*Journal of Economic Studies (JES)*
*Department of Economics,*
*Nnamdi Azikiwe University, Awka,*
*Anambra State, Nigeria.*

*Web: www.nauecojournals.com* *ISSN 1119-2259*

# IS RESOURCE RENTS CROWDING OUT INDUSTRIAL GROWTH? ANALYSIS OF NATURAL RESOURCE RENT AND INDUSTRIAL SECTOR GROWTH IN NIGERIA

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## ABSTRACT

*Growth in the industrial sector drives structural transformation in resource dependent economies, yet the effect of natural resource rents on industrial growth in Nigeria remains unclear. This study examines that relationship for Nigeria between 1990 and 2024, using GDP growth, inflation, the real exchange rate, and regulatory quality as control variables. Annual data were sourced from the World Bank and estimated with the Autoregressive Distributed Lag (ARDL) framework. The bounds test finds no long-run cointegrating relationship among the variables, so the analysis focuses on short-run dynamics. Diagnostic tests confirm the model is stable. Natural resource rents significantly reduce industrial sector growth, weakening the sector's competitiveness. GDP growth and inflation both raise industrial growth, the former by expanding overall economic activity and the latter through price adjustments that favour domestic producers. The real exchange rate reduces industrial growth by raising production costs when the currency depreciates. Regulatory quality has no significant effect in the short run.*

***Keywords:*** *ARDL Model, GDP Growth, Industrial Sector Growth, Inflation, Natural Resource Rents, Nigeria, Real Exchange Rate, Regulatory Quality*

***JEL Classification Codes:*** *C22, O14, O55, Q32*

## 1.0 Introduction

Industrial development is central to structural transformation, productivity growth, and sustainable economic growth. Economies with a strong industrial base see higher value added, more employment, diversified exports, and faster technological change (Ruzmetov et al., 2023). Weak industrial performance produces

the opposite: deindustrialisation, rising imports, job losses, and structural weakness. These outcomes are not distributed evenly. In many resource-dependent economies, industrial development has stalled, a pattern that has pushed researchers to question the long-term costs of exporting raw commodities instead of processing them at home (Henderson et al., 2025).

Natural resource rent is the income earned from producing and selling natural resources, net of production costs. In resource-abundant countries, government revenue, foreign exchange earnings, and investment levels move closely with resource rents, commodity prices, and how those rents get distributed (Henderson et al., 2025). Nigeria's continued dependence on oil rents leaves its industrial sector exposed to external shocks and weakens incentives for sustained industrial investment and innovation (Usman, 2022).

Resource dependence has long been linked to uneven industrial outcomes. Resource rents can create fiscal space and foreign exchange for capital accumulation, but most resource-rich economies still show weak manufacturing growth, limited industrial diversification, and early deindustrialization (Okolo et al., 2024). Resource rents crowd out tradable manufacturing through currency appreciation, distorted incentives, and governance failures (Corden & Neary, 1982). In Nigeria, crude oil dominates export earnings and public revenue, yet the industrial sector remains held back by underused capacity, weak productivity growth, and eroding competitiveness (Iheukwumere, 2022).

The volatility of natural resource rents also threatens the persistence of industrial development. Because revenue from resource extraction is irregular and often unsustainable, it is difficult for firms to plan long-term investment around it. As resource rents come to dominate the economy, investment shifts away from manufacturing and toward consumption and non-tradable sectors (Chaffai & Plane, 2025). This makes it harder for the economy to move out of traditional, low-productivity sectors and into more productive ones, which in turn slows both industrial and overall development.

The relationship between natural resource rents and industrial development is significant. Investment incentives, exchange rate dynamics, and government spending are the main channels through which resource rents affect industrial growth. Where institutions are weak, resource rents are more likely to stall industrial development; where institutions are strong, the same rents can instead support its expansion (Kouladoum et al., 2025).

Despite numerous studies on natural resource rent dependence and economic growth, important gaps remain. Earlier work, including Mamba (2025), Nwani et al. (2023), and Ampofo et al. (2023), focuses on sector-wide

or aggregate growth outcomes. These studies pay little attention to industrial sector performance specifically. Other studies, such as Xue et al. (2023) and Adekunle et al. (2023), examine manufacturing value added and productive capacity but treat natural resource rents as a secondary factor rather than a key driver of industrial expansion. Few studies offer country-level empirical evidence on how natural resource rents affect industrial sector performance in developing countries specifically. Okolo et al. (2024) and Oyinlola et al. (2019) come closer, but their observations remain general and do not engage in detail with the Nigerian industrial sector. As a result, the existing evidence is scattered across time periods, countries, and methodologies, leaving Nigerian policymakers without a coherent empirical basis for designing industrial policy around resource rent management.

This study examines the impact of natural resource rents on industrial sector growth in Nigeria between 1990 and 2024. Specifically, it assesses the direct effect of natural resource rents on industrial output and manufacturing value added, and tests whether continued reliance on resource rents contributes to the deterioration of industrial growth performance. In doing so, the study provides direct evidence that even a large, resource-dependent economy like Nigeria's can see its industrial sector remain underdeveloped despite decades of resource extraction.

This study makes three contributions to that gap. First, it provides country-level empirical evidence on the relationship between natural resource rents and industrial sector growth in Nigeria specifically, rather than aggregate economic growth or a cross-country panel. Second, it incorporates regulatory quality alongside the standard macroeconomic controls, allowing the study to assess whether institutional quality plays a role in the resource rent-industrial growth relationship. Third, it applies the ARDL framework to capture the short-run dynamics of this relationship over the 1990–2024 period.

The remainder of the paper is structured as follows. Section 2 reviews the related literature on natural resource rents and industrial sector growth in Nigeria. Section 3 describes the data, variable construction, and estimation method. Section 4 reports the empirical results. Section 5 concludes and discusses policy implications for improving industrial sector performance in Nigeria.

## 2.0 Literature Review

### 2.1 Conceptual Review

Natural resource rent is the income earned from producing and selling a natural resource, over and above the cost of extracting it. It is a flow measure, distinct from two related terms used elsewhere in this literature: resource abundance, which refers to the stock of natural resources a country holds, and resource dependence, which refers to the share of

exports or government revenue that resources account for. A country can be resource abundant without being resource dependent, and the size of its resource rents depends on both the scale of extraction and prevailing commodity prices, not on abundance alone (World Bank, 2024). This distinction matters here because some of the studies reviewed in the next section examine resource abundance or resource dependence rather than resource rents specifically, even though the three are often treated as interchangeable in the wider literature (Gylfason, 2008; van der Ploeg, 2011).

In a resource-abundant economy, where rents make up a meaningful share of national income, industrial sector performance depends heavily on how the rents are managed, allocated, and reinvested, whether they fund productive capacity or are absorbed into consumption and non-tradable activity (van der Ploeg & Venables, 2011; van der Ploeg, 2011).

Industrial sector growth, the outcome of interest in this study, refers to the expansion of value added generated by a country's industrial activities. Under the classification the World Bank's World Development Indicators follow, the industrial sector comprises manufacturing, mining and quarrying, construction, and electricity, gas, and water supply (Anibuko & Otto, 2025). This is broader than manufacturing alone, and it is worth being explicit about: because mining and quarrying activity is itself counted within "industrial sector" value added, part of what this study measures as industrial output is generated by the same resource extraction whose rents are the paper's main explanatory variable (World Bank, 2025; Goujon & Mien, 2026). This does not invalidate the analysis, but it does mean the negative relationship this study finds between resource rents and industrial growth is, if anything, a conservative estimate of the effect on manufacturing specifically, since any extraction-driven growth captured within the industrial aggregate works against finding a negative result (Szirmai, 2012)

Industrial sector growth is commonly used as an indicator of structural transformation: a rising industrial share of output signals a shift away from low-productivity primary activity toward higher-productivity production (Ruzmetov et al., 2023). This study measures industrial sector growth using industry value added as a share of GDP, sourced from the World Bank's World Development Indicators.

### 2.2. Theoretical Framework

This study draws on three theories to explain how natural resource rents affect industrial sector growth: the Resource Curse Theory, the Dutch Disease Theory, and the Endogenous Growth Theory. Each is discussed in turn below, followed by a statement of which theory anchors this study and why.

### 2.2.1 Resource Curse Theory

Sachs and Warner (1995) formalized the resource curse hypothesis, building on an empirical observation that had puzzled development economists for decades: countries rich in natural resources often grow more slowly than countries without them. Their central proposition is that a high ratio of natural resource exports to GDP predicts lower subsequent economic growth, and that this negative relationship holds even after controlling for other determinants of growth such as initial income, trade policy, and government efficiency. The theory rests on the assumption that resource abundance, measured through export intensity or rents, tends to substitute for broader productive investment rather than complement it (Sachs & Warner, 1995).

This theory frames the central question this paper investigates: whether Nigeria's dependence on oil rents is associated with weaker, rather than stronger, industrial sector performance. Its main limitation is that the original formulation is largely correlational. It establishes that the pattern exists more clearly than it explains the mechanism behind it, and later research has shown the resource curse to be conditional on institutional quality rather than universal (Sachs & Warner, 2001; Mehlum et al., 2006). That gap is why this theory needs to be paired with a theory of the transmission mechanism, which the Dutch Disease Theory provides.

### 2.2.2 Dutch Disease Theory

Corden and Neary (1982) modelled a small open economy experiencing a boom in one tradable sector, in their case framed around natural resources, to explain how such a boom can damage the rest of the tradable sector. The theory's central mechanism runs through two channels. First, the resource movement effect draws capital and labour away from manufacturing and toward the booming resource sector. Second, the spending effect raises demand for non-tradable goods and services, pushing up their prices. Both effects cause the real exchange rate to appreciate, which raises the relative cost of producing tradable manufactured goods and erodes their competitiveness abroad. The manufacturing sector, being tradable but not the booming sector, contracts as a result (Corden & Neary, 1982).

This is also where structural transformation gets impeded, specifically: capital and labour that would otherwise flow into higher-productivity manufacturing are instead pulled toward the resource sector and non-tradable services, so the economy cannot shift its productive structure toward more productive uses in the way structural transformation requires. The theory assumes a small open economy with factors that move freely between sectors, an assumption that may not hold

cleanly in economies with structural rigidities like Nigeria's labour market. It is directly testable in this study through the real exchange rate variable, which operationalizes the mechanism the theory describes. Its main limitation is that it is primarily a short-to-medium-run theory and says nothing about how resource rents are used once earned, which is where the Endogenous Growth Theory becomes useful (Corden & Neary, 1982; Romer, 1990).

### 2.2.3 Endogenous Growth Theory

Romer (1986) and Lucas (1988) developed, independently, a theory of growth that departs from neoclassical models treating technological progress as exogenous. Their central proposition is that sustained long-run growth is generated internally, through the accumulation of human capital, knowledge, and technological innovation, each of which can produce increasing rather than diminishing returns. The theory assumes that investment in knowledge and human capital generates positive externalities that raise productivity across the wider economy, not just for the individual firm or investor making the investment (Romer, 1986; Lucas, 1988).

This theory explains why the effect of resource rents on industrial growth is not fixed in one direction. Whether rents are reinvested into infrastructure, technology, and human capital, which support industrial learning and productivity growth, or are instead diverted into consumption, determines whether resource wealth ultimately helps or hinders industrial expansion. Its limitation is that it is a general theory of growth, not one built around resource-driven economies specifically, so it explains the conditions under which reinvestment pays off without explaining why resource rents in particular tend to be under-invested. For that reason, it is treated here as a complementary lens rather than this study's primary theory (Romer, 1986; Lucas, 1988).

### 2.2.4 Theoretical Framework

Together, these three theories identify four channels through which natural resource rents can affect industrial sector growth: exchange rate movements, investment incentives, institutional quality, and capital accumulation. This study anchors its analysis on the Resource Curse hypothesis, since it frames the paper's central research question, and draws on the Dutch Disease theory to specify the exchange rate channel through which that curse is expected to operate in Nigeria. The Endogenous Growth Theory supplies a complementary explanation for why the effect of resource rents can vary depending on how those rents are used.

For Nigeria, an economy dependent on oil for the bulk of its export receipts and government revenue, these theories together imply that continued resource rent dependence would weaken industrial output and manufacturing competitiveness. This effect would be expected

to persist over the long run. It would only be offset where resource rents are efficiently reinvested into the productive uses the industrial sector needs.

### 2.3 Empirical Literature

Natural resource rents and industrial sector performance have drawn growing attention in the development literature, particularly for resource-exporting developing countries where rents make up a substantial share of national income. In principle, resource rents could fund the capital accumulation that supports industrial development. In practice, the empirical literature finds this rarely happens: rents tend to crowd out investment incentives and competitiveness in manufacturing and industry, largely through exchange rate movements, capital misallocation, institutional weakness, and a shift toward non-tradable activities.

Most of the country- and panel-level evidence on this point is consistent. Nwani et al. (2023), studying 30 Sub-Saharan African (SSA) countries between 1995 and 2019, found that resource reliance raised the extractive sector's contribution to output while reducing the industrial and service sectors' share, though financial development partly offset this by redirecting output toward more productive sectors. Xue et al. (2023), using FMOLS, DOLS, CCR, and quantile regression on a panel of European and Central Asian economies, similarly found that resource endowment weakened industrial value added and overall growth. Oyinlola et al. (2019) reached the same conclusion for SSA using system GMM, though the negative effect on industrial development shrank in countries with higher human capital accumulation.

Mamba (2025) narrowed the focus to ECOWAS manufacturing specifically: using instrumental variable fixed effects and nonlinear regression on data from 1996 to 2020, the study finds an inverted U-shaped relationship between resource rents and manufacturing growth, and shows that trade structure and investment patterns can soften the negative effect on export competitiveness. Mesagan et al. (2023), applying panel ARDL to 22 resource-rich African economies, added a temporal dimension: resource wealth supported industrial development in the short run but turned detrimental in the long run, consistent with a resource curse that took time to materialize.

The exchange rate channel this study relies on has direct empirical support. Chaffai and Plane (2025), analysing 102 developing and transition economies from 2003 to 2019, showed that the standard practice of measuring real exchange rate misalignment without accounting for resource rents biases the results: once rents were netted out of GDP, currency overvaluation had a clear negative effect on manufacturing's share of output, while undervaluation helped manufacturing up to a

threshold, beyond which the benefit faded. Their finding that resource rents distorted exchange-rate-based measures of competitiveness is a direct empirical parallel to the mechanism this study tests through the real exchange rate variable.

The institutional channel showed a more complicated picture than a simple "good institutions help" story. Kouladoum et al. (2025), using two-step system GMM across 54 African countries from 2000 to 2022, found that resource rent dependency had a nonlinear relationship with macroeconomic instability: a stabilizing effect at lower levels of dependency that turned destabilizing as dependency increased. This suggests that institutional quality did not simply switch the resource rent effect from bad to good, as implied by the intro's discussion of the Kouladoum et al. (2025) mechanism; the relationship can flip direction depending on how deep the dependency runs, which is a more cautious framing than a linear institutional story would suggest.

Not every study on the industrial or innovation side agrees with the crowding-out consensus either. Okolo et al. (2024), using instrumental variable fixed effects and Driscoll-Kraay standard errors across 79 countries, found that resource rents had a positive and significant effect on patent and trademark activity, particularly where trade openness, financial development, and human capital were already strong. Taken with the Kouladoum et al. (2025) finding above, this points to a genuine tension in the literature: whether resource rents help or hurt industrial and innovative activity depends heavily on the institutional and structural context those rents flow into, and possibly on how far along the dependency spectrum a country already sits, rather than being a fixed, universal effect.

Nigeria-specific evidence remains thin, and what exists is not directly comparable to the present study. Iheukwumere (2022) examined the performance challenges of Nigeria's state-owned refineries using a qualitative systems-thinking approach, documenting underutilized capacity and structural weaknesses consistent with the broader resource-rent literature, but the study failed to estimate a quantitative relationship between resource rents and industrial sector growth, and it was confined to a single sub-sector. It illustrated the problem this study addresses rather than solving it: even the closest available Nigeria-specific work stops short of the kind of empirical test this paper undertakes.

A separate strand of the literature studies natural resource rents and aggregate economic growth rather than industrial sector performance specifically. Adabor et al. (2022) found that oil resource rents raised economic growth in Ghana over the long run, with a negligible short-run effect. Ampofo et al. (2023) revealed the growth effect of resource

rents varied sharply by country across eight resource-rich SSA economies, from negative in the Republic of Congo to positive in Equatorial Guinea. Adekunle et al. (2023) showed that oil and coal rents raised African economic growth while forest rents reduced it. These studies establish that resource rent effects on growth are uneven across contexts, but none isolates the industrial sector, so their relevance here is limited to that general point about conditionality.

Taken together, the literature agrees that natural resource rents are, on balance, more likely to hinder industrial and manufacturing performance than to help it, running mainly through currency appreciation, weak institutions, and underinvestment in productive sectors. Where studies disagree is on timing and conditionality: some established that rents can support industrial or innovative activity in the short run or under strong institutions and trade openness (Okolo et al., 2024; Mesagan et al., 2023), some found the institutional relationship itself is nonlinear rather than a simple switch (Kouladoum et al., 2025), while the dominant finding is a long-run drag on industrial growth (Nwani et al., 2023; Xue et al., 2023; Oyinlola et al., 2019; Mamba, 2025). Methodologically, this body of work leans heavily on cross-country panels, and the one available Nigeria-specific study (Iheukwumere, 2022) is qualitative and sector-confined rather than a quantitative national-level test. That combination, no Nigeria-specific quantitative evidence and no attention to the short-run dynamics an ARDL bounds-testing approach can capture, is what this study addresses.

## 3. Methodology

The study examines the impact of natural resource rents on the expansion of Nigeria's industrial sector between 1990 and 2024, using the Autoregressive Distributed Lag (ARDL) model developed by Pesaran et al. (2001). The ARDL approach is suitable here because it can estimate both short-run and long-run relationships and can handle variables integrated at different orders, provided none is integrated beyond I(1). Unit root tests confirm that the variables in this study meet that condition, combining I(0) and I(1) series.

This study is anchored on the Resource Curse hypothesis and the Dutch Disease theory, discussed in detail in Section 2.2. Together, they provide the theoretical basis for expecting natural resource rents to constrain, rather than support, industrial sector growth in Nigeria.

### 3.1 Model Specification

Industrial sector performance is specified as a function of natural resource rents, GDP growth, inflation, the real exchange rate, and regulatory quality, the five variables through which resource rents are expected to affect investment, production costs, international competitiveness, and regulatory conditions in the industrial sector.

The functional form is stated as follows:

$$IND = f(NRR, GDPG, INF, REXR, RQ) \quad (3.1)$$

Equation (1) is estimated in econometric form below. Industrial sector growth and the real exchange rate are expressed in natural log form to stabilize variance and reduce skewness; natural resource rents, GDP growth, inflation, and regulatory quality are retained in their original form, consistent with how they are measured in Table 3.1:

$$LIND = \beta_0 + \beta_1 NRR_t + \beta_2 GDPG_t + \beta_3 INF_t + \beta_4 LREXR_t + \beta_5 RQ_t + \mu_t \quad (3.2)$$

LIND is logged industrial sector growth, NRR is natural resource rent, GDPG is the annual GDP growth rate, INF is the annual inflation rate, LREXR is the logged real exchange rate, and RQ is regulatory quality. The subscript t denotes the time period. $\beta_0$ is the intercept, $\beta_1$ through $\beta_5$ are the coefficients of the explanatory variables, and $\mu_t$ is the error term.

### 3.2 Data Source and Measurement

This study uses annual time series data from 1990 to 2024, drawn from the World Bank's World Development Indicators and the Worldwide Governance Indicators database, which provide standard measures of industrial performance, natural resource dependence, macroeconomic conditions, and regulatory quality. Variable measurement and sources are presented in Table 3.1

**Table 3.1: Data Measurement and Sources**

| Variable Name | Symbol | Measurement | Source |
|---|---|---|---|
| **Industrial Sector Growth** | LIND | Industry value added (% of GDP), logged | World Bank WDI |
| **Natural Resource Rents** | NRR | Oil rents (% of GDP) | World Bank WDI |
| **GDP Growth Rate** | GDPG | Annual percentage change in real GDP | World Bank WDI |
| **Inflation Rate** | INF | Annual percentage change in Consumer Price Index | World Bank WDI |
| **Real Exchange Rate** | LREXR | Real effective exchange rate index, logged | World Bank WDI |
| **Regulatory Quality** | RQ | Governance index measuring regulatory quality | Worldwide Governance Indicators |

**Source: Authors' compilation from WDI and WGI**

### 3.3. Estimation Procedure

Three steps are used to estimate the model and assess the significance of the findings: testing for unit roots, conducting an ARDL bounds test for cointegration, and estimating the ARDL model itself. The Augmented Dickey-Fuller and Phillips-Perron tests are used first, to confirm that no variable is integrated beyond I(1), the condition required for the ARDL approach with variables mixed across I(0) and

I(1). Second, the ARDL bounds test determines whether a long-run relationship exists between industrial sector growth and the explanatory variables; if the computed F-statistic exceeds the upper bound critical value, the null hypothesis of no cointegration is rejected, and the model estimates both long-run and short-run relationships. Where cointegration is not established, the analysis focuses solely on short-run relationships. Third, the ARDL model itself is estimated, using its lag structure to help mitigate the risk of spurious regression from endogeneity, an approach that also performs well with the relatively small sample sizes typical of single-country time series data.

The general ARDL specification for the study is expressed as follows:

$$\Delta LIND_t = \pi_0 + \sum_{i=1}^{n} \pi_1 \Delta LIND_{t-i} + \sum_{i=0}^{n} \pi_2 NRR_{t-i} + \sum_{i=0}^{n} \pi_3 \Delta GDPG_{t-i} + \sum_{i=0}^{n} \pi_4 \Delta INF_{t-i} + \sum_{i=0}^{n} \pi_5 \Delta LREXR_{t-i} + \sum_{i=0}^{n} \pi_6 \Delta RQ_{t-i} + \varepsilon_t \quad 3.3$$

Where equation (3) is the ECM dynamic ARDL regression equation with the variables remaining as earlier defined, $\pi_1$-$\pi_6$ are the short run parameter. The equation (3) will be estimated and used for the investigation of the study's hypothesis.

## 4.0. Result Presentation and Discussion of Findings

### 4.1. Presentation of Results

**Table 4.1: Descriptive Statistics**

| | LIND | NRR | GDPG | INF | LREXR | RQ |
|---|---|---|---|---|---|---|
| **Mean** | 9.166082 | 12.57665 | 4.081118 | 18.70559 | 4.608434 | -0.878038 |
| **Median** | 9.238787 | 13.09047 | 4.230061 | 13.00697 | 4.610195 | -0.940476 |
| **Maximum** | 9.644971 | 28.70544 | 15.32916 | 72.83550 | 5.609479 | 0.279770 |
| **Minimum** | 8.367250 | 2.684290 | -6.368900 | 5.388008 | 3.907510 | -1.292818 |
| **Std. Dev.** | 0.375262 | 5.784815 | 4.151732 | 15.86930 | 0.378802 | 0.273423 |
| **Skewness** | -0.965726 | 0.380346 | 0.106536 | 2.071452 | 0.634744 | 2.276574 |
| **Kurtosis** | 2.856476 | 3.282106 | 3.822569 | 6.495683 | 3.597391 | 10.82940 |
| **Observations** | 35 | 35 | 35 | 35 | 35 | 35 |

**Source: Authors' Regression Output (E-Views 9)**

The descriptive statistics for the variables used are presented in Table 4.1. Logged industrial sector growth (LIND) averages 9.1661, ranging from 8.3673 to 9.6450, with a standard deviation of 0.3753, indicating relatively stable growth over the sample period. Its skewness of -0.9657 indicates a moderately left-skewed distribution, and its kurtosis of 2.8565, close to the value of 3 associated with a normal distribution, indicates a distribution only slightly flatter than normal. Natural resource rent (NRR) averages 12.5767 percent of GDP, ranging from 2.6843 to 28.7054, with a standard deviation of 5.7848, reflecting

substantial variation in resource rents over the period. Its skewness of 0.3803 indicates a mildly right-skewed distribution, and its kurtosis of 3.2821 is close to the normal benchmark.

Economic growth (GDPG) averages 4.0811 percent, ranging from -6.3689 to 15.3292, with a standard deviation of 4.1517. This range, spanning an outright contraction and double-digit growth, points to real volatility in Nigeria's growth performance over 1990-2024. Its skewness of 0.1065 indicates a nearly symmetric distribution, and its kurtosis of 3.8226 indicates a mildly heavier-tailed distribution than normal. Inflation (INF) averages 18.7056 percent, with a minimum of 5.3880 and a maximum of 72.8355, and a standard deviation of 15.8693, reflecting substantial price pressure at points during the sample period. Its skewness of 2.0715 indicates a strongly right-skewed distribution, meaning most observations cluster at lower inflation rates with a long right tail of episodic high-inflation years, and its kurtosis of 6.4957 indicates a sharply peaked distribution relative to normal.

The real effective exchange rate (LREXR) averages 4.6084, ranging from 3.9075 to 5.6095, with a standard deviation of 0.3788. Its skewness of 0.6347 indicates a mildly right-skewed distribution, and its kurtosis of 3.5974 indicates a distribution slightly more peaked than normal. Regulatory quality (RQ) averages -0.8780, ranging from -1.2928 to 0.2798, with a standard deviation of 0.2734. The negative average indicates that Nigeria's regulatory quality score, on the Worldwide Governance Indicators scale, remained below the global mean for nearly the entire sample period. Its skewness of 2.2766 indicates a strongly right-skewed distribution, and its kurtosis of 10.8294, well above the normal benchmark, indicates a distribution with a sharp peak and heavy tails.

**Table 4.2: Correlation Matrix**

| | | | | | | |
|---|---|---|---|---|---|---|
| **LIND** | **1.000000** | | | | | |
| **NRR** | 0.583674 | 1.000000 | | | | |
| **GDPG** | 0.317145 | 0.201000 | 1.000000 | | | |
| **INF** | 0.145270 | 0.445010 | -0.373494 | 1.000000 | | |
| **LREXR** | -0.241914 | -0.420159 | -0.196553 | -0.093918 | 1.000000 | |
| **RQ** | -0.498927 | 0.007808 | -0.039245 | 0.073131 | 0.009561 | 1.000000 |

**Source: Authors' Regression Output (E-Views 9)**

According to the correlation matrix, natural resource rent has a strong positive correlation with industrial growth (0.5837), suggesting a positive association between resource rents and industrial growth at the bivariate level. Economic growth has a moderate positive correlation with industrial growth (0.3171), while inflation has only a weak positive correlation with industrial growth (0.1453). The real effective exchange rate has a weak negative correlation with industrial growth (-0.2419), consistent with the expectation that

currency depreciation could affect industrial performance. Regulatory quality has a moderate negative correlation with industrial growth (-0.4989), consistent with periods of weaker regulatory quality coinciding with periods of lower industrial growth.

The descriptive statistics and correlation analysis suggest that natural resource rents and macroeconomic variables are meaningfully related to industrial growth, providing a basis for the econometric analysis that follows, which formally tests these relationships.

**Table 4.3: Variance Inflation Factor (VIF)**

| | Coefficient | Centered |
|---|---|---|
| **Variable** | **Variance** | **VIF** |
| **NRR** | 0.000000 | 1.782849 |
| **GDPG** | 0.000152 | 1.453132 |
| **INF** | 0.000000 | 1.741275 |
| **LREXR** | 0.015546 | 1.238049 |
| **RQ** | 0.024250 | 1.006177 |
| **C** | 0.414993 | NA |

**Source: Authors' Regression Output (E-Views 9)**

Table 4.3 reveals the results of the VIF test. This test examines the issue of multicollinearity in the model. From the results, it is evident that multicollinearity does not exist in the model since all the cantered values are far below the standard cut-off point of 10. In this regard, it is evident that the model does not experience multicollinearity issues. In addition, it is evident that the maximum value of the VIF index is recorded for natural resource rent (NRR) at 1.7828, followed by inflation (INF) at 1.7413. GDP growth (GDPG) and real exchange rate (LREXR) report a VIF of 1.4531 and 1.2380, respectively, while the lowest value of the VIF index occurs for regulatory quality (RQ) and equals 1.0062. These low values ensure that the predicted coefficients are trustworthy and the model's conclusions are stable by confirming that the explanatory variables are not overly linked.

**Table 4.4: Unit Root Test-Trend and Intercept**

| **Variables** | **Standard unit root tests** | | | | **Results** |
|---|---|---|---|---|---|
| | **ADF** | | **Philips Perron** | | |
| | ***Level*** | ***First Diff.*** | ***Level*** | ***First Diff.*** | |
| **LIND** | -1.762445 | -4.228856*** | -1.394264 | -3.959928** | I(1) |
| **NRR** | -3.969819** | -7.027220*** | -3.361526* | -9.382188*** | I(0) |
| **GDPG** | -3.681964** | -8.905517*** | -3.797172** | -20.48474*** | I(0) |
| **INF** | -2.253723 | -4.579521*** | -2.595751 | -4.561461*** | I(1) |
| **RQ** | -2.211193 | -10.20599*** | -3.038560 | -9.823120*** | I(1) |
| **LREXR** | -2.291045 | -4.606622*** | -2.528010 | -4.524660*** | I(1) |

*Note: ***, **and * denote statistical significance at 1%, 5% and 10% levels, respectively.*

**Source: Authors' Regression Output (E-Views 9)**

The unit root test results for the study variables are shown in Table 4.4, using both the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests with a linear trend and intercept. The findings show that GDP growth (GDPG) and natural resource rent (NRR) are stationary at level, I(0), while industrial sector performance (LIND), inflation (INF), regulatory quality (RQ), and real exchange rate (LREXR) become stationary only after first differencing, I(1). The variables' order of integration is therefore either I(0) or I(1), which supports the suitability of the ARDL bounds testing method for examining the short-run and long-run relationships among them.

**Table 4.5: ARDL Bounds Test Results**

| Test Statistic | Value | k |
|---|---|---|
| **F-statistic** | 2.374401 | 5 |
| **Significance** | **I(0) Bound** | **I(1) Bound** |
| **10%** | 2.26 | 3.35 |
| **5%** | 2.62 | 3.79 |
| **2.5%** | 2.96 | 4.18 |
| **1%** | 3.41 | 4.68 |

** I(0) and I(1) are respectively the stationary and non-stationary bounds.*

**Source: Authors' Regression Output (E-Views 9)**

The results of the ARDL bounds test for identifying the existence of a long-term link between industrial sector growth (LIND) and the chosen variables are displayed in Table 4.5. For significance levels of 10%, 5%, 2.5%, and 1%, the F-statistic value of 2.374401 is found to be below the upper critical limit. This suggests that it is impossible to reject the null hypothesis that there is no long-term association. This result implies that there is no meaningful long-run equilibrium relationship between the chosen variables and the growth of the industrial sector over the given time period. Since the ARDL model permits short-run analysis even in the absence of a long-run link, the analysis will focus on the model's short-run relationships.

**Table 4.6: ARDL Results**

| **Short-Run** | | | |
|---|---|---|---|
| **Variables** | **Coeff** | **T-Stat** | **P-value** |
| **ΔNRR** | -0.010320 | -2.136025 | 0.0485 |
| **ΔGDPG** | 0.024076 | 4.658320 | 0.0003 |
| **ΔINF** | 0.004162 | 2.361506 | 0.0312 |
| **ΔLREXR** | -0.137601 | -2.117316 | 0.0502 |
| **ΔRQ** | 0.083305 | 1.004174 | 0.3302 |
| **C** | -0.570812 | -0.797833 | 0.4366 |

**Source: Authors' Regression Output (E-Views 9)**

Table 4.6 shows the results of the short-run ARDL model, which presents the findings of the immediate effects of natural resource rents, macroeconomic variables, and regulatory quality on industrial sector growth, (LIND).

With a coefficient of -0.010320 and a p-value of 0.0485, the findings showed that changes in natural resource rents (NRR) have a negative and substantial influence on

industrial growth. This indicates that changes in the rents for natural resources are somewhat impeding the expansion of industry. Industrial growth is positively and significantly impacted by economic growth (GDPG), with a p-value of 0.0003 and a coefficient of 0.024076. This demonstrates that industrial expansion is positively impacted by short-term economic growth. In a similar vein, industrial growth is positively and significantly impacted by inflation (INF), with a p-value of 0.0312 and a coefficient of 0.004162. This demonstrates that industrial output is not hampered by modest short-term price rises.

The real exchange rate (LREXR) adversely affects industrial growth, with a coefficient value of-0.137601 and a significance level of 0.0502. This result suggests that currency depreciation in the short run might have a negative effect on industrial performance. The regulatory quality (RQ) appears to be positive, though insignificant in its effect on industrial growth, with a coefficient value of 0.083305 and a significance level of 0.3302. This implies that short-run improvements in governance will have a little immediate effect on industrial production. However, the constant term has a negative value of-0.570812, which is insignificant at a level of significance of 0.4366; this represents the existing constraints on industrial growth when all explanatory variables are assumed to be zero.

Overall, the results show that economic growth, inflation, and natural resource rents are the major determinants of industrial growth in the short run, while exchange rate movements and institutional improvements have modest or limited short-term effects.

**Table 4.7: Diagnostic Tests**

| Specifications | LIND |
|---|---|
| **$R^2$** | 0.984990 |
| **Durbin Watson** | 2.42 |
| **Breusch-Godfrey** | 1.680619/0.2217 |
| **Breusch-Pagan** | 0.951044/0.5365 |
| **ARCH LM** | 1.290806/0.2652 |
| **RAMSEY** | 0.554786/0.4679 |
| **F-Bounds Test** | 2.374401 |

**Source: Author Regression Output (E-Views 9)**

Table 4.7 presents the results from the diagnostic tests for the ARDL model examining industrial sector growth (LIND) in Nigeria. The results confirm that the model is reliable for short-run estimation, confirming the reliability of the short-run estimates. The R-Squared value is 0.984990, which indicates that the independent variables explain a larger proportion of industrial sector growth. The Durbin-Watson value is 2.42, suggests that there is no autocorrelation between the residuals.

The Breusch-Godfrey test for serial correlation yielded a result of 1.680619 with

a corresponding probability value of 0.2217, indicating that the residuals do not exhibit serial correlation. A value of 0.951044 and a corresponding probability value of 0.5365 were obtained from the Breusch-Pagan test for heteroscedasticity. A result of 1.290806 and a corresponding probability value of 0.2652 were obtained from the ARCH-LM test. These findings imply that the error term's variance is constant. The model appears to be correctly described based on the Ramsey RESET test result of 0.554786 with a matching probability value of 0.4679. There is no long-run equilibrium relationship between the variables, as confirmed by the F-Bounds test result of 2.374401, which is less than the upper critical value at a 5% level of significance.

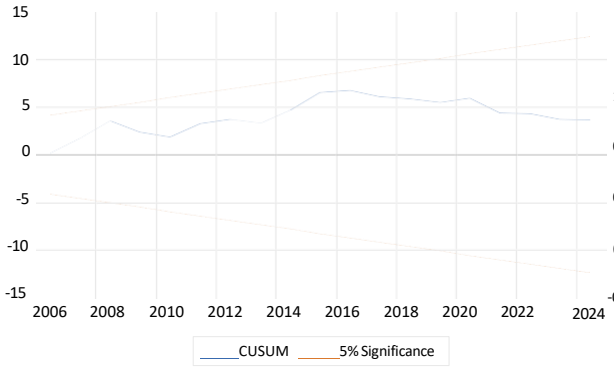



*Figure 4.1: CUSUM Test*

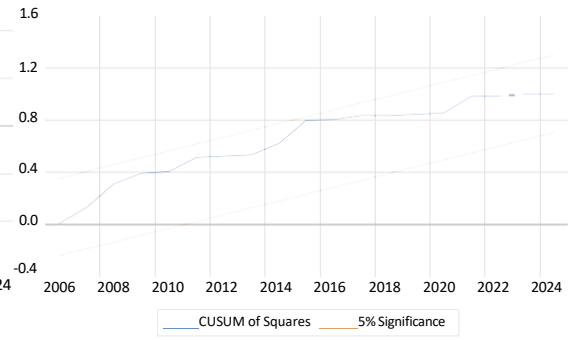



*Figure 4.2: CUSUM of Squares Test*

**Source: Authors' Regression Output (E-Views 9)**

The CUSUM and CUSUMSQ tests (Figures 4.1 and 4.2) are used to assess the parameter stability further. Both tests indicate that the parameters are stable and that there is no structural break because the cumulative residuals fall inside the critical boundaries at a 5% level of significance. All things considered, the diagnostic tests verify that the ARDL model is robust, well-specified, and suitable for examining the short-term dynamics of industrial growth in Nigeria.

### 4.2. Discussion of Findings

The short-run effect of natural resource rents (NRR) on industrial sector growth (LIND) in Nigeria is negative and statistically significant. A rise in resource rent dependence has an immediate dampening effect on industrial output, consistent with capital being diverted toward extractive activity and away from manufacturing investment. This result aligns with the Resource Curse Theory and the Dutch Disease Theory discussed in Section 2.2, both of which predict that resource dependence crowds out industrial activity and weakens structural transformation. It is also consistent with Mamba (2025) and Nwani et al. (2023), who find that rising resource rents reduce industrial output growth in Sub-Saharan

Africa. The consistency across a single-country ARDL result and cross-country panel evidence suggests the crowding-out effect is not an artifact of Nigeria's specific institutional setting, but reflects a mechanism general enough to hold across different estimation approaches and country samples.

Economic growth (GDPG) has a positive and significant impact on industrial sector growth. This indicates that periods of macroeconomic expansion immediately support industrial output, by improving investment opportunities, stimulating demand for goods, and raising capacity utilization. This result is consistent with the Endogenous Growth Theory discussed in Section 2.2, which emphasizes the role of capital accumulation, technological adoption, and innovation in driving sectoral productivity. It also aligns with Adabor et al. (2022), who find that economic growth in resource-dependent economies supports sectoral performance when resources are productively managed. Read together with the negative NRR finding above, this points to a specific policy distinction: it is not economic growth itself that hurts industrial performance in Nigeria, but the composition of that growth, since growth driven by resource rents appears to work against industrial expansion, while broader GDP growth supports it.

Inflation (INF) also has a positive and significant short-run impact on industrial sector growth. A moderate level of price increases does not appear to impede production in the short run, and may even encourage firms to raise output or pass rising costs on to final prices rather than cut production. This relationship is consistent with cost-push reasoning, where input price changes shape production decisions in the short term rather than deterring them outright. Oyinlola et al. (2019) similarly find a short-run inflation effect on industrial sector growth in resource-dependent economies, though their study does not test whether this effect persists over longer horizons, something this study's own bounds test result suggests it may not, given that no long-run relationship among these variables could be established.

The real exchange rate (LREXR) has a negative and significant impact on industrial sector growth in Nigeria. Currency depreciation raises the cost of capital and intermediate inputs, which can impede industrial output in the short run. This finding is consistent with the Dutch Disease mechanism discussed in Section 2.2, where exchange rate movements in resource-dependent economies erode the competitiveness of tradable sectors, including manufacturing. It also aligns with Xue et al. (2023), who find that exchange rate

variability suppresses industrial production in resource-rent-dependent economies, and with Chaffai and Plane (2025), whose finding that resource rents distort standard measures of exchange rate misalignment offers a direct explanation for why this channel matters specifically in a resource-dependent economy like Nigeria's, rather than in a generic small open economy.

Regulatory quality (RQ) has a positive but statistically insignificant effect on industrial sector growth in Nigeria in the short run. Although the coefficient is not significant, its direction is consistent with the Endogenous Growth Theory's emphasis on institutional quality as a channel supporting industrial productivity, even though this study's short-run results cannot confirm that channel is currently operating with any strength in Nigeria. This is also consistent with the nonlinear relationship Kouladoum et al. (2025) find between resource rent dependency and macroeconomic stability: at Nigeria's current level of regulatory quality, shown in Table 2 to sit well below the global mean throughout the sample period, the stabilizing effect that institutions need to provide before resource rents can translate into industrial gains may simply not yet be strong enough to register as statistically significant.

In essence, the short-run ARDL results suggest that resource rent dependence, economic growth, inflation, and exchange rate movements are the significant short-run determinants of industrial sector growth in Nigeria, while the effect of institutional quality remains statistically marginal at current levels. The results underscore the need to manage resource rents and macroeconomic conditions carefully, and to maintain exchange rate stability, if Nigeria's industrial sector is to perform well while the economy remains resource-dependent.

## 5.0. Conclusion and Policy Recommendations

This study examined the relationship between natural resource rents and industrial sector growth in Nigeria between 1990 and 2024, using GDP growth, inflation, the real exchange rate, and regulatory quality as control variables. No long-run relationship was found among the variables, so the analysis focused on the short run, where the evidence points clearly in one direction: natural resource rents constrain Nigeria's industrial sector growth, while broader economic growth supports it.

The empirical findings show that natural resource rents have a negative and significant effect on industrial sector growth in the short run, consistent with increased dependence on resource revenue diverting capital and policy attention away from manufacturing and productive industrial activity. This reflects

the kind of structural distortion commonly associated with resource-dependent economies, where extractive activity crowds out industrial expansion. Economic growth has a positive and significant effect, indicating that overall economic expansion supports investment and productive capacity in the industrial sector. Inflation also has a positive and significant short-run effect, suggesting that the inflationary conditions observed in this sample did not constrain industrial growth and may instead reflect active demand conditions. The real exchange rate has a negative and significant effect, indicating that currency depreciation raises the cost of imported inputs and capital goods, limiting industrial productivity. Regulatory quality has a positive but statistically insignificant effect, meaning this study cannot conclude that regulatory quality currently shapes industrial sector growth in Nigeria, even though the direction of the result is consistent with what stronger institutions would be expected to contribute.

The results have four policy implications. First, Nigeria should reduce its dependence on natural resource rents by encouraging diversification toward manufacturing and value-added sectors, and by channelling resource rents strategically into industrial infrastructure, technology, and human capital development. Second, macroeconomic stability needs to remain a policy priority, since sustained growth and managed inflation support industrial sector performance. Third, exchange rate policy needs to keep domestic industry competitive, particularly given the sector's reliance on imported machinery and intermediate goods. Fourth, institutional reforms aimed at improving regulatory quality, policy consistency, and transparency would help create a more attractive environment for investment in the sector.

Nigeria's industrial sector growth is shaped by how effectively resource rents are managed and directed into productive investment. Without diversification into non-resource production and without stronger institutional quality, resource rents will continue to constrain rather than support industrial sector growth. Future research should examine how Nigeria's industrial sector responds to resource rents over the long run, once sufficient data allow a cointegrating relationship to be tested, and the role that improvements in institutional quality could play in that relationship.

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