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## INVESTIGATING THE EFFECT OF AN UNDERDEVELOPED FINANCIAL SECTOR ON NON-OIL EXPORT IN NIGERIA

**ABSTRACT:** *Several policies have been implemented in Nigeria to shift the export trade from oil to non-oil goods; yet the share of non-oil export in total exports remains very small compared to oil export, which may be due to the low level of financial sector development in the country. Unlike previous studies on Nigeria that focused exclusively on financial sector development and aggregate export (combined exports of oil and non-oil goods), this study concentrates on financial sector development and non-oil export using an autoregressive distributed lag technique, the dynamic ordinary least squares technique, and the non-linear autoregressive distributed lag technique over the period 1986–2020. The empirical results showed that the relationship between financial sector development*

*and non-oil export is linear. Results also showed that, in the short term, the country's level of financial sector development worsens exports of non-oil products. However, in the long term, there is no connection between non-oil export and financial sector development, which challenges the theoretical view that trade and financial sector development are linked at any given time period. The study recommends that the government and policymakers in Nigeria should make sure that the financial sector is sufficiently developed, otherwise the goal to diversify the export base may not be achieved.*

**KEY WORDS:** *Financial sector development, non-oil export, ARDL, DOLS, NARDL, Nigeria*

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## **1. INTRODUCTION**

Ever since Nigeria gained independence, the proportion of non-oil export in the country's overall exports has steadily decreased and its export base has been dominated by crude oil. For instance, non-oil export, which accounted for about 98 percent of all exported goods in 1960, declined to about 12 per cent in 2020 (Central Bank of Nigeria [CBN], 2021). More particularly, the growth of non-oil export was sluggish throughout the reference period. On average, for instance, it accounted for about 0.4 per cent between 1986 and 2020 (CBN, 2021). Nevertheless, due to persistent oil price shocks, which worsen oil revenue, and the enormous and mostly unexploited employment potentials in the non-oil export sector which could hasten economic growth and decrease the escalating level of poverty in the country, diversifying the export base from oil to non-oil export has been a priority for the government and policymakers. However, this goal has yet to be realised despite several policy efforts.

Although several factors may have combined to explain this development, the poor performance of the country's financial sector could be a major contributor. Available evidence shows that even though the financial sector development index in Nigeria is increasing, it is shallow and seems underdeveloped (see International Monetary Fund [IMF], 2022). For instance, while Nigeria's index of financial sector development rose to 0.22 in 2020 from 0.19 in 1986, South Africa and Malaysia saw increases from 0.32 and 0.31 to 0.62 and 0.73, respectively, between 1986 and 2020 (IMF, 2022). It has been emphasised (see Caglayan et al., 2013; IMF, 2009) that the amount of credit that will be provided by an underdeveloped financial sector might be less significant and insufficient to facilitate trade and, hence, may function as a trade barrier to exporting firms that rely on external funding.

Furthermore, even though it has been theoretically acknowledged (see Dornbusch et al., 1977; Heckscher et al., 1991) that the endowments of physical capital, labour, land, and technology are the necessary and sufficient conditions for the attainment of a desired trade volume, the stability and proper development of the financial sector is absolutely important to the restoration of growth in the non-oil export sector and, indeed, the overall economy (see Beck, 2002). In his path-breaking theory, Beck (2002) argued that nations with lower

levels of financial sector development will always experience lower export shares of manufactured goods in total merchandise exports.

With this understanding, the purpose of this study is to examine the effect of Nigeria's financial sector development on non-oil export. Although there have been some attempts (see, for instance, Adeboje et al., 2021) to present a clear understanding of how the country's financial sector development has impacted merchandise export, these studies, nevertheless have some significant weaknesses. For one, they relied on aggregate merchandise export, that is, the combination of oil and non-oil exports, which does not show the relationship between financial sector development and non-oil export, despite the nation's efforts to grow non-oil export in the face of an underdeveloped financial sector. Furthermore, the private sector credit-to-GDP ratio — which measured financial depth — was employed in these previous studies to capture financial sector development. Unfortunately, available evidence suggests that it is, in fact, financial efficiency, access and, depth that are the characteristics of financial sector development. Thus, the private sector credit-to-GDP ratio may not reflect the multidimensional nature of financial sector development (see IMF, 2022). Therefore, by examining the proportion of private sector credit to GDP, it may not be possible to properly understand how developed the country's financial sector is. Worse still, while previous studies (see Raifu & Folarin, 2020; Bank-Ola, 2022; Adeboje et al., 2021) assumed a linear relationship between financial sector development and total merchandise export, evidence (Sare et al., 2019; Kurul, 2021; Xinzhong et al., 2022) suggests that there could be a potential non-linear relationship as financial sector development indicators may generate breakpoints that could trigger nonlinearity.

Thus, the significant ways that our study adds to the literature are as follows: First, unlike previous studies in which aggregate export was the main focus, this study examines disaggregated export. In particular, it examines how financial sector development has impacted non-oil export over the last few decades in Nigeria. Second, while previous studies use the private sector credit-to-GDP ratio as an indicator of financial sector development, this study employs a robust financial sector development index that accounts for the multidimensional nature of financial sector development - in terms of efficiency, access and depth. Third, whereas previous studies on Nigeria assumed a linear relationship, our study

investigates the possibility of a non-linear relationship between financial sector development and non-oil export.

Our short-term finding supports Beck's theoretical claim. In particular, in the short-term, we specifically found that the financial sector in Nigeria is not yet sufficiently developed to support exports of non-oil products. Surprisingly, the link between non-oil export and financial sector development is insignificant in the long-term, which challenges the theoretical view that financial sector development and trade are significantly linked at any given time period. The results are robust to different estimation techniques. Four sections make up the remaining discuss. In Section 2, the body of literature is evaluated. The theoretical framework, model, and data as well as methodology employed are reported in Section 3. The empirical findings are presented in Section 4, with the conclusion in Section 5.

## **2. A REVIEW OF THEORETICAL AND EMPIRICAL LITERATURE**

### **2.1. Theoretical Literature**

Theoretical models on trade flows between and among nations abound in the trade literature. In the Ricardian and Heckscher-Ohlin trade models, for instance, trade is predicted in terms of a nation's levels of technology, physical capital, land and labour (see Gandolfo, 1986; Ricci, 1997). However, on the basis of the ground-breaking trade model of Kletzer and Bardhan (1987), Beck (2002) realised that the differences in nations' levels of financial sector development could predict trade flow. Concentrating on the Kletzer and Bardhan (1987) theoretical model, Beck (2002) noticed that the manufacturing sector, unlike the agricultural sector, depends more on external financial assistance and, consequently, nations with a more-developed financial sector would always have a greater export share in manufactured products. In line with Beck (2002), Berthou (2010) and Xinzhong (2022) established theoretically that when there is an increase in the level of financial sector development, firms begin to export, particularly firms that depend more on external funding.

### **2.2. Empirical Literature**

Several empirical studies have linked financial sector development and trade. For instance, Caporale et al. (2022) established that, in six European economies, both

the volume and the variety of trade are connected to long-term expansion of the financial sector, although the relationship is more obvious in the industrial sector than in the trade of agricultural goods. Adeboje et al. (2021) also found that the expansion of the financial sector and Nigeria's entire export are linked. The authors established that overall merchandise exports are considerably and favourably affected by an expansion of the financial sector, which is in line with the findings of Raifu and Folarin (2020). However, focusing on a group of 64 nations, Kurul (2021) noticed that too much expansion of the financial sector worsens trade. For instance, the author confirmed that as financial services improve, trade openness and exports rise to a point beyond which further financial sector expansion causes trade openness and exports to fall. Surprisingly, Babatunde and Fowowe (2010) found no connection between levels of expansion of financial sectors in sub-Saharan African economies and the overall volume of their trade, whereas Sare et al. (2019) discovered little impact of financial sector expansion on overseas trade in 46 African economies. However, Bilas et al. (2017) claimed that while the expansion of Croatia's financial industry had a positive and significant short-term effect on trade flows, the long-term effects are negative and severe. Focusing on South-North and South-South trade, Demir and Dahi (2011) revealed that financial sector expansion in the South promote trade within South-South economies but its role in trade is minimal in the South-North nations, which supports the findings of Kim et al. (2010), who documented minimal impact of financial sector expansion on trade openness in 87 OECD and non-OECD economies.

On the other hand, Cezar (2014) found mixed effects of financial sector development on trade in manufactured goods from 80 nations across the globe. More specifically, his study showed that firms in the manufacturing sector that rely more on external funding export larger quantities from nations with developed financial sectors. At the same time, financial sector development decreases trade for firms with low levels of financial dependence. Jaud et al. (2015) also found that financial sector development supports the long-term export of agricultural products with high export-related financial requirements in Tanzania, Senegal, Malawi, Mali, and Ghana. However, the findings of Nguyen and Su (2021) on 48 high-income countries, 31 upper-middle-income countries, and 49 low-middle-income countries showed a feedback effect between a multidimensional financial development index and export quality. Moreover, the

results revealed a positive and significant effect of the multidimensional financial development index on export quality at all income levels. Nieminen (2020) measured the impact of multidimensional financial sector development on exporting firms' behaviour and export trade diversification using firm-level export data from more than 60 nations. He showed that there is disparity in the structure of export in the nations included in the study and, specifically, provided evidence that the disparities are connected to a cross-country difference in the level of financial sector development as well as the composition of financial sector development. Furthermore, his results revealed that access to financial services significantly promote export diversification. Contrarily, Kasseeah et al. (2013) examined the link between access to finance and trade in Mauritius but found an insignificant link between the two variables.

In addition, Kumarasamy and Singh (2018) verified how financial sector development and financial access influence firms' capacity in Asia-Pacific nations to go into the export business. Their study revealed that access to finance is critical in improving firms' capacity to export. Their findings also showed that the development of the financial sector encourages firms to participate in foreign trade. Jiang et al. (2020) investigated the effect of financial sector development on foreign trade in services in Asian, South and Central American and African economies. They found that financial sector development exerts a positive and significant effect on trade in services in Central and South America. However, the effect is insignificant in Asia and Africa. Jaud et al. (2018) looked at how financial vulnerability affects export dynamics in 34 developing nations in the regions Europe and Central Asia, East Asia and the Pacific, the Middle East and North Africa, sub-Saharan Africa, and South Asia, and found that financial crises decrease firms' goods and destination entry rates. In addition, financial crises raise exit rates excessively more in financially vulnerable firms. Minetti et al. (2021) verified the effects of financial composition and regulation on export dynamics using data from 39 nations around the world, finding that while market-oriented systems do not increase the number of exporters, bank-oriented financial systems play a significant role in boosting their number. On the other hand, they found that in lower income nations where bank regulations are lax, banks have a propensity to slow down exporters' exit and entry.

### 3. THEORETICAL FRAMEWORK, MODEL, DATA, AND METHODOLOGY

#### 3.1. Theoretical Framework

This study is anchored on the theoretical model of Beck (2002). Beck (2002) is the first to link foreign trade and financial sector development by extending the theoretical model of Kletzer and Bardhan (1987) which is rooted in the Heckscher-Ohlin trade model. According to Beck's (2002) theoretical model, a nation's level of finance sector development could help determine the level of physical capital in the Heckscher-Ohlin trade model. Inspired by Beck (2002), Berthou (2010) and Xinzhong (2022) further stressed the role of finance sector development in trade flow. Beck (2002) notes that a highly developed financial sector is a key to promoting trade but emphasises that exporting firms of goods (manufactured) with increasing returns in capital gain more from a well-developed financial sector than exporting firms of goods (agricultural and natural resources) with increasing returns in land and labour. The model also indicates that manufacturing firms depend more on external funding, unlike the producers of other products, which could facilitate scale economies in the manufacturing sector, thereby resulting in large-scale production and the export of manufactured goods in overall production in nations with a well-developed financial sector.

#### 3.2. Model and Data

We specify a trade model that links non-oil export and financial sector development as specified in Beck (2002)

$$NO_t = \alpha_0 + \zeta FSD_t + \vartheta CV + \mu_t \quad (1)$$

where  $NO$  is non-oil export,  $FSD$  is financial sector development,  $CV$  represents a variety of control variables, and  $\mu_t$  is the error term. The control variables, as established in the literature, are the real exchange rate ( $RER$ ), foreign direct investment ( $FDI$ ), real per capita GDP ( $RPCGDP$ ), and the world financial crisis dummy ( $GFC$ ).  $FDI$  is included to account for the impact of multinational oil companies on non-oil exports since a larger amount of FDI that flows into the country goes to the oil sector. It is anticipated that an increase in FDI inflows will negatively affect non-oil export since FDI inflows promote oil exploration and exportation, which intensify the Dutch disease and the neglect of the non-oil

sector. In theory, depreciation of a currency should increase export trade and vice versa. The link between income and non-oil exports is taken into consideration by means of real per capita GDP. It is thought that exports of non-oil goods should rise with increased per capita income. The consequences of the 2007-2008 financial crisis, which are expected to have a detrimental influence on non-oil export as the crisis may reduce a nation's export capabilities by worsening the performance of its financial sector, are simulated using a global financial crisis dummy.

Except for the global financial crisis dummy, all the variables were represented by natural logarithms. Annual data covering the period 1986—2020 were utilised in the study. The timeline was carefully chosen to fall within the time when international trade and the financial sector were both liberalised. With the exception of the hypothetical worldwide financial crisis, all data utilised in the study were extracted from the CBN Statistical Bulletin (CBN, 2021), the IMF's online database (IMF, 2022) and the WDI's online database (World Bank, 2022). Real non-oil export values are used to calculate exports of non-oil commodities. The nominal exports of non-oil goods data from the CBN Statistical Bulletin, measured in millions of domestic currency, were deflated by the CPI to obtain the real quantities. The WDI online database was used to extract the consumer price index data. This measurement of non-oil export was inspired by Akinlo and Adejumo (2014).

Unlike previous studies, we used a robust financial sector development index that simultaneously covers the depth or size, accessibility, and efficiency of financial sector development. Financial crisis is taken as 1 to reveal the existence of the global financial crisis that occurred from 2007 until 2008. However, we take other periods without financial crisis as 0. It is in this way that we have measured the global financial crisis, which we called the dummy. The real exchange rate (*RER*) was measured using the real effective exchange rate. Foreign direct investment (*FDI*) was captured by net FDI inflows as a percentage of GDP. GDP per capita in constant local currency, drawn from the WDI, is our measure of real per capita GDP (see Table 1 for a comprehensive measurement and sources of data).



**Table 1.** Measurement and Sources of Data

<b>Variables</b>	<b>Measurement</b>	<b>Source(s) of Data</b>
Real non-oil exports ( <i>NO</i> )	Nominal non-oil exports values expressed in millions of Naira deflated by Nigeria's CPI	CBN, WDI
Financial sector development index ( <i>FSD</i> )	Index in terms of depth including liquidity and size, access, and efficiency including the ability of financial institutions and markets to provide financial services at low cost	IFS
Real exchange rate ( <i>RER</i> )	Real effective exchange rate	IFS
Foreign direct investment ( <i>FDI</i> )	Net FDI inflows as a percentage of GDP	WDI
Per capita GDP ( <i>RPCGDP</i> )	GDP per capita (constant local currency)	WDI
Global financial crisis dummy ( <i>DUMGFC</i> )	We set financial crisis to 1 for the period of the global financial crisis between 2007 and 2008, and 0 otherwise	Author's computation

**Note:** CPI and GDP signify the consumer price index and the gross domestic product, respectively

### 3.3. Methodology

The estimation method is the autoregressive distributed lag (ARDL) technique (see Pesaran & Shin, 1995). This method is relevant to this work because it can help to estimate the short-term and long-term effects of financial sector development on non-oil export. Furthermore, it deals with the problem of mixed stationarity (I(0) and I(1) in particular) inherent in macroeconomic variables. It also corrects endogeneity and serial correlation issues in economic modelling (see Pesaran & Shin, 1995). Thus, Equation (1) is re-written in the ARDL form

$$\begin{aligned}
 \Delta NO_t = & \alpha + \varphi_1 NO_{t-1} + \varphi_2 FSD_{t-1} + \varphi_3 RER_{t-1} + \varphi_4 FDI_{t-1} + \varphi_5 RPCGDP_{t-1} \\
 & + \varphi_6 DUMGFC_{t-1} + \sum_{i=1}^p \beta_i \Delta NO_{t-i} + \sum_{i=0}^p \phi_i \Delta FSD_{t-i} + \sum_{i=0}^p \psi_i \Delta RER_{t-i} \\
 & + \sum_{i=0}^p \wp_i \Delta FDI_{t-i} + \sum_{i=0}^p \varepsilon_i \Delta RPCGDP_{t-i} \\
 & + \sum_{i=0}^p \gamma_i \Delta DUMGFC_{t-i} + \mu_t
 \end{aligned} \tag{2}$$

where the primary difference operator is provided as  $\Delta$ , long-term coefficients are given as  $\varphi_i$  ( $i = 1 - 6$ ), and coefficients in the short -term are  $\beta, \phi, \psi, \wp, \varepsilon, \gamma$ . Inspired by Vuong et al. (2019), the lag lengths are optimally selected using the smallest lag length from the SIC and AIC. To verify whether the variables in the study move together in the long-term, an F-test was conducted for the lagged level coefficients in Equation (2). In this regard, the null hypothesis,  $H_0: \varphi_1 = \varphi_2 = \varphi_3 = \varphi_4 = \varphi_5 = \varphi_6 = 0$  was tested vis-à-vis the null hypothesis's alternative,  $H_1: \varphi_1 \neq \varphi_2 \neq \varphi_3 \neq \varphi_4 \neq \varphi_5 \neq \varphi_6 \neq 0$ . Pesaran et al. (2001) bounds critical values (lower and upper) of an identified significance point are employed as decision criteria.

Our study also used the dynamic ordinary least squares (DOLS) method to estimate Equation (1) in order to check the robustness of the long-term ARDL coefficients. This method also deals with mixed stationarity, serial correlation, endogeneity, simultaneity, and small sample size issues (see Stock & Watson, 1993). Furthermore, since one of the objectives of this study is to verify the possibility of a non-linear relationship between financial sector development and non-oil export, an extended version of the ARDL, known as non-linear ARDL or NARDL (see Shin et al., 2014), which was designed to estimate a non-linear relationship between variables, was considered. Following Shin et al. (2014), Equation (2) is reformulated to reflect nonlinearity as specified in Shin et al. (2014). Hence,

$$\begin{aligned}
 \Delta NO_t = & \alpha + \varphi_1 NO_{t-1} + \varphi_2 FSD_{t-1}^+ + \varphi_3 FSD_{t-1}^- + \varphi_4 RER_{t-1} + \varphi_5 FDI_{t-1} + \varphi_6 RPCGDP_{t-1} \\
 & + \varphi_7 DUMGFC_{t-1} + \sum_{i=1}^p \beta_i \Delta NO_{t-i} + \sum_{i=0}^p \phi_i \Delta FSD_{t-i} + \sum_{i=0}^p \psi_i \Delta RER_{t-i} \\
 & + \sum_{i=0}^p \varphi_i \Delta FSD_{t-i}^+ + \sum_{i=0}^p \omega_i \Delta FSD_{t-i}^- + \sum_{i=0}^p \varepsilon_i \Delta RPCGDP_{t-i} \\
 & + \sum_{i=0}^p \gamma_i \Delta DUMGFC_{t-i} + \mu_t
 \end{aligned} \tag{3}$$

In addition, we tested the stationarity properties of the variables to ensure the suitability of the techniques employed. The augmented Dickey-Fuller (ADF) unit root test was used to confirm the stationarity properties. However, the ADF model to test a unit root is of three types: the ADF model with a trend and a constant, the ADF model with a constant, and the ADF model without a trend and without a constant (see Wolters & Hassler, 2006). For this reason, we study applied the strategy found in Dolado et al. (1990) to choose the appropriate ADF model. For instance, when running the test on a variable, it is required that the significance of the trend is determined and if found to be significant, the ADF model with a trend and a constant is appropriate. If the trend is found not to be significant, the ADF model with a trend and a constant is not appropriate and the significance of the constant is checked. If the constant is found to be significant, the ADF model with the constant is employed; otherwise, it is discarded and the ADF model without a trend and without a constant is considered appropriate. We also employed the Phillips-Perron (PP) unit root test as a robustness check, since the ADF test could miss a substantial discontinuity in a series' development, if one exists, and thus might fail to sufficiently reject the null hypothesis of a unit root (see Phillips & Perron, 1988). The results of the ADF unit root test are shown in Table 2 (panel A). The results indicated that the variable *NO* is stationary after first difference, thus an I(1) variable. *FSD*, *RER*, *FDI*, *RPCGDP*, and *DUMGFC* are all stationary in their original values and, thus, they are I(0) variables. Surprisingly, the PP unit root test results, presented in Table 2 (panel B), are similar to those of the ADF test, except for the *RPCGDP* variable, which is now stationary after first difference. Therefore, due to the fact that the variables are either I(0) or I(1), the ARDL, DOLS, and NARDL are appropriate techniques for the study.

**Table 2.** Panel A: Results of ADF Unit Root Test

Variable	Constant	Trend and Constant	No Trend and No Constant	Remark
<i>NO</i>	-7.16***	-7.09***	-	I(1)
<i>FSD</i>	-	-3.64**	-	I(0)
<i>RER</i>	-3.47***	-3.66**	-	I(0)
<i>FDI</i>	-	-4.01***	-	I(0)
<i>RPCGDP</i>	-	-3.31*	-	I(0)
<i>DUMGFC</i>	-	-	-3.31***	I(0)

**Note.** ADF represents augmented Dickey-Fuller. \*=10%, \*\*=5%, \*\*\*=1% significance levels

**Source:** Authors' computations, 2023 via Eviews

**Table 2.** Panel B: Results of PP Unit Root Test

Variable	Constant	Trend and Constant	No Trend and No Constant	Remark
<i>NO</i>	-7.79***	-8.54***	-	I(1)
<i>FSD</i>	-	-3.33*	-	I(0)
<i>RER</i>	-3.68***	-3.75**	-	I(0)
<i>FDI</i>	-	-3.99***	-	I(0)
<i>RPCGDP</i>	-	-3.20***	-	I(1)
<i>DUMGFC</i>	-	-	-3.20***	I(0)

**Note.** PP represents Phillips-Perron. \*=10%, \*\*=5%, \*\*\*=1% significance levels

**Source:** Authors' computations, 2023 via Eviews

#### 4. EMPIRICAL ANALYSIS AND DISCUSSION OF RESULTS

We carefully examined the descriptive statistics of variables before performing the model estimation. The characteristics of sample statistics, such as the standard deviation, mean, and median, are detailed in Panel A, Table 3. The close proximity of the median and mean of the variables makes it clear that data are consistent and also, show evidence of a normal distribution. Additionally, the standard deviations of the variables are relatively small, which suggests that the data do not diverge drastically from their mean values. To further determine whether the independent variables are related or not, we use the correlation matrix. Panel B, Table 3 demonstrates unequivocally that none of the factors

affecting non-oil export included in the model are strongly connected, as correlation coefficients are less than 0.5. As a result, the models are free of the multicollinearity issue. Although, there are pairs with higher coefficients, 0.67 and 0.83, these are between the dependent variable and two of the explanatory variables (*FSD* and *RPCGDP*).

**Table 3.** Descriptive Statistics and Correlation Matrix

	<i>NO</i>	<i>FSD</i>	<i>RER</i>	<i>FDI</i>	<i>RPCGDP</i>	<i>DUMGFC</i>
<b>Panel A</b>						
Mean	7.76	-1.69	4.61	0.25	12.49	0.05
Median	7.64	-1.68	4.60	0.37	12.44	0.00
Maximum	9.39	-1.30	5.60	1.75	12.86	1.00
Minimum	6.30	-2.10	3.90	-1.63	12.20	0.00
Std. Dev.	0.86	0.19	0.40	0.73	0.24	0.23
<b>Panel B</b>						
<i>NO</i>	1					
<i>FSD</i>	0.67	1				
<i>RER</i>	-0.03	0.11	1			
<i>FDI</i>	-0.24	-0.30	-0.41	1		
<i>RPCGDP</i>	0.83	0.36	-0.10	-0.25	1	
<i>DUMGFC</i>	0.12	0.49	-0.07	0.12	0.10	1

**Source:** Authors’ computations, 2023 via Eviews

Now, it is critical to determine a specific lag time for the ARDL model and its extension (NARDL) to avoid spurious regression. From Table 4, SIC has the smallest lag, making it suitable for the ARDL model and its extension. Thus, lag length 1 was considered for this study.

**Table 4.** Lag Length Findings

Lag	LogL	LR	FPE	AIC	SIC	HQ
0	-45.85	NA	1.65e-05	3.17	3.40	3.25
1	48.20	152.83*	2.26e-07*	-1.13	0.23*	-0.68*
2	70.68	29.51	2.99e-07	-0.98	1.53	-0.14
3	102.09	31.40	2.83e-07	-1.38*	2.28	-0.16

**Note.** \*=lag length, selected by criterion

**Source:** Authors’ computations, 2023 via Eviews

Next, we check for co-integration between non-oil export and its explanatory variables using the bounds test. As shown in Table 5 (Panel A), the computed F-statistic emanating from the bounds tests for the ARDL and NARDL models are evidently bigger than the upper limit found in Pesaran et al. (2001), which was reported in Panel B of Table 5. As a result, the explanatory and dependent variables have enduring ties. Both models disprove the null hypotheses of Equations (2) and (3) in this way.

**Table 5.** Panel A: Results of Bounds Tests

Model	K	Calculated F-statistic	Interpretation
ARDL**	4	5.03	reject H <sub>0</sub>
N ARDL*	4	3.60	reject H <sub>0</sub>

Note. \*=10%, \*\*=5%, \*\*\*=1% significance levels

Source: Authors' computations, 2023 via Eviews

**Table 5.** Panel B: F-Table

K	10%	5%	1%
4	I(0) I(1) 2.45 3.52	I(0) I(1) 2.86 4.01	I(0) I(1) 3.74 5.06

Source: Pesaran et al. (2001)

We then examine the effect of financial sector development on non-oil export in Nigeria over the last few decades. We used the ARDL technique and checked the robustness of the findings via DOLS and NARDL methods. The results of the estimated ARDL are presented in Table 6, while those of the DOLS and NARDL are presented in Table 7 and 8. From Table 6, it is evident that financial sector development has a negative and significant effect on non-oil export in the short-term. This finding differs from the result of Babatunde and Fowowe (2010), who discovered no connection between financial sector development in sub-Saharan African nations (including Nigeria) and the region's total exported goods. This finding also contradicts the result of Kasseeah et al. (2013) that access to finance and trade in Mauritius are unrelated. Furthermore, the findings of our study are contrary those of Raifu and Folarin (2020) and Adeboje et al. (2021), who found that the expansion of the financial sector had a favourable and considerable short-run impact on the total volume of goods exported from Nigeria. However, our

findings indicate that, in the short-term, the country's financial sector, in terms of its development, is not at a level that could support non-oil export. Therefore, to promote Nigeria's non-oil export, it is advisable that the government execute policies that would quickly improve the financial sector through increased mobilisation of savings, adequate access to finance, and ensure that financial institutions and markets provide financial services at low cost so that domestic credit depth, access, and efficiency are increased.

The results in Table 6 throw-up more interesting facts. They demonstrate, for instance, that the real exchange rate does not have a major impact on non-oil export in the short-term. This suggests that non-oil export has not been competitive internationally as real exchange rate appreciates. This finding diverges from Ikpe et al. (2020), who observed that the exchange rate significantly depressed Nigeria's non-oil export in the short-term. However, the result is consistent with Raifu and Folarin (2020) and Adeboje et al. (2021) who found that real exchange rate in Nigeria had little short-term effect on aggregate merchandise exports. Table 6 also shows that there is a significant negative impact of foreign direct investment on non-oil export in the short-term. In particular, the result indicates that an increase in foreign direct investment inflow leads to a decrease in non-oil export. This finding might not be unconnected with the huge share of oil foreign direct investment in total foreign direct investment inflow, which promotes oil exploration and exportation and intensifies the Dutch disease and the neglect of the non-oil sector. This result is not in line with Paudel and Alharth (2021), who determined that an increase in foreign direct investment inflows in Nepal has no link with export performance. Real per capita GDP has a favourable short-term impact that is substantial. The same was also stated for sub-Saharan African countries by Babatunde and Fowowe (2010), but this result diverges from Paudel and Alharth (2021), who established an insignificant link between per capita GDP and export performance in Nepal. Surprisingly, financial crisis appears to have a significant and favourable short-term impact on non-oil export. This might be due to devaluation (depreciation) of the nation's currency during financial crisis which makes exports more competitive internationally. This observation is supported by Ma and Cheng (2005), who discovered that financial crisis increases export in the short run. Additionally, the calculated error correction component of the ARDL model is highly significant at one per cent and correctly signed (-0.74). This demonstrates that non-oil export would require

a very long time to reach equilibrium in response to changes in the independent variables.

The results from Table 6 further show that financial sector development, the real exchange rate, foreign direct investment, and global financial crisis have insignificant long-term impact on exports of non-oil goods. The insignificant link between financial sector development and non-oil export challenges the theoretical view that trade and financial sector development are significantly linked at any period of time. This finding might, however, be due to the low level of Nigeria’s financial sector development, as Babatunde and Fowowe (2010) revealed that access to finance in sub-Saharan Africa is low, which could weaken the relationship between financial sector development and trade. This finding is in line with Xinzhong (2022), who also found a weak link between financial sector development and export growth in Jiangsu County, China. Contrarily, however, Xinzhong et al. (2022) established that excessive financial sector development could also worsen growth of foreign trade significantly, whereas Nguyen and Su (2021) determined that a more developed financial sector enhances export quality, which is at variance with the finding of Xinzhong et al. (2022). Furthermore, the results from Table 5 show a positive and statistically significant long-term effect of real per capita GDP on non-oil export. This finding is consistent with the literature, indicating that non-oil export would rise with an increase in income.

**Table 6.** Estimated ARDL Model

Short-term	Coefficient	t-Statistic		Long-term	Coefficient	t-Statistic
$\Delta FSD$	-1.67*	-1.71		$FSD$	-0.39	-0.45
$\Delta RER$	0.18	0.93		$RER$	0.25	0.92
$\Delta FDI$	-0.19*	-1.75		$FDI$	-0.26	-1.61
$\Delta RPCGDP$	5.67***	3.12		$RPCGDP$	2.92***	4.86
$\Delta DUMGFC$	0.67*	1.89		$DUMGFC$	0.89	1.66
$CointEq(-1)$	-0.74***	-4.46		$c$	-16.12***	-2.59

**Note.** \*=10%, \*\*=5%, \*\*\*=1% significance levels

**Source:** Author’s Computation, 2023 via Eviews



#### 4.1. Robustness of the ARDL Results

This study verifies the robustness of the long-term ARDL results in Table 6, since the findings that financial sector development exerts an insignificant effect on non-oil exports contradicts the theoretical view (see Beck, 2002). Table 7 reveals the findings of the DOLS regression. It is interesting to see that the results are robust to different estimation techniques. In particular, the results support our prior findings, indicating that financial sector development, the real exchange rate, foreign direct investment, and global financial crisis have insignificant long-term impact on exports of non-oil goods (see Table 7). Yet, several studies, including Sare (2019), Kurul (2021), and Xinzhong et al., (2022) suggest that there

**Table 7.** Estimated DOLS Model

	Coefficient	Std. Error	t-Statistic	Prob.
<i>FSD</i>	-1.65	1.40	-1.17	0.26
<i>RER</i>	0.63	0.43	1.45	0.17
<i>FDI</i>	-0.21	0.24	-0.85	0.40
<i>RPCGDP</i>	4.03***	1.04	3.85	0.00
<i>DUMGFC</i>	0.95	0.69	1.38	0.19
<i>c</i>	-28.42**	11.54	-2.46	0.03
Adjusted R <sup>2</sup>	0.77			

**Note.** \*=10%, \*\*=5%, \*\*\*=1% significance levels

**Source:** Author's Computation, 2023 via Eviews

could be a potential non-linear relationship as financial sector development indicators may generate breakpoints that trigger nonlinearity. In this regard, our study employs the extended version of the ARDL, known as non-linear ARDL or NARDL (see Shin et al., 2014), to rigorously analyse the relationship between financial sector development and non-oil export. The results in Table 8 show the NARDL estimates and indicate that a positive shock in financial sector development is significant in explaining non-oil export in the short -term, whereas a negative shock is insignificant. In the long -term, however, both positive and negative shocks in financial sector development are insignificant in explaining non-oil export. These results imply that financial sector development and non-oil export are unconnected in the long -term, thus corroborating the earlier findings from the ARDL and DOLS regression. The short-term results also confirm the findings of the ARDL regression, indicating that the effect of financial

sector development on non-oil export is linear and negative. Therefore, this implies that previous studies suggesting a non-linear relationship between financial sector development and trade might be erroneous.

**Table 8.** Estimated NARDL Model

Short-term	Coefficient	t-Statistic		Long-term	Coefficient	t-Statistic
$\Delta FSD^+$	-2.09**	-2.44		$FSD^+$	-1.87	-1.30
$\Delta FSD^-$	0.03	0.02		$FSD^-$	-2.59	-1.01
$\Delta RER$	0.34*	1.94		$RER$	0.24	0.63
$\Delta FDI$	-0.10	-1.27		$FDI$	-0.36	-1.46
$\Delta RPCGDP$	6.65***	4.62		$RPCGDP$	1.92*	1.74
$\Delta DUMGFC$	0.59**	2.29		$DUMGFC$	0.38	1.17
$CointEq(-1)$	-0.61***	-5.29		$c$	-16.84	-1.64

**Note.** \*=10%, \*\*=5%, \*\*\*=1% significance levels

**Source:** Author’s Computation, 2023 via Eviews

#### 4.2. Diagnostic Tests

Our study uses a number of diagnostic tests associated with the ARDL and NARDL models. From Table A (see the Appendix), we found no serial correlation in the two models since the computed F-values from Breusch-Godfrey LM tests are statistically insignificant. The probabilities of the calculated Jarque-Bera statistic are also not significant. Hence, the errors are normally distributed. Because the F-values are not significant, the functional forms are correctly specified, as shown by the Ramsey RESET tests. Furthermore, neither model exhibits the problem of heteroscedasticity.

### 5. CONCLUSION AND POLICY IMPLICATIONS

Efforts to diversify Nigeria’s export trade from oil to non-oil export abound, but the proportion of non-oil export in total exports remains low, which may be due to the low level of financial sector development in the country. Unlike previous studies that focused entirely on aggregate export (combined exports of oil and non-oil goods), this study investigates the effect of Nigeria's financial sector development on non-oil export. Moreover, in contrast to previous studies where the private sector credit-to-GDP ratio was used as an indicator of financial sector development, this study employs a robust financial sector development index that

accounts for the multidimensional nature of financial sector development—in terms of efficiency, access, and depth. It also controls for a potential non-linear relationship as financial sector development indicators may generate breakpoints that trigger nonlinearity, which has been overlooked in previous studies. The findings of our study indicated that the relationship between financial sector development and non-oil export is linear. Specifically, it revealed that financial sector development is an important determinant of non-oil export in the short-term. More particularly, our study found that Nigeria's level of financial sector development worsens exports of non-oil goods in the short-term, suggesting that its financial sector development is not at a level that could support non-oil export. Surprisingly, however, the study found no significant long-term link between non-oil export and financial sector development, even with different estimation techniques. This finding might be due to the low level of Nigeria's financial sector development, as Babatunde and Fowowe (2010) demonstrated that low access to finance in sub-Saharan Africa could weaken the relationship between financial sector development and trade.

Another important finding of this study is that foreign direct investment and per capita GDP are critical in determining non-oil export in the short-term. More particularly, it found that foreign direct investment depresses non-oil export, which may be connected to the huge share of oil foreign direct investment in total foreign direct investment inflow that promotes oil exploration exportation, thus intensifying the Dutch disease and the neglect of the non-oil sector, whereas per capita GDP significantly supports non-oil export. Our study also found a favourable short-term impact of financial crisis on non-oil export, which might be due to devaluation (depreciation) of the nation's currency during the crisis, making exports more competitive internationally. Furthermore, the impact of the real exchange rate is positive in the short run, but statistically not significant. Additionally, it was found that out of all the determinants of non-oil export included in this study, only per capita GDP significantly influences non-oil export in the long run.

In light of these findings, we recommend the following: One, the Nigerian government and policymakers should ensure that the financial sector is sufficiently developed. In particular, the government and policymakers in Nigeria should execute policies that would induce greater mobilisation of savings, induce

adequate access to finance, and ensure that financial institutions and markets provide financial services at low cost. This would deepen the financial sector by improving credit depth, access, and efficiency. Two, we recommend that government and policymakers in Nigeria should consider reducing the proportion of oil foreign direct investment in total foreign direct investment inflow, in favour of non-oil foreign direct investment. This would improve non-oil sector growth as well as enhance non-oil export performance, thereby promoting diversification. Three, given that per capita GDP exerts a more favourable effect on non-oil export, the Nigerian government and policymakers should provide an enabling environment that would support greater economic activity in order to uphold GDP growth which would sustain per capita GDP.

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### **Data Availability Statement:**

Dataset for this study is freely accessible at <https://www.cbn.gov.ng/>, <https://www.imf.org/>, and <https://www.data.worldbank.org/>

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**APPENDIX:**

**Table A.** Diagnostic tests for the ARDL and NARDL Models

<b>Diagnostic Test</b>	<b>ARDL</b>	<b>NARDL</b>
Adjusted R <sup>2</sup>	0.83	0.59
Serial Correlation LM Tests	0.44 (0.64)	0.88(0.43)
Heteroscedasticity Tests	0.42 (0.89)	0.96(0.51)
Ramsey RESET Tests	0.08 (0.76)	0.80(0.38)

**Note.** Probability of F-Statistic in brackets

**Source:** Author's Computation, 2023 via Eviews