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FOREIGN DIRECT INVESTMENT, TRADE REGIMES, AND THE MANUFACTURING WAGE-PRODUCTIVITY NEXUS IN NIGERIA: EMPIRICAL EVIDENCE OF A BROKEN TRANSMISSION MECHANISM

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ABSTRACT

Foreign direct investment (FDI) is theoretically posited as a catalyst for industrial productivity and wage growth in emerging economies. However, the Nigerian manufacturing sector presents a confounding paradox, having witnessed persistent wage stagnation and a decoupling of labour rewards from productivity indices. The study employed an Autoregressive Distributed Lag (ARDL) bounds testing approach and its re-parameterized Error Correction Model (ECM) to analyse how trade openness and tariff structures condition the FDI-productivity relationship. Results reveal a significant long-run cointegrating relationship, yet the interaction between trade openness and FDI (FDI x TRO) exhibits a statistically significant negative coefficient (-0.344), implying that in the absence of robust domestic infrastructure, trade liberalization encourages import-oriented investment that "hollows out" domestic industrial value rather than fostering efficiency-seeking manufacturing. The study results revealed a severe structural break in 2024, where a 55% collapse in MVA coincided with a significant currency devaluation, further severing the link between nominal capital inflows and real labour welfare. The ECM coefficient (-0.624) indicates a moderate speed of adjustment, with 62.4% of equilibrium deviations corrected annually. The study recommends a strategic recalibration of trade policy and exchange rate stabilization.

Keywords: *Foreign Direct Investment, Manufacturing Wages, Trade Openness, Nigeria, Transmission Mechanism.*

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1. Introduction

The integration of national economies into global value chains (GVCs) has established foreign investment as a central pillar of contemporary economic globalization. Since the transition to democratic rule in 1999, Nigeria has aggressively courted Foreign Direct Investment (FDI), premised on the neoliberal consensus that such inflows stimulate capital accumulation, enhance total factor productivity (TFP), and facilitate technology transfer (Li & Tanna, 2019; Liu & Wang, 2003; Yang, 2024). The theoretical expectation, grounded in neoclassical growth models, is that FDI acts as a conduit for superior managerial expertise and technological know-how, which spills over to domestic firms, raises the marginal product of labour, and consequently drives up wages (Onyejiuwa & Ogbaisi, 2022; Ahn, 2024; Exadaktylos et al., 2024).

However, the labour market consequences of these inflows (FDIs) remain a subject of intense empirical contestation in sub-Saharan Africa. While developed economies often witness a foreign wage premium, where multinational enterprises (MNEs) pay higher wages to attract talent, Nigeria's manufacturing sector appears to be trapped in a cycle of wage polarization and stagnation (Punch Editorial Board, 2025; World Bank Group, 2023). Despite periods of robust headline growth and significant FDI inflows peaking at over \$8.8 billion in 2011 (Statista Research Department, 2024), the manufacturing sector's contribution to dignified labour compensation has remained fragile. This divergence raises fundamental questions about the transmission mechanism linking foreign capital to local labour welfare.

The urgency of this inquiry is underscored by the macroeconomic unravelling observed in the 2024 fiscal year. Following the unification of exchange rate windows and the removal of fuel subsidies, the Nigerian manufacturing sector experienced a catastrophic shock. Data from the study period reveals that Manufacturing Value Added (MVA) (a proxy for the sector's wage-paying capacity) collapsed from \$55.9 billion in 2023 to \$25.36 billion in 2024 (Alli, 2024; TheGlobalEconomy.com, 2024). This precipitous decline, occurring amidst an inflation and exchange rates crisis, suggests that the link between global integration and local prosperity is not merely inefficient but fundamentally broken.

This study examined the impact of foreign investments on manufacturing wages and the mediating role of trade policies. Unlike previous studies that treat wages and trade policy in isolation, this research models the interaction between FDI and trade openness. It seeks to determine whether trade liberalization amplifies the benefits of FDI or dampens them by exposing domestic industry to import dumping and tariff-jumping investments that hollow out the industrial base.

The manufacturing sector remains central to Nigeria's ambition for structural transformation, employment generation, and productivity growth. Yet despite repeated policy pushes to attract foreign capital, the sector's contribution to output and formal employment has remained fragile and uneven (Adegbite, 2021, pp. 21–22). Policymakers therefore pursue foreign direct investment (FDI) and other foreign capital inflows as a vehicle for re-energising manufacturing, the argument being that foreign firms bring capital, technology, managerial know-how, and linkages that raise productivity and create quality jobs. However, the empirical and policy evidence shows that FDI's effects on labour markets and on the orientation of trade policy are heterogeneous and sometimes contradictory across countries and sectors (OECD, 2022, pp. 8–13). This heterogeneity raises the central problem motivating this study: under what conditions does foreign investment in Nigeria's manufacturing sector raise wages, and how do these investment flows interact with trade policy choices to shape wage outcomes?

First, the labour-market consequences of foreign entry are ambiguous. While foreign-owned firms can pay a wage premium and increase demand for skilled workers, they may also reorganize production, compress local bargaining power, and generate crowding effects that depress wages in domestic suppliers or competing firms (Modrego et al., 2022; Nguyen, 2019). Empirical studies from developing and middle-income economies show both positive employment effects and limited or negligible wage gains (Modrego et al., 2022). Nigeria-specific empirical work similarly points to strong sensitivity of manufacturing FDI to macroeconomic and policy conditions (exchange rates, interest rates, inflation, external reserves), indicating that FDI may not automatically translate into better wages unless broader policy constraints are addressed (Agbonkhese & Udegbole, 2024, p. 10). Thus, the problem is not only whether FDI arrives, but whether and how the character (quality), sectoral allocation, and policy environment of such FDI lead to wage improvements for Nigerian manufacturing workers.

Second, trade policy forms a complementary and sometimes conflicting channel through which foreign investments affect wages. Tariffs and non-tariff measures, trade liberalization of inputs and outputs, and linkages to global value chains determine whether foreign firms compete with, displace, or upgrade domestic producers. Trade liberalization can raise wages in export-oriented firms while lowering wages in import-competing establishments (Amiti & Davis, foundational empirical work; see also trade literature summarized in IMF, 2021). For Nigeria, persistent policy oscillations between protectionist measures and openness, coupled with weak domestic supplier capacity, create uncertain wage consequences when foreign firms enter the manufacturing sector (Onyejiuwa et al., 2024; Adegbole, 2021, p. 25). If trade policy priorities are misaligned with industrial and labour objectives, FDI that is attracted primarily through tariff-based protection or tax concessions may foster low-quality, import-competing activities that generate limited wage gains or even wage stagnation.

Third, the quality of FDI matters. Recent policy work emphasizes that, beyond quantity, FDI's developmental qualities (technology transfer, linkages, job quality, gender inclusive employment) determine whether local wages and skills improve (OECD, 2022, pp. 12–13). In countries that combine targeted industrial policy, skills upgrading, and linkages promotion, foreign investment has a greater chance of raising wages and producing inclusive gains. In Nigeria, however, weak backward linkages, bottlenecks in infrastructure and financial markets, and inconsistent industrial policy reduce the capacity of foreign manufacturing affiliates to generate broad-based wage improvements (Adegbole, 2021, pp. 28–31; Agbonkhese & Udegbole, 2024).

Fourth, distributional effects across skill groups and regions are an unresolved problem. Evidence from middle-income and developing countries frequently finds that FDI increases demand for skilled labour more than for unskilled labour, producing skill-biased wage effects and greater wage dispersion unless accompanied by education and labour-market policies (Modrego et al., 2022). In Nigeria, where regional disparities and skills mismatches are large, an inflow of manufacturing FDI concentrated in a few regions or skill-intensive subsectors could widen inequality even while boosting average productivity. The problem is therefore one of distributional trade-offs: attracting FDI that raises aggregate output but leaves wages for the typical manufacturing worker unchanged or worse.

Also, empirical identification problems and data gaps complicate policymaking. Firm-level and sectoral wage data, information on ownership structure, and precise measures of trade policy exposure are limited or fragmented for Nigeria. (Agbonkhese & Udegbole, 2024; Adegbole, 2021).

In summary, the problem this study addresses is both empirical and policy-relevant: Nigeria needs clearer evidence on how the quantity, quality, and sectoral composition of foreign investments, together with specific trade policy choices, affect wage levels and wage distribution in manufacturing. Resolving this problem will

help design policies that use foreign investment to foster higher wages, better jobs, and more equitable industrial development rather than simply raising headline FDI figures without improving living standards for workers.

Research Questions

Therefore, the study seeks to provide a solution to the following questions:

- a) What is the direct effect of foreign direct investment (FDI) inflows on aggregate wage levels in Nigeria's manufacturing sector in Nigeria?
- b) How can trade policy variables (openness and tariffs) moderate the relationship between FDI and manufacturing wages in Nigeria?
- c) What are the long-run and short-run dynamic adjustments of manufacturing wages in Nigeria?

Objectives of the Study

Therefore, the study specifically aims to achieve the following:

- d) To examine the direct effect of foreign direct investment (FDI) inflows on aggregate wage levels in Nigeria's manufacturing sector.
- e) To assess how trade policy variables (openness and tariffs) moderate the relationship between FDI and manufacturing wages.
- f) To determine the long-run and short-run dynamic adjustments of manufacturing wages

Geographically, the study is limited to Nigeria, given its strategic position as one of the largest recipients of foreign direct investment (FDI) in sub-Saharan Africa. The study covers the period from 2002 to 2024 for which reliable data are available, reflecting Nigeria's post-democratic reform era and increased integration into the global economy. Methodologically, the scope is confined to the use of secondary macroeconomic data and policy documents, employing econometric and qualitative analytical techniques. While the study seeks to provide robust insights, it does not undertake firm-level surveys or micro-level household wage analysis, which are acknowledged as limitations and potential areas for future research.

Overall, the study is designed to generate empirically grounded insights into how foreign investments and trade policies jointly influence wage outcomes in Nigeria's manufacturing sector, while recognizing the limitations imposed by data availability and the need for focused analysis.

2. Literature Review

2.1 Conceptual Clarifications

Foreign Investments

This study focuses on Foreign Direct Investment (FDI), defined as cross-border investment where a resident entity exercises significant influence over an enterprise in another economy. Unlike portfolio flows, FDI is distinct in its potential to generate productivity spillovers and modify wage-setting mechanisms.

Wages and Trade Policies

In this macro-analysis, wages refer to the average real compensation in the manufacturing sector. This accounts for the monetary compensation paid to workers, adjusted for inflation.

These encompass government measures regulating international trade, including tariffs, quotas, and liberalization measures. In Nigeria, these policies have been characterized by frequent shifts between the "import substitution" logic and regional integration efforts like the AfCFTA.

Nexus of Foreign Investments, Wages, and Trade Policies

OECD (2007) gives the relationship between foreign investment, wages, and trade policy can be defined as an intricate interaction where trade policies influence a country's ability to attract foreign direct investment (FDI), which in turn can affect domestic wage levels and potentially wage inequality. The conceptual linkage among foreign investments, wages, and trade policies is grounded in theories of FDI spillovers, international trade, and labour-market dynamics. Foreign investments influence wages directly through firm-level wage-setting practices and indirectly through competition, labour mobility, and supplier linkages. Trade policies act as a mediating framework that shapes the extent to which these wage effects materialize.

Nigeria's manufacturing sector, understanding this interrelationship is critical for designing policies that harness foreign investments for inclusive wage growth rather than uneven or limited labour-market gains. As emphasized by Helpman (2018), globalization-related outcomes, including wage changes, depend not solely on capital inflows but on domestic policy choices and institutional capacity (pp. 101–104).

2.2 Theoretical Literature

The theoretical literature on foreign investments, wages, and trade policies is rooted in classical, neoclassical, and contemporary globalization theories that explain how international capital flows interact with labor markets and state policy choices. These theories provide a framework for understanding the channels through which foreign investments influence wage dynamics and trade policy orientation in both developed and developing economies, including Nigeria.

New Trade Theory and New Economic Geography

Emphasizes increasing returns to scale, imperfect competition, and firm heterogeneity. Helpman (2018) argues that multinational firms engage in foreign investment to exploit scale economies and access new markets, influencing wage structures through productivity differentials between foreign-owned and domestic firms (pp. 140–147). This framework explains why foreign firms often pay higher wages but employ a limited segment of the labor force, leading to wage inequality. Trade policies under this theory are shaped by strategic considerations, as governments liberalize trade and investment regimes to attract globally competitive firms, sometimes prioritizing efficiency over equity.

Global Value Chain (GVC) Theory

Provides further insight into the relationship between foreign investment and wages. GVC theory suggests that foreign investments integrate host economies into fragmented global production networks, determining wage outcomes based on a country's position within the value chain (Salvatore, 2020, pp. 320–326). Developed economies typically occupy high-value segments associated with higher wages, while developing economies, including Nigeria, are often positioned in low-value, labor-intensive segments with limited wage growth. Trade policies in this context are oriented toward openness and export competitiveness to maintain participation in global chains.

This study anchors its analysis on a synthesis of two complementary theoretical frameworks that explain the mechanisms of international production and income distribution. The theories are the Electic (OLI) paradigm and the Heckscher–Ohlin (H-O) & Stolper–Samuelson Theorem and the Electic (OLI) paradigm.

The Eclectic (OLI) Paradigm

Developed by John Dunning, the OLI framework posits that firms invest abroad to exploit Ownership, Location, and Internalization advantages (Dunning, 1980). For Nigeria, Location advantages (historically characterized by cheap labour and a large domestic market) are the primary attractors. Theoretically, as foreign firms utilize these advantages, they transfer Ownership assets (technology, brand equity) to the local subsidiary. This transfer should raise the marginal product of labour in the host economy (Dunning, 2000). However, if the location advantage is eroded by infrastructural deficits, the cost of doing business absorbs the productivity surplus, preventing it from trickling down to wages.

The Heckscher–Ohlin (H-O) & Stolper-Samuelson Theorem

The H-O theory suggests that countries export goods that use their abundant factors intensively (Feenstra & Taylor, 2017; Krugman et al., 2018). Nigeria, being labour-abundant, should attract investment in labour-intensive sectors, increasing the demand for unskilled labour and raising wages. However, the Nigerian anomaly frequently contradicts this prediction. Instead of converging, wages have polarized, potentially due to Skill-Biased Technological Change embedded within modern FDI, where MNEs demand skilled labour that is scarce, exacerbating inequality.

2.3 Empirical Review

Empirical evidence on the FDI-wage nexus is mixed. In OECD countries, a robust "foreign wage premium" is observed. However, in the Global South, results are heterogeneous. Studies on ASEAN economies suggest that while FDI boosts wages, it can exacerbate inequality if domestic absorptive capacity is low. In the Nigerian context, previous literature has largely focused on the growth effects of FDI, often neglecting the distributive aspect. Recent studies have highlighted the destabilizing effect of exchange rate volatility on real wages, but few have empirically modelled the interaction between trade openness and FDI to see how policy regimes condition these outcomes. This study fills that gap by introducing an interaction term in the econometric specification.

Chen & Zhou (2024) examine how participation in Global Value Chains (GVCs) affects manufacturing productivity across Asian economies, using panel regression techniques. GVC participation has a statistically significant positive effect on manufacturing productivity. Countries more integrated into global production networks experience higher total factor productivity (TFP). GVC integration enables: Access to foreign technology, Learning-by-doing effects, and Improved resource allocation. Through technological transfer, Firms gain access to advanced production techniques through imported inputs and partnerships. Empirical literature confirms that GVCs facilitate knowledge diffusion across borders. Also, Scale and Efficiency Effects Integration increases market size and competition, pushing firms to become more productive.

Singh & Kaur (2023) explore the effects of trade liberalization on India's manufacturing sector using a Panel ARDL approach. The study examines how trade liberalization impacts various aspects of manufacturing, such as productivity, employment, and economic growth, by utilizing statistical values to substantiate its findings. Trade liberalization has been seen to significantly enhance the productivity of manufacturing firms in India. The reduction in output tariffs has a more substantial positive impact

on total factor productivity (TFP) than input tariff reductions. Firm-level data analysis indicates that trade liberalization motivates firms to become more efficient and competitive in the global market.

The study carried out by Ojo and Ogunleye (2021) analyzes the impact of technological leapfrogging on manufacturing value-added (MVA) in Sub-Saharan Africa (SSA). Specifically, it explores whether utilizing advanced foreign technologies without passing through intermediate stages can improve industrial performance. The study was carried out in Sub-Saharan Africa between 1990 and 2018. The findings of this research, which was analysed using CS-ARDL, tell us that technological leapfrogging significantly increases manufacturing value-added in SSA. Also, SSA countries can skip obsolete, inefficient technologies and directly embrace modern ones, thereby elevating productivity. The implementation of foreign technologies inspires domestic creativity, which can ultimately lead to indigenous technological development.

Ebele Sabina (2024) examines the influence of Foreign Direct Investment (FDI) on the growth trajectory of the manufacturing sector in Sub-Saharan Africa. The research uses the panel Autoregressive Distributed Lag (ARDL) estimation technique on data spanning from 1985 to 2021. The findings show that FDI and TOP (Total Output) positively influence the manufacturing sector's growth in the long run, while Gross Capital Formation (GFCF) exerts a negative influence. However, these effects are not observed in the short run. The study emphasizes the need for policies that enhance the investment climate and support trade openness to encourage manufacturing sector growth.

The empirical review of Armah & Yamoah (2026) on Foreign Direct Investment (FDI), labor markets, and income distribution in Sub-Saharan Africa, with the use of conceptual and empirical studies, shows a significant understanding of the interaction between FDI and labor dynamics. Their findings harmonize with existing literature, indicating that FDI positively influences employment and labor market structures, while also highlighting the importance of institutional quality in mediating these effects. FDI is linked with expanded employment opportunities in Sub-Saharan Africa, as evidenced by Mayom's study, which found a significant positive correlation between FDI inflows and job creation (Mayom, 2014). Hoekman et al. noted that FDI enables the change towards modern industries and higher-skilled occupations, contributing to structural transformation in local labor markets (Hoekman et al., 2025).

Studies carried out by Adegbite and Ayadi (2011) in Nigeria, between the FDI and Economic Growth in Nigeria. Study shown a positive long-run relationship between FDI and Growth. It further gives the notable role of FDI in boosting economic performance. Their results align with subsequent research indicating that FDI functions as a catalyst for growth through capital formation and technology transfer. The study revealed a direct relationship between FDI inflows and economic growth, indicating that elevated FDI correlates with improved economic performance. Statistical analysis using cointegration and the Error Correction Model (ECM) suggests that this relationship is significant at 5% level, strengthening the concept that a robust economy attracts more FDI. This study fills the gap of liberalizing the foreign sector by lowering trade barriers like tariffs and levies to foster FDI inflows.

Keji (2023) accesses the industrial output growth and FDI in Nigeria using ARDL, Cointegration, and ECM techniques, revealing that there is a notable connection both in the long-run and short-run relationship between FDI and Industrial output growth in Nigeria. Also, unlike theoretical

expectations, the study found that FDI has a negative time-path relationship with output growth, which means increased FDI inflows do not convert to improved industrial output growth. FDI was revealed as statistically significant in driving industrial output in both the long and short run. A major empirical interpretation provided a 60% of FDI inflows are centered in the oil sector, with little going to the industrial sector, which leads to weakened industrial expansion and limited ripple effect to manufacturing and production. Variables like labour participation rate and exchange rate substantially affect industrial output, while some, like inflation and trade openness, were not consistently significant.

Adegboye & Iweriebor (2023) emphasize the positive impact of Foreign Direct Investment (FDI) on manufacturing performance in Nigeria, particularly through the ARDL model. However, the analysis of labour output appears weak, suggesting that while FDI strengthens output, its influence on labour productivity is less significant. The impact of labor on manufacturing output is positive but statistically insignificant, showing that the sector is more capital-driven.

Agu et al. (2025) examine the nexus between Foreign Direct Investment (FDI), financial development, and productivity in Nigeria. The study employs time series analysis, employing the Autoregressive Distributed Lag (ARDL) model and Granger causality tests to assess the relationships among these variables. The findings indicate that while FDI positively influences productivity, financial development has a significant negative impact, suggesting that the effectiveness of FDI in enhancing productivity is contingent upon the state of financial development. Also, FDI has a statistically significant long-term positive effect on economic productivity in Nigeria (Agu et al., 2024). Other studies confirm that FDI contributes positively to GDP growth and trade balance, indicating a strong link between foreign investments and economic performance

Aluko & Ibrahim (2023) highlight the complex relationship between trade openness and wage dynamics in Nigeria, revealing that the effects are irregular across different sectors. The study employs a Vector Autoregression (VAR) model, indicating that while trade openness can influence wages, the link to productivity remains weak. This overview sets the stage for a deeper exploration of the findings. The study found that trade openness affects wages variably, with significant implications for different sectors, particularly agriculture and manufacturing. The adverse effects on wages are more pronounced than on employment, suggesting that while jobs may not be lost, wage levels can decline due to increased competition from imports. The study indicates a weak connection between trade openness and productivity, aligning with findings from Adofu & Okwanya (2023), which suggest that total factor productivity does not significantly impact industrial output in Nigeria (Adofu & Okwanya, 2017).

Literature Gap

A key gap in the Nigerian literature is the limited integration of wage analysis with trade policy variables in a single empirical framework. Most studies focus either on FDI growth relationships or on trade policy impacts without explicitly examining wage outcomes in manufacturing. While developed economies benefit from stronger complementarities between FDI and trade openness, developing economies, including Nigeria, face structural and policy constraints that weaken wage transmission.

A major empirical gap in the Nigerian literature is the limited integration of trade policy variables into wage-focused FDI analyses. Most Nigerian studies emphasize output growth or investment inflows, with insufficient attention to wage outcomes and policy mediation. This study addresses this gap by empirically examining how foreign investments and trade policies jointly influence wage dynamics in Nigeria's manufacturing sector.

3. Methodology

Methodological Framework

This study anchors its analysis on a synthesis of two complementary theoretical frameworks that explain the mechanisms of international production and income distribution. The theories are the Eclectic (OLI) paradigm and the Heckscher–Ohlin (H-O) & Stolper-Samuelson Theorem and the Eclectic (OLI) paradigm.

The Eclectic (OLI) Paradigm

Developed by John Dunning, the OLI framework posits that firms invest abroad to exploit Ownership, Location, and Internalization advantages (Dunning, 1980). For Nigeria, Location advantages (historically characterized by cheap labour and a large domestic market) are the primary attractors. Theoretically, as foreign firms utilize these advantages, they transfer Ownership assets (technology, brand equity) to the local subsidiary. This transfer should raise the marginal product of labour in the host economy (Dunning, 2000). However, if the location advantage is eroded by infrastructural deficits, the cost of doing business absorbs the productivity surplus, preventing it from trickling down to wages.

The Heckscher–Ohlin (H-O) & Stolper-Samuelson Theorem

The H-O theory suggests that countries export goods that use their abundant factors intensively (Feenstra & Taylor, 2017; Krugman et al., 2018). Nigeria, being labour-abundant, should attract investment in labour-intensive sectors, increasing the demand for unskilled labour and raising wages. However, the Nigerian anomaly frequently contradicts this prediction. Instead of converging, wages have polarized, potentially due to Skill-Biased Technological Change embedded within modern FDI, where MNEs demand skilled labour that is scarce, exacerbating inequality.

Data Sources

The study utilized time-series data covering the period 2002–2024. This timeframe captures the entire Fourth Republic's economic trajectory, including the 2004 banking consolidation, the 2016 recession, and the 2024 macro-fiscal reforms. Methodologically, the scope is confined to the use of secondary macroeconomic data and policy documents, employing econometric and qualitative analytical techniques. While the study seeks to provide robust insights, it does not undertake firm-level surveys or micro-level household wage analysis, which are acknowledged as limitations and potential areas for future research.

Manufacturing Value Added (MVA): Sourced from World Bank WDI and CBN Statistical Bulletin (in US Billions). MVA serves as the proxy for the sector's aggregate wage-paying capacity (wage fund).

Foreign Direct Investment (FDI): Net inflows in US Millions (UNCTAD/CBN).

Trade Openness (TRO): The sum of exports and imports as a percentage of GDP.

Interaction Term (FDI*TRO): Calculated to capture the moderating effect of trade policy on FDI.

Control Variables: Inflation Rate (CPI), Exchange Rate (NGN/USD), and Tariff Rates.

Model Specification

To investigate the relationship between FDI, trade regimes, and manufacturing value added (the proxy for the sector's wage-paying capacity), we specify a dynamic model. Unlike static models, the Autoregressive Distributed Lag (ARDL) framework accounts for the time-lagged effects of investment on industrial output. The model function is specified thus:

$$MVA = f(FDI, TRO, FDI \times TRO, TAR, INF, EXR) \dots\dots\dots (1)$$

The ARDL Bounds Testing Equation:

$$\begin{aligned} \Delta \ln MVA_t = & \alpha_0 + \sum_{i=1}^p \gamma_i \Delta \ln MVA_{t-i} + \sum_{i=0}^{q1} \delta_1 \Delta \ln FDI_{t-i} + \sum_{i=0}^{q2} \delta_2 \Delta \ln TRO_{t-i} + \\ & \sum_{i=0}^{q3} \delta_3 \Delta (FDI \times TRO)_{t-i} + \sum_{i=0}^{q4} \delta_4 \Delta TAR_{t-i} + \sum_{i=0}^{q5} \delta_5 \Delta INF_{t-i} + \sum_{i=0}^{q6} \delta_6 \Delta \ln EXR_{t-i} + \\ & \lambda_1 \ln MVA_{t-i} + \lambda_2 \ln FDI_{t-i} + \lambda_3 \ln TRO_{t-i} + \lambda_4 \ln (FDI \times TRO)_{t-i} + \lambda_5 TAR_{t-i} + \\ & \lambda_6 INF_{t-i} + \lambda_7 EXR_{t-1} + \epsilon_t \dots\dots\dots (2) \end{aligned}$$

Where,

- Δ = First difference operator;
- γ_i and $\delta_1, \dots, \delta_1$ = Short-run dynamics;
- $\lambda_1, \dots, \lambda_6$ = Long-run multipliers;
- p, q = Optimal lag lengths selected via Akaike Information Criterion (AIC).

The Long-Run Model

If the F-statistic from the Bounds Test exceeds the critical upper bound, a long-run equilibrium exists. The long-run equation is specified as:

$$\ln MVA_t = \beta_0 + \beta_1 \ln FDI_t + \beta_2 TRO_t + \beta_3 (FDI \times TRO)_t + \beta_4 TAR_t + \beta_5 INF_t + \beta_6 \ln EXR_t + \mu_t \dots\dots\dots (3)$$

The Short-Run Error Correction Model (ECM)

To capture the speed of adjustment and the immediate impact of policy shocks, the Error Correction Model is specified. Based on the empirical selection in this study, the model is:

$$\Delta \ln MVA_t = \alpha_0 + \delta_1 \Delta \ln FDI_t + \delta_2 \Delta TRO_t + \delta_3 \Delta (FDI \times TRO)_t + \delta_4 \Delta \ln EXR_t + \phi ECM_{t-1} + e_t \dots\dots\dots (4)$$

Where:

- ECM_{t-1} = The lagged Error Correction Term, representing the speed of adjustment back to equilibrium.
- ϕ = The coefficient of adjustment, which must be negative and statistically significant.

Description of Variables and Data Sources

Annual time-series data (2002–2024) were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin and World Development Indicators (WDI).

Variable	Definition	Expectation
ln MVA	Log of Manufacturing Value Added (Proxy for wage capacity)	Dependent Variable
ln FDI	Log of Foreign Direct Investment Inflows	Positive (+)
TRO	Trade Openness (% of GDP)	Positive/Negative (+/-)
FDI x TRO	Interaction: (FDI * Trade Openness)	Negative (-)
TAR	Average Tariff Rates	Negative (-)
INF	Inflation Rate (CPI)	Negative (-)
ln EXR	Log of Official Exchange Rate (NGN/USD)	Negative (-)

Estimation Technique

Given the potential for mixed orders of integration among the variables (I(0) and I(1)), the Autoregressive Distributed Lag (ARDL) bounds testing approach is employed. The ARDL method is preferred for its robustness in small sample sizes and its ability to simultaneously estimate short-run dynamics and long-run equilibrium relationships.

4. Results and Discussion

4.1 Results Presentation

Descriptive Analysis

The descriptive statistics for the variables employed in the model are presented below. The data reveals significant volatility characteristic of a resource-dependent emerging economy. Table 1 highlights the extreme volatility in the Nigerian macroeconomic environment. The standard deviation of the exchange rate (315.2) relative to its mean indicates massive currency instability, particularly driven by the 2024 depreciation, where the rate hit N1,478/\$. Manufacturing Value Added (MVA) shows a wide range, peaking at \$64.9 billion in 2022 before crashing to \$25.36 billion in 2024. This structural break in the dependent variable is critical; it suggests that nominal gains in productivity can be swiftly eroded by monetary shocks, severely impacting the real wage fund available to workers. The positive skewness in inflation and exchange rates indicates that the distribution is tailed towards higher values, reflecting the persistent inflationary pressure and currency devaluation risks.

Table 1: Descriptive Statistics (2002–2024)

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
MVA (\$bn)	35.81	34.50	64.90	9.50	16.72	0.23	1.89
FDI (\$mn)	3,923	3,503	8,840	1,028	2,450	0.65	2.45

Openness (%)	28.76	28.79	39.50	20.80	5.34	0.31	2.10
Inflation (%)	14.73	13.25	33.24	5.40	6.25	1.28	4.12
Ex. Rate (N/\$)	287.4	158.55	1,478.6	118.57	315.2	2.85	10.5

Source: Author's Computation (2025)

Unit Root Analysis

Before proceeding to the ARDL estimation, it is imperative to determine the stationarity properties of the series to ensure no variable is integrated of order 2, $I(2)$, which would invalidate the F-statistics. The unit root test results in Table 2 confirm a mixed order of integration. Trade Openness (TRO) and Inflation (INF) are stationary at levels $I(0)$, while Manufacturing Value Added (MVA), FDI, the Interaction term, and Exchange Rate are stationary at first difference $I(1)$. This mixed integration structure ($I(0)$ and $I(1)$) provides the necessary justification for employing the ARDL bounds testing technique, as it is superior to the Johansen cointegration method, which requires all variables to be $I(1)$.

Table 2: Augmented Dickey-Fuller (ADF) Unit Root Test Results

Variable	Level t-stat	Prob.	First Diff t-stat	Prob.	Order
lnMVA	-1.945	0.305	-4.821	0.001***	$I(1)$
lnFDI	-2.103	0.245	-5.112	0.000***	$I(1)$
TRO	-3.150	0.038**	-	-	$I(0)$
Interaction	-2.221	0.451	-4.665	0.002***	$I(1)$
INF	-3.054	0.042**	-	-	$I(0)$
lnEXR	-0.892	0.788	-3.994	0.005***	$I(1)$

Note: ***, **, * indicate significance at 1%, 5%, and 10% respectively.*

Bounds Test for Cointegration

To establish whether a long-run relationship exists among the variables, the ARDL Bounds Test was conducted. The computed F-statistic of 5.842 significantly exceeds the upper critical bound of 3.61 at the 5% significance level. This leads to the rejection of the null hypothesis of no cointegration. Consequently, this study concludes that there is a stable long-run relationship between manufacturing wages (proxied by MVA), FDI, trade openness, and the other macroeconomic variables in Nigeria. This allows us to proceed to estimate both the long-run and short-run coefficients.

Table 3: ARDL Bounds Test for Cointegration

Test Statistic	Value	k (Independent variables)
F-statistic	5.842	6
Critical Values (5%)	Lower Bound $I(0)$	Upper Bound $I(1)$
	2.45	3.61

Long-Run Estimates and Discussion

The long-run coefficients provide insight into the equilibrium relationship between the variables.

FDI and Wages: The coefficient is positive (0.415) and significant. This implies that a 1% increase in FDI inflows leads to an approximate 0.42% increase in manufacturing value-added (wage capacity) in the long run. While positive, the elasticity is less than unity, suggesting that the wage-generating impact of FDI is inelastic. This confirms the hypothesis that FDI contributes to the wage fund but is not a magic bullet for wage growth in isolation.

The Interaction Effect (The "Broken Transmission"): The interaction term yields a statistically significant negative coefficient (-0.344). This is a critical finding. It indicates that as the Nigerian economy becomes more open to trade, the marginal positive impact of FDI on manufacturing wages diminishes. This supports the hollowing out hypothesis: in a highly open trade regime with weak domestic infrastructure, FDI inflows are more likely to be market-seeking (importing finished goods) rather than efficiency-seeking" (local manufacturing). Openness allows foreign investors to bypass local labour markets by importing inputs or finished goods, thereby dampening the wage-productivity link.

Tariffs and Inflation: The negative coefficient for Tariffs (-0.153) suggests that high protectionism hurts the sector, likely by increasing the cost of imported intermediate raw materials, which Nigerian manufacturers heavily rely upon. Similarly, Inflation exerts a significant negative drag (-0.042), eroding the real value added and, by extension, the real wages of workers.

Exchange Rate Shock: The exchange rate has the largest negative magnitude (-0.651). The massive devaluation seen in 2024 is empirically validated here as the primary destroyer of manufacturing value. A depreciation of the Naira significantly contracts the sector's dollar-denominated value added, implying a massive reduction in the real purchasing power of manufacturing wages.

Table 4: Estimated Long-Run Coefficients (Dependent Variable: lnMVA)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	4.120	1.050	3.923	0.001***
lnFDI	0.415	0.192	2.161	0.042**
TRO (Openness)	0.852	0.384	2.218	0.038**
FDI * TRO	-0.344	0.125	-2.752	0.012**
TAR (Tariff)	-0.153	0.068	-2.250	0.035**
INF (Inflation)	-0.042	0.011	-3.818	0.001***
lnEXR	-0.651	0.105	-6.200	0.000***

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

Short-Run Dynamics and Error Correction

The Error Correction Model (ECM) reveals the speed of adjustment to equilibrium after a shock. The ECM(-1) coefficient is -0.624 and is highly significant at the 1% level. This confirms the stability of the model and indicates a relatively fast speed of adjustment. Approximately 62.4% of any disequilibrium caused by short-run shocks (like the 2024 FX crisis) is corrected within one year.

In the short run, trade openness has a negative impact on MVA (-0.210). This aligns with the infant industry argument, suggesting that sudden liberalization exposes domestic manufacturers to intense competition they are ill-equipped to handle immediately, leading to reduced output and potential wage cuts or layoffs. The exchange rate impact in the short run (-0.850) is even more severe than in the long run, confirming that currency shocks are the most immediate threat to labour welfare in the sector.

Table 5: Short-Run Dynamics (Error Correction Model)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(lnFDI)	0.122	0.085	1.435	0.165
D(TRO)	-0.210	0.095	-2.210	0.038**
D(FDI*TRO)	-0.115	0.062	-1.854	0.078*
D(lnEXR)	-0.850	0.120	-7.083	0.000***
ECM(-1)	-0.624	0.115	-5.426	0.000***

Diagnostic Tests

To ensure the reliability of the estimates, post-estimation diagnostic tests were conducted. The diagnostics confirm the robustness of the model. The Breusch-Godfrey test ($p > 0.05$) indicates the model does not suffer from serial correlation. The Breusch-Pagan test confirms homoscedasticity, meaning the variance of the errors is constant. The Jarque-Bera test confirms the residuals are normally distributed, which is essential for the validity of t-statistics. The CUSUM (Cumulative Sum) plot (not shown here but analysed) remained within the 5% critical bounds, indicating stability of the coefficients over the study period, although the structural break in 2024 pushed the boundaries of stability.

Table 6: Diagnostic Tests Results

Test	Statistic	p-value	Conclusion
Breusch-Godfrey LM Test	0.452	0.341	No Serial Correlation
Breusch-Pagan-Godfrey	1.250	0.285	Homoscedastic (No Heteroscedasticity)
Jarque-Bera Normality	1.150	0.562	Residuals are Normally Distributed
Ramsey RESET Test	1.052	0.320	Model is Stable (No specification error)

4.2 Discussion of findings

The empirical analysis revealed a positive but inelastic relationship between FDI and Manufacturing Value Added (MVA), suggesting that while foreign capital contributes to the sector, its capacity to drive broad-based wage growth is severely constrained. This finding corroborates recent scholarship on the enclave nature of FDI in resource-dependent economies. The Organisation for Economic Co-operation & Development (OECD, 2023) and Garrido & Garrido (2022) state that in sub-Saharan Africa, FDI employment elasticity remains weak because investments are often capital-intensive or directed towards extractive industries, creating few direct jobs relative to the volume of capital invested. In Nigeria, manufacturing FDI often targets brownfield acquisitions or light assembly with low domestic value addition, limiting the productivity spillovers (Akinlo, 2004; Ogundipe et al., 2023). Consequently, the foreign wage premium observed in OECD countries fails to materialize broadly in

Nigeria because the capital does not deepen the productive capacity of the average firm; instead, it remains ring-fenced in high-productivity islands that are disconnected from the wider labour market.

A critical and novel finding of this study is the negative coefficient of the interaction term. This contradicts the standard Heckscher-Ohlin prediction that openness should boost returns to labour in a labour-abundant country like Nigeria. Instead, it supports the premature deindustrialization hypothesis. Recent empirical evidence suggests that in the absence of robust infrastructure, trade liberalization exposes domestic manufacturers to intense competition that they cannot withstand, forcing them to pivot from production to importation (Thia & Ong Lopez, 2023; Wahab, 2024). Omoregbee et al. (2025) found that trade openness contributed positively to job creation in Nigeria's industrial and service sectors, while causing job losses in agriculture due to competition from imports. They also observed a positive relationship between trade liberalization and manufacturing output, largely due to better access to imported intermediate goods, though they cautioned against overreliance on imports. When FDI enters a highly open but structurally weak economy, it often seeks market access (selling imported goods) rather than efficiency (making goods) (Anyanwu, 2012; UN Trade & Development, 2023). This hollows out the manufacturing base, converting potential manufacturing wages into lower-paid service or trading wages, thereby severing the link between global integration and local labour welfare.

The structural collapse of MVA to \$25.36 billion in 2024 serves as a validation of the macro-instability hypothesis. The data confirms that exchange rate volatility is not merely a monetary phenomenon but a labour market shock of the highest order. This aligns with findings by Agbonkhese and Udegbole (2024), who posit that in import-dependent manufacturing sectors, currency devaluation acts as a massive supply-side shock that erodes the real wage fund. The 2024 crisis, characterized by the unification of forex windows and subsequent naira devaluation, drastically increased input costs. As noted in recent industry reports, manufacturers faced with 40% increases in energy costs and FX scarcity were forced to rationalize labor and freeze wages, leading to a "decoupling" where nominal productivity might appear stable or rising (due to inflation), but real wages and purchasing power collapsed. This effectively broke the transmission mechanism, as the cost of capital and inputs consumed the surplus that would have otherwise accrued to labour.

The findings also lend weight to the wage polarization phenomenon discussed in development economics. While the aggregate data shows stagnation, the underlying dynamic is likely one of divergence. FDI and trade openness in Nigeria appear to be driving a demand for a small elite of high-skilled workers (to manage complex imported technologies) while depressing demand for mid-skilled manufacturing labor.⁶ This reflects the "Skill-Biased Technological Change" (SBTC) effect, where trade liberalization in developing countries raises the skill premium rather than lowering it, contrary to the Stolper-Samuelson theorem.⁷ The result is a labour market characterized by a "missing middle," where the manufacturing sector fails to play its historical role of absorbing unskilled labour into decent, middle-income jobs, leaving the majority of the workforce trapped in low-productivity informal activities.

5.0 Conclusion and Recommendations

5.1 Conclusion

This study provides empirical evidence that the interaction between Foreign Direct Investment and Trade Policy in Nigeria has failed to deliver the anticipated dividends of high manufacturing wages. The findings validate the hypothesis of a "broken transmission" mechanism. While FDI has a latent positive potential for wage growth, this potential is largely negated by the negative interaction with trade openness and the hostile macroeconomic environment.

The negative interaction term suggests that trade openness, in the absence of domestic productive capacity, facilitates a shift from manufacturing to importation, effectively exporting jobs and importing poverty. The structural collapse of Manufacturing Value Added in 2024 to a 15-year low of \$25.36 billion serves as a definitive indictment of a laissez-faire approach to liberalization that ignores domestic infrastructural realities. The study concludes that foreign capital acts as a fuel, but without the engine of a stable exchange rate and protective industrial policy, it cannot drive inclusive wage growth.

5.2 Recommendations

Based on the empirical findings, the following policy recommendations are proposed:

- a) **Re-calibration of Trade Policy (Smart Protectionism):** The negative interaction between openness and FDI necessitates a shift from blanket liberalization to smart protectionism. Tariffs should be removed on critical intermediate machinery to aid production (addressing the negative TAR coefficient), but maintained or increased on finished consumer goods that compete directly with nascent local industries. This will force FDI to be efficiency-seeking (building factories) rather than market-seeking (jumping tariffs).
- b) **Exchange Rate Stabilization as Labor Policy:** The study identifies the exchange rate as the most potent destroyer of real wages. Monetary authorities must prioritize FX liquidity for the manufacturing sector. A distinct FX window for manufacturers to import raw materials at a stable rate is not just a trade policy but a labour welfare policy to prevent the erosion of the wage fund.
- c) **Infrastructure-Linked Investment Incentives:** To reverse the negative interaction effect, FDI incentives (tax holidays, pioneer status) should be strictly tied to "backward integration" and infrastructure development. Investors who build power plants or source >60% of raw materials locally should receive premium incentives. This re-links capital inflows to the domestic supply chain and labour market.
- d) **Wage-Productivity Indexing:** To address the decoupling of wages from productivity, the Ministry of Labor should establish a "Manufacturing Productivity Index." Tripartite wage negotiations (Government, Labor, Private Sector) should use this index to ensure that periods

of productivity growth (like 2011-2014) automatically trigger wage reviews, preventing the stagnation observed in the data.

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