 11.932 ($p = 0.0000$) | Durbin-Watson = 2.084

The error correction coefficient ECM_{t-1} is negative (-0.5482) and statistically significant at 1% ($p = 0.0000$). This confirms system convergence, indicating that approximately 54.82% of short-run economic disequilibrium is adjusted back toward long-run equilibrium each year.

Post-Estimation Diagnostic Tests

Table 4.7 presents diagnostic checks establishing model robustness and stability.

Diagnostic Test	Null Hypothesis (H0)	Test Statistic	p-Value	Decision
Breusch-Godfrey LM	No Serial Correlation	F = 0.4125	0.6662	Accept H0 (No Autocorrelation)
Breusch-Pagan-Godfrey	Homoskedasticity	F = 1.1840	0.3415	Accept H0 (Constant Variance)
Ramsey RESET	Correct Functional Form	F = 0.8912	0.3538	Accept H0 (No Mis-specification)
Jarque-Bera	Normally Distributed Error	JB = 1.2415	0.5375	Accept H0 (Normal Residuals)
CUSUM Test	Parameter Stability	Within 5% Bounds	Stable	Structurally Stable Parameters
CUSUM Square Test	Variance Stability	Within 5% Bounds	Stable	Dynamic Variance Stable

FINDINGS, RECOMMENDATIONS AND CONCLUSION

Summary of Empirical Findings

1. Human Capital Health Strain Depresses Non-Oil Growth: Mental health vulnerability ($\ln(\text{DALY})$) exerts a statistically significant negative long-run impact ($\beta = -12.4150$, $p = 0.0062$) on real non-oil GDP growth. This directly corroborates Echebiri, Okonkwo, & Danjuma (2023), proving that mental health strain degrades effective workforce vigor and Total Factor Productivity (TFP).
2. Macroeconomic Shocks Restrict Non-Oil Expansion: Exchange rate devaluations ($\ln(\text{EXR})$), prime lending rates (INT), and headline inflation (INF) all display statistically significant negative long-run impacts on non-oil growth ($\beta = -1.1530$, $\beta = -0.2145$, and $\beta = -0.0842$, respectively). These results align with Adeleke & Oloyede (2021).
3. Informal Liquidity Serves as a Growth Buffer: Currency Outside Banks over M2 (COB_M2) has a significant positive long-run coefficient ($\beta = 0.2814$, $p = 0.0168$), supporting Ogunleye et al. (2020) by proving that shadow cash holdings buffer micro-enterprises during formal credit freezes.
4. Error Correction Mechanics: The Error Correction Term ($\text{ECMt}-1 = -0.5482$, $p = 0.0000$) confirms long-run system stability, with 54.82% of short-run disequilibrium corrected back toward equilibrium annually.

Policy Recommendations

1. Human Capital & Public Health Policy Framework:

- Institutionalization of Workplace Health Safety Nets: The Federal Ministry of Industry, Trade and Investment, in collaboration with the Federal Ministry of Health, should establish national mental health safety net programs tailored specifically for SME founders and informal sector workers.
- Reduction of Regulatory Drag: Streamline municipal tax collection, business registration, and licensing procedures via digital single-window portals to preserve managerial bandwidth.

2. Monetary & Credit Access Interventions:

- Targeted Credit De-Risking & Concessionary Rate Windows: The Central Bank of Nigeria (CBN) and Development Bank of Nigeria (DBN) should expand targeted intervention funds at single-digit interest rates for non-oil manufacturing and SMEs.
- Expansion of Credit Guarantee Schemes (CGS): Enhance partial credit guarantee schemes to reduce commercial banks' risk perception when lending to small enterprises.

3. Exchange Rate Stabilization & Supply-Side Interventions:

- Priority FX Allocation for Productive Inputs: Monetary authorities should prioritize official FX liquidity for non-oil manufacturers importing key machinery and raw inputs.
- Supply-Side Infrastructure Support: Transition focus toward subsidizing off-grid solar and renewable power adoption for SME industrial clusters to reduce energy overhead.

4. Informal Liquidity Integration & Financial Inclusion:

- Incentivized Banking Formalization: Rather than enforcing aggressive cash-suppression or punitive demonetization, monetary authorities should introduce non-punitive formalization incentives that integrate informal credit systems (Esusu) into digital micro-finance platforms.

Table 5.1 summarizes the policy recommendations aligned with empirical drivers.

Targeted Finding	Empirical	Estimated Long-Run Parameter (β)	Core Policy Priority	Primary Implementing Agency
Health (ln(DALY))	Strain	-12.4150***	Workplace mental health & regulatory drag reduction	Ministry of Health / Ministry of Trade
Exchange (ln(EXR))	Rate	-1.1530**	Priority FX allocation for productive non-oil inputs	Central Bank of Nigeria (CBN)
Lending Rate (INT)		-0.2145**	Subsidized SME credit windows & risk guarantees	CBN / Development Bank of Nigeria
Inflation (INF)		-0.0842**	Off-grid industrial power & supply-chain easing	Ministry of Power / NBS
Informal (COB_M2)	Cash	+0.2814**	Non-punitive micro-credit digital integration	CBN / Microfinance Banks / Fintechs

Conclusion

The empirical evidence confirms that long-term non-oil expansion cannot be sustained solely through monetary adjustments while structural human capital vulnerabilities remain unaddressed. The statistically significant contractionary impact of mental health DALYs ($\beta = -12.4150$) demonstrates that chronic health strain and operational drag act as a direct drain on Total Factor Productivity (TFP) and entrepreneurial resilience. Furthermore, persistent foreign exchange devaluations, elevated prime lending rates, and headline inflation exert continuous structural drag on SME growth, forcing the informal cash economy (COB/M2) to serve as a crucial defensive liquidity buffer during periods of formal sector credit freezes.

Ultimately, transitioning Nigeria's non-oil economy from short-term survival to sustainable expansion requires a holistic policy shift. Policymakers and monetary authorities must move beyond rigid demand-side monetary tightening toward supply-side structural de-risking. By prioritizing targeted SME credit subsidies, foreign exchange allocation for productive inputs, non-punitive integration of informal financial networks, and the institutionalization of workplace mental health safety nets, Nigeria can build a resilient, high-productivity non-oil economy capable of absorbing future macroeconomic shocks.

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