IMPACT OF MANUFACTURED PRODUCTS EXPORT ON NIGERIA'S ECONOMIC GROWTH

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ABSTRACT

This study examined impact of manufactured products export on economic growth in Nigeria from 1990 to 2022. A model from endogenous growth theories known as AK growth model is put to empirical test. The study adopted an ex post facto research design and the Auto Regressive Distributed Lag bounds testing approach. The result of the bounds test to cointegration indicates a long-run equilibrium relationship between manufactured products export and Nigeria's economic growth. The result of the long-run estimation revealed that manufactured products export exert positive significant influence on economic growth in Nigeria. In short-run, the results reveals that manufactured products export also had positive significant influence on economic growth in Nigeria. Therefore, the study recommends that policy actions should point to the direction of trade liberalization and increase in productivity; that that adequate policies and institutional framework should be put in place by the Nigerian government to control inflation and saving rates in the economy so as to stimulate vigorous performance of the indigenous manufacturing industries sand also patronage of made in Nigeria goods.
Keywords: Economic growth, inflation rate, manufactured products export, saving rate

INTRODUCTION

Producing goods for use or sale through manufacturing involves labor, machinery, equipment, chemical and biological processes, or formulation. The term "manufacturing" is used to describe a variety of human endeavors, from manual labor to high-tech-powered processes. However, but it is mostly used to describe industrial production, in which raw materials are converted into finished goods en mass. Industrialization has been viewed as a real path to achieving high and desirable vision and benefits of increased quality of life (Adofu et al., 2015).

Converting raw resources into fished goods, intermediates, or semi-finished commodities is manufacturing. Manufacturing, like other industrial pursuits, boosts agriculture, diversifies the economy, and increases a country's gains from foreign exchange. It also makes it possible for local labor to learn new skills. Nigeria has a long history of industry dating back to pre-colonial times. Small-scale producers of commodities for commerce and other social reasons are prevalent in communities, including those of the Hausa, Benin, and Ibo people (Charles-Anyaogu, 2012).

Despite government's efforts to improve capacity utilization and increased production, the industrial sector has experience decrease in manufacturing output in Nigeria; and this has been a course for concern. Massive imports of finished goods and insufficient financial support for local manufacturing are key causes of the decline in capacity utilization and underwhelming performance of the manufacturing sector in Nigeria; and trend is likely to continue for as long as manufacturers find it increasingly difficult to access raw materials due to fierce rivalry from multinational companies (Obamuyi et al., 2012).

Nigeria's manufacturing sector is faced with a number of difficulties, including lack of investment in R&D and innovation, dependence on imported machinery, equipment, and spare parts, restrictions on foreign exchange, etc. The sector's contribution to Nigeria's gross domestic product (GDP), which averaged 4% from 2004 to 2009, makes the deterioration clear (Szirimai, 2008). Earliest efforts in manufacturing activities in Nigeria were oriented towards the adoption of an import substitution strategy in which light industry and assembly related ventures were embarked upon by trading companies.

Up to about 1970 key players in the manufacturing sector were private enterprises that established agro-based light manufacturing units such as vegetable oil extraction plants. The import-dependent industrialisation strategy virtually came to a halt in the late 1970s and early 1980s when the liberal importation policy expanded the import of finished goods to the detriment of domestic production (Loto, 2012). In light of the foregoing, this study aims to investigate the impact of manufactured products export of Nigeria's economic growth.

LITERATURE REVIEW

Manufactured Products Export and Economic Growth

Exports of manufactured products remains a powerful engine for economic growth. It acts as a catalyst to transform economic structures of a countries, from simple slow value activities to more productive activities that enjoy greater margins and higher growth prospects (Albaledjo, 2008); and bridges the income gap with the industrialized world (Amakom, 2012) through its pull effect on other sectors of the economy.

The manufacturing sector is key to technological and human development; and represents the hub of technical progress in developed and developing countries (Amakon, 2012). The sector plays a catalytic role in the transformation of modern economies (Zoramawa et al., 2020; Loto, 2012). It is an avenue for increasing productivity in relation to import replacement and export expansion, creating foreign exchange earning capacity, creates investment capital, raising employment and per capita income, and promotes wider and more effective linkages between sectors, which in turn, causes unique consumption patterns (Loto, 2012; Ogwuma, 1995).

Abdul-Aziz (2021) examined the relationship between disaggregate exports (manufacturing and primary export) and economic growth from 1982 to 2017, using Johansen Juseiluis multivariate cointegration. The result indicates a long-run relationship between manufacturing and primary export and economic growth in the ASEAN-4 during the period. Abdurrahman (2021) investigated effect of oil and non-oil exports on Saudi Arabia's economic strength from 2005 to 2019. The study models' linear and non-linear forms were estimated using the ordinary least square approach. The findings reveal both oil and non-oil exports had a positive impact on Saudi Arabia's economic performance over the study period.

Zayone et al. (2020) studied effects of Angola's agricultural, manufacturing, and mineral exports on the country's economic growth from 1980 to 2017. The result from ARDL model indicates that exports from all three sectors (manufacturing, mineral, and non-mineral) have propelled Angola's economic growth in the long run, the estimates show that only non-manufacturing exports have driven its growth in the short-run. Iwuoha and Awoke (2019) explored impact of non-oil exports on economic growth in Nigeria from 1981 to 2017 using ARDL technique. In the long-run, the ARDL results demonstrate that all the components tend to move simultaneously on economic growth. However, the study indicates that the impact of non-oil exports on economic development is insufficient to propel the country to an enviable position during the research period.

Bururac (2019) evaluated impact of industrial exports on economic development, using applied Vector Error Correction and reveal that manufacturing exports have a favorable impact on economic development in Nigeria from 1990 to 2018. Imoughele and Ismaila (2015) analysed effect of non-oil

exports on economic growth in Nigeria from 1986 to 2013 using Johansen cointegration; and found that increase in non-oil exports negatively impact economic growth.

Also, Saleem and Sial (2015) evaluated the relationship between exports and economic growth in Pakistan, applying ARDL techniques. The findings shows that there is a unidirectional causation from exports to GDP and GDP per capita, as well as evidence of unidirectional causal relationship through financial development to economic growth, confirming the theory of growth-driven exports (GDE).

In addition, Tsegaye (2015) examined impact of macroeconomic variables on trade using Cobb Douglas production function under Vector Error Correction Model (VECM) and Granger causality. The study showed that a long-run, unidirectional causal relationship exists between economic growth and export, as well as the presence of bi-direction causality for imported goods in Korea. Furthermore, the analysis discovered unidirectional short-run causation between exports and imports and economic growth.

Odi (2015) tested a model comprising agricultural, manufacturing and solid mineral component of non-oil export using Ordinary least square (OLS) and error correction mechanism (ECM). The results show that shift in these sectors account for variation in Nigerian's economic growth. Similarly, Njimanted and Aquilas (2015) used Johansen Cointegration and VECM to investigate impact of timber export on Cameroon's GDP growth from 1980-2014. The results indicate that timber exports has weak positive impact on economic growth in the long-run and the short-run. In other studies, Ezike (2012) reported a negative relationship between trade policies and non-oil export in Nigeria; Elbeydi et al. (2010) revealed a long-run bi-directional causality between exports and economic growth in Libya; Kotil and Konur (2010) found export growth leads to GDP growth in Turkey from 1989-2007; while Ozturk and Acaravcı (2010) revealed a Uni-directional causality from real exports to real GDP in Turkey.

Theoretical foundation

The foundational theory of this study is the AK growth model, which establishes the role of total factor productivity in the process of economic growth. AK model endogenizes improvement in technology through "learning by doing." Such learning can be gained from exporting, due to interactions with advanced foreign firms or through investing, due to use of better quality foreign technology. In order to capture the role of exports in output through the productivity channel we start with the AK-type production function.

$Y_t = A_t K_t^b$ (1)

Where:

Y = yield or output

K = capital stock

A = total factor productivity (TFP).

This production function has proven valuable in numerous studies (see Herzer, 2011; Ben-Hammouda et al., 2006; Berthelemy & Chauvin, 2000). TFP is thought to be a component of all private investment in the economy. In order to examine how exports, affect economic growth through change in productivity, it is assumed that the productivity perimeter can be expressed as a function of exports, X_t and trade openness.

$A_t = f(X_t) = X_t^b$ (2)

And because the interest is the components of the export to measure the magnitude of its impact on economic growth, therefore disaggregate the exports X_t into oil and non-oil export: $A_t = f(X_{agrex,})$

Empirical Model

Empirically, the role of export compositions through AK- model has proved useful in studies conducted by Forgha et al. (2014) and Dreger and Herzer (2011). However, in modification to the adopted models, variable for trade openness is introduced and import variable dropped. Following the theoretical model above, the econometric model can be specified as;

$Ln(GDP_t) = \beta_1 \ln(MAEX_t) + \beta_2 \ln(INFL_t) + \beta_3 \ln(SAV_t) + u_t$ (3)

Where:

Y= GDP per capita
MAEX= Manufacturing products export
INFL=Inflation Rate
SAV=Saving Rate
u_t = Stochastic disturbance term

METHODOLOGY

This study adopted an ex post facto research. The study collected data CBN's Statistical Bulletin (2022) and World Bank Open Data Bank (2022). Specifically, data on manufacturing products export was obtained from World Bank Open Data Bank while data on proxies of economic growth (GDP, inflation rate and saving rate) were obtained from CBN Statistical Bulletin.

Estimation Procedure and Model Specification

Unit Root Tests/Traditional Unit root test

The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests are used to test the null hypothesis that each of the variables in the study is non-stationary or has a unit root. The alternate hypothesis is that each variable is stationary and has no unit root. The stationarity of a variable at levels means that the variable is integrated of order zero (I (0)). If a series is stationary at first difference and at second difference, then the variable is integrated of order one (I(1)) and order two (I(2)) respectively (Dickey & Fuller, 1981; Phillips & Perron, 1988).
The general equation is given as;

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \Sigma \alpha \Delta Y_{t-i} + \varepsilon_t \quad (4)$$

Where ε_t is a pure white noise error term and Y_t the relevant variables under investigation.

Zivot-Andrews Unit Root

This study conducted Zivot-Andrews unit root to examine the structural break in the trend property of the variables in the study. Unlike other traditional unit root tests (Augmented Dickey- Fuller (ADF), Phillips-Perron (PP) and Kweiatkowski-Philiph-Schmidt-Shin (KPSS) tests which assumed no break in the time series, the Zivot-Andrews unit root and Perron (1989) confirmed that the series might include certain break over time.

Cointegration Technique

In addition, the researcher's intentions were to provide new empirical knowledge by testing the impact of manufactured products export on Nigeria's economic growth, using newly developed bootstrap autoregressive distributed lag (ARDL) testing technique as proposed by (McNown et al., 2018). The recent form of ARDL includes additional t-test $t_{dependent}$ or F-test $F_{independent}$ on the coefficients of lagged independent variables or coefficients of lagged dependent variables (Alhodiry et al., 2021; Goh et al., 2019). The critical values (CV) in the bootstrap ARDL approach lead to eliminating unstable results of the ARDL bounds testing model (Alhodiry et al., 2021; Goh et al., 2019).

However, McNown et al. (2018) critical values gained by bootstrap simulation will lead to better results than the traditional ARDL bounds test. The Pesaran et al. (2001) CV allows for (1) endogeneity of all explanatory examined variables. Also, this approach is more suitable for data that contains more than one explanatory variable to be endogenous, while the CV generated with a bootstrap technique allows for the endogeneity of all explanatory examined variables. Moreover, the bootstrap ARDL test has one unique quality as compared to other bounds tests, it eradicates the possibility of indeterminacy (Caglar, 2020; Saleem et al., 2020). Furthermore, the Bootstrap procedure has the additional advantage of eliminating the possibility of inconclusive inferences (Lin et al., 2017). Thus, the general Bootstrap ARDL model is specified as:

$$\Delta(lnGDP)_t = \beta_0 + \sum_{i=1}^{p} \beta_1 \Delta(lnGDP)_{t-i} + \sum_{i=0}^{r} \beta_2 \Delta(lnMAEX)_{t-i} + \sum_{i=0}^{h} \beta_3 \Delta(LINFL)_{t-i} + \sum_{i=0}^{h} \beta_4 \Delta(LSAV)_{t-i} + \delta_1 lnGDP_{t-1} + \delta_2 (lnMAEX)_{t-1} + \delta_3 (LINFL)_{t-1} + \delta_4 (LSAV) + \delta_5 (DUM)_{t-1} + Ut$$

RESULT DISCUSSION

Results of Unit Root Test

The Bootstrap ARDL bounds testing approach does not require the restrictive assumption that all series are integrated of the same order, this allows either I(0) or I(1) for the time series in a long-run relationship. In addition, Pesaran et al. (2001) noted that the employment of I(2) variable invalidate the use of ARDL approach. Therefore, this study employed the Augmented Dickey- Fuller (ADF) and Phillips-Perron (PP) tests for robustness check to examine the order of integration of the variables employed in the model.

Table 1: Results of Unit Root Tests

	ADF Test		PP Test		
Variables	Level	First Difference	Level	First Difference	Stationary Status
RGDP	-1.0163	-6.1160***	-0.1586	-5.6357***	I(1)
LMAEX	-2.5685	-5.3185***	-2.4507	-10.4266***	I(1)
INF	-2.1519	-9.7167***	-2.4255	-4.5124***	I(1)
LSAV	-7.9980***	_____	-4.3412***	_____	I(0)

Source: Author's computation (2023).**Note:*****, **and * denotes significance at 1%,, 5% and 10%, respectively.

The results from ADF and PP tests in table 4.1 reveal that all the variables (MAEX, GDP and INF) have unit root at their level, I(0), which means they are not stationary. After taking the first difference, the unit roots of the variables were eliminated and became stationary and therefore integrated are integrated of order one, I(1). However, the variable (LSAV) is stationary at level and integrated in to order of zero I(0). In addition, these confirmed that most of the macroeconomic variables are not stationary at level but after first differencing they will become stationary (see Table 4.1). Therefore, the mixture of order of integration provided the justification for the employment of Bootstrap ARDL bounds testing approach in the study.

Zivot-Anderews Unit Root Test Results

The results from Zivot-Andrews unit root tests is presented in table 4.2 reveal that variables such as MAEX and INF have no unit root at level both in the intercept and trend. However, variables RGDP and LSAV have unit at their level both in trend and intercept, but after taking the first difference the unit root disappeared and became stationary with the break in the trend and intercept. Thus, the study rejects the null hypothesis and concludes that variables are stationary and have a break at the endogenously identified dates.

Table 2: Zivot-Anderews Unit Root Test Results

Variables	t-statistics	Break point
MAEX	4.151883*	1998
ΔRGDP	9.261536***	2016
ΔLSAV	5.243633***	2013
INFL	4.823571***	2017

Note: ***, * and *** denote 1%, 5% and 10% level of significance. The maximum lag length used is 4, except for INF where the lag used is 5.
Source: Author's computation (2023).

Furthermore, in order to get accurate result, this study estimated the models with structural break using the structure break in the regressors of interest. To capture the break, dummy variables was employed which took the values of 0 from 1990 to 1997 and 1 from 1998 to 2022. Thus, the mixed order of integration of the variables indicates a strong evidence for the employment of the ARDL model in this study.

Bootstrap ARDL Bounds Testing to Cointegration

The result from Bootstrap ARDL bounds testing to cointegration presented in Table 4.3 indicated that the F and T-test of lag level variables significant at 1% level. Also, the values of T-test of lag level dependent variable and F and T-test of lag level independent variables are greater that the critical values of McKnown et al. (2018). The study rejects the null hypothesis and confirmed that there is long-rung relationship between AGREX, FDI, LITR and GDP in the study.

Table 3: Cointegration Results Using Bootstrap ARDL Bounds Test

Dependent Variable		F	tdep	findep	Result
LDINV		63.77***	127.55******	8.59******	Cointegration
Bootstrap-based table CV	1%	7.59	7.99	7.99	
	5%	5.05	5.05	5.05	
	10%	3.99	3.99	3.99	

*** denotes statistical significance at 1% level. Note: F is the F-statistic for the coefficients, tdep denotes the t-statistics for the dependent variable, findep denotes the t-statistics for the independent variable. K=3

Source: Author's calculation (2023).

Results of Selected Long-run and Short-run Model

The Bootstrap ARDL bounds testing to cointegration was conducted and confirmed that there is a long-run cointegration among the variables in the model. Also, SIA suggested the optimal lag-length for the variables is (1, 0, 2, 0, 2). The results of the long-run and short-run for the models are presented in Table 4.

Table 4: Results of ARDL Model

Panel A: Long-run Coefficients – dependent variable is lnGDP				
Regressors	Coefficient	Standard Error	T-Ratio	Prob.
LMAEX	0.1814	0.0643	2.8210	0.0102**
INF	-0.0095	0.0051	3.7435	0.0774**
LDSAV	-0.0510	0.0681	-0.7482	0.4626
DUM	-0.3173	0.2630	1.2063	0.2411
C	1.9348	0.2160	8.9539	0.0000***
Panel B: Short-run Coefficients – dependent variable is ΔlnGDP				
ΔGDP_{t-1}	0.1388	0.0465	-2.9851	0.0002***
ΔLMAEX	0.0251	0.0058	4.3352	0.0003
ΔINF_{t-1}	-0.0013	0.0006	-1.9731	0.0618**
ΔLDSAV	-0.0070	0.0074	-0.9565	0.3497
ΔDUM_{t-1}	0.0440	0.0285	1.5455	0.1371***
ΔINF	-0.0008	0.0004	-1.6463	0.01146**
ΔDUM	-0.0526	0.0478	0.0205	0.0182**
ECT_{t-1}	-0.1388	0.0156	-8.880	0.0000***
Adjusted R-squared	0.728748			
F-statistic	17.11967			0.0000 *******

Δ is the first difference operator. **Note:** ***, ** and * denote significance at 1%, 5% and 10% respectively. Selected Model: ARDL (1, 0, 2, 0, 2)

Source: Author's calculation (2023).

The result from the estimation reveals that there is a positive significant relationship between GDP and manufactured products export both in short-run and the long-run. An increase of manufacturing export by 1% increases GDP by 0.025 in the short-run. While in the long-run, a 1% increase in manufacturing export leads to a 0.18% increase in GDP at 5% level. The result is in line with the previous findings that increase in manufactured products export positively influences GDP in Nigeria (Osabohein, 2019; Bururac, 2019). Another finding indicates negative relationship between inflation and GDP both in short-run and the long-run. Rising inflation by 1% reduces GDP by 0.009 and 0.0013 both in the short and long-run, respectively. The outcome is consistence with the findings that rising inflation reduces GDP in Nigeria. Moreover Saving is also found to be negative and insignificant relationship between with GDP in Nigeria.

Table 5: ARDL-ECM Model-Estimation Tests

Test statistic	Results
Serial Correlation: Breuch-Pegan LM CHSQ(2)	0.4445[0.6476]
Functional Form: Ramsey Reset F-stat (1, 20)	0.01828[0.8938]
Normality: Jarque-Bera	0.3430 [0.8423]
Breuch-Pegan Hetroscedasticity: CHSQ(21)	0.856213[0.5761]

Source: Author's calculation (2023).

The result of post estimates presented in table 4.4 confirmed that there is no serial correlation among the residuals since the P-value (0.6476) is statistically insignificant. In addition, the result from the estimation reveals that the model is correctly specified and there is no omitted variables bias because the F stat. (0.01828 and the P-value is 0.8938. the Jargue-Bera shows that the errors term are normally distributed since the histogram indicate U-shape. Lastly, the result also confirmed the existence of Homescesdacity among the error term. Thus, there is no Hetroscedacity among the error term.

Results of Stability Test

The cumulative sum of recursive residuals (CUSUM) and cumulative sum of square of recursive residuals (CUSUMQ) tests were conducted. The plots of both CUSUM and CUSUMQ are within the boundaries (see Fig. 1 & 2). Generally, the estimated parameters are stable in the long-run.

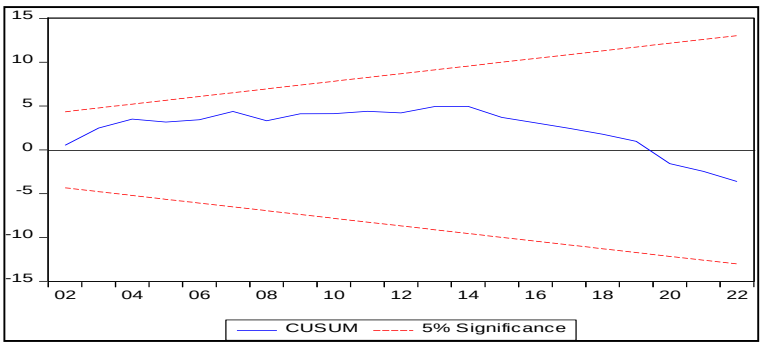

Fig. 1: Plot of cumulative sum of recursive residuals (CUSUM)

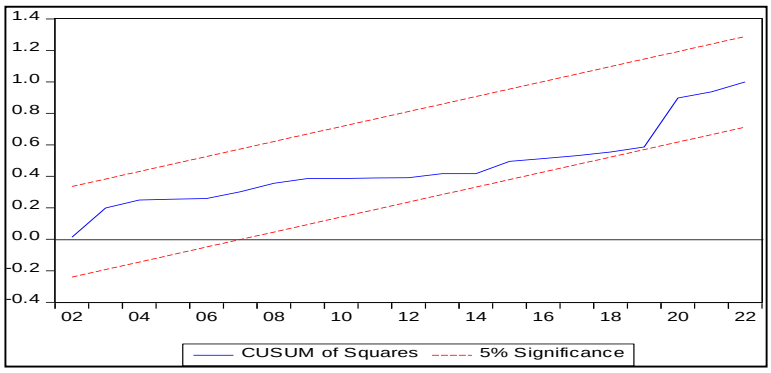

Fig 2: Plot of Cumulative sum of square of recursive residuals (CUSUMQ)

CONCLUSION AND RECOMMENDATIONS

Nigeria's policy concern on exports over the years has been to diversify the export base by improving non-oil component of export. Policies on export promotion have been phased in by various administrations. However, the recent economic recession which is ascribed to decline in both quantities and price of oil has proven that much is needed to develop competitive non-oil exports. It also raises concern on the need for empirical works on the role of exports on economic growth.

This study investigated the nexus between manufactured products export and economic growth in Nigeria from 1990-2022. Bootstrap ARDL bounds test to cointegration was employed and confirmed that there is a long-run relationship between manufactured products export and GDP. The result show that manufactured products export has positive effect on Nigeria's GDP; and that a negative relationship exists between inflation and GDP both in short-run and the long-run. Raising inflation by 1% reduces GDP by 0.009 and 0.0013 both in the short and long-run, respectively. However, saving rate is also found to have negative insignificant relationship with GDP.

Based on the analysis and findings, the study recommends that:

a) Government should create enabling environment in the area of infrastructural provision, security and quality control in the economy. With these measures it will promote attraction of more capital inflow, foreign direct investment, thereby enhancing manufacturing export in the economy.
b) Government should institute policies, reforms and incentive to encourage production and export of non-oil tradable, to reduce the nation's dependence on crude oil.
c) Government should create adequate measure to provide low-interest loans for local and infant industries manufactures.

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