

An Empirical Analysis of the Impact of Non-Tariff Trade Restrictions on Manufacturing Jobs in Nigeria

Research Paper

Ayodele Folorunso Oshodi

Department of Economics, Faculty of Social Sciences, University of Ilorin, Ilorin, Nigeria, ayodele.f.oshodi@gmail.com, ORCID: <https://orcid.org/0009-0001-4088-2592>

Received 18 June 2025; Accepted 26 November 2025

Abstract: **Research purpose.** The research sought to investigate the impact of non-tariff trade restrictions on manufacturing jobs in Nigeria. **Design / Methodology / Approach.** In accomplishing this, the study adopts an econometric approach and employs the Auto Regressive Distributed Lag (ARDL) estimation technique to capture both short-run dynamics and long-run relationships between employment (EMP) and explanatory variables. **Findings.** The findings show that non-tariff trade restrictions significantly contribute to short-term and long-run job creation within the Nigerian industrial sector. However, import restrictions excluding taxes and tariffs do not exhibit significant short-term effects, suggesting that the type of trade restrictions implemented matters for immediate employment outcomes. The negative relationship between real wages and industrial employment across both short and long runs indicates that rising labour costs can deter firms from expanding their workforce, pointing to the critical role of managing wage levels for job sustainability in the industrial sector. **Originality / Value / Practical implications.** The extent to which non-tariff measures affect trade, manufacturing employment and wages is less well understood and documented in Nigeria; hence, this study examines the impact of non-tariff trade restrictions on manufacturing jobs in Nigeria. Unlike most previous studies that used factor content or growth accounting approaches and the gravity model in explaining the effects of trade on employment, this study employs an econometric modelling approach to labour demand and uses measures of aggregate trade restrictions as a proxy for measuring non-tariff trade restrictions in Nigeria. Thus, while trade restrictions can be used to protect domestic industries and industrial employment, nevertheless, manufacturing job sustainability can only be guaranteed if complementary policies that would improve the quality of manufactured products, increase domestic demand and value addition in industries are implemented.

Keywords: Non-tariff Trade Restrictions • Non-Tariff Measures • Manufacturing Jobs • Nigeria

JEL codes: F16; L60; O24

Introduction

There has been an increase in the use of non-tariff trade restrictions in international trade since the signing of the agreement by 164 member countries of the World Trade Organisation (WTO) in 2021 to reduce the use of tariffs on trade flows across the world (Chin & Che Rusli, 2015; Yalcin et al., 2017). Non-tariff measures (NTMs) and non-tariff barriers (NTBs) were embraced to restrict trade, protect domestic industries from imports, and protect consumers from the harmful consumption of products (Vysotckaia, 2021). Early NTMs, such as quotas and anti-dumping, were used to replace tariffs, while the new NTMs, such as administrative procedures, technical regulations, sanitary and phytosanitary measures, customs and border procedures, financial regulations, domestic subsidies, and quantitative restrictions, are being used for consumer health and safety, and environmental protection (Vysotckaia, 2021).

* Email: ayodele.f.oshodi@gmail.com

Non-tariff measures (NTMs) are artificial barriers other than tariffs used to influence international trade between countries in the world. They can be used to achieve both legitimate and protectionist objectives. In theory, NTMs are usually imposed by the government on imports and exports to reduce trade deficits, serve as sources of government revenue, help in the diversification of industry, protect domestic employment, and protect domestic industries and consumers from unsafe products (Chin & Che Rusli, 2015).

In addition, NTMs such as technical regulations, sanitary and phytosanitary requirements and licensing rules are usually imposed to achieve public policy objectives of protecting health, safety, and the environment (Chinagorom-Abiakalam & Leiborici, 2025). Thus, NTMs have helped to shape global trade by ensuring health, safety and environmental regulations, as well as serving as trade barriers (Chinagorom-Abiakalam & Leibovici, 2025).

The debate on the impact of non-tariff trade restrictions on employment and wages continues. While some researchers posit that NTMs result in a decline in manufacturing employment and lower wages for workers, others opine that NTMs actually result in an increase in manufacturing employment and higher wages for workers. Due to this conflicting evidence from existing literature, there is a need to carry out a country-specific study by investigating whether non-tariff trade restrictions hurt manufacturing jobs in Nigeria. This is the motivation for this novel study. This paper provides answers to the following questions: Do non-tariff trade restrictions boost or hurt manufacturing jobs in Nigeria? To what extent do non-tariff trade restrictions affect manufacturing jobs in Nigeria?

Therefore, the study investigated the impact of non-tariff trade barriers on manufacturing jobs in Nigeria. The findings of the study would not only be of immense benefit to advance the existing body of knowledge but also provide insight for policy implications in Nigeria. In addition, the study is in line with Sustainable Development Goals (SDG) goal 8, which seeks to promote inclusive and sustainable economic growth, full and productive employment, and decent work for all. Studies to protect domestic industries and manufacturing jobs in Africa's most populous nation would not only be beneficial to the country but to the global community, since any effort at reducing unemployment and consequently, reducing poverty would go a long way in helping to achieve the SDGs, which is of concern to the global community.

The paper contributes to the extant literature theoretically and empirically in many ways: First, the extent to which non-tariff measures affect trade, manufacturing employment and wages is less well understood and documented in Nigeria. Thus, it is the first paper which investigated the impact of non-tariff trade barriers on manufacturing jobs in Nigeria. Second, in terms of methodology, the paper employs an econometric modelling approach to labour demand and adopts the ARDL in estimating the models. Furthermore, measures of aggregate trade restrictions excluding taxes and tariffs were used as a proxy for measuring non-tariff trade restrictions. Third, on the theoretical front, the paper establishes that NTMs can be used selectively to promote industrial employment in Nigeria. The rest of this paper is organised as follows: Section 2 reviews relevant literature; Section 3 describes the research methodology; Section 4 presents and discusses the empirical results, and Section 5 concludes the paper.

Literature review

Non-tariff barriers to trade often involve less transparent ways of protecting producers against international competition. The need to meet the standards of products by foreign producers is one of the ways of restricting trade. Product and process standards are often imposed by some countries. Process standard can be imposed in a way where importing countries require that products be made in certain ways, while product standard involves either the producers in the exporting country or the importing country validating that the product meets certain standards (Bjornskov, 2005).

Non-tariff trade restrictions have both positive and negative impacts on trade and welfare, as well as employment and wages. This fact was corroborated by Nenci and Vurchio (2024), who opined that NTMs such as quotas and prohibitions have restrictive and distortionary effects on international trade since the impact of such trade restrictions not only negatively affected the exports of the country's trading partners but also affected the country itself through the value chain linkages. However, on the positive note, they pointed out that NTMs such as sanitary and phytosanitary measures help to improve the quality of products, while technical barriers to trade help to give valuable information to consumers, thereby improving consumption patterns and confidence (Nenci & Vurchio 2024).

The impact of NTBs within economic integration, such as the European Union (EU) and the North American Free Trade Agreement (NAFTA), differs from that of non-member nations. The EU and NAFTA remove trade barriers among their member nations by creating a single market while imposing trade barriers on non-member nations.

This leads to trade creation within the union and trade diversion outside the customs union. Trade creation occurs when a member nation takes advantage of the free trade and the large single market to increase its trade. This often results in a tremendous increase in trade between members, which leads to overall economic benefits for the union. On the other hand, trade diversion occurs when the existence of a customs union/market results in a shift in trade patterns away from more efficient producers outside the union to less efficient producers within the union.

There are several theoretical underpinnings/ arguments in development literature for the imposition of non-tariff measures/barriers. These include: first, the infant industries argument, which argues that infant industries should be protected against foreign competition until they become internationally competitive (Bjornskov, 2005). New, small, and inexperienced industries need temporary protection from old established firms from other countries for two reasons (Dunn Jr. & Mutti, 2004). Initially, they are protected to enable them to grow and develop. As they grow, they learn until they become mature. They may never be large enough to be efficient if they are not protected. Second, industries are protected to enable them to achieve economies of scale (Bjornskov, 2005). It is assumed that the bigger a firm, the more cost-efficient it is and the better it is able to sell its products at lower prices (Bjornskov, 2005).

Second, protection is desirable against anti-dumping. Dumping is the practice when firms choose to charge a higher price at home and a lower price in a foreign market in order to penetrate and outsell the home firms. Thus, the products being dumped in the foreign market disadvantaged the domestic industries, hence the need to protect them from these unfair trade practices (Dunn Jr. & Mutti, 2004). The third argument is the need to increase output, income, and employment, which will occur when imports from other countries are restricted, arising from the multiplier effects of reducing imports (Dunn Jr. & Mutti, 2004). It is envisaged that there will be an increase in the domestic output, which will lead to an increase in income and, consequently, an increase in employment. For the policy to work, it presupposes that countries whose export sales and output have been reduced will not retaliate. This is not realistic, as the countries that suffer import loss may retaliate.

Besides, NTMs may take the form of technical regulations such as technical barriers to trade (TBTs) and sanitary and phytosanitary (SPS) measures usually imposed to achieve social and administrative objectives designed to regulate the domestic markets (Fugazza, 2013). Theoretically, the technical measures can affect the volume of trade and ability to trade in either way (Fugazza, 2013). A stringent public regulation promotes trade if its demand-enhancing effect is greater than its trade-cost effect, while it impedes trade if its demand-enhancing effect falls short of the trade cost effect (Fugazza, 2013).

Trade and employment

Theoretically, the Heckscher-Ohlin-Samuelson (HOS) model provides a simple framework for explaining the impact of trade on employment. The theory opines that when there is a decrease in trade barriers, the exporting sector will expand while the import-substituting sector will contract, thus, trade leads to redistribution of employment away from import-substituting industries to export-promoting industries (Greenaway et al., 1999). The study by Greenaway et al. (1999), which uses a dynamic labour demand framework on a panel of 167 manufacturing industries in the United Kingdom, indicates that an increase in the volumes of trade-imports and exports resulted in a decline in the level of derived labour demand. This finding supports the axiom that trade affects x-inefficiency, with the strongest competition for manufacturers from the United Kingdom coming from the United States and the European Union.

Empirically, studies by OECD (1992) and Baldwin (1995) also agree with the theory that the impact of changes in output and employment on trade between developed and developing countries shows significant net employment effects on exports but insignificant effects on imports. These studies reveal that changes in trade volume have significant negative effects on employment in labour-intensive industries. When trade was decomposed into manufactured products, their findings show that trade in manufactured products has a negative net impact for four out of the seven countries studied: France, Canada, the United Kingdom, and the United States. OECD (1992) and Baldwin (1995) studies further reveal that within the manufacturing sector, trade in products of low-wage industries such as food, beverages, and tobacco, textile and apparel, wood and cork products, and electrical machinery other than communication equipment would have negative effects on employment.

Non-Tariff measures and employment

The impact of non-tariff measures on trade and employment continues to be debatable in the extant literature. The divergence in results of studies conducted on NTMs on trade and employment in developed and developing countries is due to differences in methodologies, empirical approaches and indicators used in measuring them. Nevertheless, important inferences can be made from the reviews of existing literature on NTMs.

Empirically, studies conducted for different countries on the effects of NTMs on trade, employment, wages, and welfare include Peterson et al. (2013), Arita et al. (2015), Dal Bianco et al. (2016), and Cadot and Gourdion (2016), all of which concurred that NTMs discourage global trade. Similarly, studies by Disdier and Marrette (2010), Dal Bianco et al. (2016), and Yalcin et al. (2017) all agreed that NTMs hurt trade in their various studies.

The study by Disdier and Marrette (2010) shows a negative impact on imports but an increase in domestic and international welfare if stricter measures are imposed. While Dal Bianco et al. (2016) study, which investigated the impact of trade barriers on world wine trade for main importers and exporters from 1997 to 2010, shows that trade costs hinder exports and that regulation adversely affects trade, but sanitary and phytosanitary measures do not hinder exports. Yalcin et al. (2017) studies align with previous studies and opines that the implementation of non-tariff barriers may slow down global trade by 16 per cent, bilateral imports by 12 per cent and bilateral trade by about 11 per cent, if at least one trade defence measure is implemented.

On the contrary, studies by De Frahan and Vancanteren (2006) and Webb et al. (2020) affirm that technical trade barriers may catalyse trade. The study by De Frahan and Vancanteren (2006) opines that NTMs have a positive impact on trade. Webb et al. (2020) studied the differentiated effects of NTMs cost burden on exporters and importers and discovered that the partial liberalisation implemented by the major ASEAN countries resulted in distorting types of NTMs, which had a positive effect as it led to an increase in GDP and welfare in all countries studied, with the effect being more pronounced for Vietnam and the Philippines.

Some studies opine that NTMs have both positive and negative impacts (UNCTAD, 2018; Vysotskaia, 2021). While the UNCTAD (2018) study reveals that NTMs help to protect humans, animals or plants and the environment, the study, however, observed that NTMs can lead to increased costs of products and hinder trade and development. Also, Vysotskaia's (2021) study shows that protectionism supports domestic industries by protecting them from unfair foreign competition and stimulating production growth, while it weakens competition and motivation to improve products, stimulates an increase in prices of domestic goods and reduces consumers' choices from available goods. Furthermore, it limits export opportunities of a country and prevents the country from leveraging on the international division of labour.

Another strand of the literature focuses on the impact of rising import competition from low-income countries, which reveals that an increase in import competition often results in a decline in manufacturing employment in many advanced countries such as the United States of America, the United Kingdom and Australia (Autor et al., 2013; Gaston, 1998; Greenaway et al., 1999; Tuhin, 2015).

Autor et al. (2013) relate changes in labour market outcomes across the labour market in the US from 1990 to 2007 in relation to exposure to Chinese import competition, showing that increasing imports arising from such exposure affected the labour market through a reduction in manufacturing employment, lower labour force participation, and led to a reduction in manufacturing wages in the US.

Tuhin (2015) adds to empirical literature by exploring the impact of international trade on employment in Australia. The findings revealed that NTMs lead to a reduction in manufacturing employment in Australia due to the influx of imports from low-income labour countries. Furthermore, the study shows that manufacturing imports have a statistically significant negative relationship with Australian manufacturing industries' employment, while manufacturing exports have a significant positive relationship with manufacturing employment in Australia. This signifies that the more a country imports, the lower the employment in manufacturing industries of that country and the more a country exports, the more employment is generated in the manufacturing industries (Tuhin, 2015).

A similar study on Australia by Gaston (1998) shows that the impact of international trade and protection on Australian manufacturing employment indicates that a reduction in assistance to industries resulted in a downward decline in the level of manufacturing employment in Australia. However, a weak link between the level of protection and real wages in manufacturing employment in Australia was established.

On the contrary, Leonardi and Meschi (2021) show that the use of NTMs to protect domestic products through restricting imports plays a crucial role in mitigating the effects of import exposure on manufacturing employment. They obtained positive and significant estimates on wages, which indicates that NTMs protect the demand for manufacturing jobs. Thus, NTMs increase manufacturing employment for both skilled and unskilled workers, particularly more for the unskilled. However, their result shows a non-significant effect of import exposure on manufacturing wages since wages adjust to import penetration shocks in many ways.

Baldwin (1995) explores the effect of trade and Foreign Direct Investment (FDI) on employment and relative wages in OECD countries and found that domestic factors such as changes in demand for domestic goods and an increase in labour productivity are more important in leading to changes in total employment than changes in the

demand for imports. Thus, the employment-creating effects usually dominated the employment-displacing effects of an increase in imports. However, increased imports were adjudged to be a significant factor leading to a decline in specific low-technology industries.

The study by Chinagorom-Abiakalam and Leibovici (2025) on non-tariff barriers in the US and the EU shows that the EU has a higher prevalence of NTMs than the US in 13 out of 15 broad sectoral groups, which indicates that the EU uses more extensive regulatory measures than the US. The EU imposed NTMs across all sectors and applied them more broadly, relying more on technical measures, export-related regulations and import licensing, while the US concentrated on financial regulation and shipment inspections (Chinagorom-Abiakalam & Leibovici, 2025).

The study by Busse et al. (2024), which examines trade liberalisation and manufacturing in 131 developing countries from 1991 to 2020, concurs with previous studies that NTMs hurt developing countries. Using a panel fixed effect, the study revealed that on average, trade liberalisation hurts manufacturing employment in developing countries. Thus, reducing trade barriers led to a decline in manufacturing share in total employment in many developing economies, with countries in Sub-Saharan Africa and Latin America most adversely affected (Busse et al., 2024).

Dang et al. (2024) employ the DiD model to identify the impact of the US-China trade war on Vietnamese exports to the United States. Their findings revealed that the US-China trade war resulted in about a 14 per cent increase in Vietnam's total export to the US due to the increase in the US tariffs on Chinese imports, which boosted the competitiveness of Vietnamese products, leading to a substitution effect of Vietnamese goods for Chinese goods in the US. The industries that had significant benefits are the textile and garments, machinery and mechanical appliances, plastic and iron and steel products, while agricultural products, machinery and electronic equipment and furniture did not experience any significant increase in Vietnam export to the US as a result of the trade war.

The study on Nigeria by Udoffia et al. (2025), which employs the ARDL Bounds Test to analyse the impact of trade protectionism on the economic growth of Nigeria, showed a positive and significant impact of trade protection on economic growth, which indicates that openness of Nigeria's trade should be discouraged in the long run in order to boost domestic production for export earnings. The study, however, revealed that trade openness can be encouraged in the short run in order for domestic industries to obtain raw materials for production.

Gaps in extant literature

The review of the literature does a number of things: first, it shows that trade leads to an increase in demand for labour, which consequently leads to an increase in industrial employment. The corollary is that trade restrictions imposed on other countries lead to an increase in output of domestic producers, which consequently leads to an increase in industrial employment. Second, it establishes that NTMs were imposed to protect domestic industries, prevent dumping, correct adverse terms of trade, protect consumers from harmful consumption of goods, maintain standards, and protect the environment. Third, it reveals that the effects of the use of NTMs on trade, output, employment, and welfare are mixed across countries, which necessitated the need to carry out a country-specific study on Nigeria. It is instructive to note that Nigeria can learn from what happens to OECD countries, where domestic factors such as demand for domestic goods and an increase in labour productivity are more important in influencing total employment than changes in imports.

So far, only scanty studies have been carried out on non-tariff trade restrictions and manufacturing industries in Nigeria. These include the study by Salik and Aras (2020) on trade restrictions and its implications on domestic production of rice in Nigeria; the study by Aka-Wolugbom and Amah (2021), which examined trade barriers and growth of local industries in Nigeria; the study by David-Wayas (2014) on trade barriers and economic growth in Nigeria and Udoffia et al. (2025) study, which examines the impact of trade protectionism on economic growth in Nigeria. Nevertheless, there is no known study to the best of one's knowledge that has examined the impact of non-tariff trade restrictions on manufacturing jobs in Nigeria. This paper enriches and contributes to the existing body of knowledge on NTMs by examining the impact of non-tariff trade restrictions on manufacturing jobs in Nigeria. Second, the extent to which non-tariff measures affect trade, manufacturing employment and wages is less well understood and documented in Nigeria. This paper fills these identified gaps in the literature. Third, this paper employs an econometric modelling approach to labour demand and adopts the ARDL in estimating the models. It also uses measures of aggregate trade restrictions excluding taxes and tariffs as a proxy for measuring non-tariff trade restrictions. Fourth, on the theoretical front, the paper establishes that NTMs can be used selectively to promote industrial employment in Nigeria.

Based on the empirical literature and Heckscher-Ohlin-Samuelson (HOS) model, the study postulates that policymakers should strategically use non-tariff trade restrictions that will improve market efficiency, protect domestic industries, and provide a conducive environment for industrial employment growth and sustainability. Hence, this study hypothesised that *non-tariff trade restrictions have a significant impact on manufacturing jobs in Nigeria*.

Research methodology

Research design and data

The study adopts a quantitative econometric approach to examine the impact of non-tariff trade restrictions on manufacturing employment in Nigeria. Annual time series data from 1990 to 2022 were sourced from the World Development Indicators (WDI) and the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). The dependent variable is industrial employment (EMP), while the main independent variable is the measure of aggregate trade restrictions excluding taxes and tariffs (MATR_nt). Subcategories of trade restrictions, payments and proceeds for invisibles restrictions (PPIR_nt), restrictions to payments (RPYMT_nt), and import restrictions (IMPREST_nt), were also included. Control variables are real wages (WGE), manufacturing value added (MAV), foreign direct investment (FDI), and economic growth rate (GDP).

Model specification

To test the hypothesis and empirically investigate the impact of non-tariff trade barriers on manufacturing jobs in Nigeria, this paper employs an econometric modelling approach to labour demand, as utilised in studies by Gaston (1998), Greenaway et al. (1999), and Tuhin (2015). The estimation of labour demand equations at the industry level involves regressing employment on a set of explanatory variables derived from the standard labour demand framework.

This study modifies the labour demand equation at the industry level by incorporating non-tariff trade measure variables and additional controls for macro-sectoral movements. Accordingly, the baseline models for this study are given as:

$$EMP_t = a_0 + \beta_1 MATR_nt_t + \beta_2 WGE_t + \beta_3 \ln MAV + \beta_4 FDI_t + \beta_5 GDP_t + \varepsilon_t \quad (1)$$

$$EMP_t = a_0 + \beta_1 PPIR_nt_t + \beta_2 WGE_t + \beta_3 \ln MAV + \beta_4 FDI_t + \beta_5 GDP_t + \varepsilon_t \quad (2)$$

$$EMP_t = a_0 + \beta_1 RPYMT_nt_t + \beta_2 WGE_t + \beta_3 \ln MAV + \beta_4 FDI_t + \beta_5 GDP_t + \varepsilon_t \quad (3)$$

$$EMP_t = a_0 + \beta_1 IMPREST_nt_t + \beta_2 WGE_t + \beta_3 \ln MAV + \beta_4 FDI_t + \beta_5 GDP_t + \varepsilon_t \quad (4)$$

Estimation procedure

Preliminary analyses, including descriptive statistics and correlation tests, were conducted to summarise the data and identify relationships among variables. To confirm data stationarity, the Augmented Dickey-Fuller (ADF) (1979) and Phillips-Perron (PP) tests (Phillips & Perron, 1988) were employed. The ARDL Bounds test (Pesaran et al., 2001) was used to verify long-run cointegration, while the ARDL model captured both short- and long-run relationships. The error correction term (ECT) indicated the speed of adjustment toward equilibrium.

Auto regressive distributed lag (ARDL)

The choice of the ARDL model is justified by the pre-estimation test results and the characteristics of the dataset. The unit root tests (ADF and PP) reveal that the variables are a mix of stationary at level, $I(0)$, and first difference, $I(1)$, which aligns with the ARDL model's flexibility in handling variables with different orders of integration (Pesaran & Shin, 1999). Furthermore, the ARDL Bounds test results indicate the presence of a long-run relationship between employment in the manufacturing sector and various indicators of the non-tariff trade measures, with the F-statistics exceeding the critical bounds at the 10% significance level. This confirms that the ARDL model is appropriate for estimating both the short-run dynamics and long-run equilibrium relationships. This approach not only accounts

Table 1. Variable Description (Source: Authors' Construction, WD1, 2022, IMF, 2022)

Variable	Symbol	Description and Measurement	Sources
Employment	EMP	Is Employment in Industry (percentage of total employment (modelled ILO estimate)	World Bank (2022)
Non-tariff Trade Restriction	MATR_nt	Measure of aggregate trade restriction excluding taxes and tariffs	IMF (2022)
Non-tariff Trade Restriction	PPIR_nt	Payments and proceeds for invisible restrictions	
Non-tariff Trade Restriction	RPYMT_nt	Restrictions on payments	
Non-tariff Trade Restriction	IMPREST_nt	Import restrictions, excluding taxes and tariffs.	World Bank (2022)
Manufacturing Value Added	MAV	Manufacturing, value added (constant LCU)	
Real Wage Rate	WGE	Wage and salaried workers, total (% of total employment) (modelled ILO estimate)	
Foreign Direct Investment	FDI	Foreign direct investment, net inflows (% of GDP)	
Economic Growth Rate	GDP	GDP growth (annual %)	

for dynamic interactions over time but also ensures robustness in the results, adhering to econometric principles. Empirical studies, such as those by Narayan (2005) and Pesaran et al. (2001), support the ARDL approach for mixed-order datasets and cointegrated relationships.

The general ARDL specification goes accordingly;

ARDL ($p, q1.... qK$):

$$Y_t = a + \sum_{i=1}^p \gamma_i Y_{t-1} + \sum_{i=1}^k \sum_{j=1}^q X_{j,t-1} \beta_{j,1} + \varepsilon_t \quad (5)$$

Diagnostic tests

Post-estimation diagnostics ensured model robustness. The Breusch-Pagan test checked for heteroskedasticity, the Durbin-Watson statistic tested for serial correlation, the Ramsey RESET test verified model specification, and the Jarque-Bera test assessed normality. Results confirmed that the models were correctly specified and statistically sound. All computations were carried out using EViews 8 for preliminary analysis and model estimation.

Research results

Summary, description of variables and measurement

Table 2, which displays the descriptive statistics reveal the overall distribution and variability of the variables in the study. Industrial employment shows moderate variation, suggesting some fluctuations in employment levels within the industrial sector. Non-tariff trade restrictions and payments-related restrictions generally exhibit stable values, with limited variation in their measurements. Real wages display a higher degree of variation, indicating more significant differences in wage levels across the sample. Other variables, such as manufacturing value added, GDP, and foreign direct investment, show a broader range of values, with GDP demonstrating the most substantial variability. The dataset provides a diverse set of data points that reflect the dynamic nature of the economic factors under study.

Correlation analysis

The correlation matrix presented in Table 3 reveals the relationships between the study's variables. There is a strong negative correlation between industrial employment (EMP) and real wages (WGE), suggesting that higher wages are associated with lower employment levels in the industrial sector. Non-tariff trade restrictions, such as MATR_NT, PPIR_NT, and RPYMT_NT, show moderate to strong correlations with each other, indicating that these trade restrictions tend to move in the same direction. The correlation between industrial employment and non-tariff restrictions is negative, although very weak, reflecting that higher trade restrictions might be linked to lower employment. Manufacturing value added (LNMAV) shows a strong positive correlation with industrial employment,

Table 2. Descriptive Statistics (Source: Author's computation)

	EMP	MATR_NT	PPIR_NT	RPYMT_NT	IMPREST_NT	WGE	LNMAV	GDP	FDI
Mean	11.864	14.578	3.000	3.636	2.757	17.021	29.071	4.017	1.301
Median	11.413	14.000	3.000	4.000	3.000	17.258	28.909	4.195	1.380
Maximum	14.560	17.000	4.000	4.000	3.000	18.848	29.541	15.329	2.900
Minimum	10.146	12.000	1.000	3.000	2.000	14.002	28.695	-2.035	-0.039
Std. Dev.	1.236	1.385	0.790	0.488	0.435	1.521	0.326	3.728	0.855
Observations	33	33	33	33	33	33	33	33	33

Note: EMP, MATR_nt, PPIR_nt, RPYMT_nt, IMPREST_nt, WGE, LNMAV, and FDI denote employment in industry, measures of aggregate trade restriction excluding taxes and tariffs, payments and proceeds for invisibles restrictions, restrictions to payments, import restrictions excluding taxes and tariffs, real wage rate, manufacturing, value added, economic growth rate and foreign direct investment, respectively.

indicating that higher manufacturing output is associated with increased employment. Foreign Direct Investment (FDI) is positively correlated with wages and negatively correlated with industrial employment, suggesting that FDI might influence wage levels but reduce employment. Additionally, GDP has moderate positive correlations with several variables, reflecting some level of interaction between economic growth and these factors.

Unit root test

The unit root tests result is presented in Table 4, which was carried out to determine the stationarity of the time series and their levels of integration. Employing the Augmented Dickey-Fuller and Phillips-Perron test, the result shows that, except for the economic growth rate (GDP), which is stationary at level form, all other variables obtained stationarity after first difference. The implications of the mixed order integration are that certain estimation techniques cannot be applied to estimate the specified model. In this case, the most appropriate linear regression estimation is the autoregressive distributed lags (ARDL) test. But first, the ARDL bounds test for cointegration was conducted to ascertain if a long-run relationship exists between the variables.

Cointegration test

Table 5 shows the ARDL bounds test results for Model 1 to Model 4. The result indicates the presence of long-run relationships among the variables. In each model, the F-statistic (3.477388 for model 1, 3.597471 for model 2, 3.454984 for model 3 and 4.989744 for model 4) exceeds the upper critical value (I1 Bound) at the 10% significance level, confirming the rejection of the null hypothesis of no long-run relationships. These findings suggest that the independent variables in all models are cointegrated with the dependent variable, implying a stable long-term equilibrium relationship between the variables over the sampled period.

Regression analysis results

The short-run ARDL result in Table 6 reveals several important relationships between the independent variables and industrial employment (EMP). The lagged value of employment (D (EMP (-1))) is positive and highly significant across all models, with coefficients ranging from 0.348 to 0.717. This indicates strong inertia in industrial employment, where past employment levels significantly influenced current levels. Among the trade restriction variables, the measure of aggregate trade restriction excluding taxes and tariffs in Model 1 and restrictions to payments in Model 3 are significant and positively affect manufacturing employment. These results suggest that an increase in trade payment restrictions and aggregate trade restrictions can yield short-term benefits for industrial employment, possibly by improving market efficiency and resource allocation. However, import restrictions excluding taxes and tariffs in Model 4 show no significant effect, indicating that import restrictions excluding taxes and tariffs might not have an immediate impact on manufacturing employment in the short run.

The results for real wage rate consistently show a negative and significant impact, indicating that higher wage levels are associated with lower short-term employment in the industrial sector. This finding aligns with economic theory, where higher wages can increase labour costs, reducing demand for workers. Manufacturing value added (D(LNMAV)) demonstrates a robust positive effect in most models, underscoring its critical role in driving short-term industrial employment. Interestingly, economic growth (D(GDP)) and foreign direct investment (D(FDI)) generally lack significance in the short run, suggesting that their effects may take a longer time to materialise. This highlights

Table 3. Correlation Matrix (Source: Author's computation)

	EMP	MATR_NT	PPIR_NT	RPYMT_NT	IMPREST_NT	WGE	LNMAV	GDP	FDI
EMP	1.00								
MATR_NT	-0.33	1.00							
PPIR_NT	-0.33	0.88	1.00						
RPYMT_NT	0.19	0.18	0.08	1.00					
IMPREST_NT	0.28	-0.23	-0.45	-0.43	1.00				
WGE	-0.95	0.41	0.36	-0.29	-0.10	1.00			
LNMAV	0.77	-0.58	-0.53	-0.27	0.59	-0.68	1.00		
GDP	-0.34	0.53	0.30	-0.16	0.25	0.47	-0.28	1.00	
FDI	-0.63	0.30	0.17	-0.14	0.18	0.66	-0.47	0.37	1.00

Note: EMP, MATR_nt, PPIR_nt, RPYMT_nt, IMPREST_nt, WGE, LNMAV, and FDI denote employment in industry, measures of aggregate trade restriction excluding taxes and tariffs, payments and proceeds for invisibles restrictions, restrictions to payments, import restrictions excluding taxes and tariffs, real wage rate, manufacturing, value added, economic growth rate and foreign direct investment, respectively.

Table 4. Augmented Dickey-Fuller and Phillips-Perron Unit Root Test Results (Source: Author's computation)

Variables	ADF		PP		Conclusion
	Statistics	Prob.	Statistics	Prob.	Integration
EMP	-1.972436	0.0479	-2.182049	0.0301	I (1)
MATR_nt	-4.896342	0.0004	-6.823556	0.0000	I (1)
PPIR_nt	-6.489184	0.0000	-5.405470	0.0000	I (1)
RPYMT_nt	-6.952218	0.0000	-6.965584	0.0000	I (1)
IMPREST_nt	-5.385165	0.0001	-5.385165	0.0001	I (1)
MAV	-3.950897	0.0049	-4.086187	0.0035	I (1)
WGE	-7.473130	0.0000	-2.363715	0.0197	I (1)
FDI	-6.962225	0.0000	-7.013958	0.0000	I (1)
GDP	-2.956965	0.0500	-2.933528	0.0526	I (0)

Note: EMP, MATR_nt, PPIR_nt, RPYMT_nt, IMPREST_nt, WGE, LNMAV, and FDI denote employment in industry, measures of aggregate trade restriction excluding taxes and tariffs, payments and proceeds for invisibles restrictions, restrictions to payments, import restrictions excluding taxes and tariffs, real wage rate, manufacturing, value added, economic growth rate and foreign direct investment, respectively.

Table 5. ARDL Bounds Test Results Organised Table (Source: Author's computation)

Model	Test Statistic (F-statistic)	K	Critical Value Bounds	10%		5%	
				I (0)	I (1)	I (0)	I (1)
Model 1	3.477388	5		2.26	3.35	2.62	3.79
Model 2	3.597471	5		2.26	3.35	2.62	3.79
Model 3	3.454984	5		2.26	3.35	2.62	3.79
Model 4	4.989744	5		2.26	3.35	2.62	3.79

the importance of focusing on immediate drivers such as trade restrictions and manufacturing output to stimulate industrial employment in the short term.

In the long run, the relationships between industrial employment and the explanatory variables become more pronounced and consistent. Non-tariff trade restrictions, particularly measures of aggregate trade restriction excluding taxes and tariffs (MATR_nt) in Model 1, payments and proceeds for invisibles restrictions (PPIR_nt) in Model 2, and restrictions to payments (RPYMT_nt) in Model 3, exhibit positive and significant coefficients. This indicates that an increase in these trade restrictions is associated with higher industrial employment. The result suggests that when these restrictions are applied or expanded, they may create a protective environment for

Table 6. ARDL Long Run and Short-Run Estimates (Source: Author's computation)

Variable	Model 1: ARDL	Model 2: ARDL	Model 3: ARDL	Model 4: ARDL
Selected Model	(2,0,0,0,1)	(2,0,0,0,1)	(2,0,2,0,1)	(2,2,0,1,2,1)
D(EMP(-1))	0.544 *** (0.126)	0.491 *** (0.150)	0.348 ** (0.156)	0.717 *** (0.152)
D(MATR_NT)	0.086 ** (0.030)			
D(PPIR_NT)		0.132 * (0.066)		
D(RPYMT_NT)			0.323 *** (0.095)	
D(IMPREST_NT)				0.329 (0.193)
D(WGE)	-0.274 *** (0.053)	-0.247 *** (0.057)	-0.262 ** (0.109)	-0.245 ** (0.088)
D(LNMAV)	0.597 *** (0.147)	0.569 *** (0.170)	0.630 *** (0.170)	0.976 (0.544)
D(GDP)	0.003 (0.008)	0.011 (0.008)	0.017 ** (0.007)	-0.025 (0.020)
D(FDI)	-0.062 (0.040)	-0.053 (0.043)	-0.064 (0.038)	-0.089 (0.051)
CointEq(-1)	-0.425 *** (0.062)	-0.372 *** (0.066)	-0.259 *** (0.081)	-0.331 *** (0.098)
Long-Run Coefficients				
MATR_NT	0.202 ** (0.072)			
PPIR_NT		0.354 * (0.198)		
RPYMT_NT			1.246 * (0.655)	
IMPREST_NT				-0.022 (0.526)
WGE	-0.645 *** (0.064)	-0.664 *** (0.078)	-0.282 (0.229)	-0.740 *** (0.133)
LNMAV	1.405 *** (0.358)	1.530 *** (0.528)	2.427 ** (0.967)	0.131 (0.944)
GDP	0.007 (0.019)	0.030 (0.020)	0.065 (0.034) *	-0.058 (0.102)
FDI	0.088 (0.107)	0.098 (0.133)	0.064 (0.170)	0.256 (0.249)
C	-21.125 * (11.569)	-22.651330 (16.216)	-58.747* (33.727)	20.555 (27.432)
Diagnostics Tests				
R-Squared	0.993039	0.991929	0.994181	0.993816
Adjusted R-Squared	0.990507	0.988994	0.991271	0.989086
F-statistics	392.2964	337.9824	341.6945	210.1428
Prob(F-statistic)	0.000000	0.000000	0.000000	0.000000
Durbin Watson	2.026655	1.985861	1.816431	2.398413
Breusch-Pagan F_stat (p_v)	2.478001 (0.0439)	1.960888 (0.1010)	0.940941 (0.5189)	2.596276 (0.1337)
Ramsey Test	0.4566	0.6998	0.7669	0.7394
Jarque Bera F_stat (p_v)	0.765199 (0.68208)	9.635580 (0.45565)	1.411774 (0.49367)	7.174934 (0.11234)

Note: ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively. Standard errors are in parentheses (). EMP, MATR_nt, PPIR_nt, RPYMT_nt, IMPREST_nt, WGE, LNMAV, and FDI denote employment in industry, measures of aggregate trade restriction excluding taxes and tariffs, payments and proceeds for invisibles restrictions, restrictions to payments, import restrictions excluding taxes and tariffs, real wage rate, manufacturing, value added, economic growth rate and foreign direct investment, respectively.

domestic industries, promoting job creation within the industrial sector. This finding concurred with the finding of Leonardi and Meschi (2021), which reported that non-tariff measures had a positive and significant impact on manufacturing employment and wages in the US.

However, import restrictions excluding taxes and tariffs (IMPREST_nt) in Model 4 are insignificant, suggesting that specific import restrictions might not have lasting effects on industrial employment in Nigeria. This finding is contrary to economic theory, which opines that import restrictions ought to lead to greater consumption of domestically produced goods. The finding also does not conform with a priori expectations and the findings of Autor et al. (2013), Greenaway et al. (1999), and Tuhin (2015), which reported that NTMs led to a reduction in manufacturing wages in the US, U K and Australia, respectively.

Real wages (WGE) remain negatively associated with industrial employment across most models, with highly significant coefficients. This finding underscores the importance of labour costs as a determinant of employment sustainability in the industrial sector. Rising real wages may increase production costs, discouraging firms from expanding their workforce or retaining current employees. These results emphasise the importance of carefully balancing trade restrictions and labour costs to achieve sustainable industrial employment growth.

Manufacturing value added consistently displays a positive and significant impact on long-run employment in Models 1, 2, and 3, with coefficients indicating that increased industrial output significantly boosts industrial employment. However, its insignificance in Model 4 highlights potential differences in the interaction between variables. The effects of foreign direct investment and economic growth rate remain insignificant or weakly significant in the long run, indicating that their influence on industrial employment may depend on indirect or complementary factors. The results conform with the findings of Baldwin (1995) which show that domestic factors such as changes in demand for domestic goods and increase in labour productivity are more important in leading to changes in total employment than changes in the demand for imports. These findings suggest that policies that will promote manufacturing growth and reduce trade barriers will be pivotal for achieving sustainable employment growth in the industrial sector over time.

The diagnostic tests indicate that the models are well-specified and reliable. The R-squared and adjusted R-squared values are exceptionally high across all models, indicating a strong fit. The Durbin-Watson statistics suggest no significant autocorrelation issues, with values close to 2. Breusch-Pagan tests highlight heteroskedasticity concerns in Model 1, but not in other models, suggesting the need for caution in interpreting results from Model 1. The Ramsey RESET tests indicate no misspecification errors, and the Jarque-Bera statistics confirm that residuals are normally distributed. These diagnostics collectively suggest that the models are robust, and the findings are credible for policy interpretation.

Discussion

The findings of this study provide evidence on how non-tariff trade restrictions affect industrial employment in Nigeria. The results show that certain non-tariff restrictions, particularly aggregate trade restrictions and payments, have positive and significant effects on manufacturing employment in both the short and long run. The findings validated the hypothesis that non-tariff trade restrictions have a significant impact on manufacturing jobs in Nigeria. This suggests that moderate use of such measures can protect domestic industries, encourage local production, and sustain industrial jobs. These results are consistent with the findings of Leonardi and Meschi (2021), who observed that non-tariff measures in the United States contributed to preserving domestic manufacturing jobs. Likewise, Udoffia et al. (2025) found that trade protectionism can stimulate economic growth in Nigeria, particularly in the long run. In the same vein, Chinagorom-Abiakalam and Leibovici (2025) reported that the European Union's broader application of non-tariff measures, particularly technical regulations and import licensing, served as an important mechanism for protecting domestic production and employment, though implemented within a highly regulated institutional framework. This finding also supports the Heckscher-Ohlin-Samuelson (HOS) model, which argues that moderate protectionism, when well-targeted, can help developing economies like Nigeria stabilise their industrial base and sustain employment.

However, the insignificant effects of import restrictions excluding taxes and tariffs indicate that not all forms of trade restrictions deliver the same outcomes. This aligns with Autor et al. (2013) and Greenaway et al. (1999), who reported that excessive trade barriers or import exposure can reduce manufacturing employment by increasing

production costs and lowering competitiveness. In line with this, Busse et al. (2024) observed that trade liberalisation reduced manufacturing employment across developing countries, particularly in Sub-Saharan Africa, suggesting that unregulated openness can weaken domestic industries and employment. Taken together, these findings suggest that Nigeria's challenge lies in distinguishing between protective measures that genuinely support industrial growth and those that inadvertently raise production costs or limit innovation.

The persistent negative relationship between real wages and employment also mirrors the findings by Baldwin (1995) and Gaston (1998), who highlighted that high labour costs often discourage firms from hiring or expanding their workforce. This underscores the need for wage policies that balance fair compensation with industrial competitiveness. Comparable dynamics were seen in Dang et al. (2024), whose study on the U.S.–China trade war revealed that tariff-related restrictions boosted Vietnam's manufacturing exports and employment by diverting trade flows from China—showing that trade restrictions can generate employment gains when countries are well-positioned to capture shifting demand.

From a policy standpoint, these results suggest several strategic directions. First, trade policy should focus on smart protectionism, that is, applying non-tariff measures selectively to shield vulnerable manufacturing sectors without creating excessive barriers that deter investment or productivity. Second, complementary policies that enhance manufacturing value-added, such as incentives for technology adoption, quality improvement, and backward integration, can amplify the employment benefits of trade restrictions. Third, labour market policies should aim to keep real wages in line with productivity growth to ensure that rising wages do not erode firms' capacity to sustain jobs. Lastly, promoting a stable macroeconomic environment and attracting long-term FDI into high-value manufacturing can help translate short-term job gains into durable industrial employment growth.

Conclusions

This paper analysed the impact of non-tariff trade restrictions on industrial employment, with a particular focus on manufacturing jobs in Nigeria. The findings revealed that non-tariff trade restrictions, particularly aggregate trade restrictions and restrictions on payments, significantly contribute to both short-term and long-run job creation within the industrial sector. These measures, which can improve market efficiency and protect domestic industries, appear to foster an environment conducive to employment growth. However, import restrictions excluding taxes and tariffs were found to be insignificant, implying that not all types of trade restrictions yield positive employment outcomes. The effectiveness of such measures, therefore, depends on their design, implementation, and alignment with broader industrial and trade objectives.

The observed negative relationship between real wages and industrial employment across both the short and long runs indicates that rising labour costs can deter firms from expanding their workforce. This finding underscores the importance of wage moderation and productivity-based wage adjustments for job sustainability. Likewise, manufacturing value added plays a crucial role in driving employment growth, highlighting the importance of enhancing industrial output and local value addition. Conversely, the relatively weak influence of economic growth and foreign direct investment suggests that their impact on industrial employment may manifest indirectly and over a longer horizon.

In advanced economies such as the United States and the European Union, studies by Leonardi and Meschi (2021) and Disdier and Fugazza (2020) found that non-tariff measures can protect domestic manufacturing jobs but may also raise production costs if overused. Similarly, evidence from ASEAN economies (Webb et al., 2020) shows that partial liberalisation and targeted non-tariff regulations led to welfare gains and employment growth when complemented by structural reforms. In contrast, studies from Australia and the United Kingdom (Gaston, 1998; Greenaway et al., 1999) reveal that excessive trade barriers and high labour costs reduced manufacturing employment. These global comparisons suggest that the key to success lies not in the volume of restrictions but in how they are structured to balance protection with competitiveness.

In contrast, Busse et al. (2024) discovered that trade liberalisation in 131 developing countries reduced the share of manufacturing employment, especially in Sub-Saharan Africa, which implies that unrestricted openness can harm domestic job creation. Similarly, Udoffia et al. (2025) found that moderate trade protection improved Nigeria's economic growth in the long run, reinforcing this study's view that limited and strategic use of non-tariff measures can benefit industrial employment. Meanwhile, Dang et al. (2024) demonstrated how the U.S. and China

trade war indirectly boosted Vietnam's exports and industrial jobs, which shows that protectionist policies can have asymmetric benefits depending on countries' production structures and competitiveness. These findings confirm that the success of non-tariff trade measures depends on their selectivity, transparency, and alignment with industrial capabilities.

For Nigeria, this implies that policymakers should adopt smart protectionism, which is the selective and strategic application of non-tariff trade measures that protect infant industries without stifling competition or innovation. In addition, policies that promote industrial upgrading, backward integration, and value chain development should complement trade restrictions to amplify their employment effects. Labour market reforms that align wages with productivity growth are also crucial to maintaining competitiveness.

The limitation of the study is the non-availability of time series data up to date on Nigeria for measures of aggregate trade restrictions - measures of aggregate trade restrictions excluding taxes and tariffs, payments and proceeds for invisibles restrictions, restrictions on payments and import restrictions excluding taxes and tariffs. Nevertheless, the outcome of the findings of this paper is not adversely affected. Future research could examine the impact of NTMs on manufacturing jobs in Sub-Saharan Africa when historical data are available.

Disclosure

There is no potential conflict of interest.

Funding

No funding was obtained for the research.

Declaration of generative AI in scientific writing

The author did not use any type of AI or AI-assisted technologies during the research work.

References

- Aka-Wolugbom, A. L., & Amah, E. (2021). Trade barriers and the growth of local industries in Nigeria. *International Journal of Management and Marketing System*, 13(4), 51–60.
- Arita, S., Mitchell, L., & Beckman, J. (2015). *Estimating the effects of selected sanitary and phytosanitary measures and technical barriers to trade on U.S.-EU agricultural trade (ERR-199)*. U.S. Department of Agriculture, Economic Research Service.
- Autor, D. H., Dorn, D., & Hanson, G. H. (2013). The China syndrome: Local Labor-market effects of import competition in the United States. *American Economic Review*, 103(6), 2121–2168.
- Baldwin, R. E. (1995). *The effects of trade and foreign direct investment on employment and relative wages*. OECD Jobs Study Working Paper, 4, 1–46. OECD Publishing. <https://dx.doi.org/10.1787/888157653682>
- Bjornskov, C. (2005). *Basics of international economics: Compendium – trade policy*. Ventus Publishing ApS.
- Busse, M., Dary, S. K., & Wüstenfeld, J. (2024). Trade liberalisation and manufacturing employment in developing countries. *Structural Change and Economic Dynamics*, 70, 410–421. <https://doi.org/10.1016/j.strueco.2024.05.003>
- Cadot, O., & Gourdon, J. (2016). Non-tariff measures, preferential trade agreements, and prices: New evidence. *Review of World Economics*, 152(2), 227–249. <https://doi.org/10.1007/s10290-015-0242-9> Top of Form
- Chin, L., & Che Rusli, A. K. (2015). The determinants of non-tariff barriers: The role of WTO membership.

- International Journal of Economics and Management*, 9(1), 155–175.
- Chinagorom-Abiakalam, D., & Leibovici, F. (2025). *Non-tariff trade barriers in the US and EU*. Federal Reserve Bank of St. Louis.
- Dal Bianco, A., Boatto, V. L., Caracciolo, F., & Santeramo, F. G. (2016). Tariffs and non-tariff frictions in the world wine trade. *European Review of Agricultural Economics*, 43(1), 31–57. <https://doi.org/10.1093/erae/jbv008>
- Dang, B. T. T., Yawei, W., & Abdullah, A. J. (2024). The impact of the US-China trade war on Vietnamese exports to the US: A quantitative study using DiD approach. *Journal of Trade Science*, 12(4), 304–318. <https://doi.org/10.1108/JTS-02-2024-0007>
- David-Wayas, O. M. (2014). Empirical analysis of trade barriers and economic growth in Nigeria. *Innovare Journal of Social Sciences*, 2(4), 1–6.
- De Frahan, B. H., & Vancauteren, M. (2006). Harmonisation of food regulations and trade in the single market: Evidence from disaggregated data. *European Review of Agricultural Economics*, 33(3), 337–360.
- Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistics Association*, 74(366), 427–431. <https://doi.org/10.2307/2286348>
- Disdier, A. C., & Fugazza, M. (2020). *A practical guide to economic analysis of non-tariff measures*. World Trade Organization.
- Disdier, A. C., & Marette, S. (2010). The combination of gravity and welfare approaches for evaluating non-tariff measures. *American Journal of Agricultural Economics*, 92(3), 713–726. <https://doi.org/10.1093/ajae/aaq026>
- Dunn, Jr. R. M., & Mutti, J. H. (2004). *International economics*. Routledge. <https://doi.org/10.4324/9780203462041>
- Fugazza, M. (2013). *The economics behind non-tariff measures: Theoretical insights and empirical*. Policy Issues in International Trade and Commodities Study Series, 57. United Nations.
- Gaston, N. (1998). The impact of international trade and protection on Australian manufacturing employment. *Australian Economic Papers*, 37(2), 119–136. <https://doi.org/10.1111/1467-8454.00010>
- Greenaway, D., Hine, R. C., & Wright, P. (1999). An empirical assessment of the impact of trade employment in the United Kingdom. *European Journal of Political Economy*, 15(3), 485–500. [https://doi.org/10.1016/S0176-2680\(99\)00023-3](https://doi.org/10.1016/S0176-2680(99)00023-3)
- International Monetary Fund (IMF) (2022). *Annual report on exchange arrangements and exchange restrictions (AREAER) 2022*. International Monetary Fund.
- Leonardi, M., & Meschi, E. (2021). Do non-tariff barriers to trade save American jobs and wages. *Discussion Paper Series I Z A Institute of Labour Economics*, 14162. IZA – Institute of Labor Economics.
- Narayan, P. K. (2005). The saving and investment nexus for China: Evidence from cointegration tests. *Applied Economics*, 37(17), 1979–1990. <https://doi.org/10.1080/00036840500278103>
- Nenci, S., & Vurchio, D. (2024). A quasi-experimental approach to assess the causal impact of NTMs on GVC-trade. *EGEI Working Paper, 1-2024*. Economics of Globalisation and European Integration.
- Organisation for Economic Co-operation and Development (OECD) (1992). *Structural changes and industrial performance: A seven-country growth decomposition study*. OECD.
- Pesaran, M. H., & Shin, Y. (1999). An autoregressive distributed lag modelling approach to cointegration analysis. In S. Strom (ed.), *Econometrics and Economic Theory in the 20th century: The Ragnar Frisch Centennial Symposium* (pp. 371–413). Cambridge University Press.
- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289–326.
- Peterson, E., Grant, J., Roberts, D., & Karov, V. (2013). Evaluating the trade restrictiveness of phytosanitary measures on US fresh fruit and vegetable imports. *American Journal of Agricultural Economics*, 95(4), 842–858. <https://onlinelibrary.wiley.com/doi/epdf/10.1093/ajae/aat015>
- Phillips, P. C. B., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, 75(2), 335–346. <https://doi.org/10.1093/biomet/75.2.335>
- Salik, A. M., & Aras, O. N. (2020). Trade restriction and its implications on domestic production of rice in Nigeria. *Journal of Business*, 9(2), 41–53.
- Tuhin, R. (2015). Impact of international trade on employment: Evidence from Australian manufacturing industries. *Office of the Chief Economist Research Papers* 2, 1–31.
- Udoffia, D. T., Ikoh, I. M., & Iriabije, A. O. (2025). Trade protectionism and economic growth: The Nigerian Experience. *Iosr Journal of Economics and Finance*, 16(1), 42–49.
- United Nations Conference on Trade and Development (UNCTAD) (2018). *The unseen effects of non-*

- tariff measures: Insights from new database*. The World Bank. https://unctad.org/system/files/official-document/ditctab2018d2_en.pdf
- Vysotckaia, V. (2021). Non-tariff measures of international trade: Literature review, 1-16. https://www.nispa.org/files/conferences/2021/e-proceedings/system_files/papers/Non_tariff_measures_in_international_trade_literature_review.pdf
- Webb, M., Strutt, A., Gibson, J., & Walmsley, T. (2020). Modelling the impact of non-tariff measures on supply chains in ASEAN. *The World Economy*, 43(8), 2172–2198. <https://doi.org/10.1111/twec.12955>
- World Bank (2022). *World development indicators 2022*. <https://databank.worldbank.org/source/world-development-indicators>
- Yalcin, E., Felbermayr, G. & Kinzius, L. (2017). *Hidden protectionism: Non-tariff barriers and implications for international trade*. Institute of Economic Research, University of Munich.