EXPORT DIVERSIFICATIION AND GROWTH: AN EMPIRICAL STUDY OF THE RECENT PERFORMANCE GAP BETWEEN NIGERIA AND GHANA

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Abstract
This study examines the impact of export diversification on economic growth in Nigeria and Ghana. The study employed the Autoregressive Distributed Lags (ARDL) regression technique on annual time series data covering the period 1995 to 2018. The results from the ARDL estimates show that in the short run, export diversification was insignificant in Nigeria but significant in Ghana. In the long run in Nigeria, the coefficients of exchange rate, economic openness, gross fixed capital formation (GFCF) did not impact growth, however, export diversification impacted growth. For Ghana, although export diversification was negatively significant, economic openness, exchange rate, GFCF all had positive and significant impact on growth. The empirical results clearly show that economic openness, the quality of a country's total labour force are key drivers of growth. Also, findings show that revenue obtained from top five export products of Nigeria is highly dependent on petroleum, while Ghana's revenue is evenly distributed around gold, petroleum and cocoa. From the empirical findings, the study recommends that Nigerian government should pursue policies targeted at not just promoting diversification of exports but economic policies that can act as catalyst to attract more foreign investment, such as tax incentives, regulatory exemptions, etc.

Keywords: *Export Diversification, Export Concentration, Economic Growth, ARDL.*

I.0 Introduction

It is relevant to investigate the issues surrounding export diversification and growth in Nigeria and Ghana. While Nigeria has suffered two recessions in less than five years, Ghana continues to experience relative stable growth. Data from World Bank (2019) and Trading Economics (2020) shows that unlike Nigeria, Ghana has continued to record positive growth. Ghana's economy grew from 5.6% in the third quarter of 2019 to 7.9% in the fourth quarter while Nigeria recorded negative growth rate of 9.23% and 5.59% over the same period. While Nigeria's export earnings is concentrated on petroleum export and natural gas, Ghana's export earnings is derived from a combination of petroleum oil, cocoa beans, cashew nut and Gold in semi manufactured form. Surprisingly, both countries are oil producing economies in the West African Monetary Zone (WAMZ) and both countries have a number of export products, 193 for Ghana and 204 for Nigeria (WTO, 2019). The question is, what influences growth in both countries? What role does export play in defining economic growth in both countries?

Traditional trade theories, such as those popularized by Adam Smith (1776), David

Ricardo (1817) and Heckscher -Ohlin -Samuelson (HOS), emphasize on division of labour, comparative advantage, and specialization as a strategy to economic growth and development. The classical trade model of Ricardo suggests that specialization or concentration of a country on production and export of goods in which it has a comparative advantage is efficient and beneficial to economic growth (Naude, 2008). Meaning that for countries to achieve real effective growth, they should concentrate their energies in the sector they have comparative advantage. On the contrary, the new trade theories argue that the notion of specialization is less effective under uncertainty, playing down the classical trade theories that promote specialization (Osakwe, 2007).

Herzer and Nowak-Lehnmann (2006) supporting the position of Prebisch and Singer (1950) emphasized that diversifying economies away from a few commodities prevents unfavourable and declining terms of trade, low added value, and sluggish growth of productivity in developing countries. Lack of product and market diversification is argued to be one of the obstacles to growth and poses several macro-economic challenges. In the absence of diversification of exports, any shock affecting the global markets is transmitted directly to trading partners. Although, the classicalist's thesis and the neoclassical economists' antithesis are still debated, current research suggests that export concentration or specialization on a small basket of risky items could be a warning indicator of inadequate export diversity (UNCTAD, 2019).

Following the unstable growth in Nigeria in the last decade despite the claim of diversification, one may support the argument by Prebisch (1950) and Singer (1950) that a strong export concentration of developing countries on primary goods impedes growth, declines the terms of trade and escalates the instability of income. This is because Nigeria has diversified horizontally rather than vertically. With the periodic adjustment of countries crude oil quota by OPEC and OPEC+, of which Nigeria is a member, one might be tempted to believe that Nigeria, whose product is concentrated on oil, has an advantage, contrary to Prebisch-Singer Hypothesis that developing countries must compete with other countries that export similar goods in the international market, because rising prices in one country make that country's product less competitive in the international market.

While data shows that Ghana may have diversified vertically, Nigeria seems to have a horizontal diversification. Horizontal diversification of exports is simply an increase in the number of primary product mixes, which usually occur within the same export industry. Vertical diversification of exports, on the other hand, occurs when a country's export structure shift from primary products to secondary or tertiary industries or manufactured goods. Although research has shown that both the horizontal and vertical diversification of exports can benefit a country's economic growth, their effectiveness is dependent on numerous factors such as technology, marketing abilities and socio-political situations. Vertical diversification requires more advanced technology, sophisticated regulations, expertise, and initial capital expenditure than horizontal diversification. The growth potentials of any economy, including Nigeria and Ghana, can neither be understood nor fully explored and exploited without an examination of these key components and factors in an empirical manner.

Also, it is quite compelling that while petroleum accounted for over 80.0 percent of total exports in Nigeria, non-oil products contributed to less than 5 percent in 2018 (NBS, 2018). Crude oil occupies predominantly Nigeria's export basket making its revenue highly unstable and economy volatile, spearheaded by the fluctuation and uncertainty surrounding oil in the global market. While Ghana's export is evenly diversified across gold, cocoa, petroleum and cashew as shown in Table 4.1 (revenue from top five export), Nigeria is concentrated on petroleum and natural gas thus making the economy easily prone to shocks.

Ghana was no exception to economic downturns as commodity price fluctuations and political instability were the primary cause of instability in Ghana's export earnings (Ackah, Aryeetey, and Aryeetey, 2009). Between 1998 and 2000, cocoa prices decline by almost 50 percent, this was accompanied by a drop in real GDP growth by 20 percent (World Bank, 2006). Because of volatility of gross revenue, export-led diversification strategies have been promoted constantly since the 1990s, particularly the policy of increasing non-traditional agriculture export growth. Increased export supply is seen as a way for the country to generate a steady stream of foreign exchange for capital and consumer goods imports (Aidam and Anaman, 2014). The case of Nigeria, with similar political instability and commodity fluctuations like that of Ghana, have been different. What is the cause of the performance difference? Against this backdrop, the primary objective of this study is to investigate empirically the relationship between economic growth and export diversification in Nigeria and Ghana.

2.0. LITERATURE REVIEW

2.1 Conceptual Review

Diversification comprises broadening the export basket and increasing the capacity of domestic companies to convert raw goods into manufactured or semi-manufactured items for export, as well as adding a new product to the export basket. Diversification is favoured because countries whose trades' baskets are dominated by oil or other primary goods are more vulnerable to price fluctuations and seasonality. As part of the export diversification process, knowledge spillovers from new manufacturing techniques, organisational or promotion strategy, could help other industries (Amin Gutierrez de Pineres and Ferrantino, 2000). The dynamic influence of export diversification on higher per capita income development can be demonstrated in the production of a growing assortment of export products. In a similar vein, Agosin (2007), proposes an export diversification and growth model in which countries below the technological frontier increase their comparative advantage by imitating and adapting dynamic market conditions.

The concentration of a country's exports on a small number of products or trading partners is measured by export concentration. It shows us if a small number of commodities account for a large proportion of a country's exports or, on the contrary, if exports are evenly spread among a wide range of products. As a result, it can be used to indicate a lack of export diversification. Diversification reduces macroeconomic volatility, as evidenced by empirical research (IMF, 2014). Furthermore, while there is little evidence that diversity can support help

low-income nations grow, a study conducted by the IMF (2014), found that diversification in both exports and output is a major factor of growth for low-income countries (LICs). Diversification into new principal export products or manufactured goods is typically thought to be a desirable thing. Higher and more steady export revenues, job creation and learning impacts, and the development of new skills and infrastructure to support the development or discovery of new export items are just a few of the advantages (Osakwe, 2007).

In an attempt to derive empirical measures of the extent and nature of export diversification in Nigeria and Ghana, the researcher adopts Samen's (2010) methods of measuring the extent of export diversification (concentration ratio and the aggregate specialization index).

Export Diversification and Concentration Ratio

The concentration ratio is used to measure the degree of diversification. It is assumed that a smaller value of the concentration ratio is associated with a broader or diversified export mix and also that it is associated with the growth and stability of export earnings. The concentration ratio is calculated as follows:

$$\mathrm{CR} = \mathrm{d_i} + \sum_{\mathrm{i}=1}^{\mathrm{N}} \frac{\left(SX_t - \frac{1}{N}\right).^2}{\frac{1}{N}} \qquad \ldots (2.1)$$

where, N represents the total number of export commodities in the export portfolio, SX_t is the actual share of the ith commodity in total exports and 1/N is assumed to be the ideal share of export earnings for each commodity.

Specialization Index (ASI)

Another method for calculating diversification or concentration is the aggregate specialization index (ASI). The ASI measures the long run structural change in the composition of the export mix. The specialization index is calculated as follows:

$$\mathrm{ASI} = \sum_{i=1}^{N} \left(\frac{X_i}{X}\right).^2 \qquad \ldots (2.2)$$

Where, X_i is the export of commodity i and X is the country's total exports and N the number of export commodities. When the specialization index is approaching zero, the export mix is said to be diverse.

2.2 Theoretical Framework

This study is anchored on Prebisch and Singer's Hypothesis, the modern Portfolio Theory and Endogenous Growth Theory. Prebisch and Singer's findings, published mainly separately in 1950, gave rise to the generally accepted belief that primary commodity prices tend to fall relative to the price of manufactured goods. While their prediction that the terms of trade will move against commodities was based on a simple examination of pricing data, their work inspired a slew of econometric studies to test the hypothesis, which have continued to this day.

This hypothesis states that the prices of raw materials (exported) decrease relative to those of manufactured products (imported) over time, resulting in a deterioration in terms of trade for commodity-producing countries, based on Raul Prebisch and Hans Singers' empirical analysis of the period 1876-1948.

Global economic expansion does not favour demand for developing country products since the impacts of technological progress are asymmetric, and the price and income elasticity of demand for agricultural and mineral resources is lower than for manufactured commodities. In the nineteenth century, classical economists such as Ricardo, Malthus, Mill and Jevons predicted that the price of primary commodities would rise relative to the price of manufactured goods in the long run, implying that commodity-producing developing countries' barter terms of trade would improve. To put it another way, the terms of trade and national income would be negatively correlated. Prebisch and Singer also emphasized the importance of sectoral diversification for commodity-exporting countries, as well as industrialization through import substitution as one of the keys to economic success. Their hypothesis does not present argument in favour of diversity per se; instead, it explains the disadvantages of specializing in the wrong sector, namely primary production, rather than manufacturing.

The foundations of Modern Portfolio Theory can be found in economist Harry Markowitz's theoretical work. According to Markowitz's (1952) diversification theory, the optimal diversification approach is a function of the means, variance, and pair-wise correlations of risky assets. Diversification has been acknowledged as a means to reduce a country' reliance on a single product or a small range of unprocessed primary exports, influenced by Modern Portfolio selection theory. According to Samen (2010), diversification will aid many emerging countries whose commerce is dominated by a few primary products. The portfolio principle can be used to calculate the advantages of diversity for an economy by selecting export portfolios that balance market risks with expected returns.

Furthermore, because exports account for a significant portion of foreign revenue, governments might reduce the risk of export volatility by expanding their export industries. This indicates that a country reliant on a few commodities for export faces significant risks in the face of high demand elasticity and commodity price volatility on the international market. The "portfolio effect" of diversification is the theory that increasing the number of export industries lead to long-term growth by stabilizing export revenues (Iwamoto and Nabeshima, 2012).

The late 1980s and early 1990s saw the emergence of the Endogenous Growth Theory, which was driven by (Romer, 1986, Lucas, 1988, Grossman, 1991). It asserts that human capital investment, knowledge, and innovation all contribute considerably to growth. The endogenous growth theory claims that an economy's long-term growth rate is mostly determine by policy decisions. Externalities and positive spill over effects can also contribute to economic growth, according to the idea. It also emphasizes how important human capital and technical skills are in diversification (Aghion and Howitt, 1998; Lucas, 1988).

2.3 Empirical Literature

Doki and Tyokohol (2019) used annual data from 1981-2016 to examine the effect of export diversification and economic growth in Nigeria. Using Autoregressive Distributed Lags (ARDL)

techniques, they discovered that export diversification has a positive, though insignificant, effect on economic growth in Nigeria in the long and the short-run (meaning that export diversification is not a factor that influences growth in Nigeria). Similarly, Innocent and Paul (2018) used the ARDL bound testing approach to cointegration to investigate the impact of export diversification on Nigerian economic growth from 1980 to 2016. Export diversification has a positive but insignificant impact on Nigeria's economic progress, according to the findings. Export of products and services, as well as their growth rate, had a positive and statistically significant impact on the country's economic growth, whereas trade openness had a negative and insignificant impact. Additionally, investment, as measured by gross fixed capital formation, had a statistically significant positive connection with economic growth. The study, however, did not consider the impact of the real exchange rate and domestic financing, which could have a combined effect with export diversification.

Joshua, Gubak and Dankumo (2016) investigated the growth of non-oil sectors as a key to diversification and economic performance in Nigeria, using the Auto-regressive Distributed Lag (ARDL) and VECM Granger causality model to estimate the short-and long-term parameters as well as the direction of causation of the variables. The findings demonstrated that the variables were cointegrated. Agriculture and telecommunication components are positively contributing to GDP, according to long-run characteristics. Mubeen and Ahmad (2016) used Gini Hirschman (GHI) to explore the factors and degree of export diversification in Pakistan. Using time-series data from 1980 to 2015, the study looked at the determinants of export diversification. To observe long-term correlations in the underlying variables, the researchers used the Auto-regressive Distributed Lag technique. According to the study, geographic concentration of exports increases product concentration in exports and decreases export diversification. Foreign direct investment, world income, and the real effective exchange rate all play a role in increasing export diversification. Trade openness, on the other hand, boosts export concentration.

The importance of country-specific variables in determining the mechanism of diversification of the export was investigated by Noureen, Mahmood, and Sector (2014). The article created a time series for export diversification using the Herfindahl index. Foreign direct investment, domestic investment, competitiveness, depreciation of home currency, financial sector development, and institutional strength were all found to be significantly and positively connected to export product diversity, according to the researchers.

The Error Correction Model (ECM) was used by Esu and Udonwa (2015) to determine the extent to which Nigeria would benefit from diversifying its economy. Their findings demonstrated that diversification benefits the economy and that Nigeria might benefit from its mostly untapped trade potential in both the short and long term. They argued that this could be accomplished by making deliberate efforts to diversify the economy, supporting large-scale industrialization of the non-oil sector, emphasizing the deepening of technology in any discussion of trade and investment, and increasing the momentum of industrialization in the non-oil sector.

Mudenda, Choga and Chigamba (2014) looked at the impact of export diversification on economic growth in South Africa between 1980 and 2011. The study demonstrated that export diversification and trade openness are positively associated with economic growth using the Vector Error Correction (VEC) model. As a result, they advocated for the continuation of trade liberalization as well as the promotion of innovation and new products. Sannassee et al. (2014) used a vector co-integration approach to investigate Mauritius' diversification and economic progress. They discovered a positive association between export diversification and economic growth in Maurutius, both in the short and long-term, using the inverse of the Herfindahl index as a measure of diversification and real GDP per capita as a measure of economic development.

In an attempt to answer the question of what motivates African export diversification, Kamuganga (2012) used the conditional logit technique and highly disaggregated bilateral trade flows at HS 6-digit level for African countries from 1995 to 2009. He discovered that intra African regional trade cooperation increases the possibility of an African nation exporting fresh goods and fresh market margins. The study further found that infrastructure-related trade frictions, such as export pricing, time to export, export procedures and insufficient export support institutions, have a detrimental influence on African export diversification. Likewise, macroeconomic issues, such as currency rate instability, financial underdevelopments and improper foreign direct investment were found to inhibit African countries' ability to diversify their exports.

Ferdous (2011) looked into the factors that influence East Asian export diversification. Official exchange rate, tariff, and GDP, were determine to be key determinant of export diversification using fixed effects panel analysis. Export diversification is facilitated by greater integration, according to the research. Depreciation of the currency encourages exporters from other industries, which helps diversify the economy. Similarly, in the middle-income countries of Asia and Latin America, Hong, Long and Anho-Dao (2015) investigated the link between export diversification and the real exchange rate from 1995 to 2015. The study discovered that both variables have bidirectional causality.

Between 1980 and 2007 Arip, Yee and Abdulkarim (2010) looked into the long-term relationship between export diversification and economic growth in Malaysia. Export diversification aided Malaysia's economic progress, according to the findings of the study. They also said that Malaysia needed to diversify its export in order to preserve long-term growth.

2.4 Gaps in Empirical Literature

It is evident from the studies reviewed above that recent studies on similar topics are limited, especially in examining the effect of export concentration on growth. Majority of the studies focus on export diversification and economic growth, ignoring the effects of key variables such as real exchange rate and the domestic credit that may have an effect cumulatively with diversification on growth. The study is anchored on the Prebisch and Singer Hypothesis, the modern portfolio theory and the endogenous growth theory. This research is distinct from previous studies. It focuses on export concentration (as a measure of the degree of export

diversification) and includes key variables such as domestic credit and real exchange rate as well as further comparing the exports concentration of both countries and their trade partners.

3.0: Methodology

This study hinges on the Prebisch-Singer Hypothesis which argues for export diversification away from primary exports. Since this work is exploratory in nature, it sets out to determine the impact of export diversification on economic growth in Nigeria and Ghana; the secondary research design (correlational and regression method) was adopted.

3.1 Model Specification

To examine the impact of export diversification on economic growth, this study is based on the analytical framework of` Cobb-Douglas production function below:

$$Y = AK^{\alpha} L^{\beta} \quad (3.1)$$

where, Y denotes a country's output level (GDP), A is the state of technology or production efficiency exogenously determined, K and L as capital and labour, respectively. The model shows that output is determined by the productivity parameter and its inputs of labour and capital.

From the algebraic form into log-linear form, equation (3.1) is stated as:

$$logY = logA + \alpha logK + blogL \quad (3.2)$$

Thus, the general form of the model for the study is expressed as:

$$GDPGR = f(\alpha_1 + \alpha_2 X_t + \mu_t) \quad (3.3)$$

where, GDPGR is gross domestic product growth rate, and X_t is a set of growth determining factors.

Consequently, the study adopts and modifies the model of Doki and Tyokohol, (2019) which has its theoretical basis on the Prebisch-Singer Hypothesis and the production function. The implicit form of the model is given as:

$$lnPCGDP = f(EXDIV, DOP, DIN, lnEXC, FDI) \quad (3.4)$$

where, lnPCGDP = logarithm of Gross Domestic Product per capita, EXDIV = Export Diversification index, DOP = Degree of Trade Openness, DIN = Domestic Investment (proxied by gross fixed capital formation), lnEXH = logarithm of Exchange Rate.

To achieve the objective of this study and reflect the Nigerian and Ghana context, the equation is modified to capture other growth determinants not included in (3.4) and stated as:

$$GDPGR = f(EXDIV, OPN, GFCF, EXCHR, DOMCREDIT, INFL, TLF \text{ and } POPGR) \quad ...(3.5)$$

where, GDPGR = Gross Domestic Product Growth Rate, EXDIV = degree of Export Diversification, OPN = Degree of Trade Openness, DOMCREDIT = Domestic credit, EXCHR = Exchange Rate, GFCF = (proxy for capital stock), INFL = inflation rate, TLF = Total labour force and POPGR = population growth rate.

Equation 3.5 can further be stated as:

$$\Delta GDPGR_t = \alpha_0 + \sum_{i=1}^{k} \alpha_{1i} \Delta EXDIV_{t-i} + \sum_{i=1}^{k} \alpha_{2i} DOMCREDIT_{t-i} + \sum_{i=1}^{k} \alpha_{3i} \Delta OPN_{t-i} + \sum_{i=1}^{k} \alpha_{4i} \Delta GFCF_{t-i} + \sum_{i=1}^{k} \alpha_{5i} \Delta EXR_{t-i} + \sum_{i=1}^{k} \alpha_{6i} \Delta INF_{t-i} + \sum_{i=1}^{k} \alpha_{7i} \Delta POPGR_{t-i} + \sum_{i=1}^{k} \alpha_{8i} \Delta TLF_{t-i} + \varepsilon_{1t} \quad \ldots (3.6)$$

where, α_0 represents the intercept, α_1-α_8 are the coefficients, ε is the error term.

Apriori, export diversification (EXDIV), domestic credit (DOMCREDIT), gross fixed capital formation (GFCF), Total labour force (TLF) and real exchange rate (EXCHR), are expected to exert positive effect on economic growth; while, degree of trade openness (OPN), inflation (INFL) and population growth rate (POPGR) are expected to be either positive or negative.

The data used in the study are mainly from secondary sources. Time series data for the study were obtained from World development indicator 2019, data on export concentration were obtained from WITS (2019). The data used span the period of 1995 to 2018. This period 1995 to 2018 is utilized, as data on export concentration are available only within this span on the WITS (2019) database.

3.2 Estimation Technique

The ARDL regression technique was applied on the historical data since the unit root of the data set when subjected to preliminary test were found to be integrated of order zero I(0) and order one I(1). The study first investigated the time series properties of the data by using Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) tests after which the tests for short-run and long-run relationships using (ARDL) approach were conducted.

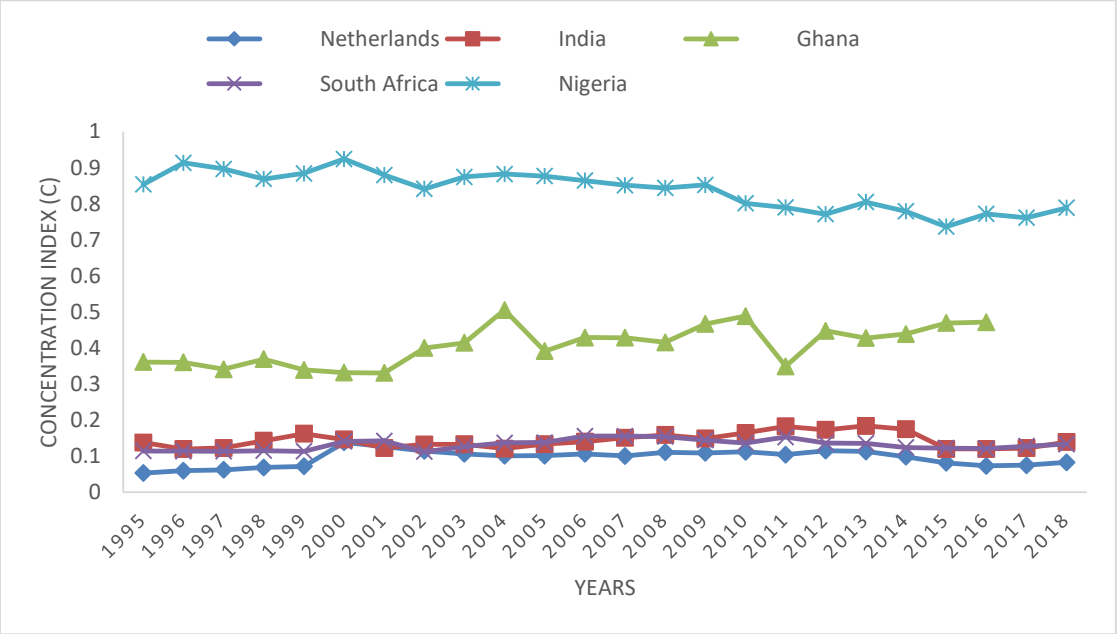
Cointegration Test was used to ascertain whether the parameter estimates of the economic relationship or model are theoretically meaningful and statistically satisfactory in the long run. The Bound test technique developed by Pesaran, Shin and Smith (2001) known as the Autoregressive Distributed Lag (ARDL) bound test was applied. The calculated F-statistic of the bound test was compared with two sets of critical values to motivate our decision.

4.0: Presentation and Analysis of Empirical Results

This section presents a stylized fact on export concentration. It also presents the regression results as well as the interpretation. The procedure for estimation involves, unit root test, the Bound test of co-integration, ARDL regression results and finally, diagnostic test.

4.1 Stylized Facts on Export Concentration

Figure 4.1: Trend of Export Concentration of Ghana, Nigeria and selected trade partners



Source: Authors' computation on the basis of data from WITS (2019)

Figure 4.1 shows the trend of export concentration (C) of Ghana, Nigeria and selected trade partners. If a country exported only one commodity, C would be 1. Concentration would then be at a maximum. In no case could C be more than 1 or less than 0. In general, therefore, the closer C is to 1 the greater the degree of concentration, and conversely, the closer it is to 0 the greater the degree of diversification. It is observed that Nigeria and Ghana have a higher concentration compared to their export partners, India, Netherland and South Africa. Nigeria has the highest export concentration which implies that her earnings come from a small number of products when compared to Ghana and other trade partners whose exports are comprised of a larger number of products as indicated by their lower export concentration ratio. Consequently, instability of export earnings as a result of endogenous and exogenous shocks will have different effect on economic growth for both Nigeria and Ghana. The degree of export diversification for both countries is further corroborated with the data in Table 4.1 below.

Table 4.1: Top Five Export Products of Nigeria and Ghana (US$ Million)

2008	**Nigeria**	**US$**	**%**	**Ghana**	**US$**	**%**
1	Petroleum oils and bituminous oil	74.832	96.0%	Gold (semi-manufactured)	1.722	56.5%
2	Floating or submersible drilling	1.443	1.9%	Cocoa beans	1.031	33.8%
3	Goat or kid skin leather	0.647	0.8%	Cashew nuts fresh or dried	0.119	3.9%
4	Cocoa beans	0.510	0.7%	Gold in unwrought form	0.092	3.0%
5	Polyethylene	0.492	0.6%	Wood not sawn	0.084	2.7%
	Total	**77.924**	**100**		**3.048**	**100**
2012	**Nigeria**	**US$**	**%**	**Ghana**	**US$**	**%**
1	Petroleum oils and bituminous oil	99.055	76,4%	Gold in semi-manufactured	5.790	43.3%
2	Petroleum oils, crude	12.279	9.5%	Petroleum oils and bituminous oil	3.684	27.6%
3	Technically specified rubber	9.385	7.2%	Cocoa beans	1.968	14.7%
4	Natural gas, liquefied	5.570	4.3%	Gold in unwrought form	1.302	9.7%
5	Ethylene, propylene, butylene	3.308	2.6%	Butanes, liquefied	0.616	4.6%
	Total	**129.597**	**100**		**13.361**	**100**
2016	**Nigeria**	**US$**	**%**	**Ghana**	**US$**	**%**
1	Petroleum oils and bituminous oil	26.980	85.6%	Gold in semi-manufactured	4.345	50.4%
2	Natural gas, liquefied	3.847	12.2%	Cocoa beans	1.886	21.9%
3	Petroleum gases and other gaseous hydrocarbon	0.301	1.0%	Petroleum oils and bituminous oil	1.079	12.5%
4	Cocoa beans	0.231	0.7%	Cashew nuts, fresh or dried	0.987	11.5%
5	Propane, liquefied	0.151	0.5%	Coniferous wood sawn	0.315	3.7%
	Total	**31.509**	**100**		**8.613**	**100**
2017	**Nigeria**	**US$**	**%**	**Ghana**	**US$**	**%**
1	Petroleum oils and bituminous oil	36.057	85.7%	Gold in semi-manufactured	5.674	49.3%
2	Natural gas, liquefied	5.196	12.4%	Petroleum oils and bituminous oil	3.620	31.4%
3	Petroleum gases and other gaseous hydrocarbon	0.432	1.0%	Cocoa beans, whole or broken	1.642	14.3%
4	Petroleum gases and other gaseous hydrocarbon	0.197	0.5%	Cashew nuts, fresh or dried	0.296	2.6%
5	Cocoa beans	0.191	0.5%	Cocoa paste, wholly or partly defeated	11.514	100
	Total	**42.064**	**100**		**11.514**	**100**
2018	**Nigeria**	**US$**	**%**	**Ghana**	**US$**	**%**
1	Petroleum oils and bituminous oil	51.371	86.4%	Gold semi-manufactured	5.445	38.4%
2	Natural gas, liquefied	6.151	10.3%	Petroleum oils & bituminous oil	5.195	36.6%
3	Tugs and pusher craft	1.198	2.0%	Cocoa beans	2.437	17.2%
4	Petroleum gases and other gaseous hydrocarbon	0.425	0.7%	Gold in unwrought form	0.648	4.6%
5	Cocoa beans	0.302	0.5%	Cashew nuts, fresh or dried	0.458	3.2%
	Total	**59.447**	**100**	**Total**	**14.182**	**100**

Source: Authors' computation on the basis of data from WITS (2019)

Table 4.1: shows the top five export products of Nigeria and Ghana. From the table it can be concluded that while petroleum is the major component of Nigeria's revenue (96%, 76.4%, 85.6%, 85.7% and 86.4% were the oil composition of the top five revenue for 2008, 2012, 2016, 2017 and 2018 respectively), Ghana's revenue is evenly distributed around gold, petroleum and cocoa. Between the period 2012 to 2018, revenues' composition for gold, petroleum and cocoa in Ghana were 50.4%, 12.5% and 21.9% respectively for 2016; 49.3%, 31.4% and 14.3% for 2017; and 38.4%, 36.6%, 17.2% for 2018. Figure 4.1 and Table 4.1 show the diversification drive in Ghana is high compared to Nigeria. A high concentration on one export commodity can pose a negative economic implication in terms of revenue instability, planning and growth, because of shocks from world commodity market and other phenomena (such as the COVID -19 global pandemic, when oil prices crashed as low as $5 per barrel in 2020).

4.2 Unit Root (Ghana)

Table 4.2: Unit Root Test Results in Levels and Difference

	Level (prob-value)	Difference (prob-value)	95% critical level	Order of co-integration
GDPGR	-2.944088	-5.420415	-3.632896	1(1)
EXPDIV	-2.990431	-5.946961	-3.632896	1(1)
OPN	-3.138112	-4.709781	-3.644963	1(1)
GFCF	-2.895363	-4.469756	-3.644963	1(1)
EXCHR	-2.641055	-4.254507	-3.632896	1(1)
DOMCREDIT	-2.147097	-6.004671	-3.632896	1(1)
TLF	-2.655417		-1.956406	1(0)
INFL	--4.077406		-3.622033	1(0)
POPL	-4.959714		-3.632896	1(0)

Source: *Computed by Author using Eviews 10*

Table 4.2, presents the results of the unit root tests based on Augmented Dickey-Fuller and Dickey fuller tests. It shows that total labour force, inflation rate and population growth rate were stationary at levels while other variables, real exchange rate, degree of openness, export diversification, domestic credit and GDP growth rate were all stationary at first difference.

4.2.1 Unit Root (Nigeria)

Table 4.2.1: Unit Root Test Results in Levels and Difference

	Level (prob-value)	Difference (prob-value)	95% critical level	Order of co-integration
GDPGR	-4.303042		-3.622033	1(0)
EXPDIV	-1.567908	-5.721691	-3.632896	1(1)
OPN	-3.251522	-4.846412	-3.644963	1(1)
GFCF	-8.425489		-3.632896	1(0)
EXCHR	-2.286998	-5.152717	-3.632896	1(1)
DOMCREDIT	-0.651507	-3.006801	-1.957204	1(1)
TLF	-0.783275	-3.479228	-3.190000	1(1)
INFL	-10.70456		-3.622033	1(0)
POPL	-4.835308		-3.632896	1(0)

Source: *Computed by Author using Eviews 9*

Table 4.2.1, also shows that GDP growth rate, GFCF, Inflation rate and population growth rate were stationary at levels I(0) while the other variables, real exchange rate, domestic credit and export diversification index were all stationary at first difference I(1).

Table 4.3: ARDL Bounds Test (Nigeria)

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	8.155985	10%	2.03	3.13
K	7	5%	2.32	3.5
		2.5%	2.6	3.84
		1%	2.96	4.26

Source: Author's computation (2021)

Table 4.3.1: ARDL Bounds Test (Ghana)

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	5.622482	10%	1.95	3.06
K	8	5%	2.22	3.39
		2.5%	2.48	3.7
		1%	2.79	4.1

Source: Author's computation (2021)

The co-integration test was conducted to ascertain the long run relationship among the variables. Table 4.3 and 4.3.1 show the results of the co-integration analysis. From the table, it can be seen that the calculated F-statistic values exceeded their upper bound critical values for

both Nigeria and Ghana. This means the null hypothesis of no co-integration among the variables used is rejected at the 5% level hence there exist cointegration (a long run relationship) between the variables. Thus the result is a sufficient condition for fitting the error correction mechanism model.

4.4 ARDL Error Correction Regression (Nigeria and Ghana)

Variables	**NIGERIA**		**GHANA**	
D(EXPDIV)	-14.443790	(0.5084)	-46.280584	(0.0128)
D(OPN)	-4.622961	(0.4580)	18.396774	(0.0060)
D(GFCF)	0.031977	(0.2896)	0.0000001	(0.0076)
D(EXCHR)	-0.003179	(0.6837)	-0.758242	(0.0412)
D(DOMCREDIT)	0.104987		-0.697286	(0.0520)
	(0.4676)			
D(TLF)	-11.476254		-5.398401	(0.0040)
	(0.0107)			
D(INFL)	0.266257		0.133720	(0.1162)
	(0.0008)			
D(POPGR)	--------		-140.84083	(0.0051)
CointEq(-1)*	-1.241064	(0.0008)	-1.909252	(0.0000)
R-squared	**0.839541**		**0.955341**	
Adjusted R-squared	0.607768		0.859645	
Durbin-Watson stat	2.349127		2.575090	
Diagnostics				
Normality	JB 1.41163		JB 1.5041	
	(0.49370)		(0.47138)	
Heteroskedasticity Test	F-statistic 1.3225		F-statistic 3.2208	
	(0.3433)		(0.8055)	
Serial Correlation	F-statistic 0.83429		F-statistic 0.603	
	(0.3877)		(0.1229)	

Source: *Computed by Author using Eviews 9*

The result of Table 4.4 shows that the R-Square value of 0.83 and 0.95 were obtained for Nigeria and Ghana, respectively. This implies that 83.9 percent of the total variation in economic growth in Nigeria are explained by changes in the explanatory variables. In the same vein, 95.5 percent of the total variation in economic growth in Ghana are explained by changes in the explanatory variables. The error correction terms are negative and significant at 5% probability level. The existence of long-run equilibrium among the time series variables is validated by these results. Also, with respect to the diagnostics, the estimates conformed to the OLS (BLUE) properties, as there are no perfect multicollinearity, heteroscedasticity, no serial correlation and the data are normally distributed.

With respect to the variables, the coefficients of exchange rate (EXCHR) are -0.0031 (P-value = 0.6837), and -0.7582 (P-value = 0.0412) for both countries; this indicates a negative and insignificant relationship between exchange rate and economic growth at 5% level of significance in Nigeria but a significant negative relationship between exchange rate and

economic growth at 5% level of significance in Ghana. This implies that a decrease in the value of the exchange rate increases GDPGR by 0.75 units in Ghana.

The coefficients of export concentration (EXPDIV) are -14.443 (P-value = 0.5084), and -46.208 (P-value = 0.0128), for Nigeria and Ghana. This indicates a negative and insignificant relationship between export diversification and economic growth in Nigeria but significant negative relationship in Ghana. The economic implication of this might be that as Ghana strives for diversification, in the short-run there may likely be decline in growth which may be offset in the long run.

The coefficients of economic openness are - 4.622 (P-value = 0.4580), and 18.396 (P-value = 0.0060), for Nigeria and Ghana respectively. The result thus indicates a positive and significant relationship between the degree of economic openness and economic growth at 5% level of significance in Ghana and insignificant negative relationship in Nigeria. This result points to the fact that, the more open and business viable an economy is, the more growth it is likely to attract.

4.5 ARDL Long Run Result (Nigeria)

Long Run Coefficient

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXPDIV	24.405958	12.802605	1.906327	0.0890
OPN	-3.724997	4.358241	-0.854702	0.4149
GFCF	0.066375	0.048923	1.356724	0.2079
EXCHR	0.012363	0.008807	1.403829	0.1939
DOMCREDIT	-0.199986	0.081991	-2.439124	0.0374
TLF	9.247108	3.330839	2.776210	0.0215
INFL	0.128694	0.090102	1.428319	0.1870
C	-178.601163	65.227108	-2.738143	0.0229

4.5.1 ARDL Long Run Result (Ghana)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXPDIV	-29.778194	8.228085	-3.619092	0.0085
OPN	9.635592	2.403773	4.008528	0.0051
GFCF	0.000000	0.000000	4.788625	0.0020
EXCHR	0.192205	0.044242	4.344383	0.0034
DOMCREDIT	-0.365214	0.147773	-2.471449	0.0427
TLF	-1.158007	0.176219	-6.571393	0.0003
INFL	0.117195	0.074542	1.572213	0.1599
POPGR	-6.279396	4.594763	-1.366642	0.2140
C	65.275789	15.338624	4.255648	0.0038

The results of the long run relationship in Table 4.5 and 4.5.1 are very interesting and revealing. The result reveals that for Nigeria, while the coefficient of export diversification was significant at 10% level, the coefficients of total labour force had significant positive domestic

impact on growth and domestic credit had negative significant relationship with growth. On the other hand, gross fixed capital formation, exchange rate and inflation are insignificant but positive while economic openness is negatively insignificant. The result is an indication that Nigeria's export concentration is high as revealed also in Figure 4.1, which is not ideal for revenue stability. Also, the negative impact of economic openness, points to the hiccups on the ease of doing business in Nigeria. For domestic credit, there is no adequate single digit interest rate for businesses to strive hence the negative relationship.

For Ghana the case is very different. The result helps us to answer the question raised in section one, on what influences growth in both countries and what role does export concentration play in defining economic growth differently in both countries? While, the long run result reveals that unlike Nigeria, there is negative significant relationship between export diversification and growth in Ghana (i.e., export diversification inversely affects growth), which may be as a result of her low concentration (Figure 4.1). Economic openness, GFCF and exchange rate are positive and significant. This sets both countries apart.

V. Conclusion and Recommendations

This study compares export diversification and economic growth in Nigeria and Ghana. The objective was to investigate empirically the impact of export diversification on economic growth in both countries. The study employed the ARDL regression techniques to address this specific objective. This study found out from reviewing previous studies that there was no concluding evidence of the impact of diversification on growth. More so they neglected to include openness, domestic credit, total labor force, exchange rate among others that may have an effect cumulatively with diversification on growth. In addressing the gap, the study included these variable and adapted the production function model.

The study revealed that Nigeria has the highest export concentration when compared to Ghana and other trade partners, which implies that her earnings come from a small number of products unlike Ghana and her trade partners whose exports are comprised of a larger number of products (Figure 4.1). Findings from Table 4.1 which showed the revenue obtained from top five export products of Nigeria and Ghana revealed that while petroleum is a major component of Nigeria's revenue, Ghana's revenue is evenly distributed around gold, petroleum and cocoa.

The ARDL short term result revealed that export diversification was insignificant in Nigeria but significant in Ghana negatively which was quite surprising. Economic openness however had a negative and insignificant impact on growth in Nigeria but a positive and significant impact in Ghana, which can be attributed to the sustained growth in Ghana. In the long run in Nigeria, the study revealed that the coefficients of export diversification, economic openness, exchange rate, GFCF all had insignificant impact on growth. For Ghana, although export diversification was negative, economic openness, GFCF and exchange rate had positive and significant impact on growth.

Recommendations

Following the findings of this study, some recommendations are presented below:

1 From the study, exchange rate had insignificant impact on Nigeria's economic growth, compared to Ghana which had significant positive impact. Nigeria will need a more complicated monetary policy focused on inflation (inflation targeting monetary policy, i.e., single digit) as well as exchange rate (favourable exchange rate). When managing inflation, unemployment, growth, and exchange rates monetary policy becomes more complicated. As a result, maintaining external competitiveness and promoting growth remains a difficult challenge for policymakers, as it necessitates the management of an exchange regime in conjunction with other consistent macroeconomic policies. Since export diversification had a significant negative impact but economic openness had a significant positive impact on Ghana's economy; Nigeria should pursue policies targeted at not just only promoting diversification of export but economic policies that are economically friendly to attract more foreign inflows, such as tax incentives, financial subsidies and regulatory exemptions, etc.

2 Considering the negative and significant impact of domestic credit in the Ghana's growth process which points to the dearth of single digit credit facilities for enterprises at a larger scale. Therefore, there is need for Nigeria's Government and Central bank to re-evaluate the credit market, remove every bottle-neck (high lending rate, collateral, guarantors, among others) that impairs borrowing and set a framework that will strengthen the domestic credit market as well as pass relevant laws to prosecute commercial and microfinance banks that violate credit rules and regulations.

REFERENCES

Agosin, M. R. 2007. "Export Diversification and Growth in Emerging Economies." Working Paper No. 233. Departamento de Economía, Universidad de Chile.

Aghion, P., and P. Howitt. (1998). *Endogenous Growth Theory*. Cambridge, MA: MIT Press.

Aidam, P.W. and Anaman, K.A. (2014) Export Earnings Instability and Investment in Ghana, 1981 to 2011. *Modern Economy*, 5, 625-634.

Amin Guitierrez de Pineres, S., and M. J. Ferrantino. 2000. Export Dynamics and Economic Growth in Latin America. Burlington, Vermont: Ashgate Publishing Ltd.

Arip, M. A., Yee, L. S. and Karim, B. A. (2010). Export diversification and economic growth in Malaysia. https://mpra.ub.uni-muenchen.de/20588/1/MPRA. (Retrieved on 22nd May, 2020)

De Piñeres, S. A. G., & Ferrantino, M. J. (2000). Export dynamics and economic growth in Latin America: a comparative perspective. Ashgate Publishing. Mexico City.

Doki, N. O and Tyokohol, M. Y (2019). Export Diversification and Economic Growth in Nigeria. *International Journal of Economics and Financial Management,* 4(2): 2545 – 5966

Esu, G. E. and Udonwa, U. (2015). Economic diversification and economic growth: Evidence from Nigeria. *Journal of Economic and Sustainable Development*: 6(16): 56-68.

Ferdous, F. B. (2011, February). Pattern and determinants of export diversification in East Asian economies. In *Proceedings of the International Conference on Social Science and Humanity*. (pp. 26-28). Singapore. http://www.ipedr.com/vol5/no1/33-H00080.pdf. (Retrieved on 3rd April, 2020)

Grossman G.M. (1991), Helpman E. Innovation and growth in the global economy. Cambridge: MIT Press.

Herzer, D., and Nowak-Lehnmann D, F. (2006). What does export diversification do for growth? An econometric analysis. *Applied economics, **38***(15): 1825-1838.

Hong, P. M., Long, T. H. A. I., and Anh-Dao, T. T. (2015). Real exchange rate and export diversification: A causality analysis. *The Journal of International Trade & Economic Development, 16* (4): 101-134.

International Monetary Fund (2014). Sustaining Long-Run Growth and Macroeconomic Stability in Low-Income Countries- The Role of Structural Transformation and Diversification". In: IMF Policy Paper (2014).

Innocent, U. D. and Paul, O. E (2018), "Empirical Investigation of the Impact of Export Diversification on Economic Growth: Evidence from Nigeria, 1980-2016" *Journal of Economics, Management and Trade* 21(7): 1-24: 2456-9216

Iwamoto, M., and Nabeshima, K. (2012). Can FDI promote export diversification and sophistication of host countries? Dynamic panel system GMM analysis. *Institute of Developing Economies, Japan External Trade Organization (JETRO).* IDE Discussion Paper No. 347. https://ideas.repec.org/p/jet/dpaper/dpaper347.html. (Retrieved on 22nd May, 2020)

Joshua S.R, Gubak H.D and Dankumo A.M (2016) Growth of Non-Oil Sectors: A Key to Diversification and Economic Performance in Nigeria *Public Policy and Administration Research,* 6 (3): 2224-5731

Kamuganga, D. N. (2012). What drives Africa's export diversification? (Graduate Institute Of International And Development Studies Working Paper No. 15/2012). *Geneva, Switzerland: International Economics Session*. http://hdl.handle.net/10419/77445. (Retrieved on 3rd April, 2020)

Lucas R. E. (1988) On the mechanics of economic development. Journal of Monetary Economics. 1(22):3-42.

Markowitz, H. (1952). Portfolio Selection. The Journal of Finance, 7(1), 77-91

Mubeen, N. and Ahmad, N. (2016). Towards measurement and determinants of export diversification: An empirical analysis of Pakistan. *Pakistan Journal of Commerce and Social Sciences, 10*(3): 588-605. https://www.econstor.eu/handle/10419/188269. (Retrieved on 3rd April, 2020)

Mudenda, C., Choga, I. &Chigamba, C. (2014). The role of export diversification and economic growth in South Africa. *Mediterranean Journal of Social Sciences*. 5 (9):1-25.

Naudé, W.A. (2008). `Entrepreneurship in Economic Development', UNU-WIDER Research Paper no. 20/2008, United Nations University, Helsinki.

Noureen, S., Mahmood, Z. and Sector, H. (2014). Explaining trends and factors affecting export diversification in ASEAN and SAARC regions: An empirical analysis. *Nust Journal of Social Sciences and Humanities*, 2(1), 1-28.

Osakwe, P. N. (2007). Foreign aid, resources, and export diversification in Africa: A new test of existing theories. *African Trade Policy Centre* Working Paper N. 61. Economic Commission for Africa. https://mpra.ub.uni-muenchen.de/2228/ (Retrieved on 2nd October, 2020)

Prebisch, R., (1950), "The economic development of Latin America and its principal problems," *United Nations, New York. https://repositorio. cepal.org/handle/ 11362/ 29973*. (Retrieved on 2nd October, 2020)

Romer P.M. (1986) Increasing returns and long run growth. Journal of Political Economy. 5(94):1002-1037.

Samen, S. (2010). A primer on export diversification: key concepts, theoretical underpinnings and empirical evidence Growth and Crisis Unit, World Bank Institute. *https://web.worldbank.org/archive/website01601/WEB/PRIMER_E.HTM* (Retrieved on 2nd October, 2020)

Sannassee, R. V., Seetanah, B. and Lamport, M. J. (2014). Export diversification and economic growth: The case of Mauritius. World Trade Organization assisted paper.

Singer, H., (1950), "The distribution of gains between investing and borrowing countries," *American Economic Review* ***40***(2): 473-85.

Trading Economics (2020). Countries Indicator. https://tradingeconomics.com/ (Retrieved on 2nd December, 2020)

UNCTAD (2019).Indicators explained: Export Product Index and Export concentration Index *https://unctadstat.unctad.org/en/IndicatorsExplained/statie2019d1_en.pdf.* (Retrieved on 2nd October, 2020)

World Bank (2006). Doing Business in 2006, Country Profile: Ghana, Washington DC: World Bank.

World Bank (2019). World Development Indicators| World Databank [WWW Document]. http://databank.worldbank.org/data/reports.aspx?source=world-developmentindicators (Retrieved on 2nd November, 2019).