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Non-Oil Export Promotion and Manufacturing Capacity Utilization in Nigeria and South Africa: A Tale of Two Countries in Africa

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ABSTRACT: This paper studies the dynamics between non-oil export promotion and manufacturing capacity utilization in Nigeria and South Africa. The empirical analysis applies the asymmetric ARDL cointegration technique proposed by Shin et al. (2011) from 1986 to 2022. The evidence suggests that ignoring the intrinsic nonlinearities may lead to misleading inference. In particular, the results reveal significant differences in the response of manufacturing capacity utilization to positive or negative changes in non-oil export and other explanatory variables in both the long- and short-run time horizons. The evidence of asymmetry could be of major importance for more efficient policymaking and forecasting in the Nigerian and South African manufacturing sectors to grow.

KEYWORDS: Non-oil export, manufacturing capacity utilization, Nigeria, South Africa, NARDL
JEL Codes: C32, N17, F40, P33

1. INTRODUCTION

In contemporary economies, the focus on industrialization remains paramount, facilitating the transition of resources from less productive sectors to more promising ones like manufacturing. Scholars like Kaldor (1967) have long recognized industrialization's role in driving economic performance, echoed by contemporary researchers such as Hauge and Chang (2019). Manufacturing considered the engine of industrialization, plays a crucial role in sustaining income and wealth growth (Rodrik, 2006; Mcmillan & Rodrik, 2011). Notably, Europe exemplifies the significance of the manufacturing sector, contributing substantially to GDP and employment (Behun et al., 2018), showcasing its pivotal role in global competitiveness (Herman, 2016; Eurostat, 2017). Despite challenges encountered during transition periods, countries like Romania have witnessed significant growth in industrial production (Herman, 2016). However, the US faces trade deficits with Asian countries, particularly China, impacting its global ranking and highlighting China's manufacturing dominance (Baily & Bosworth, 2014; World Trade Atlas, 2018).

In Africa, the manufacturing sector's contribution to GDP has faced challenges due to infrastructure limitations and unfavorable business environments (World Bank, 2021). Nonetheless, initiatives such as the African Continental Free Trade Area (AfCFTA) and digital manufacturing signal potential growth avenues (African Union, 2019; Oxford Business Group, 2021). Despite challenges, Nigeria and South Africa exhibit growth potentials, especially with increased investments and favorable policies (Fitch Solutions, 2020; South African Government, 2021). Non-oil export promotion emerges as a crucial mechanism for enhancing manufacturing efficiency in Africa (Ross, 2019). Strategies like Export Processing Zones (EPZs), Export Credit Guarantee Schemes (ECGSs), and Export Promotion Agencies (EPAs) have bolstered manufacturing growth by attracting investments and supporting exports (AfDB, 2018; Ibeh & Kasem, 2019).

While Africa's manufacturing sector has seen some positive developments, further efforts are needed to enhance its competitiveness in the global market. Initiatives such as EPZs, ECGSs, and EPAs have shown potential in attracting investments and supporting exports (Kenya Investment Authority, 2016; UNCTAD, 1993; Weissman, 1996; ILO, 2007; Ibeh & Kasem, 2019). However, more comprehensive strategies are required to address infrastructure deficits, improve the business environment, and boost innovation and technological adoption in the manufacturing sector. Additionally, fostering regional integration and cooperation, as exemplified by initiatives like AfCFTA, can further enhance Africa's manufacturing competitiveness and facilitate its integration into global value chains (African Union, 2019; Oxford Business Group, 2021).

The lack of infrastructure, skilled labor shortages, and over-reliance on oil resources are key factors limiting the growth of the manufacturing sector in African economies such as Nigeria and South Africa. Despite efforts to promote non-oil exports through strategies like Export Processing Zones (EPZs) and Export Credit Guarantee Schemes (ECGSs), inadequate transportation systems, unreliable power supply, and limited access to financing hinder manufacturers' operations and competitiveness. Moreover, stiff competition from foreign manufacturers with lower production costs exacerbates the challenge, while the "Dutch Disease" effect from oil exports further hampers non-oil export competitiveness. Additionally, over-reliance on oil revenues may divert investments away from sectors like manufacturing, hindering infrastructure development and economic diversification. In Nigeria, although the manufacturing sector has shown some growth, it still faces challenges such as inadequate infrastructure and high energy costs, while South Africa's manufacturing sector struggles with declining contributions to GDP despite government policies aimed at promotion and export development. These challenges underscore the need for comprehensive interventions to address the constraints facing the manufacturing sectors in both countries. Specifically, it will examine the asymmetric effect of non-oil export on manufacturing capacity utilization in Nigeria and South Africa.

2. LITERATURE REVIEW

The manufacturing sector, often hailed as the engine room of an economy, occupies a central position in driving economic growth and development by facilitating the transformation of raw materials into finished goods. This sector is integral to the process of industrialization, which is widely recognized as essential for sustainable economic progress (Afolabi & Laseinde, 2019). Industrialization encompasses various sectors, including manufacturing, construction, and community services, and is characterized by the adoption of technology, machinery, and capital-intensive processes to increase productivity and output. The manufacturing industry adds significant value to raw materials through a combination of labor, technology, and machinery, ultimately contributing to increased economic activity and employment opportunities.

Despite minor differences in terminology, the concepts of manufacturing and industry are closely intertwined, both playing critical roles in poverty reduction, employment generation, and overall economic output. Manufacturing, often used interchangeably with industry, involves the conversion of raw materials into finished goods through various production processes (Brand South Africa, 2017). This transformation adds value to raw materials and fuels economic growth by creating value-added products for domestic consumption and export. The United Nations Department of Economic and Social Affairs (DESA) defines manufacturing as the process of converting raw materials into final products, emphasizing the importance of industrial processes in economic development (Popa, 2015).

Empirical evidence supports the positive relationship between manufacturing sector output and economic growth. Research has shown that growth in the manufacturing sector leads to increased GDP growth and has spillover effects on other sectors of the economy, enhancing overall productivity and development (Dollar & Kraay, 2004). This positive impact is particularly evident in countries such as China and India, where rapid industrialization and manufacturing sector growth have contributed significantly to poverty reduction and economic expansion (Brandt et al., 2012; Ghani et al., 2012). However, the performance of the manufacturing sector is influenced by various factors, including technological advancements, trade policies, infrastructure development, and access to finance.

2.1 Theoretical Issues

The study adopts Kuznets' retardation theory of industry growth, which has sparked debates since the 1930s (Kuznets, 1930). Kuznets observed that economic growth during the industrial revolution appeared limitless, with industries rising and then being surpassed by new ones, exemplified by Great Britain losing its textile industry dominance to Germany and the United States. Burns supported Kuznets' findings, asserting that individual industries' growth rates decline with age, framing it as the law of industrial growth (Burns, 1934). Burns argued that the emergence of new industries threatened existing ones through competition for production and consumer spending, echoing Schumpeter's concept of creative destruction. While Gold critiqued Burns' S-shaped growth curve and its relevance, Van Duijn later validated Burns' model, highlighting the importance of industry-specific conditions in determining post-maturity trajectory (Van Duijn, 1983). These debates illuminate the complex dynamics of industry growth, influenced by technological advancements, emergence of new industries, and competition among them, emphasizing the need for contextual understanding in studying industry growth patterns.

The following equations are used to establish the basic issues arising from retardation in the industrial sector.

$$n(t) = n_0 e^{n,t} p(t)^{-\alpha} \quad (1)$$

Where n_l is the exponential rate of growth of the long-run demand curve, its value reflects the impact of changes in population growth and growth in per capita income on the demand for the new commodity.

$$T = -\frac{d}{dt} \log h(t) = h_1 + \varepsilon g_s \quad (2)$$

Where h_1 is the exogenous rate of cost reduction and ε is the progress elasticity that binds together the decline in investment because of cost and investment to the growth of capacity. If we take this as a starting point, then we can integrate the technical progress function to give (IV) instead of (4) above.

$$h(t) = h_0 e^{-h_1 t} y(t)^{-\varepsilon} \quad (3)$$

Here there is instability in the unit costs because it is determined by the influx of new brands of products in the market.

Bringing (I) and (IV) in the process of normal expansion, we have as follows.

$$\frac{dx}{dt} = B[\log K + (n_1 + \alpha h_1)t - (1 - \alpha\varepsilon)x] \quad (4)$$

Where the new coefficients are defined as

$$B' = B(1 - \alpha\varepsilon), logK' = \frac{\log K}{1 - \alpha\varepsilon}, and\ G = \frac{n_1 + \alpha h_1}{1 - \alpha\varepsilon} \quad (5)$$

Assuming we have a normal operation in existence, we may be left with no option other than to introduce the condition, $\alpha\varepsilon < 1$, or else long-run expansion will break down. Given that, the new essential rate of growth in the industry, K' will become proportional to the earlier value of the function K, and G is the long-run rate of growth of the industry.

$$x(t) = logK' + e^{-B't}[logY_0 - logK' + A] + G\left[t - \frac{1}{B'}\right] \quad (6)$$

Where A = G/B' is the long-run rate of growth of the sector divided by the basic rate of growth of the industry. For large t, is growing at a fast speed at, G. This new growth rate tends to be higher, and the higher the growth rate of demand and the faster is the rate of cost reduction as expressed by larger values. That way, it will no longer follow a Gompertz curve, the growth path is therefore given as follows.

$$Y(t) = \left[e^{logK'} e^{(logY_0/logK')e^{-B't}}\right][\phi(t)] \quad (7)$$

Where log (t) = $A\left(e^{-B'}t\right) + Gt$ is a modifying function, which for large t grows exponentially at rate G.

Since the market is growing at an exponential rate, it is no longer clear if there can be impediments to productivity growth at each point on the usual curve.

Further, it is important to find out how growth is likely going to continue to rise in the scale of this position. In what follows, subtracting this from (8) we have.

$$logK'(t) = logK' + Gt$$

$$log\frac{Y(t)}{K'(t)} = e^{-B't}\left[\log\left(Y_0/K'\right) + A\right] - A \quad (8)$$

The equation describes output-to-market value ratio, following a Gompertz curve towards an upper limit. It's determined by niche expansion rate divided by industry growth rate. In a static scenario, growth rate is steady, yielding outcomes based on initial value relative to niche growth rate. If initial value exceeds niche growth rate, constant exponential growth occurs; if lower, growth accelerates towards the niche rate. Kuznets (1929) and Burns (1934) suggest hindrances occur when industry scale is notably lower than earlier market worth. Therefore, the exact condition for output retardation can be written as

$$\mathrm{g(t)} = -B'e^{-B't}[logY_0 - logK' + A] + G \quad (9)$$

In sum the Burns/Kuznets argument can be summarized; thus, the condition is sufficient to guarantee that the original growth rate of the industry is good and will continue to be good.

For output retardation, it is also necessary that which is more likely to be satisfied the smaller is the niche growth rate relative to the intrinsic growth rate of the industry. And those delays in growth will always occur at any time the original level of productivity is less than the value given by chance. Therefore, there will be a likelihood of retardation but not in absolute terms.

$$\frac{d\mathrm{g(t)}}{dt} = B'[G - \mathrm{g(t)}] \quad (10)$$

Only if g (0) > G will the industry $log\left(\frac{K'}{Y_0}\right) > \frac{G}{B'} = A$

The equations above illustrate the concept of growth retardation in the industry as posited by Burns and Kuznets, suggesting that industries may face bottlenecks altering their growth patterns.

2.2 Empirical Review

Rahayu (2021) investigated the decline in Indonesia's exports, focusing on non-oil and gas exports in the manufacturing sector. Utilizing a descriptive methodology covering the period from 2016 to 2021, the study highlighted the critical role of the manufacturing sector in Indonesia's export landscape, despite challenges posed by the COVID-19 pandemic. Sahoo et al. (2022) examined the impact of export activities on the productivity and competitiveness of Indian manufacturing firms using firm-level data from 1994 to 2017. Their findings suggested that exporting firms tend to exhibit higher productivity levels, indicating that engagement in exporting facilitates the adoption of new knowledge and practices.

Idowu and Tomisin (2021) evaluated the influence of manufacturing sector performance and government expenditure on Nigeria's economic performance. Employing time series data spanning from 1981 to 2020, their study revealed positive impacts of manufacturing sector performance, foreign direct investment, and certain government expenditures on economic performance, while Ogodo (2018) found no significant relationship between manufacturing sector output and economic growth in Nigeria from 1981 to 2017. Additionally, the CBN statistical bulletin (Amoo et al., 2017) reported various disbursements by the Bank of Agriculture and capital inflows into the Nigerian economy from 2011 to 2015, reflecting ongoing developments in the country's financial landscape.

Okere et al. (2019) recently investigated the impact of bank credits on Nigeria's manufacturing sector output from 1981 to 2018. Using an ARDL bound co-integration test and ECM, the study examined manufacturing sector output, credit to the manufacturing sector, bank interest rates, and inflation rates as key variables. The findings indicated a long-run positive relationship, but a negative and statistically significant relationship between bank credit and manufacturing productivity. Furthermore, studies by Okorie and Chikwendu (2019) and Apkan et al. (2016) using the ARDL model and VECM, respectively, highlighted the impact of private sector credit and lending rates on private sector investment and manufacturing output. Gideon et al. (2015) investigated the effects of banking sector reforms on manufacturing output, revealing positive impacts of banks' lending rates and exchange rates on sector growth, while interest rate spread and financial deepening exerted negative effects. Overall, these studies underscore the significance of macroeconomic conditions, such as lending rates and exchange rates, in influencing manufacturing sector performance and economic growth, with implications for policy interventions aimed at improving productivity and competitiveness.

In their study, Bhattacharya and Rath (2020) analyze Chinese and Indian manufacturing firms from 2012 to 2014, finding that innovation positively affects labor productivity in both countries. However, the impact of innovation on firm productivity is comparatively weaker in India than in China. They also highlight the significant contributions of worker wages, education, and training to enhancing labor productivity in both contexts. Interestingly, their findings suggest that innovation's influence on labor productivity is more pronounced in large firms compared to medium-sized ones, but it doesn't significantly affect labor productivity in small manufacturing firms in either China or India. Meanwhile, employing the system GMM estimator, Bournakis and Mallick (2018) uncover several key insights. Firstly, they identify the Ackerberg et al. (2015) algorithm as the most credible technique for estimation, followed closely by the GMM system (GMM-SYS). Secondly, they observe a negative impact of the 2009 global financial crisis on Total Factor Productivity (TFP). Thirdly, they find that corporate taxes have an adverse effect on TFP growth, introducing distortive influences on productivity-enhancing investments. Lastly, they note that this negative impact is more pronounced among R&D and exporting firms, suggesting that corporate tax distortion disproportionately affects financially constrained and risk-exposed firms.

3.0 METHODOLOGY

3.1 Variables and Data Collection

This study employed an ex-post facto research design, recognized as an instrumental research tool by experts (Kerlinger, 1964), which is known for analyzing cause-and-effect relationships between dependent and independent variables (Akinlua & Haan, 2019). Secondary data spanning from 1981 to 2022 for Nigeria and from 1986 to 2022 were gathered from the World Development Indicators (WDI). The explained variable used in the study was manufacturing capacity utilization (MCU). Conversely, the study considered non-oil exports (NOXP), domestic credit to the private sector (CPS), lending rate (LR), general government final consumption expenditure (GGFE), and exchange rate (EXT) as the explanatory variables. Additionally, to address non-oil export promotion, a dummy variable was introduced into the model due to the lack of precise spending data on non-oil export promotion by the governments of Nigeria and South Africa. For Nigeria, non-oil export promotion strategies commenced in 1986, resulting in a dummy value of 0 from 1981 to 1985 and 1 from 1986 to 2022. Similarly, South Africa initiated non-oil export promotion strategies in 1996, leading to a dummy value of 0 from 1981 to 1995 and 1 from 1996 to 2022.

3.2 Model Specification

Given the objective of this study, a linear model has two disadvantages – cannot be used to test for the asymmetric uncertainty effects and our data may contain other inherent nonlinearities.. Furthermore, asymmetric models may perform better with equity data than do symmetric models. For example, among autoregressive models, nonlinear asymmetric methods may provide a better fit for volatility in returns (see Chkili et al., 2012; Curto & Pinto, 2012; Karmakar, 2007; Dakhlaoui & Aloui, 2016). Given these caveats, a linear model may impose unrealistic restrictions, and possibly lead to biased inferences (Katrakilidis & Trachanas, 2012). To empirically model the non-oil export promotion effects of Nigeria and South-Africa manufacturing capacity utilization, an appropriate nonlinear model is required.

The NARDL model has three main advantages (see Lahiani et al., 2016) that are directly relevant to this study. First, it distinguishes between short- and long-run asymmetries, enabling us to look for specific features (e.g., overshooting) in the immediate reaction of manufacturing capacity utilization to non-oil export shocks. At the same time, we can characterize the long-run, equilibrium relationship between non-oil export and manufacturing capacity utilization performance. Second and relatedly, the methodology allows for testing of dependent variable responses to positive and negative changes in each of the explanatory variables (Lahiani et al., 2016; Liang et al., 2020). This enables us to construct and depict the asymmetry line. Third, the NARDL method is flexible to the cointegration dynamics between variables, as it can accommodate multiple data series of different integration orders, and it can be used to test for both linear and nonlinear cointegration.

The analysis is performed on the following general empirical model:

$$lmcu_t = f\left(lcps_t, lnoxp_t^+, lnoxp_t^-, lr_t, lextr_r ggfe_t, dum_t\right) \quad (11)$$

Where, $lnoxp_t^+$ and $lnoxp_t^-$ are partial sums of positive and negative changes in $lnoxp_t$, respectively. Concerning the application of the ARDL method it can be applied irrespective of the regressors' order of integration. It is imperative to initially test the stationary properties of the involved series to ensure that none are integrated of order I (2). Consequently, we apply the Augmented Dickey-Fuller (ADF) and Philipp Perron unit root tests. The findings presented in Table 1, suggest that some examined variables are nonstationary in levels while some turn stationary in first differences and thus we can proceed with testing for cointegration in the NARDL framework. The NARDL (*p, q*) model can be written as:

$$lmcu_t = \sum_{j=1}^{p} \varphi_j lmcu_{t-j} + \sum_{j=0}^{q}\left(\theta_j^+ lnoxp_j^+ + \theta_j^- lnoxp_j^-\right) + \sum_{j=0}^{r} \phi_j X_j' + \varepsilon_t \quad (12)$$

Where φ_j is the autoregressive parameter, θ_j^+ *and* θ_j^- are the asymmetrically distributed lags, ϕ_j the symmetrically distributed lags, X_t is a $k \times 1$ vector of the symmetry explanatory variables, ε_t is a zero-mean, homoscedastic *i.i.d.* process. The asymmetric error-correction equation can be specified;

$$\Delta lmcu_t = \rho lmcu_{t-1} + \theta^+ lnoxp_{t-1}^+ + \theta^- lnoxp_{t-1}^- + \phi X_t' + \sum_{j=1}^{p-1} \gamma_j \Delta lmcu_{t-j}$$
$$+\sum_{j=0}^{q-1}\left(\delta_j^+ \Delta noxp_{t-j}^+ + \delta_j^- \Delta noxp_{t-j}^-\right) + \sum_{j=0}^{r-1} \lambda_j \Delta X_{t-j}' + \varepsilon_t \quad (13)$$

Where $\rho = \sum_{j=1}^{p} \varphi_{j=1} - 1$ *and* $\gamma_j = -\sum_{i=j+1}^{p} \varphi_i$, *for j=1,....p-1,* δ^+*and* δ^- are positive and negative short-run adjustments to changes in non-oil export, λ is the short run for the symmetry explanatory variables vector.

4. RESULTS AND ANALYSIS

4.1 Stationary Test

We examine the order of integration among the variables, using the augmented Dickey-Fuller (ADF) and Philips-Perron (PP) tests (Dickey & Fuller, 1979; Phillips & Perron, 1988). The Table 3 unit root test output identifies all our time series, except for MCU (Nigeria) and LR (South Africa), as I(0), under ADF and only MCU as I(0) under PP. This implies that the order of integration of the series is mixed, signifying and necessitating the use of the Nonlinear Autoregressive Distributed Lag (NARDL) as proposed by Shin et al. (2014), which allows mutually co-integrated series.

Table 1: Stationarity Tests

	Level		First Difference	
Variable	ADF	PP	ADF	PP
Nigeria				
	-3.7646**	-3.8952**	-8.4860***	-8.5290***
	-2.2160	-2.6099	-4.3961***	-10.1464***
	-1.2020	-1.1837	-5.9131***	-6.1444***
	2.2401	-2.2401	-6.6652***	-6.7185***
	-2.1856	-2.0407	-4.1760**	-11.0487***
	-2.8380	-2.3621	-2.9895***	-7.3374***
South Africa				
	-2.8199	-2.8242	-6.8041***	-9.8468***
	-1.2967	-0.6422	-4.80933***	-11.9299***
	-2.6611	-2.0588	-4.4982***	-4.7727***
	-1.8684	-1.8684	-6.6582***	-6.9254***
	-3.1642	-3.0562	-3.5525*	-5.8146***
	-5.6368***	-2.7868	-5.4830***	-3.8673**

Source: Authors' own computation
Notes: * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

4.2 Empirical estimates

The short-term findings from the NARDL model analysis in Nigeria, as presented in Table 2, reveal several significant correlations. There exists a positive association between CPS and MCU, as an increase in domestic credit to the private sector positively impacts manufacturing capacity utilization, alongside mixed effects of exchange rates, GGFE, and lending rate. The lending rate (LR) also demonstrates a positive association with MCU, as does the implementation of export promotion strategies by the government. Additionally in the short-run, the coefficient of positive and negative shocks in non-oil export is positive, respectively. The estimates show that increase in NOXP lead to an increase in MCU, while a decrease in NOXP will lead to a decrease in Nigeria's MCU.

Table 2: Short-and Long-run non-Linear ARDL estimates

	Nigeria	South Africa
δ^{lcps}	8.8763***	-0.0057***
	(2.1046)	(0.0011)
δ^{lextr}	2.2102***	0.23529**
	(0.2253)	(0.0638)
δ^{lggfe}	6.0747***	-0.3071*
	(1.0340)	(0.1711)
$\delta^{lnoxp^{+}}$	5.9322*	0.0141**
	(2.724)	(0.0061)
$\delta^{lnoxp^{-}}$	3.7100*	0.0037***
	(2.0107)	(0.0009)
δ^{lr}	1.6865***	-0.0076**
	(0.1446)	(0.0035)
δ^{dum}	0.8950**	0.9962***
	(0.1886)	(0.2533)
λ^{lcps}	-14.1539**	0.2176*
	(5.9286)	(0.1134)
λ^{lextr}	10.8934**	-0.2305*
	(4.9102)	(0.1205)
λ^{lggfe}	15.72502***	0.1407**
	(4.0028)	(0.0672)
$\lambda^{lnoxp^{+}}$	8.5123*	0.1400***
	(4.2048)	(0.0301)
$\lambda^{lnoxp^{-}}$	4.7443*	1.2453***
	(2.6443)	(0.1908)
λ^{lr}	2.0121	0.0420
	(1.4671)	(0.0281)
λ^{dum}	0.8019**	0.2743**
	(0.3670)	(0.1034)
λ^{ect}	-0.5871***	-0.3920***
	(0.0571)	(0.0392)

The values in parentheses are the standard errors. They are for the long run, while the values that are starred are for the short run. ***, ** & * imply significance at the 1%, 5% and 10% levels, respectively.

More so in the short-run, the coefficient of the dummy variable is positive, showing that as Nigeria government implementation of export promotion strategies increases, it will lead to an increase in manufacturing capacity utilization. For South Africa, as shown in Table 2, the short-term NARDL model results depict similar dynamics with some distinctions. A negative nexus exists between CPS and MCU, while exchange rates show varying impacts. Similarly in the short-run, the coefficient of increase and decrease in non-oil export is positive, respectively, showing that increase in NOXP lead to an increase in manufacturing capacity utilization, while a decrease in NOXP will lead to a decrease in South Africa's manufacturing capacity utilization. Importantly, the implementation of export promotion strategies significantly boosts capacity utilization, highlighting the effectiveness of government initiatives in driving manufacturing sector fluctuations, as the coefficient of the dummy variable is positive.

In the long run, there is evidence that the domestic credit to private sector (CPS) has negative association with MCU in Nigeria, as exchange rate, GGFE and lending rate exert positive relationship with manufacturing capacity utilization in Nigeria. More so, it was further established that in the long run, increase in non-oil export has a statistically significant positive impact on manufacturing capacity utilization in Nigeria, as a decrease in non-oil export led to a decrease in MCU in Nigeria. The dummy coefficient is positive showing that as Nigeria government implementation of export promotion strategies increases, it will lead to an increase in manufacturing capacity utilization. The speed of adjustment coefficient is negative and statistically significant as required, indicating that about 58.71% of the short-run deviations from the long-run equilibrium are corrected annually. The adjusted speed for this study is 1.70 (i.e., $1/0.5871$), which implies that it would take about one (1) year and eight months for short-run deviations from the long-run to be corrected in Nigeria.

Conversely, from Table 2, there is evidence that CPS, GGFE and lending rate has a positive relationship with manufacturing capacity utilization, as exchange rate depicted a significant negative relationship with MCU in South Africa. It was also revealed that, in the long run, an increase in non-oil export will lead to an increase, while a decrease in non-oil export will lead to a decrease in manufacturing capacity utilization in South Africa. Also, the dummy coefficient is positive. The estimates show that as South Africa government implementation of export promotion strategies increases, it will lead to an increase in manufacturing capacity utilization. The result also depicted that export promotion strategies implementation has significant influence on manufacturing capacity utilization in South Africa. The speed of adjustment coefficient is negative and statistically significant as required, indicating that about 39.2% of the short-run deviations from the long-run equilibrium are corrected annually. The adjusted speed for this study is 2.50 (i.e., $1/0.3920$), which implies that it would take about two years and six months for short-run deviations from the long-run to be corrected in South Africa.

The study aims to explore the asymmetric impact or effect of non-oil export on manufacturing capacity utilization in Nigeria and South Africa. The empirical findings are consistent with findings in some other studies. For instance, the findings that non-oil exports positively impact MCU aligns with the findings by Sahoo et al. (2022) who examined the importance of the manufacturing sector in Indonesia and India, respectively. Although their focus is on the broader economic contributions and productivity of the sector. Similarly, this result aligns with the works of Idowu and Tomisin (2021) and Gideon et al. (2015) in considering factors such as government expenditure, credit availability, and lending rates in the manufacturing sector. The asymmetric analysis contributes to the existing literature by shedding light on the varying impacts of these factors on manufacturing capacity utilization in the short and long term. Contrasting this with the empirical review, Rahayu (2022)'s study on Indonesia indicates the importance of the manufacturing sector in supporting non-oil and gas exports, highlighting a positive relationship. However, the Nigerian study contradicts Ogodo (2021) results, which suggested that manufacturing sector output has no statistical significance on economic growth. The analysis on credit availability, such as Okere et al. (2022) study, and the impact of lending rates in Nigeria, as seen in Apkan et al., (2023)'s work, supports the importance of credit availability and lending rates on manufacturing sector performance. The study also aligns with the study by Gideon et al., (2022) indicating that lending rates positively impact the growth of the manufacturing sector. However, it contrasts with Okorie and Chikwendu (2022) findings that private sector credit has a positive but insignificant impact on private sector investment in Nigeria in the long run.

It is crucial to note that while other studies may have provided a broader context, touching on various studies that assess the manufacturing sector's impact on economic performance, trade policies, and government expenditure, the Nigerian study, by focusing specifically on the asymmetric impact of non-oil exports, adds depth to the understanding of the manufacturing sector's dynamics, contributing valuable insights to the existing body of literature.

4.3 Wald tests of long-and short-run asymmetry

When *F*-test of Pesaran et al. (2001) is significant, we can test for long- and short-run asymmetry in the relationship between non-oil export and manufacturing capacity utilization for Nigeria and South Africa. Table 3 shows that the Wald Test rejects the null hypothesis of a symmetric relationship between non-oil export and MCU in Nigeria and South Africa. These findings indicate that NOXP shocks cause differing MCU reactions in Nigeria and South Africa.

Table 3: Results of long-run and short-run asymmetry tests

Country	NOXP and MCU	
	$Wald_{LR}$	$Wald_{SR}$
Nigeria	9.809***	12.839***
	(0.007)	(0.004)
South Africa	4.5615**	5.2000**
	(0.033)	(0.023)

Note: $Wald_{LR}$ and $Wald_{SR}$ refer to the Wald statistics for the null hypotheses of long- and short-run symmetry. The values in parentheses are the p-values. The are for the long run, while the are for the short run. ***, ** & * imply significance at the 1%, 5% and 10% levels, respectively

4.4 Comparative analysis

Non-Oil Export Promotion and Manufacturing Capacity Utilization in Nigeria and South Africa: A Tale of Two Countries in Africa

The comparative analysis for Nigeria and South Africa delved into the asymmetric impact of non-oil exports on manufacturing capacity utilization, employing the NARDL methodology as the appropriate analytical framework. Empirical results, as delineated in Tables 2, confirmed the existence of short- and long-run asymmetries in both countries, shedding light on the dynamic economic landscapes. Notably, in the short term, the influence of domestic credit to the private sector (CPS) on manufacturing capacity utilization differed starkly between Nigeria and South Africa. While Nigeria exhibited a positive correlation between CPS and capacity utilization, South Africa experienced a negative relationship, suggesting contrasting patterns in credit accessibility and utilization within the manufacturing sectors of the two nations.

Further examination revealed intriguing dynamics regarding long-term manufacturing capacity utilization trends. In Nigeria, a negative correlation between credit to the private sector and capacity utilization emerged in the long run, while South Africa displayed a positive association. This disparity hints at divergent economic structures and financing mechanisms, with Nigeria relying more heavily on credit facilitation for manufacturing operations compared to South Africa, where other factors such as foreign direct investment may play a more dominant role. Additionally, currency dynamics in the long run showcased Nigeria's depreciating Naira against the South African Rand's appreciation, reflecting the differential import dependencies and exchange rate impacts on manufacturing processes.

The implications of these findings are manifold, offering valuable insights for policymakers, researchers, and stakeholders in both Nigeria and South Africa. In Nigeria, the observed positive correlation between non-oil exports and short-term manufacturing capacity utilization underscores the imperative of export diversification for driving sectoral growth. Policymakers are encouraged to prioritize initiatives aimed at promoting non-oil export expansion and enhancing market access to capitalize on this relationship. Conversely, in South Africa, the nuanced relationship between domestic credit, exchange rates, and non-oil exports underscores the complexity of export-led growth strategies, necessitating targeted interventions to bolster manufacturing capacity utilization and foster economic development. Comparative analysis with existing literature underscores the need for tailored policy interventions that account for country-specific nuances, ultimately contributing to sustainable economic growth and competitiveness on the global stage.

5. CONCLUSION AND RECOMMENDATIONS

This study aimed to explore the asymmetric impact of non-oil exports on manufacturing capacity utilization in Nigeria and South Africa, employing the NARDL methodology to analyze the intricate relationships within each economic context. The findings confirmed the short- and long-run asymmetries in both countries highlighted the complex dynamics at play, with Nigeria relying on domestic credit to the private sector and South Africa depending on general government final consumption expenditure for manufacturing capacity utilization. These disparities underscore the necessity for tailored policy interventions to address the specific economic landscapes of each nation. These findings underscore the importance of acknowledging the contextual differences between Nigeria and South Africa and tailoring policy measures to address the specific economic dynamics of each nation. Recommendations for policymakers include diversifying funding sources in Nigeria, addressing high production costs, promoting export diversification in South Africa, facilitating ease of doing business, and adopting a flexible and adaptive approach to policymaking. Additionally, collaborative research initiatives and knowledge-sharing platforms can further enhance informed decision-making and contribute to the sustainable economic development of both nations.

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